Risk Sharing and the Banking Channel.

An Empirical Note about Regional Interest Rates in Italy[§]

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Abstract: *In the last decade, Italy has experienced a convergence of regional nominal interest rates on current accounts and short-term credit, whereas the convergence of real rates has been much weaker. In a risk-sharing perspective, however, these outcomes allow for a high degree of neutralization of idiosyncratic shocks on regional consumption.*

JEL Classification: E21, G21

Keywords: Risk sharing, Banking market segmentation, Interest rates evolution.

1. Introduction

This paper investigates the risk sharing role of the banking channel by analyzing the dynamics of the real interest rates on current accounts and on short term credits in Italy in the period 1986.1-2002.4.

In the period under scrutiny, the banking sector has changed significantly because of the processes of privatization, deregulation and re-regulation and because of

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the shift from the traditional deposits and credits activities to the asset management[1]; all these changes could have enhanced the efficiency of the banking system, induced a long-run fall in the prices and fees charged to households and increased the convergence of regional nominal interest rates. The risk sharing implications of the dynamics of the regional real rates, however, have not been fully explored. Idiosyncratic risks can be redistributed between households through three channels - the capital, government, and banking channels, characterized by specific sets of instruments and time horizons[2]. The capital and the government channels can neutralize temporary and persistent shocks through the redistribution of ownership rights and taxes and subsidies, whereas the banking channel, with the households' borrowing and lending, is particularly important for temporary shocks[3].

The preliminary empirical evidence presented in the paper suggests only a partial convergence of the real rates[4] but also the existence of a significant degree of regional risk sharing.

The paper is organized as follows: in section 2, we develop our analytical framework; in sections 3 and 4, we describe the dynamics of the deposits and short term credits rates; in section 5, we discuss the econometric evidence on the regional risk sharing in terms of interest rates behavior; section 6 concludes.

[1] In 1992 the Law n. 481 introduces the Second EC Banking Directive into the Italian legislation; in 1993 the Legislative Decree n. 385 rationalizes the banking regulatory framework, replacing some 1,400 previous regulations and completing the introduction of the Directive. On these themes see, among others, Angelini and Cetorelli (2003), Enria, Focarelli and Landi (1999), Focarelli and Panetta (2003) and Panetta (2003).

[2] Short run (temporary) shocks are neutralized better than long run (persistent) shocks; see Canova and Ravn (1996).

[3] In the USA, the banking channel absorbed about a quarter of the total volatility in per capita consumption over the period 1963-90 (Asdrubali *et al.*, 1996); in Italy, about a fifth of the volatility in the period 1961-94 (Dedola *et al.*, 1999).

[4] Also in the US significant geographical differences still remain in the rates on checking accounts, NOW and money market deposits; see Heitfield and Preager (2002). In any case, nominal convergence might not enhance the convergence of real variables: in the EU, Kalemli-Oczan *et al.* (2004) found persistent divergence in real per capita GNP despite the recent monetary and financial integration.

2. Regional interest rates and consumption smoothing

Let the regional representative households be characterized by the same time-invariant preference structure[5]. Each period, the income of each household is subject to two different shocks: an aggregate, nation-wide shock, and an idiosyncratic, regional shock. Households can neutralize the idiosyncratic shocks via the deposit market (*ex-ante*) and via the credit market (*ex-post*). Under full risk sharing, idiosyncratic temporary shocks are completely neutralized[6] and there is only one (national) real interest rate on current accounts and one (national) real interest rate on short-term loans.

Households are typically net lenders to the bank and use their deposits as buffer stock to neutralize small idiosyncratic shocks. If (negative) idiosyncratic shocks are large, full risk sharing requires a bank loan, in addition to other portfolio adjustments, and the bank becomes aware of the household's situation. No effect should emerge on the national loan rates[7]as banks can completely neutralize the regional shocks via the inter-bank market.

Whereas a complete risk sharing could be provided by offering the same interest rate on short term credit, regional banks actually charge different interest rates, because different households are expected to face different idiosyncratic shocks, because of the difficulties that arise in distinguishing between permanent or temporary shocks, and because there are different profit maximizing interest rates for banks that retain some power on local markets characterized by different population, income, wealth, and

[5] The standard risk sharing framework has been developed, for example, by Cochrane (1991) and Mace (1991). The case of heterogeneous consumers has been analyzed, among others, by Obstfeld (1994). The economic implications of the risk sharing model is that consumers can smooth consumption intertemporally as well as across any different states of the world *i.e.* regions, markets, etc.

[6] Therefore, the change in the marginal utility of consumption is equalized across households. This implies that in a regression of the consumption growth rate of the regional household the only explanatory variable is the national aggregate consumption growth rate; any other variable (like the regional income) should not have explanatory power and its coefficient should be not significantly different from zero. See, for example, Cochrane (1991) and Mace (1991).

[7] See Bhattacharya and Gale (1987) and Smith (1991).

"transportation" costs[8]. In conclusions, deposits (and loans) markets are still considered as local; which are then, the consequences in terms of risk sharing?

