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Bank Lending Rates and Financial Structure in Italy: A Case Study

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Abstract

This paper discusses the relation between the financial structure and the determination of bank lending rates in Italy. It notes that the high degree of stickiness of bank lending rates observed in Italy in the past was related to constraints on competition within the banking and financial markets. In this light, it discusses the effect on the lending rate determination process of the sweeping financial liberalization process that characterized the last few years. The paper discusses also the role of the discount rate in speeding up the adjustment process of bank interest rates, and the pros and cons of its possible indexation. The empirical analysis is characterized by use of microeconomic (individual bank) data for a group of 63 Italian banks operating in locally different financial environments. This approach allows the identification of some aspects of the relation between financial structure and lending rate stickiness that were not highlighted in previous studies.

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Summary

This paper contributes to the empirical literature on the behavior of lending rates by focusing on the Italian bank loan market. The Italian case is particularly relevant for two reasons. First, bank lending still represents the bulk of total financial flows to the private sector. Second, the stickiness of Italian lending rates has long been recognized as a serious impediment to the transmission of monetary policy.

More specifically, the paper provides an econometric measure of the degree of lending rate stickiness in Italy, and compares it with the measures obtained for a sample of 30 industrial and developing countries. Then, the paper analyzes the structural factors affecting the stickiness of lending rates, pointing at the effects of constraints on competition within the financial market. The analysis is based not only on cross-country comparisons, but also on microeconomic data on lending rates charged by 63 Italian banks acting in different financial environments within Italy. It is shown that differences in the degree of lending rate stickiness among Italian banks are mainly due to the different degree of concentration of the local loan markets in which banks operate: banks operating in less concentrated, more competitive markets adjust their lending rates faster.

Next, the paper discusses the implications for lending rates of the liberalization of Italian financial markets that characterized the early 1990s. It is argued that the liberalization should lead to a reduction of lending rate stickiness and to a faster transmission of monetary policy. Indeed, there is already evidence that the degree of stickiness, while still high, has substantially declined.

Finally, the paper argues that the stickiness of Italian lending rates is also due to a form of "discount rate addiction" typical of countries in which the discount rate is used as monetary policy signal. De-emphasizing the discount rate is likely to increase the response of banks to money market changes, but would deprive the central bank of a powerful instrument to spur bank's reaction, whenever needed.

I. Introduction

In recent years economic literature has focused once again on the role of bank credit for the transmission mechanism of monetary policy (Bernanke and Blinder (1988), Bernanke and Gertler (1989), Bernanke (1993), Calvo and Coricelli (1994), Alexander and Caramazza (1994)). This renewed interest has been fueled by the recognition that, while losing some ground vis-à-vis securities markets (see, for example, Goldstein et al. (1992)), banks retain their qualitative importance even in highly securitized economies (Boyd and Gertler (1993)). Moreover, in many countries, nonmarketable bank loans still represent the bulk of financial liabilities of the private sector. Correspondingly, the behavior of bank interest rates--particularly their "stickiness" with respect to money market rates--has also attracted increased attention (Takeda (1985), Hannan and Berger (1991), Lowe and Rohlings (1992), Cottarelli and Kourelis (1994)).

This paper contributes to the empirical literature on the behavior of lending rates by focusing on the Italian bank loan market. The Italian case is particularly relevant for two reasons. First, despite rapid growth of the stock market and increased access to international financial markets, domestic bank lending still represents the bulk of total financial flows to the private sector (about 54 percent in 1991-93). Second, the stickiness of Italian lending rates has long been recognized as a serious impediment to the transmission of monetary policy (see Banca d'Italia (1986), page 211).

More specifically, the paper is organized as follows. Section II provides an econometric measure of the degree of stickiness of lending rates in Italy, and compares it with the measures obtained for a sample of 30 industrial and developing countries. Section III analyzes the structural factors affecting the stickiness of lending rates. It discusses the results of Cottarelli and Kourelis (1994) relating the stickiness of lending rates to the features of the financial structure; and presents new evidence on this issue based on microeconomic data on the lending rates series of 63 Italian banks. Section IV reviews the changes in the Italian financial structure during the 1980s and early 1990s, assesses how these changes affected the stickiness of lending rates, and discusses how banks' responsiveness to the stimuli stemming from money markets could be enhanced.

II. Evidence on the Stickiness of Bank Lending Rates in Italy

In a liberalized financial system central banks control bank lending rates only indirectly: they can affect money market rates through their intervention instruments, but the speed at which changes in money market conditions are transmitted to the economic system depends, among other

things, on how quickly banks adjust their lending and deposit rates. 1/ There is clear empirical evidence that Italian banks are comparatively slow in adjusting their rates.

1. Macroeconomic evidence

In order to measure the degree of stickiness of lending rates in Italy, we start from a simple model of the lending rate determination process. Standard economic theory (for example, Klein (1971)) implies that, in a monopolistic competition environment, the bank lending rate should be, in the long-run, related to the level of a money market interest rate, the latter reflecting the marginal yield of a risk-free investment. However, the short run relation between lending and money market rates may be characterized by lags, relating to adjustment costs and uncertainty about future interest rate movements. In this context, changes in the discount rate, insofar as they announce fundamental changes in the stance of monetary policy, are often regarded as an important catalyst in spurring banks' reaction (see, for example, Thornton (1986)).

Thus, a common representation of the dynamic lending rate determination process is the following:

$$\phi(L) i_L = \alpha + \beta(L) i_M + \gamma(L) \Delta i_D + OTH + \epsilon \qquad (1)$$

where i_L is the lending rate, i_M is the money market rate, i_D is the discount rate (which enters the equation only in first difference because it is assumed not to affect the long-term relation between lending and money market rates), OTH is a component reflecting the effect of other relevant variables, ϵ is an error term, and $\phi(L)$, $\beta(L)$ and $\gamma(L)$ are lag polynomials. Our measurement of the degree of lending rate stickiness will be based on the estimation from equation (1) of the impact and interim multipliers reflecting the change in the lending rate after a unit change in the money market rate, in the absence of discount rate changes. The reason why we focus on the response in the absence of discount rate changes is that the discount rate in Italy, as in many countries, is administered and may itself be relatively sticky.

Based on this definition, there is substantial econometric evidence that Italian lending rates are sticky, that is they do not adjust promptly and commensurately to money market changes (see, for example, Verga (1984), Banca d'Italia (1986b), Banca d'Italia (1988)). As a reference, we

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1/ Lending rate stickiness does not necessarily impede the transmission mechanism of monetary policy if banks adjust the degree of credit rationing in response to changes in money market conditions. However, there is evidence that credit rationing is not a relevant phenomenon in Italy (Pittaluga (1991)).

estimated equation (1) using Italian average monthly data for the period June 1986-December 1993. After some specification search, we obtained the following error correction equation relating the average lending rate to its long-term determinant (the average treasury bill rate): 1/

$$\Delta i_L = \underset{(3.29)}{0.61} + \underset{(8.15)}{0.42}*\Delta i_{L-1} + \underset{(2.32)}{0.07}*\Delta i_M + \underset{(8.02)}{0.41}*\Delta i_D - \underset{(-5.69)}{0.13}*i_{L-1} +$$

$$+ \underset{(5.09)}{0.12}*i_{M-1} + \underset{(3.28)}{38.10}*\Delta BADLOAN \qquad (2)$$

Adjusted R^2= 0.87 DW = 1.81 S.E.= 0.13

The error correction representation was adopted because both the lending rate and the treasury bill rate resulted to be I(1) variables (based on the Augmented Dickey-Fuller test). Equation (2) was estimated by ordinary least squares, under the hypothesis of exogeneity of the treasury bill rate. A Granger test with five degrees of freedom confirmed that, over the sample period, the treasury bill rate Granger-causes the lending rate at the 1 percent probability level. The reverse causality hypothesis does not hold at least at the 10 percent level.

In addition to current and lagged values of the lending and treasury bill rates, equation (2) includes on the right hand side discount rate changes (consistently with equation (1)), and changes in the ratio between

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1/ For most of the sample period, the average treasury bill rate can be considered as the most representative money market rate in Italy. Only in the last few years the interbank rate has increased its relevance as indicator of money market conditions (see Section IV). The treasury bill rate is the average rate at the fortnightly auctions on the 3-6-12-month maturities, net of withholding tax. The lending rate is the average of ten-days statistics, referring to the average rate on overdraft and short-term loans (weighted by the outstanding stock of credit) of a group of banks representing over 90 percent of the loan market. Most bank credit in Italy is granted through overdrafts, or has a short maturity.

bad loans and total loans (seasonally adjusted). 1/ The specification search started with an "overparametrized" model including at least six lags for all differenced variables; the more parsimonious equation (2) was derived based on the estimated t-statistics. 2/

Equation (2), which passes all the standard diagnostic tests 3/ and has a remarkably good fit, indicates that, in the long run, a unit change in the treasury bill rate brings about a similar change in the average lending

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1/ In the Italian bank statistics, bad loans are defined as loans for which legal procedures aimed at their repayment have been started. This variable was included, initially both in levels and changes, because an increase in the riskiness of lending operations (as reflected in a higher bad loan ratio) should be offset by a higher expected yield of loans vis-a-vis risk-free money market instruments. However, the level of the bad loan ratio was significant only at the 10 percent level and after controlling through a dummy for a strong increase in lending rates in July 1992 (during the ERM-related financial market turmoil). While further work is being made at the Bank of Italy to assess the relation between bad loans developments and lending rates, it was here decided to drop the level of this variable, owing to its low significance. The fact that only the change in the bad loan ratio affects the lending rate may be explained in the following way. An increase in the ratio between bad loans and total loans requires a matching increase in the corresponding risk funds. Such an increase requires, ceteris paribus, an accumulation of profits (before amortization) at a faster rate, and hence a temporary increase in lending rates. In any case, the estimates of the other parameters of the equation is not substantially affected by the inclusion of the bad loan ratio.

