The implementation of monetary policy in Italy: the role of repo operations and official rates

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Summary and introduction

In Italy, the tactics of monetary policy are based both on the setting of official rates and on open market operations, mainly conducted through variable rate auctions on securities repurchase agreements. Official rates are moved in discrete steps and infrequently; allotment rates at repo auctions are indirectly influenced by the Bank of Italy through liquidity control, and usually move in a more flexible and gradual way. This paper addresses the issue of their different role in monetary transmission.

Section 1 describes the main institutional features of the monetary instruments in Italy and discusses in some detail the setting of policy rates and their relation to liquidity management. Section 2 compares the Italian situation with that of other countries and discusses the implications of different tactics in interest rate management. Section 3 presents econometric estimates of the effect of both official rates and repo rates in monetary transmission (on bank rates, short and long-term market rates and non-financial agents' expectations).

1. Monetary policy instruments of the Bank of Italy

Since the eighties, a number of institutional reforms have improved the working of the monetary and financial markets and the effectiveness of indirect monetary control. Among these,[1] the creation of the screen-based interbank market (MID) in February 1990 and the introduction of reserve averaging in October 1990 were aimed at decreasing the volatility of very short-term interest rates and fostering their role as operating targets. Monetary procedures have increasingly focused on the control of very short-term interest rates.[2] To this end, the Bank of Italy relies mainly on two instruments: the setting of official interest rates and open market operations (mainly repurchase agreements).

The official discount rate and the rate on fixed-term advances are set by the Governor of the Bank of Italy.[3] They are changed infrequently and by relatively large increments: in the period between 1990 and 1996, the discount rate was changed, on average, every 98 days and by 75 basis points each time. The *discount rate* applies to ordinary advances,[4] a collateralised overdraft facility for

1 The main reforms concerned the working of the monetary and financial markets, the setting of official rates, the Treasury's accounts with the Bank of Italy and the required reserve regime. See Gaiotti and Salvemini (1992), Gaiotti (1992) and Passacantando (1996). On the passage from indirect to direct controls in the 1980s, see also Majnoni and Zautzik (1986).

2 This development is common to many other countries. According to BIS (1986), since the mid-1980s short-term rates have played a major role as operating targets in almost all countries, while changes in instruments and procedures were intended to make interest rate setting more flexible.

3 The Governor of the Bank of Italy has directly set official rates since 1992. Previously, the formal decision was taken by Treasury acting on a proposal from the central bank. See Passacantando (1996).

4 Ordinary advances derive from the "conti di anticipazione e deposito", which were used for transactions and as a liquidity buffer before the introduction of reserve averaging. Its role has diminished since then. The credit granted through this facility has gradually decreased since the mid-1980s (on September 1996 it was about 1.8 trillion lire);

commercial banks that is accorded automatically but whose amount is limited; although the discount rate has very little direct impact on the banks' refinancing costs,[5] it is seen by market participants as an important signal of the medium-term orientation of monetary policy. It is normally below market rates.

Fixed-term advances[6] are a standing facility to cope with unexpected end-of-day liquidity needs. Since May 1991, the rate on this facility has been uniform for all banks and equal to the discount rate plus a surcharge, as a consequence of reform aimed at increasing its role as an instrument of monetary policy and its signalling content. In normal conditions, the rate on fixed-term advances represents a ceiling on short-term fluctuations of money market interest rates. The Bank of Italy has occasionally rationed the supply of fixed-term advances, thus letting short-term rates temporarily rise above the rate on fixed-term advances.

Repurchase agreement operations[7] and *currency swaps*[8] are the main source of Bank of Italy refinancing to the banking system (Figure 1).[9] Repos are the more relevant in signalling the monetary stance to the market, since they are the instrument used to regulate liquidity in the face of

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since the overnight rate is usually above the discount rate, due to arbitraging all available credit on the overdraft is used.

5 Commercial bill discounting also exists but the amounts involved are negligible.

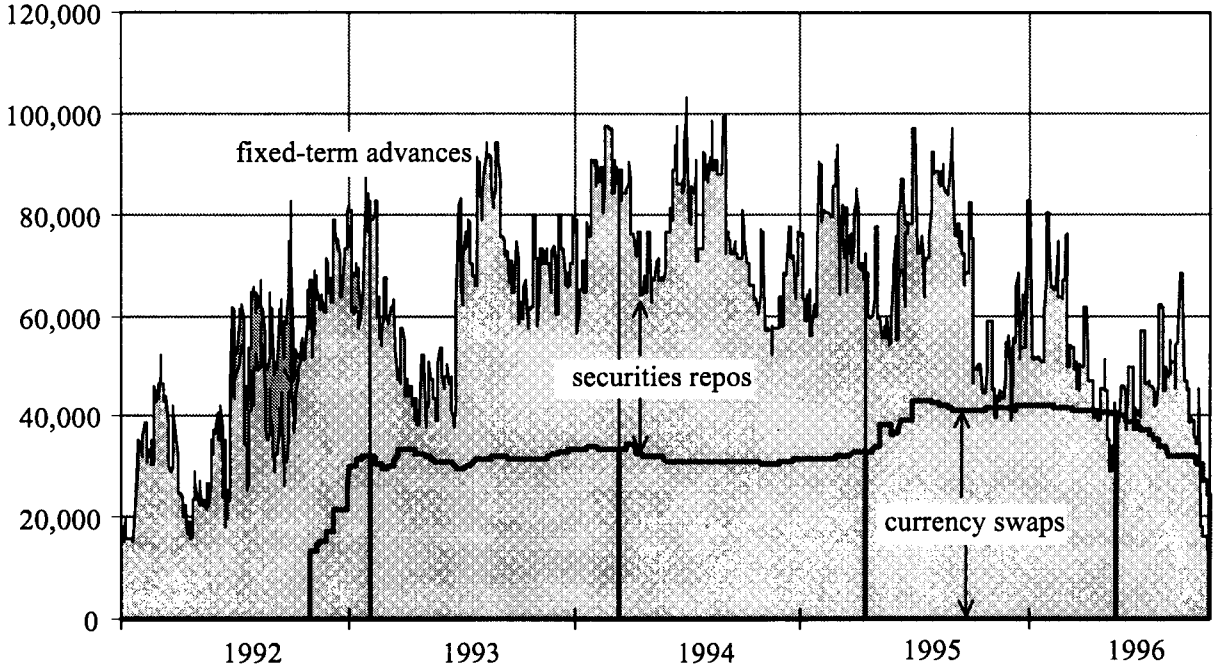
6 Fixed-term advances are activated upon a bank's request. The Bank of Italy retains discretion in accepting or refusing the requests.The maturity is set by the Bank of Italy, at between 1 and 32 days. However, banks can repay funds in advance, either fully or in part. The surcharge on the discount rate never exceeded 1.5 percentage points (its present level). Although the supply has occasionally been rationed, beyond the short run rationing may be difficult to implement, since it conflicts with the need to ensure financing for end-of-day shortages. In addition to the official rate, a penalty charge – equal to the discount rate plus 8 percentage points – is applied to advances granted after 4 p.m., near the closing of daily net settlement; this helps to avoid risks of *moral hazard* in using the facility.

7 Repo auctions are announced by the Bank of Italy early in the day on which the auction takes place, depending on its appraisal of liquidity conditions. Funds are allotted by American-type auctions, in which the Bank of Italy retains the possibility to cut the demand schedule *ex-post*, in order to limit excessive fluctuations in allotment rates. "Cuts" were used more frequently until the beginning of 1993. They have been used only once since then: on 25 August 1995 no applications were accepted at rates below 10%, contributing to stabilize short-term interest rates slightly above that level. Depending on the overall shortage or excess of liquidity created by autonomous factors, reverse repos may take the place of normal repos. Operations with very short maturity – even 1 day – have sometimes taken place, usually in the closing days of the reserve maintenance periods. Participation in securities repos is extended to a broad range of institutions, including all the banks and securities investment firms with a status of specialist in the screen-based market for Treasury bonds (MTS, Mercato telematico dei titoli di Stato).