3. The data set

We consider the real interest rates on current accounts and on short term credits of the 20 Italian regions in the period 1986.1-2002.4. The real interest rate is computed as the difference between the nominal interest rate and the inflation rate. The nominal interest rate is the ratio of the payment made by the bank to the account holder divided by the average balance of the deposit. The nominal interest payment is net of any expenses charged by the bank to the account holder (for example, the cost of mailing the account statement). Our data (provided by the Bank of Italy) refer to interest paid to households, non-financial companies and quasi-companies, private social institutions and other not classifiable units. We restrict our analysis to the interest rates on deposits below €25,000, which are likely to be relatively more frequent among households[9]. In the case of interest rates on short term credit we consider interests paid by households, non-financial companies and quasi-companies, private social institutions and other not classifiable units, as published by the Bank of Italy. We focus on loans below €125,000[10] which are likely to be relatively more frequent among households[11]. The regional inflation rates are computed from the regional CPI for household consumption[12]. As regional accounts are provided only annually, quarterly data for inflation are obtained by means of a linear interpolation between successive yearly

[8] See, for example, Coccorese (1988), Di Battista and Grillo (1988), Berger and Hannan (1989), Calem and Carlino (1991) and Barros (1999).
[9] Interests paid to consumer households are not publicly available for the whole period under scrutiny. In the last years, more than 80% of the current accounts are hold by consumer households.
[10] In the period 1986.1- 1995.4 the interest rate has been computed as a weighted average between the interest rates on loans below 50,000 Euros and loans between 50,000 and 125,000 Euros. The weight are the shares of "customers" belonging to each class.
[11] Also in this case interests paid by households are not published by the Bank of Italy.
[12] The series are published by Crenos, a research branch of the University of Cagliari, for the period 1986-1994 and by Istat, the official Italian statistical institute, for the period 1995-2002.

rates. Whereas this procedure smoothes the series, it should not induce any significant and persistent bias in the following analyses.

We will also distinguish between the North and the South of Italy, because of the well-known strong and persistent geographical differences in terms of real and financial variables[13]. The regions Piemonte, Valle d'Aosta, Lombardia, Liguria, Trentino Alto Adige, Veneto, Friuli Venezia Giulia, Emilia Romagna, Toscana, Marche belong to the Northern group; the Southern regions are Umbria, Lazio, Abruzzo, Molise, Campania, Puglia, Basilicata, Calabria, Sicilia and Sardegna.

4. Risk sharing and the banking channel: a preliminary evaluation

4.1 Current account interest rates

At the beginning of 1986 the nominal rate on current accounts averaged to 9%, but within a year dropped to 6% (Figure 1). Neglecting the year 1992, characterized by the collapse of the EMS (and by the temporary rise of the nominal interest rate in front of a fall in inflation), the period 1988-1999 is one of falling nominal rate and inflation (whose series remain closely intertwined) with the real rate fluctuating around zero. In 1999 as the nominal and the inflation rates exhibited distinct dynamics, the real rate became negative, an outcome not reversed in the subsequent years.

(FIGURE 1 ABOUT HERE)

[13] The literature on finance and growth in this case often identifies one of the causes of the persistent backwardness of the South in the underdevelopment and inefficiency of its banking system. See, for example, Galli and Onado (1990) and Faini, Galli and Giannini (1993).

The nominal interest rate convergence (measured in terms of standard deviation among regional values) emerges neatly from Figure 2, but for the real rate of interest and the inflation rate the evidence is not clear[14].

In 1986-1992 the regional nominal interest rates remain roughly constant in terms of level and variability, except for the temporary peak of the last months of 1992 following the crises of the Italian currency; in 1993-2002 the nominal interest rates fall and become less variable.

The inflation series exhibited a different dynamics. Until 1991 the average inflation was quite high and variable across regions, with a peak in 1990, and the subsequent disinflation process was associated to wide geographical dispersion of the interest rates (in 1998, inflation averaged about 2%, one third than in the years 1987-1989, but the volatility across regions remained constant). Now, the convergence of nominal rates is almost complete, as rates are low and similar across regions, but the disinflation process has not reduced the regional variability of the inflation[15]. As a consequence, the correlation coefficient between the level and the variability of inflation, equal to 0.31 for the whole sample, drop to 0.07 in the 1997-2002 sub-period. As shown in Figure 2, the variability of the real rate of interest tracks quite closely the variability of the inflation rate, especially in the second half of the sample[16].

(FIGURE 2 ABOUT HERE)

[14] The sectional standard deviation of the these series are computed by giving the same weight to peripheral regions in terms of population and/or income (like Basilicata) and to core regions (like Lombardia).

[15] The scale of the standard deviation depends on the average value of the series. If measured in relative terms (for example by the coefficient of variation), the geographical variability of inflation increased because the drop in the average inflation rate has not been matched by an analogous drop in the standard deviation.

[16] The correlation coefficient between the inflation rate standard deviation and the real interest rate standard deviation, equal to 0.69 for the whole sample, increased to 0.97 in the 1997-2002 sub-period. The correlation coefficient strongly decreases if we consider the coefficient of variation. It becomes negative (and equal to -0.11) if we consider the whole period but it strongly increases to 0.05 if we consider the sub-period 1997-2002.