2/ Despite the nonstationarity of the two interest rates, the error correction representation implies that the parameters of equation (1) follow standard distributions, under the hypothesis of co-integration (see Banerjee et al. (1993)). Consequently, the specification search could proceed based on the estimated t-statistics. The hypothesis of co-integration was confirmed by stationarity tests performed on the residuals of equation (1).

3/ More specifically, Lagrange multiplier tests could not reject the null hypothesis of lack of autocorrelation for each of the first twelve lags, at a level of probability of at least 15 percent (30.5 percent for first-order autocorrelation). Durbin's H (1.03) also confirmed the absence of first-order autocorrelation. The Ljung-Box test rejected the hypothesis of autocorrelation for the first 12 and 24 lags at levels of probability of 50 and 85 percent. A Lagrange multiplier heteroskedasticity test was also passed (albeit only at the 9.5 probability level); the t-statistics based on White's procedure did not differ significantly from those of equation (2).

rate (the long rung multiplier is 0.92). 1/ However, the short term response is much lower. The impact multiplier is 0.07, implying that a 100 basis point increase in the treasury bill rate brings about a change of 7 basis points in the lending rate during the month when the shock occurs. After three months, the adjustment is 38 basis points, while after 6 months it is 56 basis points. In summary, two quarters after the initial shock, the lending rate has adjusted for only little more than one half of the initial change in the treasury bill rate.

The adjustment is much faster when the discount rate is also changed. The impact, 3-month, and 6-month multipliers for a joint change in treasury bill and discount rates are, respectively 0.47, 0.73, and 0.79.

Based on the same approach used for the average lending rate, we estimated the following equation for the minimum lending rate (i_{MIN}): 2/

$$\Delta i_{MIN} = \underset{(4.22)}{0.52} + \underset{(8.52)}{0.31}*\Delta i_{MIN-1} + \underset{(3.81)}{0.08}*\Delta i_M + \underset{(15.93)}{0.55}*\Delta i_D - \underset{(-6.50)}{0.11}*i_{MIN-1} + \underset{(5.49)}{0.09}*i_{M-1} \qquad (3)$$

Adjusted R^2= 0.92 DW = 1.90 S.E. 0.09

The results are similar to those of equation (2), with the exception that the change in the bad loan ratio did not appear to be significant. The estimated impact, 3-month, and 6-month multipliers for changes in the treasury bill rate are respectively 0.08, 0.36, and 0.66, close to the multipliers estimated from equation (2). The multipliers reflecting joint changes in the treasury bill and discount rate are also similar.

1/ The hypothesis of unit coefficient in the cointegrating regression cannot be rejected at the standard significance levels. The restriction, however, was not imposed in equation (2), as, within the context of a monopolistic competition model, it has no clear theoretical basis (the long-run coefficient depending in theory on the shape of the long-term demand for bank loans).

2/ The minimum lending rate is not to be confused with the prime rate announced by Italian banks. The latter is a posted rate, while the former is an actual rate charged on best customers. More specifically it is defined as the lowest rate applied to residents' non-collateralized lira current account overdrafts in at least 30-50 accounts for each bank. Should a bank not reach this number, the calculation is based on a more limited number of accounts.

The above results confirm--together with the importance that discount rate changes have in Italy--the low speed at which lending rates react when money market rates change in the absence of discount rate changes.

Italian lending rates are sticky not only in absolute terms but also compared to other countries. Table 1, derived from Cottarelli and Kourelis (1994) reports the impact, 3-month, and 6-month multipliers relating changes in lending rates to changes in money market rates for a group of 30 developing and industrial countries. The average impact multiplier (0.32; first column of Table 1)) is more than four times larger than the one estimated for Italy, and sizable differences are also present at longer lags. This result is not explained by differences in the definition of the relevant lending rates: the last three columns of the table report the multipliers adjusted for the heterogeneous nature of the lending rates across countries, without major changes in group averages. 1/

2. Microeconomic evidence

Further evidence on the degree of stickiness of lending rates in Italy can be derived by analyzing the behavior of individual banks. The use of microeconomic data is particularly appropriate in this context for two reasons. First, it is well known that aggregation may significantly bias the estimation of dynamic economic relations (Harvey (1981), pages 42-43). Second, as we will see, microdata shed light on some structural factors behind lending rates stickiness.

Therefore, equation (1) was re-estimated using data on the average lending rate on all types of outstanding loans applied by 63 banks. 2/ In this way, a set of 63 impact multipliers, referring to the response of the interest rate of each bank to changes in the treasury bill rate, was derived. The simple average of the impact multipliers was 0.12, confirming the indications coming from aggregate data on the strong stickiness of

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1/ Different lending rates (e.g. prime rates vis-à-vis rates on nonprime customers, posted rates vis-à-vis actual rates) may react differently to changes in money market rates. Based on the estimates derived in Cottarelli and Kourelis (1994), the data in the last three columns of Table 1 were adjusted for the difference in the degree of stickiness related to the nature of the lending rate series used to estimate the multipliers (see footnote 1 in the table).

2/ The sample included 45 banks located in Northern Italy and 18 in other regions of the country. As to bank size, 37 banks were "small banks" (based on definitions used by the Bank of Italy), operating mostly in local credit markets. The sample banks represented about 72 percent of the Italian loan market, and comprised all banks submitting ten-days statistics for the period under consideration, except some smaller banks whose time series presented strong irregularities.

Table 1. Lending Rate Multipliers (Effect on the Lending Rate of Changes in Money Market Rates)

Country	Raw multipliers				Adjusted multipliers 1/			
	Impact	3 months	6 months	Long run	Impact	3 months	6 months	Long run
Australia	0.11	0.40	0.60	1.17	0.40	0.64	0.60	1.17
Belgium	0.21	0.61	0.81	1.03	0.50	0.85	0.81	1.03
Canada	0.76	0.93	1.00	1.06	0.59	0.73	1.00	1.06
Colombia	0.42	0.87	0.97	1.03	0.42	0.87	0.97	1.03
Denmark	0.07	0.25	0.38	0.71	0.07	0.25	0.38	0.71
Finland	0.13	0.20	0.27	0.60	0.13	0.20	0.27	0.60
Germany	0.38	0.67	0.83	1.04	0.38	0.67	0.83	1.04
Greece	--	0.40	0.74	1.05	0.29	0.64	0.74	1.05
Hungary	0.09	0.31	0.47	0.88	0.09	0.31	0.47	0.88
Iceland	0.61	1.04	1.07	1.08	0.44	0.84	1.07	1.08
Indonesia	0.19	0.59	0.84	1.21	0.19	0.59	0.84	1.21
Ireland	0.32	0.80	0.96	1.03	0.61	1.04	0.96	1.03
Israel	0.77	1.22	1.24	1.25	0.77	1.22	1.24	1.25
Jamaica	0.15	0.38	0.66	0.92	0.15	0.38	0.66	0.92
Japan	0.06	0.19	0.25	0.75	0.06	0.19	0.25	0.75
Malaysia	0.16	0.29	0.39	0.91	--	0.09	0.39	0.91
Mexico	0.83	1.40	1.34	1.29	0.83	1.40	1.34	1.29
Netherlands	0.52	0.97	1.03	1.04	0.35	0.77	1.03	1.04
New Zealand	0.09	0.48	0.60	0.67	0.38	0.72	0.60	0.67
Philippines	0.27	0.75	0.81	0.87	0.27	0.75	0.81	0.87
Poland	0.04	0.15	0.24	0.59	0.33	0.39	0.24	0.59
Portugal	0.28	0.77	0.97	1.12	0.28	0.77	0.97	1.12
Singapore	0.27	0.71	0.83	1.00	0.10	0.51	0.83	1.00
South Africa	0.61	0.79	0.88	0.99	0.44	0.59	0.88	0.99
Spain	0.35	0.80	0.98	1.12	0.35	0.80	0.98	1.12
Sri Lanka	--	0.22	0.28	0.30	--	0.02	0.28	0.30
Swaziland	0.48	0.52	0.54	0.57	0.72	0.72	0.54	0.57
United Kingdom	0.82	1.02	1.04	1.04	0.65	0.82	1.04	1.04
United States	0.32	0.69	0.85	0.97	0.15	0.49	0.85	0.97
Venezuela	0.38	1.03	1.30	1.48	0.38	1.03	1.30	1.48
Mean	0.32	0.65	0.77	0.96	0.34	0.64	0.77	0.96
Variation coefficient	0.77	0.50	0.40	0.25	0.65	0.49	0.40	0.25

Source: Cottarelli and Kourelis (1994).