8 Currency swaps were introduced in October 1992. They help to diversify the range of available instruments and remove the distortions that could at times be caused by either a scarcity of securities available (in periods of large indebtness of the banking system with the Bank of Italy) or a reluctance to mobilize them (in periods of falling prices). Their stock increased gradually from about 30 trillion lire to approximately 40 trillion in the first months of 1995; it has been gradually reduced to roughly 30 trillions in the second half of 1996. Tender procedures for currency swaps are like those for repos. Auctions are announced the day before the operation takes place. They are called on an irregular basis: on average 1-2 in US dollars and 2-3 in Deutsche marks per month. The maturity of the swaps is in most cases 1 month for operations in marks and 3 months for those in dollars.

9 Among other open market operations, since February 1994 the Bank of Italy has conducted *outright transactions in T-bills* through auctions with the primary dealers of the MTS. Given their short maturity, these operations are comparable to repos. They are mainly used to regulate liquidity when either the small amount or the urgency of the intervention required would prevent announcing a repo auction. *Outright transactions in Treasury bonds* at the initiative of the Bank of Italy are occasionally used to smooth excessive fluctuations in bond prices and to keep market conditions orderly; their volume is small in relation to market turnover. The Bank of Italy also participates in outright transactions taken at the initiative of the market and bilateral reverse transactions with primary dealers: the former help MTS specialists to overcome temporary shortages in particular securities, and are very often in the form of barter securities transactions.

Figure 1
Bank of Italy's financing of the banking system
In billions of lire



exogenous fluctuations both in demand (such as changes in required reserves) and supply (such as changes in foreign reserves or Treasury drawings on its deposit accounts with the Bank of Italy),[10] while currency swaps constitute a roughly constant stock of basic refinancing and are normally renewed at maturity. Repos take place as interest rate tenders. As Table 1 shows, they have no fixed periodicity or maturity; on average, there are one or two auctions per week, while most repos have a maturity ranging from between 10 and 20 days.

Daily liquidity fluctuations between two repo auctions caused by exogenous factors are normally dealt with by banks through *required reserve averaging*,[11] which was introduced in October 1990. Under the present system, banks are subject to both a daily liquidity constraint (they cannot mobilise more than 12.5% of the total required reserves on a single day) and an average monthly constraint (the average of excess reserves in the maintenance period must not be negative). In deciding the frequency and volume of its repo operations, the Bank of Italy takes into account both the liquidity available on a given day and the liquidity expected to be available over the entire reserve computation period, estimating the latter on the basis of forecasts for exogenous liquidity creation through autonomous channels and for the demand for cash.

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10 Since 1st January 1994, in compliance with the Maastricht treaty, the Treasury has no access to direct financing from the Bank of Italy. The Treasury holds two deposits with the Bank of Italy, the "Conto Disponibilità" ("Treasury payment account") and the "Fondo Ammortamento" ("Sinking fund for the redemption of government securities").

11 Reserve averaging was introduced with the explicit objective of fostering the development of the money market and increasing the information content of short-term interest rates; these results were undoubtedly achieved, as the volume of transactions on the screen-based market for interbank deposits increased substantially and the volatility of money market interest rates – especially the overnight rate – decreased dramatically. Banks must hold the required reserve balance, computed on the basis of the average stock of deposits in month t, on average over a maintenance period which runs from the 15th of month t+1 to the 14th of month t+2. The daily balance cannot be less than a given percentage (currently 87.5%) of the average requirement. Carry-over from one computation period to the next is not allowed.

Table 1
Security repurchase agreements of the Bank of Italy

Year	Auction			Quantity[1]			Maturity		
	number	partici-pants[2]	accepted bids[2]	offered[2]	demand-ed[2]	assigned[2]	mini-mum[3]	maxi-mum[4]	average[5]
1982	7	18	15	850	1,706	1,289	4	21	12
1983	17	10	6	1,168	1,838	1,168	6	26	14
1984	20	15	9	2,015	2,797	1,956	1	33	11
1985	20	18	9	1,975	3,640	1,975	2	29	13
1986	64	19	11	2,138	3,551	2,130	1	29	12
1987	31	24	14	2,573	4,529	2,573	2	31	11
1988	11	29	9	3,841	6,866	3,841	1	21	8
1989	11	27	12	2,955	4,837	2,920	2	25	8
1990	36	44	19	3,479	5,302	3,329	1	28	11
1991	77	41	23	3,500	5,695	3,234	2	28	14
1992	144	57	35	5,771	9,635	5,692	1	32	16
1993	110	52	28	6,141	11,716	6,089	1	32	19
1994	89	50	32	7,674	14,656	7,674	2	41	24
1995	74	51	28	8,074	14,799	8,030	3	35	19
1996[6]	34	39	19	8,066	14,983	8,063	1	30	14

[1] Billions of lire. [2] Yearly average per auction. [3] Minimum maturity in the year. [4] Maximum maturity in the year. [5] Average maturity, calculated over all auctions in the year. [6] January-September.

Each day, the Bank reviews its estimates for excess reserves on the following day and computes an index of the interventions needed in the rest of the maintenance period to keep average excess reserves at zero, based on the available information on liquidity flows.[12] The supply at repo auctions is set on the basis of this information, although it may sometimes also reflect a desire to marginally tighten or loosen the liquidity conditions.

At the auction, each bank can present a single bid, specifying both the quantity demanded and the interest rate offered; the latter depends on the short-term interest rates that the bank expects to prevail over the remainder of the reserve maintenance period. The banks have two types of information on aggregate liquidity conditions: the running average of balances on the reserve account since the beginning of the period, which is published by the Bank of Italy on Reuters screens each day, and an estimate of the aggregate daily level of excess reserves, computed by private forecasters. The running average is only an approximate, backward-looking measure of the need for liquidity in the rest of the period.[13]

Econometric estimates show how the repo rate is affected by liquidity policy. The relation of the rate at each repo auction with the supply of liquidity, as measured by the two indices of

12 This index is described in Angeloni and Prati (1996).

13 This index is the best measure of the liquidity stance only if the agents have no information on the autonomous liquidity flows expected in the remaining days. A thorough examination of alternative definitions of this index, under different assumptions on the information set of market participants, is given in Angeloni and Prati (1996). They find that both the daily and monthly indices affect the overnight rate; among different versions of the monthly index, they also find that those embodying forward-looking information about liquidity flows perform better, although the simpler definition used here also performs well.

"daily" and "average" excess reserves, is shown in Table 2[14] (the repo rate is also regressed on its level at the preceding auction, on the discount rate prevailing at the time of the last auction and on its change since then).[15] The coefficient of the average index is significantly negative, indicating that a decrease in liquidity (for instance, due to a reduced supply of funds at the auction) induces an increase in the repo rate. The coefficient of daily balances has also the correct sign, but it is somewhat less significant.[16] Although the stable, negative relation with the supply of liquidity indicates that the allotment rates at repo auctions are affected by Bank of Italy policy, the relatively low R^2 of the regression (16.5%, corresponding to a standard error of the regression of 17 basis points) also suggests that their very short-term fluctuations cannot be fully interpreted as a monetary policy signal, but also reflect shifts in the demand schedule.