As stated before, the dualism between the North and South of Italy is present also in the financial and banking systems. Whereas several analyses concern the lending process to the southern firms, important geographical differences exist also in the deposit rates and in the level and composition of the households' financial wealth.

It has also been suggested that, because of the different socio-economic environment, banks are less efficient and more risky in the South than in the North, so that if Southern households have some market power over the banking system, they should earn a positive risk premium, in the form of higher returns on current accounts; on the contrary, less efficient Southern banks with enough market power might charge their local depositors with the cost of their X-inefficiencies.

Some descriptive evidence is shown in Figure 3. The North-South nominal spread, positive in the period 1986-1994, becomes slightly negative thereafter[17]. In fact, the different level of efficiency was likely to be important in the first half of the sample, but with the crisis and collapse of the southern banking system, and its replacement with northern-based banks, might be reduced in the second part of the sample.

The convergence of the real rates is rather weak, with a spread negative (except in 1986.1-1988.1 and in 1992.2-1994.4) and more volatile than the nominal interest rate spread. The North-South difference in the nominal interest rates is small and, except in 1986, the average inflation in the North was higher than in the South. Therefore, the real rate spread mirrors the inflation spread: to a positive North-South spread on inflation, in most of the cases corresponds a negative spread on the real interest rate. In conclusion, in the North current accounts are, in real terms, more costly to households than in the South.

[17] These findings are in line with Panetta (2003) and Focarelli and Panetta (2003): the process of consolidation of the Italian banking system has increased the efficiency of the Southern banks, and enhanced the convergence of nominal interest rates.

(FIGURE 3 ABOUT HERE)

4.2 Short term credit interest rate

Full risk sharing can be reached also ex-post, via short term credits, if there is a unique national interest rate. The empirical evidence, however, is one of a persistent (but decreasing) real and nominal North-South spread. In contrast to the case of current accounts, local market conditions are more important than inflation in explaining the regional differences in real interest rates on short term loans (Figure 4).

If the loan contract would be an efficient real shock absorber, the nominal interest rates would adjust in order to reach a zero real interest rates spread between any pair of regions (and also between the Northern and the Southern groups).

However, the convergence of the real rates is, at most, partial during the period under scrutiny[18]: the North-South real spread decreases but remained positive, possibly because of the persistent regional differences in inflation rates and in the quality of loan applicants. More precisely, in the period 1986.1-1996.1, both the nominal and the real interest rates spreads increased, because of the crisis of the South whereas in the period 1996.2-2002.4, the adjustment and consolidation processes produced a positive effect, with a decrease of nominal differentials from 2.5% to 0.6% and of real differentials from 3.0% to 0.9%[19].

(FIGURE 4 ABOUT HERE)

[18] The period was characterized by the Northern banks' acquisitions of Southern banks, and by a process of deregulation, branching liberalization and technological innovation. The bank efficiency and profitability are analyzed, among others, by Calcagnini and Hester (1997), Coccorese (1998) and Barros (1999).

[19] The same conclusions can be reached also in terms of volatility. These results, available upon request from the authors, are not shown for the sake of brevity.

5. Risk sharing and the banking channel: econometric results

In this section, therefore, we formally test different specifications of regional risk sharing of the banking channel in Italy through the observations of the real interest rates behavior.

Even if the equality among regional real interest rate is rejected by the data, a result of partial neutralization of idiosyncratic (regional) risks might emerge. In fact, households and banks usually ignore whether the disturbances are aggregate or local, persistent or temporary. Hence, shocks can not be neutralized immediately (within a quarter), but only over a longer horizon, so that temporary regional differences in current accounts real rates and/or short term credits might emerge. Therefore, having denoted with r_{jt} the (borrowing or lending) real interest rate of region j in quarter t, with r_t the corresponding national rate and with e_{jt} the spread between the two interest rate series:

$$r_{jt} - r_{ITAt} = e_{jt} \qquad (1)$$

our first risk sharing test implies that $E_t(e_{jt}) = 0$. Table 1 summarizes the results.

(TABLE 1 ABOUT HERE)

Except for Emilia Romagna, Lazio, Abruzzo, and Sardegna, the real interest rate spreads on current accounts are, on average, significantly different from zero. In the North the real interest rates is, on average, lower than the national one whereas in Southern regions are present both positive and negative average differentials.

Excluding Umbria, all regional short term credit rates are significantly different from the national interest rate: banks discriminate between regional households, and rates are higher in the South.