1/ Adjusted multipliers are derived from raw multipliers by adding the effect related to the different nature of lending rate series used to estimate the multipliers. More specifically, based on Cottarelli and Kourelis (1994), the impact, and three-month multipliers which had been derived from posted lending rate series were increased respectively by 29 and 24 basis points. Those which had been derived from posted prime lending rate series were reduced respectively by 17 and 20 basis points (see also discussion in section II.a).

lending rates. The average 3- and 6-month multipliers (respectively 0.39 and 0.66) and long-run multipliers (1.00) were also similar to those derived from aggregate data. 1/

The analysis of microeconomic data on bank lending rates also shows that the degree of stickiness varies across different geographical areas. As depicted in Chart 1, lending rates in Southern Italy are, on average, about 2 percentage points higher than in the rest of the country, a feature that has been attributed to the greater riskiness of Southern borrowers and to more limited competition in the South (D'Amico, Parigi, and Trifilidis (1990) and Faini, Galli, and Giannini (1993)). More importantly from our perspective, the chart also shows that the movements of the spread between lending rates in Southern and Northern Italy are correlated with the level of the treasury bill rate, particularly in the presence of strong swings in the latter, suggesting that the adjustment of lending rates in the South is slower than in the rest of Italy. 2/

This evidence points at a possible relation between degree of lending rate stickiness and financial structure. Indeed, one important feature of the Italian economy is the uneven degree of economic and financial development of different regions--the differences being more marked between the South and the rest of the country, but being present also in finer partitions of the country. For example, in the South bank concentration and the population per branch ratio are much higher--a fact that is often interpreted as evidence of lower competition--and the overall degree of financial development is generally lower. Thus, it could be conjectured that more limited competition and financial development may explain not only the higher level of lending rates in the South, but also the higher lending rates stickiness. This hypothesis is developed in the following sections.

III. Bank Lending Rates Stickiness and Financial Structure

In recent years, the hypothesis that bank interest rates stickiness and financial structure are strictly related has attracted increasing attention (Hannan and Berger (1991), Lowe and Rohlings (1992), Cottarelli and Kourelis (1994)). This hypothesis can be summarized as follows. The financial structure--a term which is here referred to a set of features such as the number and degree of development of financial markets, the degree of competition within the banking industry, the existence of constraints on financial intermediation, the ownership structure of financial intermediaries--affects the elasticity of demand of bank loans faced by each bank, and, consequently, the cost for banks of keeping lending and deposit rates out of equilibrium (Hannan and Berger (1991)). Thus, by

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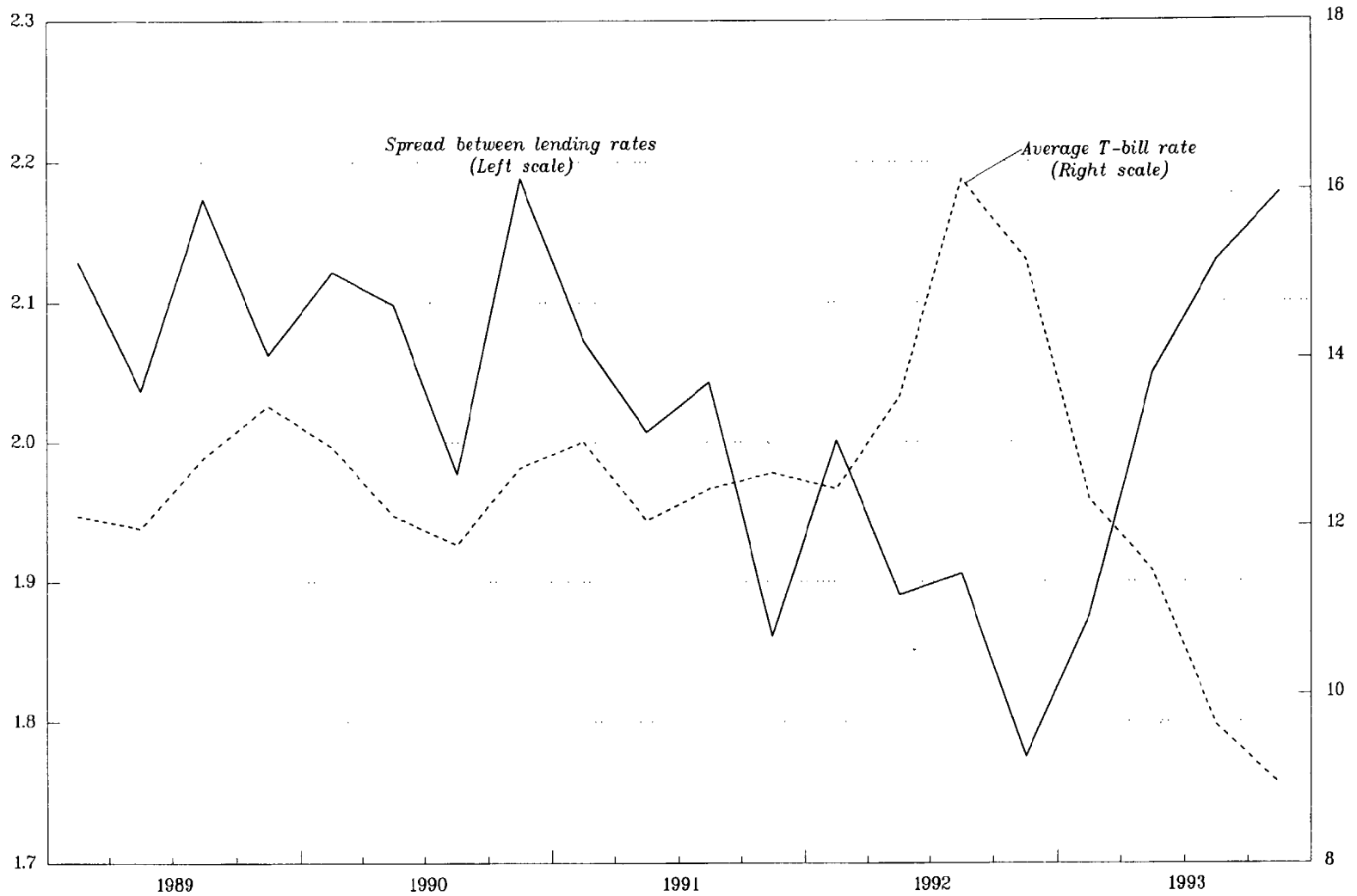
1/ The 63 estimated equations are available upon request to the authors.

2/ Over the period 1989-93 the correlation coefficient between the spread and the level of the treasury bill rate is -0.57, and is significant at the 1 percent level.

CHART 1
ITALY
SOUTH-NORTH LENDING RATE SPREAD AND TREASURY BILL RATE



Source: Bank of Italy.

affecting the cost of disequilibrium, changes in the financial structure can affect the degree of lending rate stickiness (high stickiness typically reflects low disequilibrium costs). 1/

This hypothesis was tested empirically by Cottarelli and Kourelis (1994), henceforth CK, using cross-country data. After briefly reviewing their results, we present additional evidence based on the individual bank data discussed in Section II.b.

1. The cross-country evidence

The results presented by CK cast some light on the factors behind the stickiness of lending rates in Italy. CK regressed the multipliers reported in Table 1 (and the corresponding estimates for Italy) against a set of country-specific structural financial variables, after controlling for a number of other factors which may also affect the measured stickiness of lending rates. 2/ Their preferred equation, referring to the impact multipliers (h_0), is the following: 3/

$$h_0 = \underset{}{0.30} + \underset{(4.07)}{0.011}*INFLA + \underset{(6.53)}{0.17}*PRIME - \underset{(3.50)}{0.29}*POSTE - \underset{(-3.86)}{0.12}*CAPCO - \underset{(-2.01)}{0.025}*RANDO - \underset{(-4.48)}{0.013}*OTHMA - \underset{(-5.48)}{0.045}*PUBLI + \underset{(-5.04)}{0.036}*ENTRY + \underset{(2.74)}{0.14}*EDISC - \underset{(-3.71)}{} \quad (4)$$

Adjusted R^2=0.78 standard error 0.114

Equation (4) implies that the estimated impact multipliers depend on four set of factors. First, the nature of the lending rate used in measuring the degree of stickiness: posted prime rates move faster (the coefficient on the dummy variable PRIME is positive), while posted nonprime rates are adjusted more slowly (the coefficient on the dummy POSTE is negative). Second, the inflation history of the country: in countries

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1/ The financial structure may also affect the extent to which banks are sensitive to profit maximization targets, and hence their concern for disequilibrium positions. For example, public banks may be thought to be less concerned for profit maximization, and hence could be less prompt in responding to money market changes.