Table 2
Dependent variable: change in the allotment rate for Bank of Italy securities repurchase agreements[1]

constant	$REPO_{t-1}$	$\Delta DISC$	$DISC_{t-1}$	daily "liquidity"[2]	average "liquidity"[3]	R^2	SEE	DW	LM(1) test for auto-correlation
0.20 (2.2)	-0.04 (1.8)	0.51 (6.0)	0.02 (1.1)	-0.006 (1.8)	-0.03 (3.8)	0.17	0.17	2.3	[16%]

[1] OLS estimates. White's t-statistics in parentheses. Daily observations on auction days. Sample: 1993-1995. $REPO_{t-1}$: allotment rate at the preceding repo auction; $\Delta DISC$: change in the discount rate since the preceding repo auction; $DISC_{t-1}$: discount rate at the time of the preceding repo auction. [2] Daily excess reserves plus the portion of required reserves that can be mobilised, measured the day before the auction. [3] Cumulative sum of excess reserves since the beginning of the reserve computation period, divided by the number of days remaining in the period, measured on the day of the auction.

In one sense, official rates and the repo rate have opposite features: since the former are set directly by the Bank of Italy, they are a clear signal of the monetary policy stance, but their direct impact on banks' refinancing cost is negligible; the latter is more relevant in determining the actual cost of bank refinancing, but is only indirectly controlled and its short-run volatility also reflects factors other than Bank of Italy policy.

The behaviour of the two official rates and the auction rate on repos in the 1992-1996 period is shown in Figures 2a and 2b. All played a role in monetary policy management. When the need for a strong, unequivocal signal was felt, official rates were adjusted. The importance of the signalling effect of monetary policy actions increased in recent years: since the exchange rate was allowed to float, inflationary expectations have played an increasingly large role in monetary policy

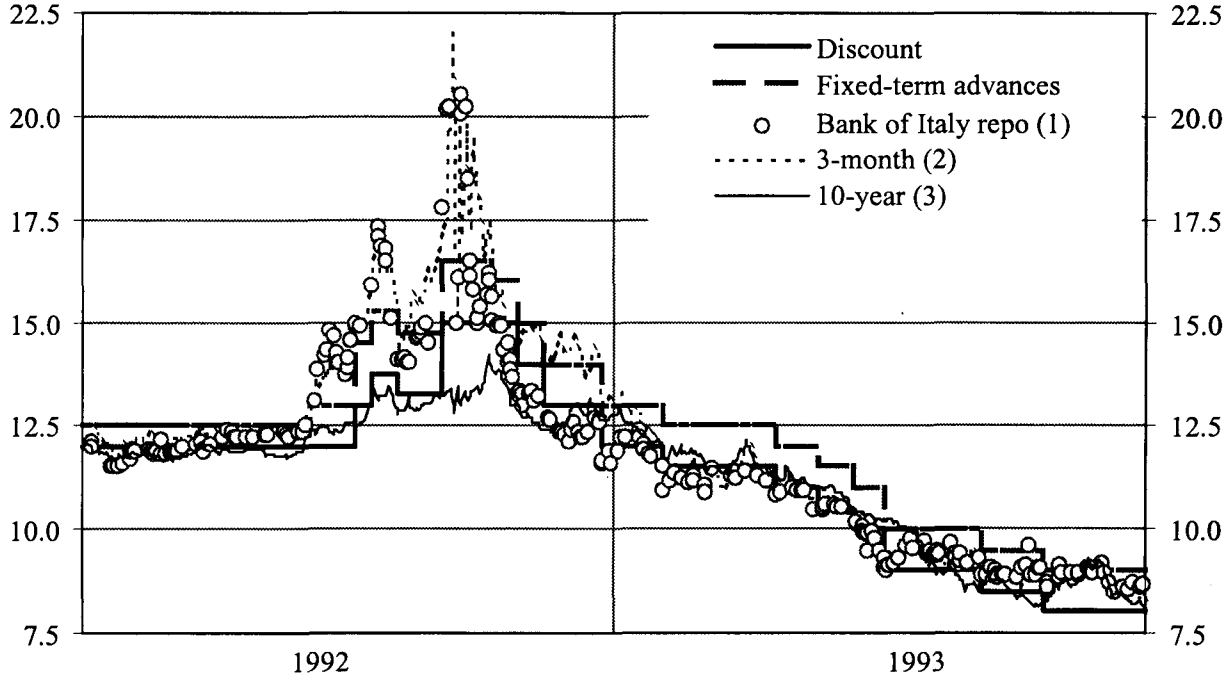
14 The regression reproduces, for the repo rate and over the 1993-96 period, the analysis originally conducted by Angeloni and Prati (1996) on the overnight rate for the period 1991-92.

15 Different lag lengths were tested. F-tests suggested including the simultaneous value of the average index and one lag of daily liquidity. The average index used in the regressions is constructed as the cumulative sum of excess reserves since the beginning of the reserve computation period, divided by the number of days remaining in the period. This corresponds to the average excess reserves that would be necessary in the second part of the computation period to bring the total average to zero. The daily liquidity indicator is defined as daily excess reserves (balances on the reserve account less the requirement, plus the undrawn portion on the "conto di anticipazione") plus the portion of required reserves that can be mobilized.

16 The effect of daily liquidity is much stronger on the overnight rate than on the repo rate, as both the results of Angeloni and Prati (1996) and our own estimates indicate.

transmission, both for their direct effect on prices and their indirect effect through the exchange rate.[17] Correspondingly, there has been increasing concern to send clear signals to the market and to act in advance, countering inflationary expectations before they translate into actual price increases;[18] this was done with relatively substantial moves in official rates (largely unexpected by the market) in August 1994 and in February and May 1995.[19]

Figure 2a
Monetary policy rates and market interest rates
In percentage points



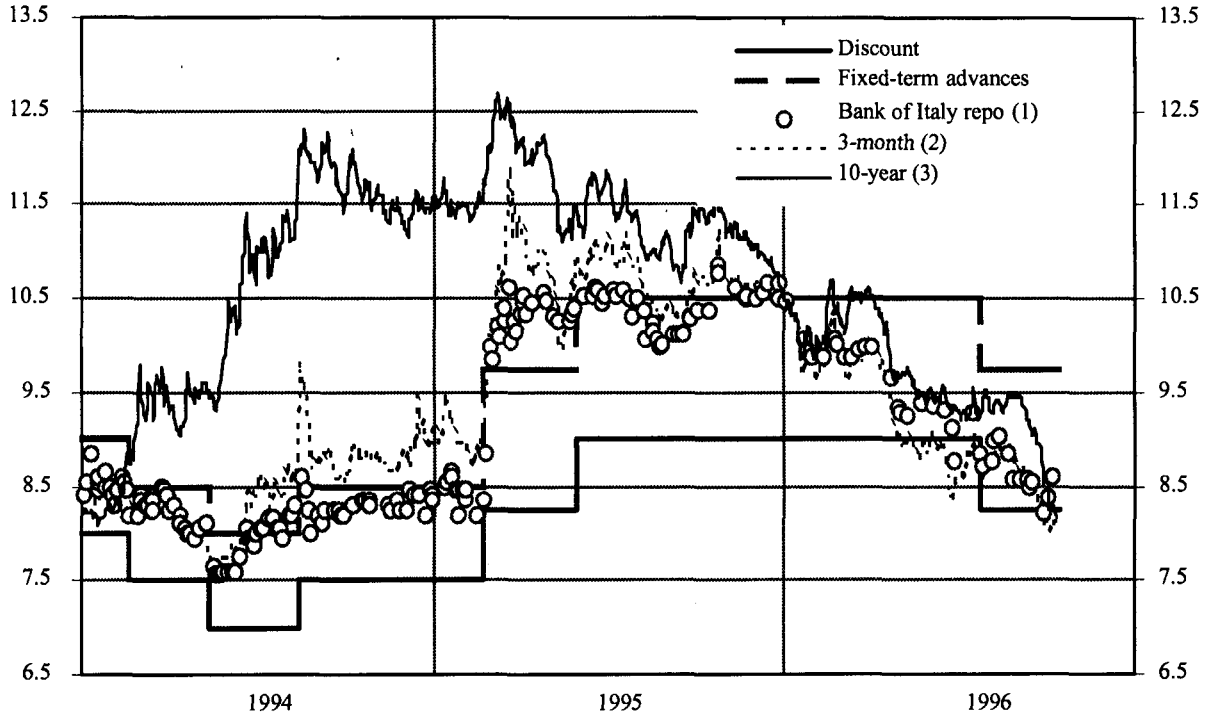
(1) Marginal allotment rate. (2) LIBOR rate. (3) Swap rate.