A second risk sharing test could allow for non zero spread and temporary deviations between r_{jt} and r_t. A non zero spread might emerge for region j if, for example, the degree of risk aversion of the region j representative household differs from the average or if the region j degree of efficiency or competition is different than in the rest of the country. Even when average regional rates differ, the neutralization of the idiosyncratic shocks is still possible if the series follow the same dynamics, and only react to the same aggregate shocks. More formally, in this specification, the risk sharing hypothesis implies that the (nonstationary) regional series r_{jt} and r_t cointegrate with a (-1, 1) cointegration vector (the spread series is stationary).

$$r_{jt} - r_{ITAt} = a_0 + e_{jt}. \qquad (2)$$

The empirical evidence based on the Augmented Dickey Fuller tests is summarized in Tables 2 and 3. In Table 2 we first analyze the degree of integration of the original series r_j. Excluding Valle d'Aosta, the hypothesis of non stationarity can not be rejected for all the regional real rates[20]. As shown in Table 3, interest rate spreads are stationary in seven regions out of 20, when evaluated within a maximum one year lag[21]. Only in four cases (Piemonte, Umbria, Molise, and Sicilia) a stationary spread emerges for both deposit and short term credit.

(TABLES 2 AND 3 ABOUT HERE)

[20] The ADF tests of the first differences suggest an order of integration equal to 1 for all the series. The reuslts are available upon request from the authors.

[21] A one year lag is enough to obtain residuals of the ADF regressions with the required desirable properties.

Our final test of the risk sharing hypothesis evaluates the stationarity of the regional interest spreads by allowing for an endogenous shift of the constant term in the cointegration relationship between the interest rate series. In fact, it is well known that the omission of a break in the analysis can spuriously induce nonstationarity. In this case, we look for risk sharing in a framework of an (exogenous) structural change in financial markets: for example, the change in the degree of competition in a regional banking system can change the "equilibrium" spread for both deposit and short term credit rates. As new financial instruments and the branch liberalization have increased the competition and reduced the discrimination among customers, the emergence of risk sharing might be conditional to the existence of a break in the cointegration relationship.

The change in the spread has been modeled as follows:

$$r_{jt} - r_{ITAt} = a_0 + a_1 du_t + e_{jt}, \qquad (3)$$

where $du_\tau=0$ for $t=0,1\ldots\tau$, with $0 < t_0 < \tau < t_1 < T$, and $du_t=1$ otherwise.

In other words, up to the break period τ, the average interest rate spread is a_0, whereas after the break the spread is a_0+a_1; moreover, in a situation in which competition increases we expect opposite signs for the estimated coefficients a_1 and a_0 and also $|a_1|<|a_0|$[22]. We use the Gregory and Hansen (1996) ADF* methodology, which tests for the existence of a cointegration relationship allowing for an endogenously determined break point by means of a modified ADF test. Even if the flexibility of this approach is high, its limitations must be recognized. The procedure tests for the existence of only one break, whereas several breaks might occur in the period under scrutiny. Moreover, instead of being given by a sudden change in the intercept of

regression (3), the adjustment process might be better described by a smooth transition process from one regime to another[23].

The results for the ADF* tests together with a summary of the previous results are shown in Table 4[24]. For the sake of simplicity, the test statistics for the regions with a null or stationary spread are not reported[25]; in these cases only the order of integration of the spread series is given (this occur for Piemonte, Trentino Alto Adige, Marche, Umbria, Molise and Sicilia for the deposit spread and Piemonte, Liguria, Umbria, Molise, Calabria and Sicilia for the short run credit spread).

When a significant break emerges, we report the estimated value of the constant term and of the dummy variable (with the corresponding P-value in square brackets), together with the quarter in which the break occurred, and the relevant value of the ADF* test statistic. In the remaining cases no cointegration with break emerges; for this group only the values of the ADF* and the corresponding period are shown.

An overall evaluation of the stationarity of the spreads is also given in Table 4. A zero order of integration – the stationarity of the real interest rate spreads (and the existence of some type of risk-sharing) is reached for most regions. More precisely, for Valle d'Aosta, Lombardia, Veneto, Friuli Venezia Giulia, Toscana, Lazio, Puglia, Calabria and Sardegna, the stationarity of the spread is reached in the current account or in the short term credit markets, whereas for the representative household of the other eleven regions some form of neutralization of temporary shock emerges for both deposits and loans.

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[22] However, if the monopoly power of the bank has increased, the shift might lead to an higher equilibrium spread.

[23] For example, Ferri and Gobbi (1992), claimed that in Italy the process of liberalization and deregulation of credit market had only reduced sectoral and geographical differences. The limited length of our series, however, does not allow the smooth transition analysis along the lines developed by Granger and Teräsvirta (1993) and applied, among others, by Chelley-Steeley (2004).

[24] It is worth noting that the endogenous breaks coincide with structural economic changes that characterized the nineties consolidation process in Italy.

[25] The existence of cointegration with an endogenous break however has been tested for all regions. In the case of regions for which the spread is stationary the results of the latter test confirm our previous result. The complete results are available upon request from the authors.

(TABLE 4 ABOUT HERE)

6. Conclusions

In this paper, we have investigated the role of the banking channel in the risk-sharing process between the Italian regions over the period 1986-2002. Rather than looking at the growth rates of consumption, we focus on the behavior of the bank deposit and the short term credit markets.

Our results suggest that in the Eighties and Nineties, macroeconomic and financial policies have led to a significant convergence among regional nominal interest rates for both current accounts and short term loans, whereas the convergence of the real rates has been only partial.