2/ The equations reported by CK were estimated by weighted least squares because the lending rate multipliers were not observed but estimated (Saxonhouse (1976)); see Cottarelli and Kourelis (1994) for related econometric problems.

3/ Similar results were obtained for longer-term multipliers. However, the goodness of fit of estimated equations and the significance of estimated coefficients deteriorate at longer lags, probably because the cross-country differences in the degree of stickiness are less marked at longer lags.

marked by a history of high inflation lending rates are more flexible, presumably as a result of implicit or explicit indexation. Third, five financial structural variables, namely: the presence of capital controls (CAPCO); the size of the random component in the movement of money market rates (RANDO); the size of the market for negotiable short-term financial instruments such as treasury bills and banks' certificates of deposit (OTHMA), the share of public banks within the banking system (PUBLI), 1/ and the existence of barriers to entry, measured by the intensity of regulations on the opening of bank branches (ENTRY). The signs of the estimated coefficients imply that the impact multiplier is higher in countries where competitive forces are stronger (owing to the absence of capital controls and barriers to entry), financial markets are deep (as reflected by sizable markets for short-term financial instruments, and by limited interest rate volatility), and the public sector presence in the banking industry is limited. Fourth, a dummy variable (EDISC) captures the effect of the discount rate policy followed by the monetary authorities. In countries where the latter is set administratively to signal monetary policy changes (EDISC=1), the impact multiplier for changes in money market rates (in the absence of discount rate signals) is lower. This finding supported what CK called "discount rate addiction" hypothesis, that is the reluctance of banks to adjust lending rates in the absence of discount rate signals.

As the error term for Italy in equation (4) is virtually zero, the equation can be used to explain the relatively high degree of stickiness of bank lending rates in Italy in terms of the features of its financial structure. Italian financial markets are, for some aspects, quite developed and deep. The ratio between short-term marketable securities and GDP (OTHMA above) is one of the highest in the country group here considered, and the random component of the movements in money market rates is relatively low. 2/ However, during most of the period over which the multipliers of Table 1 were estimated (June 1985-February 1993 for Italy) the Italian financial structure was relatively constrained: capital movement restrictions were in place (CAPCO was high) and the opening of bank branches was regulated administratively (ENTRY was also high). Both restrictions were gradually lifted during the second half of the sample period (see Section IV), but the effect of structural changes of this type is bound to show up only gradually. 3/ Moreover, the bulk of the Italian banking system is directly or indirectly controlled by the public sector (PUBLI is very high), a feature which has only recently started changing. Finally, the discount rate has traditionally been used to signal changes in the monetary policy stance, which, according to equation (4), may have structurally lowered the reactivity of lending rates to money market rates.

1/ More precisely PUBLI is the number of public banks out of the first five largest.

2/ The value of RANDO for Italy is the tenth smallest in the sample.

3/ Indeed, for all countries, the value of the structural variables included in (4) is the average of the value taken by those variable during the estimation period lagged two years (see Cottarelli and Kourelis (1994)).

In summary, based on equation (4), the stickiness of lending rates in Italy during the sample period was due to the existence, during that period and in the preceding years, of strong capital controls, barriers to bank competition (particularly entry barriers), a large presence of the public sector in the banking system, and the "discount rate addiction" related to using the discount rate as monetary policy signal.

2. Evidence from Italian micro data

Further evidence on the causes of lending rate stickiness can be derived by analyzing the differences in the degree of stickiness of rates charged by Italian banks operating in heterogeneous financial environments.

As noted above, the financial structure varies widely across Italian regions. In particular, the banking system is highly fragmented: very few large banks spread their loans evenly over the various parts of the country, while most banks--even of relatively large size--specialize within a regional, or even local, basin. This circumstance allows a fairly good mapping of regional differences into differences in each bank's performance, with respect to both the level of lending-deposit rate spread and--more importantly for our purpose--the degree of lending rate stickiness. 1/

The advantage of working with micro (individual bank) data is twofold. 2/ First, it is possible to use consistent definitions of lending rates across banks, thus avoiding the use of dummy variables (such as PRIME and POSTE in the cross-country equation (4) above). Second, some explanatory variables can also be measured more precisely. For example, CK tried to include in equation (4) a measure of the degree of market concentration, namely the market share of the five largest banks in each country, but with limited success, possibly because simple market shares are a poor measure of bank market concentration. Alternative and better measures (such as an Herfindahl index computed over local markets) were not available at the cross-country level, but can be computed for different Italian regions and banks. Other variables, related to the portfolio composition of banks were also not available at the cross-country level.

1/ The fragmentation of the Italian banking system is important for our analysis. Strong regional differences would not be reflected in data referring to individual banks if banks' portfolios were evenly distributed throughout the economy. Note also that using regional data would have not been possible as the latter are not available at monthly level (as needed for an accurate measure of the degree of stickiness).

2/ Other papers have used micro-data to study the relation between financial structure and the parameters affecting the transmission mechanism of monetary policy. For example, Kashyap and Stein (1994) explore the lending channel of the transmission mechanism of monetary policy by focusing on banks with different capability of raising funds in the wholesale market. Angeloni et al. (1995) contrast the behavior of banks lending mostly to large firms with that of banks lending mostly to small firms.

Using microdata has also some drawbacks. First, cross-regional or cross-bank differences in the degree of stickiness are not as marked as cross-country differences, thus making it more difficult to identify the relation between financial structure and lending rate stickiness. Thus, lower t-statistics and R^2s should be expected. Second, the effect of all structural factors which, within the same country, are invariant at the bank level (as many of the variables in equation (4)) cannot be measured.

With the above proviso, we tried to explain the differences in the impact multipliers estimated in Section II.b for the 63 Italian banks through eleven structural factors, some of which are akin, at the micro level, to the variables included in equation (4), while others reflect portfolio differences of various nature. The partial correlation coefficients (PCCs) between these variables and the impact multipliers, together with the corresponding t-statistics, are reported in Table 2.

More specifically, a first set of variables measures the degree of competition in the markets in which each bank operates. HERF is the average value of the Herfindhal index, 1/ here considered as a proxy for the degree of bank concentration and competition faced by each bank. 2/ The expected sign on this variable is negative as, consistently with equation (4)), an increase in the degree of concentration should involve stickier lending rates. The value and significance of the PCC in Table 2 seems to confirm this expectation. An alternative measure of the degree of competition is the population per branch ratio (POBR). Consistently with spatial competition models (Salop (1979)), a decline in such a ratio, for

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1/ More specifically, the value of the index for each bank (H_i) was computed as:

$$H_i = \Sigma_j q_{ij} h_j \qquad for\ h=1,\ldots,M$$

where $q_{ij} = L_{ij}/L_i$ is the share of the loans of bank i granted in the local market j, M is the number of local markets, and h_j is the Herfindhal index for local market j. The latter is computed as:

$$h_j = \Sigma_k \alpha^2_{kj} \qquad for\ k=1,\ldots,P$$

where α_{kj} is the market share of bank k on market j (for each of the P banks lending on market j). For this computation, 95 "local markets", corresponding to the administrative provinces of Italy, were used.

2/ Conceptually, HERF is a measure of actual competition, while the variable ENTRY in equation (4) is a measure of regulatory barriers to entry in the banking market, and hence of potential competition. Formally, there were no differences in the regulatory barriers to entry in the banking market across different regions of Italy. However, until 1990, the opening of bank branches was subject to ad-hoc approval by the Bank of Italy. In practice, the distribution of bank branches and the degree of concentration within regional markets were very differentiated (see Section IV).

given Herfindahl index, would signal an increase in competition related to a simultaneous increase in the market presence of all banks (the latter would leave the Herfindahl unchanged). The PCC on this variable has the expected sign, but is not significant. A third proxy for the degree of competition is OPEX, the ratio between banks' operating expenses and total resources. Indeed, both the X-inefficiency hypothesis (Leibenstein and Maital (1992)) and the "quiet life-expense preference hypothesis" (Edwards (1977)) maintain that higher operating costs are associated with lower competition. Also for this variable the sign of the PCC is correct, but not significant.

A second group of variables reflects the composition of bank liabilities. CDSH is the share of each bank's certificates of deposit (CDs) with respect to total deposits, a variable that (like OTHMA in equation (4)) reflects the importance of negotiable short-term financial instruments in influencing the dynamics of lending rates. More specifically, in a context in which banks follow a mark-up mechanism in pricing their loans, a higher share of CDs in a bank's portfolio should imply a faster adjustment, as the rates on CDs (a money market instrument) are more reactive to changes inmarket interest rates than the rate of bank deposits. 1/ The PCC (0.32 with a t-statistics of 2.6) provides prima facie support to this hypothesis. The presumed higher reactivity of banks borrowing directly from the money market is captured by a second variable DUIB, a dummy taking value 1 for banks which are structural borrowers on the interbank market. The PCC is indeed positive, albeit not significantly different from zero.