17 In the period during which the lira participated in the Exchange Rate Mechanism of the EMS, the strategy of monetary policy was based on the interaction of exchange rate control and interest rate policy (see Gressani, Guiso and Visco (1988)); targets for monetary and credit aggregates were also announced, since the large fluctuations margins of the lira and the controls on capital movements left monetary policy with some degrees of freedom. After 1992, in the absence of the nominal anchor provided by the exchange rate, the Bank of Italy put greater emphasis on the control of monetary aggregates. In recent years, the Bank of Italy has been more explicitly and directly linking its policy to the evolution of inflation: the explicit reference to the anti-inflationary objective is an essential element of its present strategy, although it does not implement a formal scheme of direct inflation targeting. (see Visco (1994) and Passacantando (1996)).

18 For instance, the Bank of Italy *Annual Report* for 1995 argues that "by orienting expectations, monetary policy can influence the inflation rate through an additional channel alongside its more traditional ones of aggregate demand regulation and direct impact on the exchange rate".

19 "The Bank of Italy raised official interest rates at the end of May; in the wake of the previous increases in August 1994 and February 1995, this constituted a further reinforcement of the restrictive monetary stance aimed at forcing down inflationary expectations" (Banca d'Italia, *Economic Bulletin* No. 22, February 1996, p. 44). This objective, already indicated in the press release on the occasion of the first rise, was emphasized even more explicitly in the case of the following move ("The increase is aimed at curbing inflation and countering the deterioration of inflationary expectations"). The increased need for pre-emptive measures to ward off inflation has also been repeatedly emphasized; indeed, a comparison of the movements in official rates and short-term interest rates at the time of the last three upturns in consumer price inflation (in October 1978, December 1986 and August 1994) indicates that the tightening of monetary conditions was more timely in the last instance (Banca d'Italia, *Annual Report* for 1994, pp. 84-85).

Figure 2b
Monetary policy rates and market interest rates
In percentage points



(1) Marginal allotment rate. (2) LIBOR rate. (3) Swap rate.

At the same time, the rate on repurchase agreements has been used with greater flexibility in the short run, when the Bank of Italy has sought to defuse short-term tensions without necessarily signalling a change in its medium-term orientation. The emergence of tensions on the foreign exchange market due to domestic or international shocks, and the recurrent worsening of expectations on the process of budgetary adjustment, have been countered by tightening liquidity conditions, reflected in the position of the repo rate with respect to the official rates. In some cases, there was a subsequent increase in the official rates, when the shock proved not to be temporary or when it started to feed back onto inflationary expectations. In some other cases, when tensions quickly abated, the increase in the repo rates was reversed. These tactics were employed several times in the course of 1995, when instability affecting the exchange rate and domestic securities prices was repeatedly generated by the volatility of expectations concerning budgetary adjustment (linked to domestic political factors) and by changes in the climate in international markets.[20]

A gradualist strategy was followed in periods of decreasing interest rates (as in 1993, in the wake of the 1992 exchange rate crisis, and in 1996), deploying both liquidity control and the official rates, albeit to different extent. The official rates were reduced cautiously in order to ensure

20 "Between late February and mid-April the lira suffered a further sharp depreciation owing to tensions in the foreign exchange markets and domestic political uncertainty; there was a simultaneous increase in yields of government securities. The Bank of Italy progressively tightened monetary conditions by limiting the supply of liquidity on offer at auctions of repurchase agreements. Allotment rates for Bank of Italy repos and overnight rates rose above the rate on fixed-term advances" (Banca d'Italia, Economic Bulletin No. 21, October 1995, p. 44). In the second half of October, "liquidity control was tightened in response to a heightening of tension in the financial and foreign exchange markets; repo allotment rates rose to around 10.9% for a few days, thus exceeding the rate on fixed-term advances" (Banca d'Italia, Economic Bulletin No. 22, February 1996, p. 48).

that the easing would not be interpreted as a relaxation of anti-inflationary resolve.[21] The movement of repo rates sometimes anticipated the adjustment of official rates (as in the first part of 1993 and the first half of 1996), and sometimes followed it (as in the last part of 1993).

2. Different degrees of flexibility and visibility in interest rate management

Interest rates that exhibit different degrees of flexibility and visibility are also found in the other major European countries that use some kind of interest rate "corridor", including an upper and lower limit (either posted rates on standing facilities, as in Germany, or repo rates, as in France) and a more flexible rate, controlled by the central bank in ways that depend on country-specific characteristics. While in Italy the latter is determined via variable-rate auctions and thus to some extent reflects market conditions, it may be more strictly controlled by the central bank (sometimes determined with fixed-rate operations) or be a market rate (such as the overnight rate), which is only indirectly influenced by the supply of liquidity.

The presence of an interest rate corridor often is the result of very different country-specific institutional developments: in Italy, the configuration of monetary policy rates depicted in Figures 2a and 2b is not the deliberate project of reform, but the *de facto* consequence of a number of institutional changes in the previous years.[22] In all these countries, however, both the official rates and the repo rate (or its equivalent) appear to play a role in the transmission of monetary policy and seem to be regarded by the markets as measures of monetary policy. In this sense, there are "many" policy rates.[23]

The situation in some other countries is different. The distinction between short-term interventions and the longer-term policy stance may be blurred when the central bank is almost continuously present in the market (for instance, in the absence of reserve requirements with averaging provisions, as in the United Kingdom), or official rates may have little impact in determining market yields, as in the United States where, according to most interpretations, the

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21 In 1993, it was felt that a large, immediate cut in official interest rates "would have generated fear of laxity in monetary management, impeding the restoration of confidence and a lasting reduction in long-term market rates." (Banca d'Italia, *Economic Bulletin* No. 16, February 1993, p. 38). In this period "open market operations kept very short-term interbank rates close to the discount rate in the first half of the year, pushing them up towards the rate on fixed-term advances from the summer onwards with the reappearance of pronounced exchange rate instability" (Banca d'Italia, *Economic Bulletin* No. 17, October 1993, p. 47). In 1996, while the improved outlook for inflation and inflation expectations allowed an easing of monetary policy, the need remained to "completely eradicate the expectations of a resurgence of inflation", as was stated by Governor Fazio. Liquidity policy and official rate changes were both used: in the first part of the year monetary policy allowed a decrease in short-term market rates, while maintaining the underlying orientation unchanged, as was shown by the level of the official rates; these were reduced only in July.

22 The introduction of repo operations as a way to manage liquidity, in the 1980s, coincided to a large extent with the move to indirect monetary control. The introduction of an averaging system for required reserves was aimed at giving stability to very short-term rates and allowing a larger use of short-term interbank rates as an operating target for monetary policy, giving the banks more flexibility in managing their liquidity and fostering the development of the interbank market. The change in the mechanism for setting the rate on fixed-term advances was aimed at enhancing its role as a monetary policy signal.

23 This is not a necessary conclusion. In principle, an interest rate corridor may simply be used to limit short-term volatility around a central value, thus minimizing the need for interventions. In this case, its role is only to reduce the frequency of intervention by the central bank, distinguishing monetary policy interventions (aimed at determining the interest rate "within" the corridor) from merely technical ones (thanks to the averaging of the reserve requirements and to the limits on excessive fluctuations of market rates).

federal funds rate is the main monetary policy signal and the discount rate plays a much lesser role.[24] In some countries official rates are simply linked to market rates through an indexation mechanism.