However, the existence of a spread among the regional and the national real interest rates is not necessarily at variance with the existence of some form of neutralization of temporary shocks on consumption: the empirical evidence presented in the paper, in fact, supports the case of a significant degree of regional risk sharing through the deposits and short term credits markets.

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Fig. 1 – Italian inflation rate and nominal and real interest rates on deposits – 1986.1-2002.4.

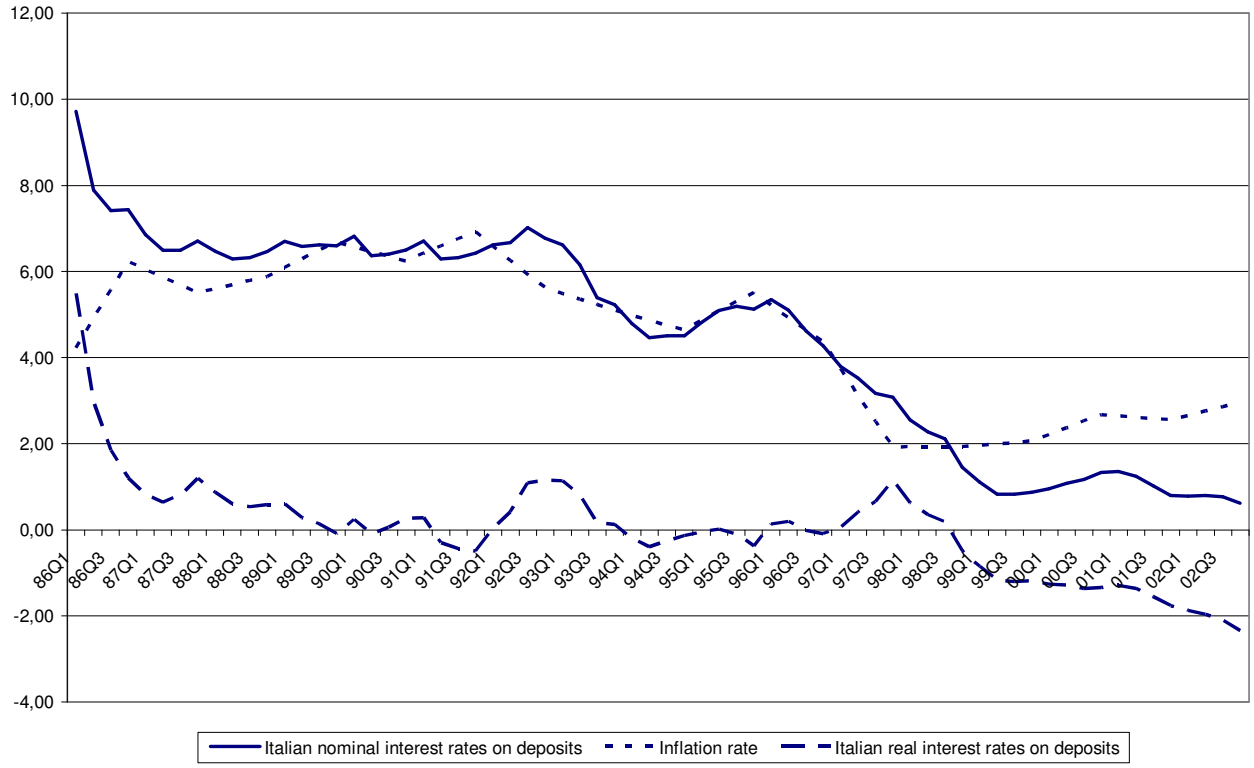

Fig. 2 – Regional variability of the Italian inflation rate and nominal and real interest rates on deposits – 1986.1 – 2002.4.