A third group of variables refers to the composition of bank assets. SELO is the ratio between securities and loans, with a negative expected sign, because, in line with Miron, Romer, and Weil (1993) banks with a larger quantity of securities can cushion the effect on lending rates of changes in their deposit base related to money market movements. Again, the PCC has the expected sign, but is not significant. SHND measures the share of undrawn credit over the amount of the total credit lines opened. The expected sign of this variable is positive because undrawn credit lines expose banks to the risk of undesired drawings, should the lending rate not be in line with market conditions; thus more exposed banks have a stronger incentive to adjust lending rates quickly. 2/ OLSH, defined as one minus the share of loans granted through overdrafts, was introduced to assess whether the loan type was a relevant factor affecting the lending rates stickiness. A priori, the sign of this variable is ambiguous. On the one

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1/ Indeed, the attempt to lower the stickiness of bank lending rates was one of the expected effects of the introduction of CDs in Italy in the early 1980s (see Carosio(1983)).

2/ It must be recalled that, contrary to other countries, overdraft credit is granted in Italy without a predetermined maturity and at adjustable rates. In countries, such as the United States, where overdraft credit bears a fixed interest rate and maturity, large undrawn credit lines may be associated with higher interest rate stickiness, thus hindering the transmission mechanism of monetary policy (Deshmukh et al. (1982)).

Table 2. Correlation Coefficient Matrix 1/

	MULT	HERF	OLSH	CDSH	LLOA	DUPR	POBR	LIND	DUIB	OPEX	SELO	HOUS
MULT	1	-0.38 -3.3*	0.42 3.7*	0.32 2.6*	0.44 3.9*	0.43 3.8*	-0.12 -1.0	0.50 4.6*	0.15 1.2	-0.02 -0.14	-0.08 -0.63	0.49 4.4*
HERF	-0.38 -3.3*	1	-0.11 -0.86	0.07 0.55	0.24 1.9**	-0.34 -2.8*	0.54 5.0*	0.05 0.4	0.01 0.11	0.46 4.0*	0.33 2.8*	0.15 1.2
OLSH	0.42 3.7*	-0.11 -0.86	1	0.01 0.09	0.35 2.9*	0.15 1.2	-0.14 -1.1**	0.47 4.3*	0.03 0.21	-0.04 -0.29	0.04 0.30	0.22 1.8**
CDSH	0.32 2.6*	0.07 0.55	0.01 0.09	1	0.23 1.8**	0.31 2.6*	0.14 1.2**	0.33 2.7*	-0.02 -0.12	-0.06 -0.50	-0.15 1.2**	0.16 1.3**
LLOA	0.44 3.9*	0.24 1.9**	0.35 2.9*	0.23 1.8**	1	0.07 0.60	0.33 2.7*	0.67 7.1*	0.34 2.8*	0.41 3.5*	0.17 1.4**	0.67 7.1*
DUPR	0.43 3.8*	-0.34 -2.2*	0.15 1.2	0.31 2.6*	0.07 0.60	1	-0.33 2.7**	0.29 2.4*	-0.02 -1.19	-0.20 -1.7*	-0.48 -4.4*	0.15 1.2
POBR	-0.12 -1.0	0.54 5.0*	-0.14 -1.1**	0.14 1.2**	0.33 2.7*	-0.33 -2.7*	1	-0.08 -0.62	0.17 1.4**	0.48 4.3*	0.43 3.7*	0.23 1.9**
LIND	0.50 4.6*	0.05 0.4	0.47 4.3*	0.33 2.7*	0.67 7.1*	0.29 2.4*	-0.08 -0.62	1	0.12 0.89	0.01 0.10	0.04 0.31	0.56 5.3*
DUIB	0.15 1.2	0.01 0.11	0.03 0.21	-0.02 0.12	0.34 2.8*	-0.02 -0.19	0.17 1.4**	0.12 0.89	1	0.24 1.9**	-0.21 1.7**	0.07 0.55
OPEX	-0.02 -0.14	0.46 4.0	-0.04 -0.29	-0.06 -0.50	0.41 3.5*	-0.20 -1.7*	0.48 4.3*	0.01 0.10	0.24 1.9**	1	0.37 3.1*	0.47 4.1*
SELO	-0.08 -0.63	0.33 2.8*	0.04 0.30	-0.15 -1.2**	0.17 1.4**	-0.48 -4.4*	0.43 3.7*	0.04 0.31	-0.21 -1.7**	0.37 3.1*	1	0.42 3.6*
HOUS	0.49 4.4*	0.15 1.2	-0.22 1.8**	0.16 1.3**	0.67 7.1*	-0.15 1.2	0.23 1.9**	0.56 5.3	0.07 0.55	0.47 4.1*	0.42 3.6*	1

1/ Estimated t-statistics are reported below each coefficient. The marks (*), (**), and (***) indicate significance, respectively at the 1, 5, and 10 percent level.

hand, it could be argued that the sign should be negative: as overdraft credit is granted without a specified maturity, the corresponding interest rates can be adjusted quickly, as banks do not have to wait until a loan is rolled-over to adjust its interest rate. On the other hand, credit relations through overdraft lending often reflect long-term bank-customer relations, and the form of implicit risk insurance against short-term movements in money market rates conjectured by Fried and Howitt (1980) and Lowe and Rohling (1992), which would suggest a positive correlation. The sign and t-statistics of the PCC indicate that, at least in Italy, this second force may be prevailing.

Three remaining variables were included. LIND, equal to the average size of each bank's loans, has expected positive sign because the demand elasticity of large, sophisticated customers is likely to be higher, thus forcing banks to a prompt adjustment of lending rates. 1/ Indeed, the PCC is high (0.50) and highly significant (4.6). The influence of the ownership structure is captured by a dummy variable (DUPR) taking value *0* if a bank is controlled directly by the public sector, and 1 otherwise. The expectation, consistent with equation (4) and with the value and significance of the PCC, is that privately owned banks adjust lending rates more rapidly than publicly owned banks, presumably because their operational decisions reflect directly profit maximization goals. Finally, the variable LLOA, equal to the logarithm of each bank's loan portfolio, is used to identify larger banks, which may play the role of market leaders. Consequently, the expected sign is positive, as suggested also by the PCC (0.44).

The above 11 regressors were used to explain the observed differences in the degree of lending rate stickiness (as measured by the impact multipliers h_0) across Italian banks. Table 3 reports the main steps of the specification search process, which started from an equation including all regressors. 2/ While the fit is relatively good (the R^2 is 0.61, which is fairly high for cross-section regressions) and the sign of the regressors is correct for ten out of eleven variables, many regressors are not significant, a possible sign of over-parametrization. In equation 2 the regressors with the lowest t-statistics are dropped, with an increase in most remaining t-statistics. By further dropping low t-statistics variables, we reached equation 4, including all variables passing a significance test at 10 percent probability level.

1/ Angeloni et al. (1995) also find that the lending rates of banks with larger average size of customers are relatively more reactive.

2/ The equation was estimated following the same methodology used by Cottarelli and Kourelis (1994). The dependent variables are the impact multipliers discussed in Section II.b. The right-hand side regressors were computed as average data for the period 1987-93 (with the exception of POBR, SHND and LIND, which were computed over 1990-93, owing to limited data availability).

Table 3. Estimates of Equation (4) (Dependent Variable: Impact Multipliers from Section II.b)

N	Constant	HERF	OLSH	CDSH	LLOA	DUPR	POBR	OPEX	SHND	LIND	DUIB	SELO	R^2	R^2 1/	S.E.
1	0.06	-0.32	0.11	0.11	0.02	0.01	-0.01	0.42	0.13	-0.04	0.01	-0.03	0.61	0.52	0.025
	(0.81)	(-3.55)	(2.13)	(1.85)	(0.57)	(0.89)	(-0.17)	(0.61)	(2.26)	(-0.29)	(0.94)	(-0.37)			
2	0.04	-0.32	0.11	0.11	0.02	0.01	...	0.25	0.13	...	0.01	...	0.59	0.53	0.025
	(0.77)	(-3.85)	(2.25)	(2.18)	(0.84)	(1.43)	...	(0.45)	(2.32)	...	(0.99)	...	...		
3	0.02	-0.32	0.12	0.12	0.03	0.01	...	...	0.13	...	0.01	...	0.59	0.52	0.025
	(0.63)	(-3.97)	(2.38)	(2.46)	(0.98)	(1.44)	...	...	(2.33)	...	(0.89)	...			
4	0.02	-0.32	0.11	0.12	0.01	0.01	...	...	(0.12)	...	...	...	0.57	0.53	0.025
	(0.48)	(-3.98)	(2.29)	(2.41)	(1.55)	(1.40)	...	...	(2.26)	...	...	...			

1/ Adjusted for degrees of freedom.