The differentiation of policy rate roles responds to the need to disentangle the effect on liquidity costs from that on market expectations. Angeloni (1994b) describes the model prevailing in continental Europe, emphasising a mixture of rigidity and a margin for flexibility, which performs the twofold function of sending clear medium-term signals to the market, through official rates, while also reacting to unexpected tensions in the short run, especially on the currency market, through liquidity management. Sanz and Val (1993) also emphasise the need to distinguish between short-term tightening and signalling the medium-term monetary policy stance. Commenting on the introduction of securities repos in Germany, Issing (1994) mentions the need to respond promptly and in a differentiated way to changing money market conditions. In the current debate on policy procedures in Europe, Jensen (1996) sees interest rates on deposit and loan facilities as the instrument for sending strong signals on the medium-term orientation, while the stance of monetary policy can be gradually adjusted via the repo rate.

In the economic literature, a call for very timely, visible and discrete moves in the policy rates stems from models in which price stability is the only concern and monetary policy works mainly through expectations. According to Goodhart (1996), with a price target, official rates should be moved in discrete steps as soon as "news" arrives; otherwise, monetary policy is always "too little, too late" and loses effectiveness. Cukierman and Meltzer (1986a) also argue that, with a single target, a noisy signal may diminish the credibility of the central bank, or make it more difficult to achieve.[25]

However, other reasons may suggest moving interest rates in a gradual way and limiting the visibility of the policy signal. Goodhart (1996) explains the observed tendency of central banks to "smooth" movements in interest rates[26] by positing some additional objective, such as avoiding interest rate reversals, which may give an impression of uncertainty and indecision (Rudebusch (1995) also cites this as a reason for gradualism). This concern may be particularly important when the central bank has imperfect knowledge of the nature and persistence of the shocks hitting the economy and time is needed to improve its understanding. The desire not to unsettle financial markets may also be a constraint: the possibility of market overreaction to policy changes may make central banks increasingly concerned about how an interest rate adjustment is perceived (sometimes, the importance attached to market reactions may even delay a decision until the need for the move is more clearly perceived by outside observers).[27] Similar arguments have been advanced for limiting the visibility of the signals sent to the market: the fear that financial markets may overreact to policy rate changes is considered a reason for the Fed's secrecy by Dotsey (1987) and Goodfriend (1986).[28] If there are many

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24 The federal funds rate target has been considered the relevant policy rate in most recent papers on the Fed's conduct (see for instance Goodfriend (1993), Radecki and Reinhart (1994), Roley and Sellon (1995) and Rudebusch (1995)).

25 The view that a clear communication of the central bank's intentions concerning interest rates is more credible and more effective in affecting inflation expectations and longer-term rates is implicit in a number of positions expressed by central bankers. According to Rudebusch (1995), this is why, for instance, the Fed's management of interest rates features stability over the medium term. In this regard, Goodfriend (1991) notices that the transmission of monetary policy to output and prices does not respond directly to movements in the federal funds rate, but rather to rates at longer maturities (at least three or six months); since these rates depend on market expectations of future fund rates, by maintaining an expected constancy of the latter for some months, the Fed can influence longer-term rates and eventually its final objectives.

26 Rudebusch (1995) shows that this is the case for the federal funds rate target: there is a high probability that a movement will be followed by another movement in the same direction. Goodhart (1996) extends this finding to other central banks.

27 See Bisignano (1995). Since the central bank often has superior information on future inflation, as shown by Romer and Romer (1996), an increase in official rates may be perceived as disclosing information that inflationary pressures are worse than previously expected and lead to a pessimistic reaction by the market.

28 The view that secrecy reduces the variability of market rates is questioned by Tabellini (1987).

targets, together with frequently changing "preferences" in the objective function, an optimal level of secrecy exists, according to Cukierman and Meltzer (1986b).[29]

The model observed in continental Europe may be seen as the choice of an optimal trade-off between these two tactics, using interest rates with different flexibility and signalling content.

The signalling role of different policy rates, however, is not a given. It depends on how they are managed and the consistency of this behaviour over time. According to Goodhart and Viñals (1994), it is not self-evident that rates on standing facilities would do a better job than open market operations in signalling monetary policy intentions. A provocative position is taken by King (1994), who notes that monetary policy signalling need not be linked to liquidity provision at all and that it could be achieved "by hoisting a flag from the top of the Bank, or by speeches by the Governor" or, in a more sophisticated way, by assigning probabilities to future policy outcomes. According to the Deutsche Bundesbank (1994) the use of repo operations in Germany, although generally successful, has only in part fulfilled "the hopes of being able to act more "discreetly" with the aid of the more flexible money market management techniques", as "particularly in the case of securities repurchase agreements, the general public has sometimes attached a significance which was not nearly warranted to marginal changes in allotment rates".

This raises two questions: whether this approach to monetary tactics is successful in fine-tuning monetary transmission, at least in the short run; and what the relevant monetary policy indicator is over longer periods.

3. The transmission of monetary policy

According to the interpretations outlined above, all the policy interest rates – both the official rates, directly set by the Bank of Italy, and the repo rates, affected by liquidity policy – are effective in transmitting monetary policy, but their effects should be different. Official rates are assumed to have greater impact on the expectations of the public and thus on longer-term segments of the yield curve. Repo rates are thought to influence mostly the shorter-term segment of interest rates and to be transmitted more slowly to market expectations, credit conditions and spending decisions.

In this section, we test the validity of these assumptions. In particular, we test for differential effects of the repo rate and of the "average official rate"[30] of the Bank of Italy through: (i) the whole structure of interest rates; (ii) survey-based measures of expectations of different sectors of the economy.

The market interest rates considered are bank deposit and lending rates, eurolira money market rates and medium and long-term swap rates. The estimation is based on reduced-form equations, linking each dependent variable to its own lags and to contemporaneous and lagged values of the two policy rates. The estimation is conducted for the period 1991-95, when the changes in the operating procedures of the Bank of Italy became effective, well-developed markets for medium and long-term securities existed and high-frequency data on market yields were available. For bank rates, we used averages computed over ten-day periods (the greatest available frequency in banking statistics); for money-market and medium and long-term yields, end-of-week data were used. Survey

29 Another important reason for sending a less explicit signal about the level of the interest rate is sometimes linked to the need to diminish outside pressure on the central bank (hence allowing more independent behaviour). According to Goodfriend (1993), the adoption of quantity, rather than interest rate, targets in the 1979-82 period in the United States was mostly motivated by this need (while the Fed was actually still looking at interest rates as operating targets).

30 I.e., the arithmetic mean between the discount rate and the fixed-term advance rate. We do not distinguish the effect of the two official rates, as they have been almost collinear in the estimation period (the spread changed only five times and has been between 1 and 1.5 percentage points for most of the period).

data refer to the inflationary expectations measured quarterly by Forum-Mondo Economico and to the Index of Consumer Confidence derived from a monthly survey of households, based on recent work by Nicoletti (1996) and Locarno and Parigi (1996). These regressions have a longer estimation period, starting in 1972 for the Forum-Mondo Economico survey and 1982 for the Index of Consumer Confidence.[31]

Table 3
Monetary policy rates and monetary transmission[1]