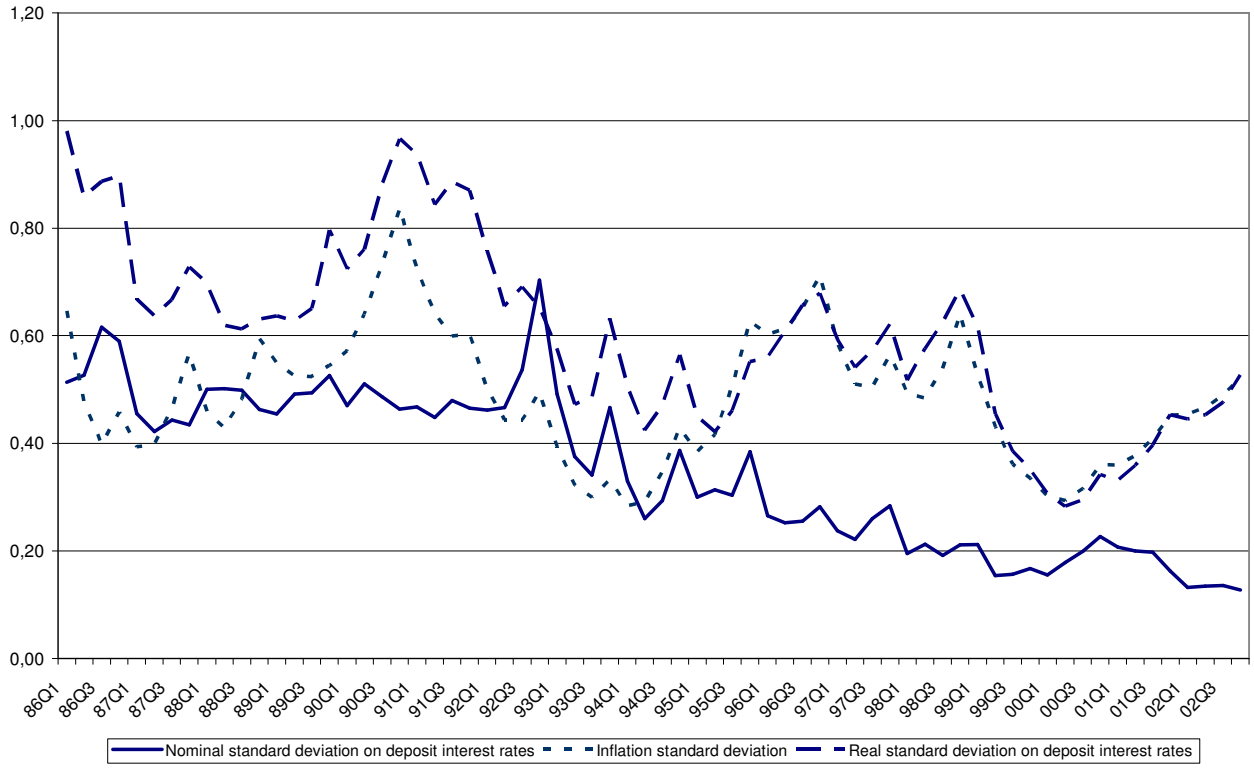

Fig. 3 – North-South spread on real and nominal interest rates on deposits and on inflation rate – 1986.1 – 2002.4.

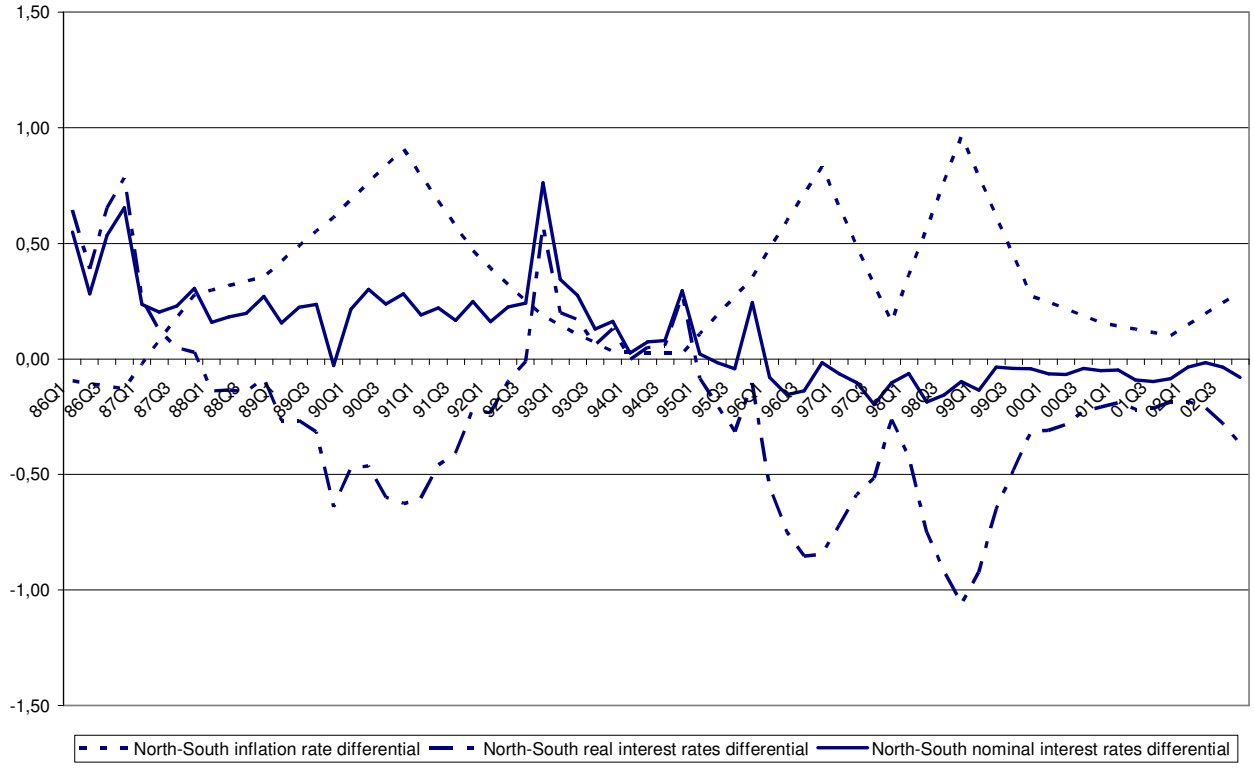

Fig. 4 – South-North spread on real and nominal interest rates on short term credit and on inflation rate – 1986.1 – 2002.4