The preferred equation 4 explains 57 percent of the variance of the impact multipliers. Its most important variable, in terms of magnitude of the coefficient and t-statistics, is the Herfindahl index. The estimated value of the coefficient implies that the impact multiplier of a bank operating as a pure monopolist (that is in a market with an Herfindahl index of 1) is 32 basis points lower than that of banks operating in a very fragmented market (the Herfindahl index approaches zero in case of pure competition). Moreover, the equation confirms that the most reactive banks are: those issuing CDs (CDSH); larger banks acting as market leaders (LLOA); banks with a higher share of undrawn credit lines (SHND); and private banks (DUPR). 1/ Finally, the equation indicates that interest rates on overdrafts are usually stickier than those on other types of lending. 2/

In summary, the above results confirm that the financial structure--as reflected in the degree of competition in the banking market, the development of money market instruments such as bank CDs, the ownership structure of the banking system--has significant effects on the degree of lending rates stickiness.

IV. Financial reform

During the 1980s and early 1990s the Italian banking market, and more generally the Italian financial structure, underwent a number of sweeping changes. This section describes those changes and discusses their effects on the determination of bank lending rates, including their degree of stickiness. While the structural reform process started earlier than the period considered in the first sections of this paper, 3/ in order to put later developments in the proper perspective it is useful to review the main steps of the financial reform process starting from the early 1980s.

1. Milestones in the structural reform of the Italian financial market

At the beginning of the 1980s the Italian financial and banking system was among the most regulated within OECD countries (Bröker (1989)). Tight foreign exchange controls were imposed on both banks and nonbank agents. The size of the securities market was limited, and most government securities were held by banks. As to the banking market, the establishment of new banks and the opening of new bank branches were subject to

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1/ Admittedly, however, the value of the estimated coefficient on DUPR is quite small, which seems to indicate that, in an environment where most banks are public, also private banks have less incentive to react rapidly to changes in market conditions.

2/ This is consistent with evidence obtained by running equation (2) using the average rate on overdrafts and other loan types as regressands.

3/ It is important to recall that the equations discussed so far were estimated for the period 1986-1993.

discretionary ad hoc authorization by the central bank. 1/ Competition from Special Credit Institution(SCI)--financial intermediaries operating mainly on medium-long term maturities--was impeded by constraints on the ability of the latter to collect short-term deposits, and by their lack of a branching network. Bank deposits were subject to high reserve requirements, and banks were prevented from issuing medium- and long-term securities; in practice they also refrained from issuing short-term securities. As to bank assets, bank loans growth was limited by credit ceilings; and investment requirements in bonds issued by SCIs constrained the allocation of the securities portfolio. Finally, the range over which most banks could grant loans was geographically limited.

Most of these restrictions were gradually lifted during the 1980s. A first reform wave took place in the early 1980s. During this period, the circulation of short-term government securities outside the banking system boomed and a new type of CDs, benefitting from more favorable reserve requirement conditions, was introduced (Caranza and Cottarelli (1987)). Perhaps more importantly, in June 1983 credit ceilings were lifted.

A second reform wave took place in the late 1980s-early 1990s. Foreign exchange controls were gradually removed between 1987 and 1990 (the most important measures being implemented towards the end of this interval). The opening of bank branches was liberalized in 1990, albeit already from the mid-1980s the Bank of Italy had followed de facto a more liberal policy in granting permits for new branches. This liberalization brought about a dramatic increase in the number of branches with respect to both population and real GDP, particularly during the 1990s (Chart 2), and a decline of concentration and specialization indexes (Chart 3). 2/ Reserve requirements were progressively lowered between 1989 and 1994. Territorial restrictions on lending were gradually lifted in the second half of the 1980s. Sectoral specialization among SCIs was dismantled in 1991, and the new 1993 banking law--in the spirit of the second EU banking directive--allowed banks and SCIs to perform all banking activities, subject only to relatively mild constraints. Privatization of many public banks also begun.

2. Financial reform and the performance of the banking system

The performance of the banking system was significantly affected by the reform process, although with a relatively long time lag. The spread

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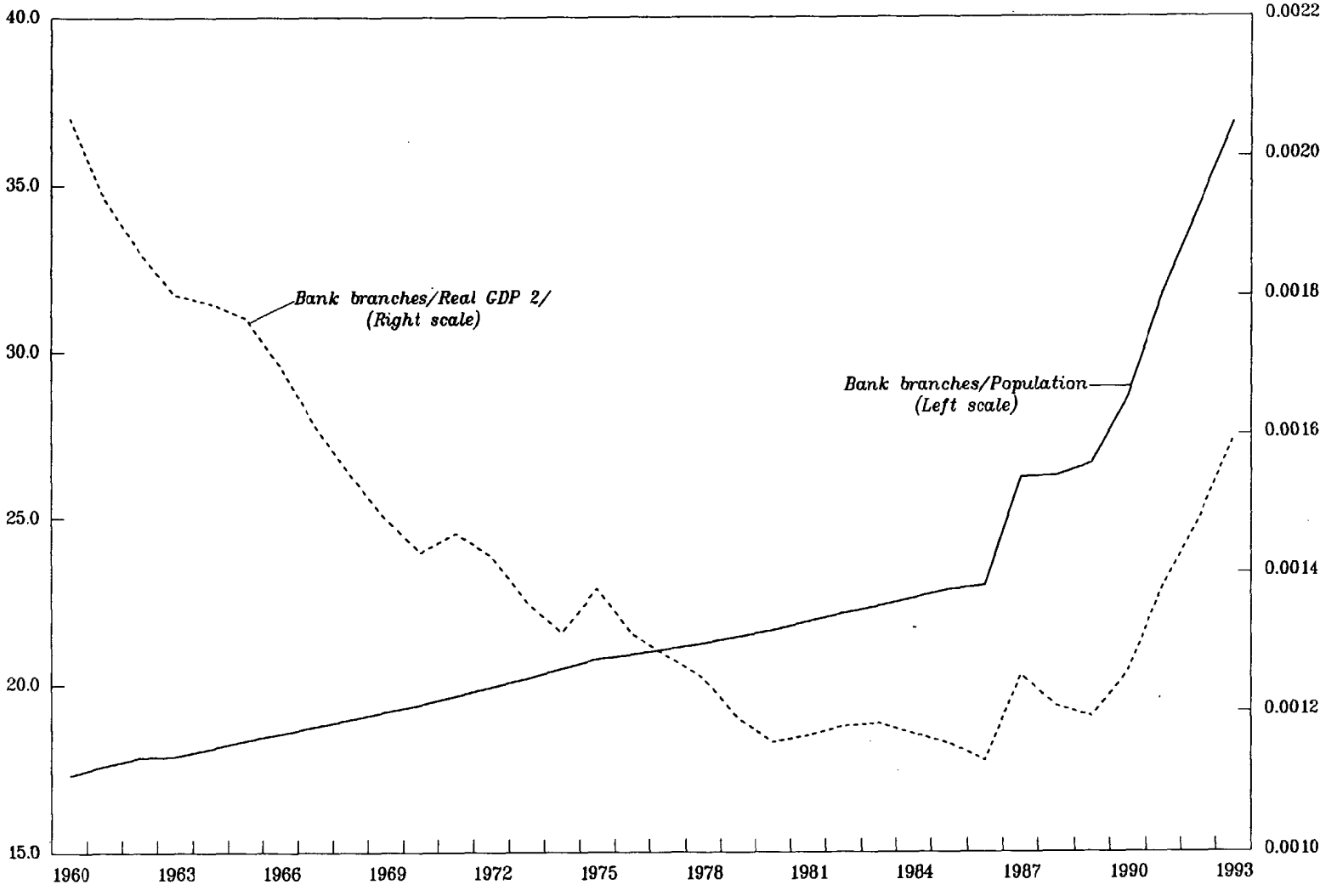
1/ Before 1987 the Bank of Italy authorized the opening of new branches based on 4-year plans reflecting estimated local needs for banking services.

2/ Concentration is measured by the Herfindhal index defined in Section III. Specialization is measured by the average William's index for the 80 largest Italian banks. This index, expressed in percentage terms, is measured for each bank as the sum of the squared shares reflecting the distribution of a banks' loan portfolio in the 95 Italian provinces. The index for a bank with all deposits in a single province is 100 percent.