Endogenous variable	Hypothesis[2]			Impact effect[3]			Steady State effect[3]		
	exclusion of repo rate	exclusion of official rate	official-repo rates have same effect	official rate[4] (+) (-)	repo rate	*GER* rate	official rate	repo rate	*GER* rate
Bank rates									
Checking deposit	[16%]	[0%] **	[0%] **	0.03 0.30 (1.8) (5.8)	-	-	0.55 (26.5)	-	-
CDs	[2%] *	[4%] **	[31%]	0.15 (2.6)	0.05 (2.5)	-	-	1.0 (12.2)	-
Average lending	[0%] **	[0%] **	[0%] **	0.37 0.12 (5.9) (2.1)	0.05 (3.1)	-	-	0.9 (31.3)	-
Minimum lending	[0%] **	[5%] *	[4%]*	0.06 (1.1)	0.03 (1.4)	-	-	0.8 (33.0)	-
Money market rates									
3-month	[0%] **	[0%] **	[16%]	0.35 (1.6)	0.65 (5.3)	0.80 (4.7)	-	1.04 (16.8)	-
6-month	[0%] **	[0%] **	[0%] **	0.46 (2.4)	0.39 (3.3)	1.73 (4.9)	-	0.95 (8.7)	-
1-year	[0%] **	[0%] **	[0%] **	0.49 (3.4)	0.31 (3.3)	1.52 (5.3)	-	0.83 (4.2)	-
Medium to long-term rates									
3-year swap	[6%]	[0%] **	[0%] **	0.39 (9.6)	0.07 (1.1)	1.01 (6.6)	-	-	0.83 (1.4)
5-year swap	[32%]	[0%] **	[0%] **	0.35 (4.3)	-	1.06 (6.0)	-	-	1.25 (2.2)
10-year swap	[45%]	[0%] **	[0%] **	0.28 (8.0)	-	1.22 (6.4)	-	-	1.8 (2.7)
Survey expectations									
Consumer confidence	[58%]	[1%] *	[4%] *	-0.20 (2.9)	-		-0.05 (2.5)	-	
Inflation expectations	[84%]	[2%] *	[13%]	-0.10 (2.3)	-		-	-	

[1] OLS estimates; sample periods and full specification of the equation estimated are described in Tables 4 to 8. Average ten-day data for bank rates (1992-95); end-of-week data for market rates (1992-95); monthly data for consumer confidence (1982-94); quarterly data for inflation expectations (1972-95). [2] χ^2 test: p-values in square brackets. (*) and (**) indicate rejection of the null hypothesis at 5% and 1% confidence level, respectively. [3] t-statistics in parenthesis. [4] (+) ≡ rises; (-) ≡ cuts.

31 Since a uniform rate on fixed-term advances did not exist until 1991, we used the discount rate in these regressions instead of the "average official rate".

The inclusion of contemporaneous values of the repo rates in the regressions requires them to be weakly exogenous with respect to the dependent variable. As described in Section 1, repo rates are affected not only by the supply policy of the Bank of Italy, but also by demand behaviour. Since the maturity of most repo operations is between 10 and 20 days, shifts in market expectations may cause simultaneous movements in both market and repo rates. In order to isolate the movements due to policy actions only and to ensure the consistency of the estimation, we used an instrumental variable approach, choosing as instruments the two liquidity indices discussed in Section 1 and various lags of the repo rate.

A summary of the results is given in Table 3, while details of the regressions are shown in Tables 4 to 8. The first and second column of Table 3 report the test for the exclusion of the repo rate and the official rate, respectively, verifying whether each rate has additional explanatory power with respect to the other in explaining the endogenous variables considered. The third column reports the tests of the hypothesis that the two rates have the same effect – both dynamically and in equilibrium – on the dependent variable;[32] this assumption is equivalent to testing whether only one policy rate matters for monetary policy transmission. As the table shows, all these hypotheses are usually rejected, indicating that both policy rates matter and that their effects are different. The main exceptions are the effects of the two policy rates on the shorter money-market rates, which are quite similar, and the absence of any effect of repo rates on medium and long-term yields and on survey expectations, which are only affected by official rates.

The last portion of the table compares the impact and steady-state coefficients of the two policy rates. While official rate changes tend to have a stronger immediate effect, accelerating the adjustment, repo rates determine the steady-state value to which market rates tend, at least as far as bank rates and short-term yields are concerned.

All in all, the management of policy rates seems to have been successful in fine-tuning the short-run effects of monetary policy, disentangling the expectations effect from the effect on liquidity conditions. Over the longer run, however, "fundamentals" matter, and the actual cost of banks' liquidity (i.e., the repo rate) is the appropriate measure of the effect of monetary policy on market yields.

3.1 Bank rates

We consider two deposit rates (on checking accounts and 6-month CDs) and two lending rates (the average and the minimum lending rates).[33]

The estimated equation for each rate is written in error-correction form:[34]

$$\Delta BR = \alpha_1 \Delta OFF_t^+ + \alpha_2 \Delta OFF_t^- + \alpha_3 \Delta REPO_t + \alpha_4 \Delta BR_t + \beta_1 OFF_{t-1} + \beta_2 REPO_{t-1} + \beta_3 BR_{t-1}$$

where *BR* is the bank rate, *REPO* the repo rate and *OFF* the official rate. The suffixes "+" and "–" on official rate changes denote positive and negative variations. This choice follows the empirical literature on bank rates in Italy, which has found an asymmetric effect of official rate changes in the

32 This assumption imposes the restriction that in each equation both the impact and the steady-state coefficients of the official rate are equal to the corresponding coefficients of the repo rate.

33 All rates are from ten-day banking statistics. The lending rate is the average rate on overdrafts and short-term loans of a sample of banks accounting for about 90% of total lending. Short-term credit in Italy represents about 50% of total bank credit. The minimum lending rate is defined as the first decile of the distribution of interest rates.

34 The specification search started from a model with more lags; the final form was selected by deleting the lags that were not statistically significant.

past; this feature was usually explained by reference to oligopolistic price setting behaviour for both deposits and loans.[35]

As is shown in Table 4, changes in the official rate usually have a larger impact on bank rates than changes in the repo rate; this is not the case, though, for instruments traded on more competitive markets (CDs; loans to the "best" customers). Similarly, the existence of an asymmetric effect of official rate changes is rejected for the CD rate and the minimum lending rate. Overall, the immediate effect of a 100 basis point rise in official rates on the various bank rates is between 3 and 30 basis points; the impact of changes in the repo rate ranges between 3 and 5 basis points. Structural forms estimated by other authors found stickiness in the adjustment of bank rates to market rates;[36] a comparison of our results with those obtained for previous sample periods suggests that there was a reduction in the stickiness of bank rates in the 1990s (an increase in the effect of the repo rate and in the speed of adjustment over the following months).[37] These changes reflect the increase in competition in deposit and to a larger extent in credit markets that has been under way since the second half of the 1980s.

Table 4
Bank rates*

Δ dependent	Checking deposit rate	6- month CDs rate	Average loan rate	Minimum loan rate
Constant	-0.10 (3.5)	-0.02 (0.7)	0.29 (3.9)	0.22 (3.7)
$\Delta dependent_{t-1}$	0.20 (2.8)	0.44 (5.7)	0.13 (2.2)	–
ΔOFF^{+}	0.03 (1.8)	–	0.37 (5.9)	–
ΔOFF	–	0.15 (2.6)	–	0.06 (1.1)
ΔOFF_t^{-}	0.30 (5.8)	–	0.12 (2.1)	–
$\Delta REPO_t$	–	0.05 (2.5)	0.05 (3.1)	0.03 (1.4)
$dependent_{t-1}$	-0.11 (6.1)	-0.04 (2.9)	-0.09 (6.1)	-0.13 (8.9)
OFF_{t-1}	0.06 (6.5)	–	–	–
$REPO_{t-1}$	–	0.04 (3.1)	0.08 (6.1)	0.11 (8.8)
$\overline{R}^2$	0.66	0.72	0.73	0.67
S.E. of regression	0.05	0.07	0.09	0.08
D.W	2.1	2.15	2.10	2.1
Autocorrelation	[53%]	[16%]	[5%]	[6%]

* OLS estimates. White's t-statistics in parenthesis. Confidence levels in square brackets. Sample: 1st January 1992-10th January 1996; average ten-day data.

35 Decreases are usually found to have a stronger effect on deposit rates than increases (the opposite holds for lending rates). See Angeloni (1994a).