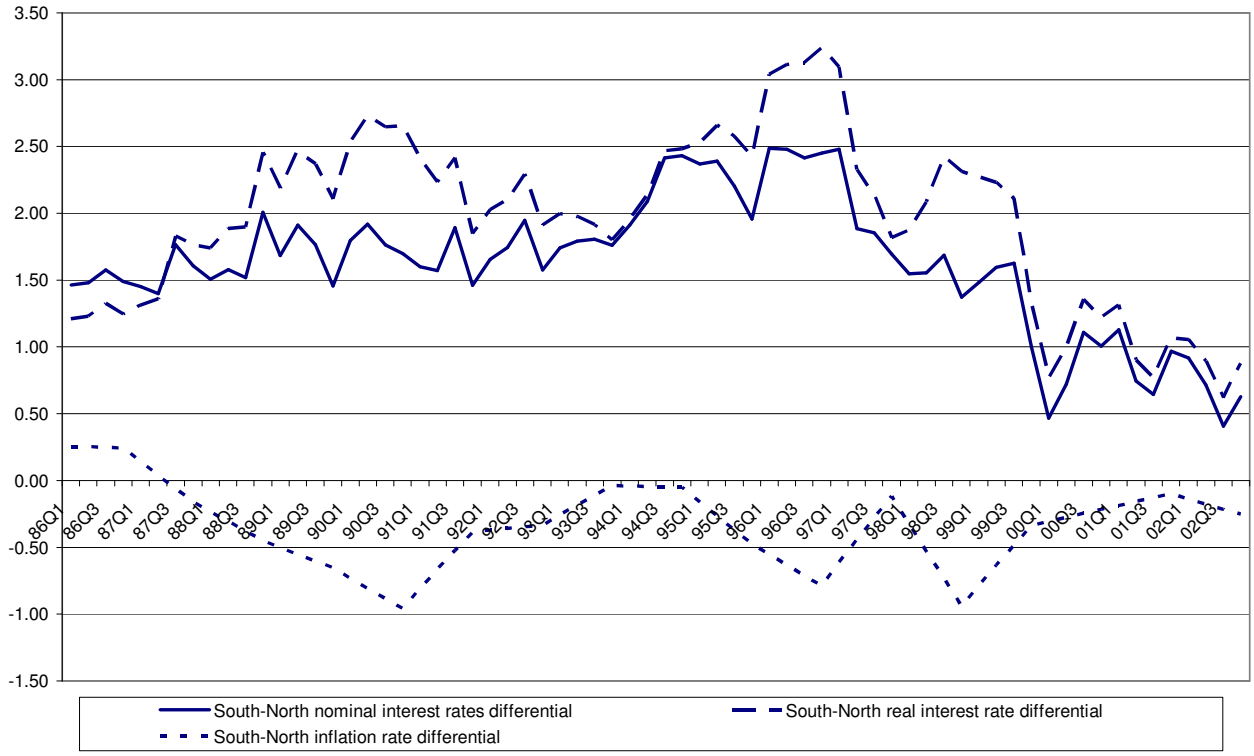

Table 1 – Mean of the real interest rates spreads on current accounts and on short term loans, 1986.1 – 2002.4.

Current accounts			Short term loans		
Regions	***Mean***	***T ratio***	***Regions***	***Mean***	***T ratio***
Pie	-0.450	-12.794 [0.000]	Pie	-0.701	-9.678 [0.000]
Vaa	-0.820	-6.986 [0.000]	Vaa	-0.932	-6.324 [0.000]
Lom	-0.172	-2.322 [0.023]	Lom	-0.897	-13.354 [0.000]
Taa	-0.479	-7.092 [0.000]	Taa	-1.624	-22.853 [0.000]
Ven	-0.191	-3.653 [0.001]	Ven	-0.192	-2.938 [0.005]
Fvg	0.155	2.457 [0.017]	Fvg	-0.676	-7.371 [0.000]
Lig	-0.295	-8.528 [0.000]	Lig	-0.225	-3.926 [0.000]
Emr	0.033*	0.804 [0.424]	Emr	-0.926	-13.619 [0.000]
Tos	0.405	9.620 [0.000]	Tos	0.190	4.007 [0.000]
Mar	0.338	5.857 [0.000]	Mar	-0.631	-6.359 [0.000]
Umb	0.340	6.408 [0.000]	Umb	-0.081*	-1.415 [0162]
Laz	0.004*	0.006 [0.995]	Laz	0.619	6.971 [0.000]
Abr	-0.007*	-0.119 [0.906]	Abr	1.063	14.415 [0.000]
Mol	0.189	2.142 [0.036]	Mol	2.391	24.4203 [0.000]
Cam	-0.548	-10.505 [0.000]	Cam	1.895	23.660 [0.000]
Pug	-0.231	-3.448 [0.001]	Pug	0.820	7.5777 [0.000]
Bas	-0.082	-1.223 [0.226]	Bas	2.572	20.928 [0.000]
Cal	-0.193	-2.462 [0.016]	Cal	1.996	13.044 [0.000]
Sic	0.523	13.614 [0.000]	Sic	1.334	22.220 [0.000]
Sar	0.032*	0.666 [0.508]	Sar	0.408	5.868 [0.000]