CHART 2
ITALY
RATIO OF BANK BRANCHES TO POPULATION AND REAL GDP 1/



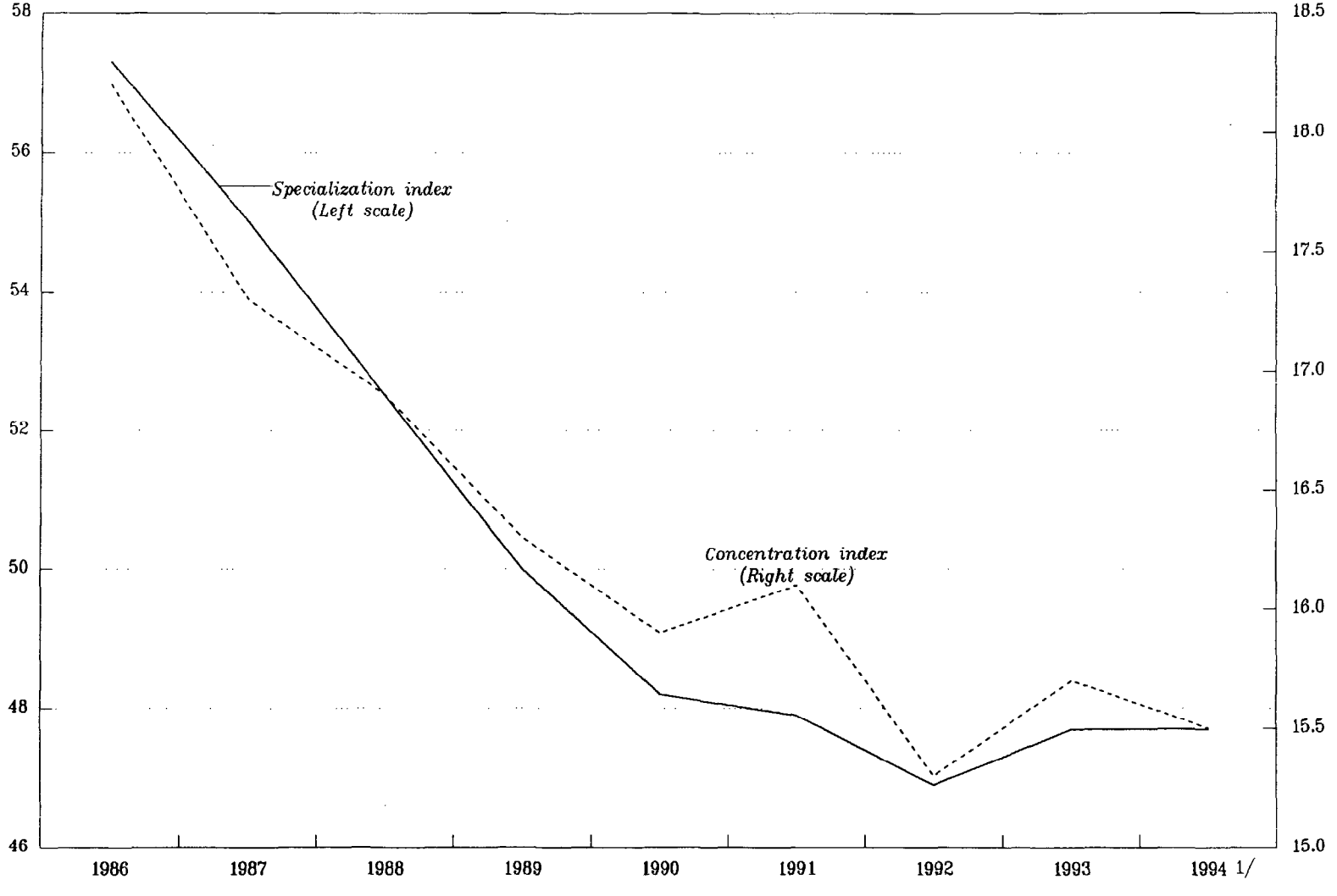
Sources: Bank of Italy; and IMF, International Financial Statistics.

1/ Branches per 100,000 inhabitants.
2/ At 1990 prices.

CHART 3
ITALY

CONCENTRATION AND SPECIALIZATION INDICES FOR THE BANKING INDUSTRY

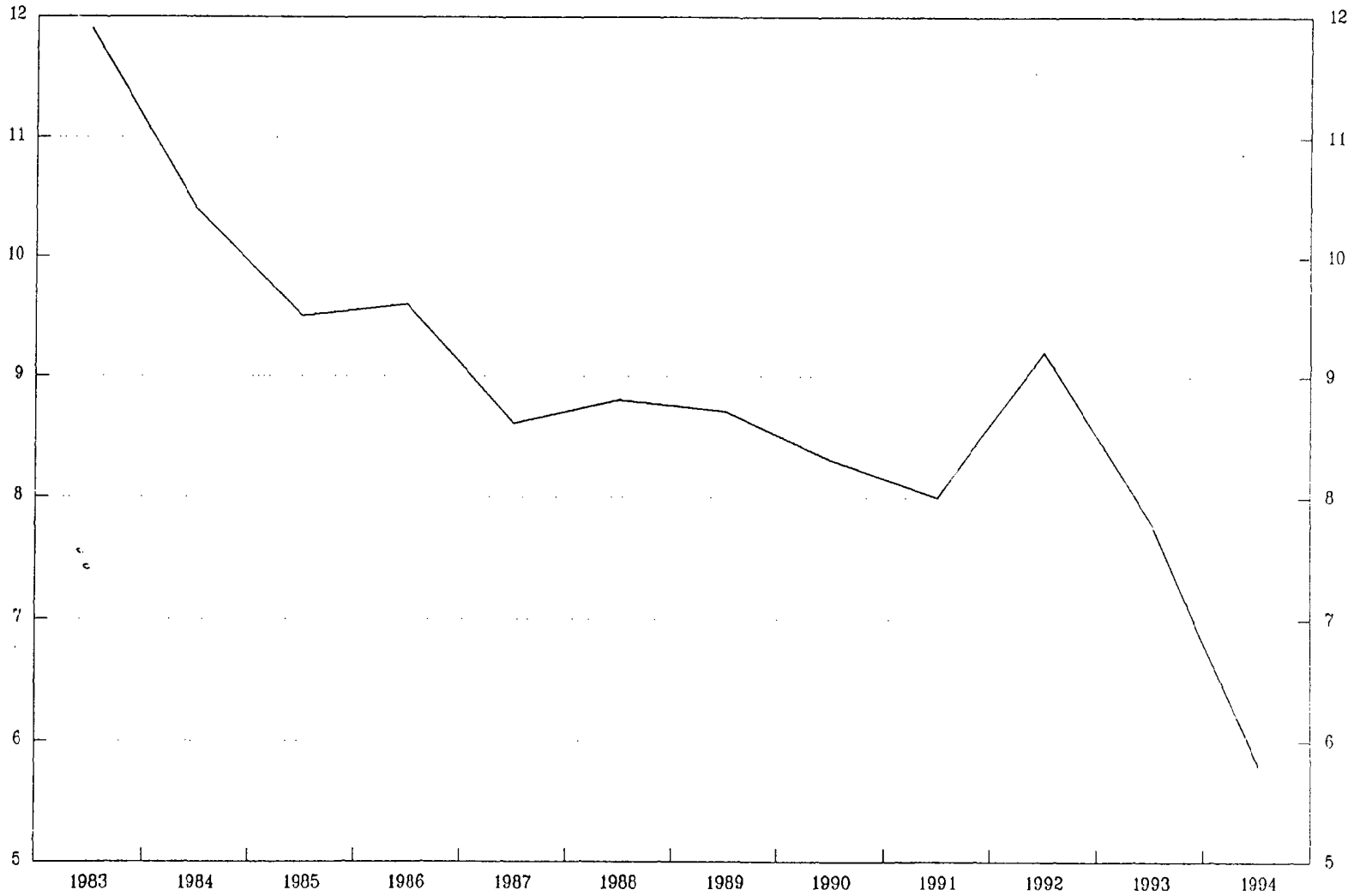
(Annual averages)



Sources: Bank of Italy.

1/ First six months.

CHART 4
ITALY
LENDING - DEPOSIT RATE SPREAD 1/



Source: Bank of Italy.

1/ Average lending and deposit rates as computed from profit and loss accounts. The figure for 1994 refers to the first six months.

between lending and deposit rates, a key indicator of banking system performance, started declining markedly only in 1987, long after the credit ceilings had been removed (Chart 4) 1/. While in the following period the spread continued declining gradually (with the exception of 1992), a second phase clearly emerged only in 1993-94, when the spread dropped to a new low, about 2.5 percent below its value in the early 1990s.

How was the stickiness of lending rates affected by the financial reform process? According to the hypothesis expounded in the previous sections the increased level of competition within the financial system should have resulted in a lower degree of stickiness. Yet, at first the empirical evidence on this point appears disappointing.

A Chow-test computed for equation (2) failed to detect structural breaks at any six-month interval between December 1988 and December 1991 (at the 20 percent probability level). Moreover, recursive estimates of the impact multiplier, covering four-year intervals between June 1986 and December 1993 did not reveal any clear trend away from the value estimated for the whole period (0.07).