36 See, for instance, Angeloni (1994a); Cottarelli, Ferri and Generale (1995).

37 In our regressions, Chow-tests reject the hypothesis of no change between the 1985-91 period and the 1992-95 period.

In the steady-state solution, bank rates converge to the repo rate (except for checking accounts); this is also consistent with earlier findings of a long-run elasticity to money market rates of about one. Overall, our results are consistent with the hypothesis that in the long run it is the actual cost of refinancing – the repo rate – that matters. The stronger impact effect of the official rate reflects its "signalling" content, which eventually vanishes if the effective cost of liquidity does not follow. Correspondingly, changes in repo rates do eventually affect bank rates even without official rate changes, although more slowly.

Table 5
Money market rates*

Independent	3-month rate	6-month rate	1-year rate
Constant	-0.02	0.15	0.17
	(0.1)	(1.4)	(1.4)
$\Delta dependent_{t-1}$	-0.68	-0.56	-0.54
	(6.5)	(4.9)	(2.6)
ΔOFF_{t+1}	0.20	0.25	0.28
	(3.0)	(4.4)	(5.1)
ΔOFF_t	0.15	0.21	0.21
	(0.8)	(1.5)	(1.6)
ΔOFF_{t-1}	0.34	0.33	0.32
	(2.35)	(2.1)	(2.1)
$\Delta REPO$	0.65	0.39	0.31
	(5.3)	(3.3)	(3.3)
$\Delta REPO_{t-1}$	0.46	0.30	0.13
	(9.6)	(5.9)	(4.9)
ΔGER_t	0.16	1.37	0.49
	(0.8)	(3.4)	(4.1)
ΔGER_{t-1}	0.63	0.36	1.03
	(2.4)	(1.8)	(3.4)
$dependent_{t-1}$	-0.23	-0.12	-0.06
	(4.1)	(3.8)	(3.1)
OFF_{t-1}	–	–	–
$REPO_{t-2}$	0.24	0.11	0.05
	(3.5)	(2.9)	(2.2)
$\overline{R}^2$	0.58	0.56	0.43
S.E. of regression	0.43	0.36	0.32
D.W	2.1	2.0	1.8
Autocorrelation	[5.2%]	[94%]	[6%]

* Instrumental Variables estimates. Newey-West's t-statistics in parenthesis. Confidence levels in square brackets. Sample: 30th week 1991-52nd week 1995; end-of-week data.

3.2 Money market rates

We considered interest rates on lira-denominated euro-deposits for maturities of 3, 6 and 12 months. After the specification search, the estimated equation was:

$$\Delta MM_t = \alpha_0 + \sum_{i=-1}^{1} \alpha_{1i} \Delta OFF_{t-i} + \sum_{i=0}^{1} \alpha_{2i} \Delta REPO_{t-i} + \sum_{i=0}^{1} \alpha_{3i} \Delta GER_{t-i} + \alpha_4 \Delta MM_{t-i} + \beta_1 REPO_{t-2} + \beta_2 MM_{t-1}$$

where *MM* is the money market rate and *GER* is the rate on corresponding Deutsche mark-denominated euro-deposits. The latter is included in differences.[38] We also included one lead of the change in the official rate. This specification, used in some of the literature on the effects of policy rates,[39] takes account of the fact that when official rate changes are anticipated, part of their effect may be embodied in market rates in the days immediately preceding the change, so that the contemporaneous and lagged coefficients may underestimate the total effect.

The results show that both policy rates affect short-term market yields; unlike the previous case, their impact effects are quite similar. A change in the official rate has a contemporaneous effect on money market rates of about 0.4 on average, increasing from 0.35 on 3-month yields to 0.49 on 12-month yields; the effect of the repo rate is similar, although decreasing with maturity, from 0.65 on 3-month yields to 0.31 on 12-month yields (Tables 3 and 5). In the steady-state solution, point estimates suggest that the level of the repo rate has a coefficient of one. This implies that in the long-run market rates are also determined by the actual cost of refinancing with the central bank.

3.3 Medium and long-term yields

For medium and long-term yields, we considered 3, 5 and 10-year swap rates on the euro-market. The general form of the equation is similar to that in the preceding section. However, in this case the specification search suggested also including the level of German yields on corresponding maturities and selecting an equation of the following form:

$$\Delta ML_t = \alpha_0 + \sum_{i=-1}^{0} \alpha_{1i} \Delta OFF_{t-i} + \alpha_2 \Delta REPO + \alpha_3 \Delta GER_{t-i} + \beta_1 GER_{t-1} + \beta_2 ML_{t-1}$$

where *ML* is a generic medium or long-term rate. The results show that while the effect of the repo rate is almost negligible, changes in the official rate display a significant effect on interest rates on these segments (Tables 3 and 6). This is consistent with the findings of Buttiglione et al. (1996) and offers evidence in favour of the expected persistence of changes in the official rates and of their larger signalling content.

Furthermore, the difference between short-run dynamics and the steady-state solution is larger than in the case of bank rates or short-term yields. Though official rate changes do affect the adjustment of market rates, they do not enter the final equilibrium in a statistically significant way. The long-run solution, rather, is characterised by a convergence of the domestic rate to the corresponding German yield. This result is consistent with other findings on Italian and international rates. Fell (1996) finds that, in many industrial countries in the course of the 1980s and the 1990s, long-term rates were increasingly responsive to international yields rather than to domestic short-term rates. He argues that a steady-state solution implying convergence of nominal rates may be satisfactory as long as the expected inflation differential is a stationary process.

The results may suffer from the omission of a relevant variable, the expected inflation differential, which is quite difficult to measure in general, let alone on weekly data. However, a similar result for the steady-state solution for 10-year Italian Treasury bond rates is obtained on quarterly data by Gaiotti and Nicoletti (1996); they find that domestic yields converge to foreign ones, augmented by a proxy for the expected inflation differential and a risk premium.

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38 The specification search rejected the inclusion of the level of the DM rate in the equation.

39 Cook and Hahn (1984), Dale (1993), Radecki and Reinhart (1994), Roley and Sellon (1995) and Buttiglione et al. (1996) consider a time interval around the day of the policy rate change.

Table 6
Medium and long-term yields*

Independent:	3-year rate (IV)	5-year rate (OLS)	10-year rate (OLS)
Constant	0.10	0.06	-0.05
	(1.2)	(0.5)	(0.4)
ΔOFF_{t+1}	0.17	0.15	0.12
	(4.0)	(4.2)	(3.9)
ΔOFF_t	0.22	0.19	0.17
	(3.2)	(3.9)	(4.2)
$\Delta REPO_t$	0.07	–	–
	(1.1)		
ΔGER_t	0.01	1.06	1.22
	(6.6)	(6.0)	(6.4)
$dependent_{t-1}$	-0.015	-0.019	-0.026
	(2.2)	(2.2)	(2.1)
OFF_{t-1}	–	–	–
$REPO_{t-1}$	–	–	–
GER_{t-1}	0.013	0.024	0.048
	(1.4)	(1.9)	(2.0)
$\overline{R}^2$	0.30	0.30	0.31
S.E. of regression	0.23	0.21	0.19
D.W	2.1	2.1	2.1
Autocorrelation	[33%]	[50%]	[60%]

* Instrumental Variables (IV) and OLS estimates. Newey-West's t-statistics in parenthesis. Confidence levels in square brackets. Sample: 30th week 1991-52nd week 1995; end-of-week data.

3.4 Survey-based measures of expectations

The significance of the impact of official rate changes on market expectations is confirmed by tests based on measures of expectations other than those implicit in the yield curve. Nicoletti (1996) and Locarno and Parigi (1996), working on survey data, showed respectively that discount rate increases do contribute to a downward revision of inflationary expectations and to a decrease in consumer confidence. Both these variables play a role in monetary transmission: inflationary expectations affect the determination of wages (and may also contribute to the short-run dynamics of prices, for a given rate of wage growth); consumer confidence contributes to explaining consumption behaviour.[40]

Since the expectations measured by the survey data are not (or not only) expressed by financial operators, but refer to a composite sample in the first case and to households only in the second, the distinction between the highly visible discount rate, widely commented in the press, and the yield on more technical operations like the repos should be quite important.