Table 2 - Stationarity of the regional real interest on current accounts and short term loans, 1986.1-2002.4		
	Current accounts	**Short term loans**
Regions	***ADF(3)***	***ADF(3)***
Pie	-2.653	-2.444
Vaa	-4.348*	-3.530
Lom	-0.982	-1.407
Taa	-2.213	-2.233
Ven	-2.206	-2.304
Fvg	-1.160	-2.200
Lig	-0.983	-1.755
Emr	-0.952	-1.455
Tos	-0.385	-1.184
Mar	-0.161	-1.480
Umb	-1.186	-.939
Laz	-0.715	-1.152
Abr	-1.433	-1.504
Mol	-1.909	-1.529
Cam	-1.376	-1.022
Pug	-0.905	-1.613
Bas	-1.136	-1.019
Cal	-1.132	-1.747
Sic	-0.612	-1.453
Sar	-1.471	-1.241
Ita	-1.064	-1.451
Note: 95% critical value for the ADF statistic = -2.9077 * indicates significance at the 95% critical value.		

Table 3 - Stationarity of the regional spreads on deposits and short term credits, 1986.1-2002.4		
	Current accounts	**Short term loans**
Regions	***ADF(3)***	***ADF(3)***
Pie	-5.429*	-3.779*
Vaa	-0.965	-1.085
Lom	-2.752	-2.192
Taa	-4.740*	-2.799
Ven	-2.879	-1.271
Fvg	-2.046	-2.424
Lig	-2.291	-3.406*
Emr	-2.804	-2.659
Tos	-2.836	-3.230*
Mar	-2.979*	-2.460
Umb	-3.443*	-3.369*
Laz	-2.716	-1.339
Abr	-3.409*	-2.139
Mol	-3.773*	-3.130*
Cam	-1.566	-0.940
Pug	-2.496	-2.362
Bas	-2.274	-0.982
Cal	-1.914	-3.197*
Sic	-3.182*	-3.078*
Sar	-2.482	-2.860
Note: 95% critical value for the ADF statistic = -2.9077 * indicates significance at the 95% critical value.		

Table 4 – - Stationarity and time breaks of the regional real interest rate spreads on current accounts and on short term loans, 1986.1-2002.4

Current accounts						Short term loans					
	Break point	***ADF****	***Constant***	***Break dummy***	***Order of integration of the spread***		***Break point***	***ADF****	***Constant***	***Break dummy***	***Order of integration of the spread***
Pie					0	Pie					0
Vaa	1995.1	-3.541	-	-	1	Vaa	1994.3	-5.175	-1.706 [0.000]	1.547 [0.000]	0
Lom	1994.4	-1.756	-	-	1	Lom	1995.3	-4.572	-.729 [.000]	-.381 [0.004]	0
Taa					0	Taa	1993.3	-6,361	-1.873 [0.000]	.44675 [0.001]	0
Ven	1991.1	-4.678	-0.075 [0.435]	-0.164 [0.154]	0	Ven	2002.4	-4,250	-	-	1
Fvg	1994.3	-4.151	-	-	1	Fvg	2002.4	-6,550	-0.699 [0.000]	1.506 [0.047]	0
Lig	2001.2	-5.066	-0.271 [0.000]	-0.244 [0.031]	0	Lig					0
Emr	1992.3	-5.849	0.276 [0.000]	-0.394 [0.000]	0	Emr	1989.2	-8.610	-0.088 [0.413]	-1.036 [0.000]	0
Tos	1989.2	-3.861	-	-	1	Tos	1995.4	-5.453	.310 [0.000]	-.282 [0.003]	0
Mar					0	Mar	1987.4	-8.152	1.075 [0.000]	-1.9016 [0.000]	0
Umb					0	Umb					0
Laz	1994.3	-2.904	-	-	1	Laz	1994.1	-6.766	1.024 [0.000]	-0.765 [0.000]	0
Abr	1988.3	-7.522	-0.568 [0.000]	0.659 [0.000]	0	Abr	1995.1	-5.879	1.006 [0.000]	0.1209 [0.417]	0
Mol					0	Mol					0
Cam	1993.4	-4.712	-0.832 [0.000]	-0.522 [0.000]	0	Cam	1989.2	-4.468	2.591 [0.000]	-0.861 [0.000]	0
Pug	2001.1	-2.749	-	-	1	Pug	1996.1	-5.805	0.657 [0.000]	0.396 [0.071]	0
Bas	1997.4	-4.735	-0.272 [0.000]	0.616 [0.000]	0	Bas	1998.3	-6.971	2.918 [0.000]	-1.304 [0.000]	0
Cal	1994.4	-3.504	-	-	1	Cal					0
Sic					0	Sic					0
Sar	1990.4	-3.038	-	-	1	Sar	1990.4	-6.355	0.622 [0.000]	-0.297 [0.055]	0

Note: 10%, 5% e 1% critical values of the ADF* statistic are, respectively -4.34, -4.61 and –5.13.