This evidence is, however, somewhat misleading. During the 1990s the treasury bill rate became less important as "reference rate" (or, more precisely, as the relevant marginal risk-free yield) for the determination of lending rates. On the one hand, the deterioration of Italian public finances challenged the tenet that Italian government debt was risk-free. Second, the interbank market became more competitive and efficient (Gaiotti (1992)). Lending on such a market, which had been limited before by a complex set of bilateral interbank relationships, started being regarded as the "true" risk-free investment. This conclusion is supported by the following equation, estimated for the period December 1990-December 1993) in which the three-month interbank rate clearly "dominates" the treasury bill rate as determinant of the lending rate:

$$\Delta i_L = \underset{(1.66)}{0.41} + \underset{(5.03)}{0.39}*\Delta i_{L-1} \underset{(-1.43)}{- 0.10}*\Delta i_M + \underset{(2.97)}{0.20}*\Delta i_{IN} + \underset{(4.46)}{0.34}*\Delta i_D \underset{(-3.81)}{- 0.13}*i_{L-1} +$$

$$+ \underset{(2.03)}{0.14}*i_{IN-1} \underset{(-0.20)}{- 0.02}*i_{M-1} + \underset{(2.56)}{56.7}*\Delta BADLOAN \qquad (5)$$

Adjusted R^2= 0.90 DW = 1.80 S.E.= 0.14

After dropping the nonsignificant treasury bill rate from equation (5), the following estimate was obtained:

1/ The ceilings were reintroduced in early 1986 and late 1987, in the wake of exchange rate crises, but only for six months; and for most of the second period they were not binding.

$$\Delta i_L = \underset{(1.42)}{0.40} + \underset{(4.01)}{0.35}*\Delta i_{L-1} + \underset{(2.83)}{0.16}*\Delta i_{IN} + \underset{(3.17)}{0.30}*\Delta i_D - \underset{(-3.58)}{0.15}*i_{L-1} +$$

$$+ \underset{(3.49)}{0.14}*i_{IN-1} + \underset{(2.63)}{69.3}*\Delta BADLOAN \qquad (6)$$

Adjusted R^2= 0.90 DW = 1.74 S.E.= 0.15

This equation suggests that there was indeed a decline in the degree of stickiness of lending rates in the latest period. The impact multiplier of equation (6) is 0.16 more than twice as large than that estimated for the whole period from equation (2). 1/

While this increase in the impact multiplier is statistically significant, it still involves a relatively high degree of stickiness, a result which is in sharp contrast with the sweeping deregulation of banking and financial markets during the early 1990s. However, changes in the financial structure are likely to affect the performance of the banking system only with fairly long lags. As noted above, the removal of the ceiling on bank loans in 1983, and the deepening of the short-term securities market, failed to affect the level of bank spreads until the second half of the 1980s. 2/ The effect of the second wave of financial deregulation, related to the liberalization of capital movements and the free establishment of bank branches, emerged fully only in 1993-94, with a further, more decisive drop in the loan-deposit rate spread. Thus, it is possible that our regression-based measure of the degree of stickiness--requiring the use of a relatively long time interval--may not yet reflect the late change in the reactivity of bank lending rates. 3/

The above interpretation--which is consistent with the long length of the time averages used to compute the regressors of equation (4)--implies that, once the effect of the early 1990s reforms has fully manifested, the reactivity of bank lending rates in Italy will be substantially enhanced. Using the coefficients estimated in equation (4), the full liberalization of capital movements, together with the removal of the barriers to entry in the banking market should eventually raise the impact multiplier by

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1/ The increase is even sharper if compared to the impact multiplier with respect to changes in the interbank rate during the 1980s, which was not significantly different from zero.

2/ Other possible indicators of competitiveness, such as the dispersion of interest rates by size, sector, and province, also signal the emergence of a more competitive environment only in the second half of the 1980s (Ferri and Gobbi (1992)).

3/ There are indeed indications that lending rates have started responding more rapidly to liquidity market conditions. In July 1994, for example, most banks significantly raised their lending rates in the absence of discount rate changes, a relatively unusual event in Italy.

about 22 basis point (approximately equally distributed between the two components), with respect to the period average. A significant contribution should also come from the privatization of the banking system, which has just started. According to equation (4), the full privatization of the five largest Italian banks should raise the impact multiplier by over 20 basis points. 1/ Finally, the degree of lending rate stickiness could also be reduced by the increased degree of securitization of banks' liabilities. 2/

3. A Post-scriptum on the discount rate: should it be indexed?

A second, not necessarily alternative, explanation of the persistent stickiness of Italian lending rates is based on the "discount rate addiction" hypothesis borne out by equation (4). As recalled above, in countries where the discount rate is used to signal changes in the monetary policy stance banks may postpone the adjustment of lending rates until the discount rate is changed, even in the presence of a dynamic and competitive financial environment. While, on average, the effect of the "discount rate addiction" on the impact multiplier appears to be relatively contained (14 basis points; see equation (4)), some countries did experience a significant drop in the degree of stickiness after the discount rate was de-emphasizing, either by its indexation (Canada) or by its abolition (United Kingdom). 3/ The above considerations suggest that if the role of the discount rate were de-emphasized, for example by indexing it to the interbank rate, the stickiness of Italian lending rates could be reduced. Should the Bank of Italy consider such a reform? Even confining the discussion to the implications of such a decision for lending rate

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1/ The above figures, while consistent with equation (4), should be considered as indicative. It should be recalled that they reflect average behaviors over a group of widely different countries. Moreover, any increase in financial competition cannot be seen as arising from single measures (the liberalization of capital movements, the removal of barriers to entry, the privatization of the banking system), but, rather, as the result of a set of mutually consistent measures.

2/ The share of CDs over total bank deposits increased from 17 percent in 1990 to 28 percent in 1993.

3/ Cottarelli and Kourelis (1994) report econometric evidence on the determination of lending rates in Canada and the United Kingdom showing that in periods when the discount rate was administered money market rates almost ceased to affect lending rates. On the contrary, in periods when the central bank stopped posting or indexed the discount rate, lending and money market rates became tightly linked.

stickiness, the answer would remain ambiguous. 1/ On the one hand, indexing the discount rate is likely to reduce the degree of stickiness of bank interest rates, thus favoring a smoother transmission mechanism of monetary policy. Indeed, there have been cases in which delays in adjusting the discount rate to the change in underlying money market conditions severely disturbed the monetary policy transmission mechanism (Cottarelli (1986)). On the other hand, the discount rate is a powerful tool in the hands of the central bank, as confirmed by equation (2). Its prompt adjustment can substantially enhance the response of the banking system. 2/ Moreover, there may be a merit in having an instrument allowing a temporary "de-coupling" of lending and money market rates. The possibility of shielding lending rates from changes in money market rates related, for example, to exchange rate pressures gives an additional (albeit temporary) degree of freedom to the central bank.

V. Conclusions

This paper re-examined the relation between financial structure and lending rate determination process by focusing on the Italian bank loan market. It presented new econometric evidence on the stickiness of Italian lending rates, taking explicitly into account the nonstationarity of the lending rate series. Moreover, the use of individual bank data allowed also to control for possible distortions arising from data aggregation. This analysis, in combination with previous results obtained by Cottarelli and Kourelis (1994), supports the view that lending rate stickiness in Italy is higher than in other countries.

Next, we focused on the structural determinants of lending rate stickiness, interpreting the Italian case in light of previous cross-country econometric evidence, and presenting new evidence based on lending rate stickiness at the bank level and--indirectly--at geographic level. The

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1/ Moreover, the issue of whether the discount rate should be indexed or not has obviously much broader implications, as the announcement effect of discount rate changes is not confined to bank interest rates but extends to a number of other economic variables, including the exchange rate and money market interest rates. The underlying issue is whether the central bank arsenal should include an instrument that moves by "quantum leaps" rather than through gradual, market-determined adjustments.

2/ A simple computation based on equations (2) and (4) would strongly support continuing using the discount rate as monetary policy signal. Equation (4) suggests that if the discount rate were indexed the impact multiplier for a change in money market rates would be raised from 0.07 to 0.21. However, equation (2) indicates that the multiplier for a joint change of money market and discount rates is 0.47, more than twice as large. Of course, this computation is based on the assumption that the discount rate is adjusted promptly, which is indeed far from clear based on past experience.

latter allowed us to conclude that differences in the degree of lending rate stickiness among Italian banks are to a large extent due to the different degree of concentration (as measured by the Herfindahl index) of the local loan markets in which banks operate: banks operating in less concentrated, more competitive markets adjust their lending rates faster. In addition, lending rate stickiness at the bank level is also influenced by: the extent of securitization of banks' liabilities; the form in which loans are granted (overdrafts vis-à-vis other loans); the share of undrawn credit lines; bank size; and by a banks' ownership structure (public vis-à-vis private).

In light of these results, and of previous results based on cross-country econometric evidence, we argued that the high degree of stickiness of Italian lending rates is related to the existence, in the past, of constraints on competition (barriers to entry resulting in high concentration, limited capital mobility) and to the dominant position of public banks within the banking system.

We also discussed the implications for lending rates of the sweeping financial liberalization process that characterized the early 1990s. We noted that all structural variables affecting the degree of lending rate stickiness moved towards a better configuration: constraints on capital movements and entry barriers were lifted, bank concentration declined, the securitization of bank liabilities proceeded, the privatization of the banking system started. These changes should lead to a reduction of lending rate stickiness and to a faster transmission of monetary policy. Indeed, we found evidence that the degree of stickiness, while still high, has substantially declined: in recent years, lending rates started reacting to a more comprehensive set of money market rates, including interbank rates, and have shown higher flexibility. Finally, we argued that the stickiness of lending rate is also due to a form of "discount rate addiction" typical of countries in which the discount rate is used as monetary policy signal. De-emphasizing the discount rate is likely to increase the response of banks to money market changes, but would deprive the central bank of a powerful instrument to spur bank's reaction, whenever needed.

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