40 See Gaiotti and Nicoletti (1996); Locarno and Parigi (1996).

Table 7
Inflation expectations*

Independent	Dependent: $\pi_{t/t-1} - \pi_{t-1/t-2}$		
$DU84 * \Delta DISC_{t-1}$	-0.11 (2.3)	–	-0.09 (1.6)
$DU84 * \Delta REPO_{t-1}$	–	-0.03 (1.2)	-0.01 (0.3)
$\pi^{i}_{t-1} - \pi_{t-1/t-2}$	0.16 (3.3)	0.16 (3.3)	0.16 (3.3)
$\Delta(CPU_{t-2} - \overline{CPU})$	0.06 (2.0)	0.06 (2.2)	0.06 (2.0)
DU_{t-2}	-0.19 (2.1)	-0.14 (1.7)	-0.18 (2.0)
$\Delta \dot{e}_{t-2}$	0.02 (2.8)	0.02 (2.8)	0.02 (2.8)
$\Delta \pi^{*}_{t-2}$	0.03 (1.3)	0.03 (1.0)	0.03 (1.2)
$\Delta \dot{pe}_{t-2}$	0.01 (2.8)	0.01 (2.6)	0.01 (2.8)
learning	1.24 (4.4)	1.22 (4.2)	1.24 (4.4)
$learning * \pi_{t-2/t-3}$	-0.45 (5.1)	-0.45 (5.0)	-0.45 (5.1)
R^2	0.54	0.53	0.58
S.E. of regression	0.25	0.26	0.26
D.W.	2.2	2.2	2.2
Autocorrelation	[24%]	[21%]	[23%]
Normality	[71%]	[79%]	[72%]
Heteroschedasticity	[62%]	[94%]	[67%]

* OLS estimates. White's t-statistics in brackets; confidence levels in square brackets. *U*: unemployment rate; *e*: rate of change of the effective exchange rate; *pe*: rate of change in energy prices; $CPU - \overline{CPU}$: divergence of the capacity utilisation rate from its normal value; $p_{t+1/t}$: one quarter-ahead CPI inflation expected at *t* (*Forum-ME* survey data, at annual rate); *p**: weighted rate of change of average prices in 14 of Italy's trading partners; *DISC*: official discount rate; *REPO*: rate on securities repurchase agreements with the Bank of Italy. *DU*84 is a dummy that takes a value of 1 after 1984. *DU*84 = dummy variable equal to 1 after 1984, "*learning*" is an adjustment variable, originally estimated with transition function technique (see Nicoletti (1996)). Sample: 1st quarter 1972-4th quarter 1995; quarterly data.

The dependent variable in the first equation is the one-quarter-ahead inflationary expectation measured by the Forum-Mondo Economico survey.[41] Apart from the policy rate, explanatory variables include past inflation, the capacity utilisation rate, the unemployment rate, the exchange rate, prices of foreign competitors and energy prices. As is shown in the first column of

41 The Forum-Mondo Economico survey of Italian experts from different sectors has been conducted since 1952. See Visco (1984).

Table 7, discount rate changes have had a significant effect on inflationary expectations since 1984.[42] This result is probably related to the transition to indirect controls after 1983. The other two columns of the table show the results obtained by running the same regression with the repo rate, either added to the discount rate or substituted for it. This rate has no additional explanatory power in the equation and substituting the discount rate with the repo rate does not yield a significant coefficient.

Table 8
Consumer confidence*

Independent	Dependent: log (*ICS*)		
constant	1.21 (4.1)	0.94 (3.5)	1.17 (4.0)
$\log(ICS_{t-1})$	0.59 (7.2)	0.63 (7.6)	0.59 (7.3)
$\Delta DISC$	-0.17 (2.8)	–	-0.21 (2.9)
$\Delta REPO$	–	0.01 (0.2)	-0.03 (1.1)
$DISC_{t-1}$	-0.05 (3.2)	–	-0.06 (2.5)
$REPO_{t-1}$	–	-0.03 (1.6)	0.04 (0.2)
$\log(ICS_{t-2})$	0.30 (3.7)	0.25 (3.0)	0.32 (3.7)
$(\Delta U + INFL)$	-0.03 (3.3)	-0.04 (3.7)	-0.03 (3.2)
$\Delta EXCH_t$	-0.59 (5.6)	-0.62 (5.4)	-0.59 (5.7)
$EXCH_t$	-0.09 (3.2)	-0.04 (1.9)	-0.09 (3.1)
$\Delta INDPROD$	0.43 (2.9)	0.50 (3.7)	0.46 (2.9)
PCYCLE	-0.01 (2.4)	-0.01 (2.1)	-0.01 (2.3)
R^2	0.95	0.95	0.95
S.E. of regression	0.018	0.019	0.019
D.W.	2.0	2.0	2.0
Autocorrelation	[75%]	[45%]	[68%]
Normality	[6%]	[8%]	[6%]
Heteroschedasticity	[35%]	[30%]	[36%]

* OLS estimates. White's t-statistics in parenthesis; confidence levels in square brackets. *ICS*: Index of Consumer Sentiment; *U*: unemployment rate; *INFL*; inflation rate, based on the cost of living index; *EXCH*: lira/DM exchange rate; *INDPROD*: index of industrial production; *PCYCLE*: dummy for periods of government crises. Sample: March 1982-December 1994; monthly data.

42 Nicoletti (1996) originally estimated the equation with variable coefficient techniques, identifying both an adjustment effect (which he calls a "learning" process) following the inflation volatility of the seventies, and a jump in the monetary policy coefficient in 1984. In our estimation, we included a dummy variable (with value one after 1984) and a learning variable reproducing the one he estimated.

As to consumer confidence, the effects of monetary policy rates on the Index of Consumer Confidence, based on a survey on households conducted every month since 1982,[43] are analysed. The first column of Table 8 reports the estimates of a regression of the index on the discount rate and some macro-variables (the inflation rate, the unemployment rate, the exchange rate, real disposable income and a variable that captures the effects of political events, given by a dummy variable for periods of cabinet crisis)[44]: a one-point increase in the discount rate worsens consumer confidence (the index decreases by about 20%). The other two columns of the table show that this effect disappears if monetary policy is measured by the repo rate. Even when both the repo and the discount rates are included among the explanatory variables, the former has no additional explanatory power.

Conclusions

The conduct of monetary policy in Italy hinges both on the direct setting of official rates and on liquidity control, which in turn affects the interest rate on the central bank's securities repurchase agreements. Both these instruments have been used in recent years, with the twofold purpose of affecting long-term inflationary expectations, due to their primary role in monetary transmission, and responding more flexibly to recurrent, if often transient, exchange rate tensions and worsening of expectations regarding adjustment of the public finance. The literature offers reasons for the choice of different policy rates and for either very transparent, discrete and persistent interest rate movements or more gradual, flexible and less immediately visible ones.

We have tested some implications of these procedures for the monetary policy transmission process in Italy, finding that the rate on repos and the official rate both matter in monetary transmission, but in different ways. The repo rate mostly affects the short-term end of the yield curve and, as it represents the actual cost of banks' refinancing, it forms the value on which market rates and bank rates converge in the long run. The official rate has a much larger role in speeding up dynamic adjustment and in shaping the expectations of non-financial operators.

43 The index is drawn from the response to nine questions concerning the general economic situation in the last and next twelve months including whether this is a good time to buy durables, expectations about unemployment, the household's economic situation in the last and next twelve months, the household's financial position and the possibility and economic advantage of saving. From 1973 to 1981 the survey was conducted every four months; since 1982, monthly.

44 This basically reproduces unpublished estimates by Locarno and Parigi on a monthly basis. Their 1996 paper reports results on quarterly data and a full description of the equation.

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