A Simple Enquiry on Heterogeneous Lending Rates and Lending Behaviour

by

Marco Mazzoli

Maggio 2001

Università degli Studi di Modena e Reggio Emilia
Dipartimento di Economia Politica
Viale Berengario, 51
41100 Modena (Italy)
e-mail: mazzoli@unimo.it

A simple enquiry on heterogeneous lending rates and lending behaviour

Marco Mazzoli*

ABSTRACT

This paper contain an empirical analysis on the most relevant determinants of heterogeneity i Italian banks' lending rate and lending behaviour, performed with descriptive statistics and dynamic pane data analysis on the basis of a "mesoeconomic" data set specifically acquired from the Bank of Italy which contains the data on interest rates, bad debts and credit flows granted by different size categories c banks under the form of different size categories of loans in different geographic areas of the country, fc the period 1990 QI –1998 QIV. The purpose of the econometric analyses is twofold: First, investigatin the possible disturbances affecting the link between policy rate and interest rates on bank credit; secon verify whether the behaviour of the largest bank loans is demand-determined. The results show that th spread between interest rate on the various classes of bank loans and the monetary policy rate is nc influenced by the loan size, while it seems to be more affected by proxies for risk and competitiv configuration of the banking sector. Furthermore, the behaviour of the largest size class of bank loan does show a pattern consistent with a "demand determined" behaviour.

Keywords: credit; monetary policy.

JEL Classification: E51, E52.

* I am very grateful to Giuseppe Marotta, Giovanni Ferri and Giancarlo Bertocco for their helpfi comments and suggestions at different stages of this research. All mistakes are mine. Financial suppo from the Italian Ministry for University and Scientific Research (MURST) is gratefully acknowledged.

A simple enquiry on heterogeneous lending rates and lending behaviour

1. Introduction

According to a well-known statement of the credit view, the monetary policy propagation process takes place both trough banks' assets (loans) and banks' liabilities (money). A great deal of empirical research in that field focuses therefore on the behaviour of interest rates spreads as well as credit supply in different phases of the business cycle to different categories of borrowers. The more common empirical tools to investigate these issues are either VAR models analysing the behaviour of credit aggregates, interest rate spreads and the way these variables affect economic activity, or, more recently, dynamic panel data estimates based on individual firms (or individual banks) observations. The former directly focuses on the behaviour of macroeconomic and policy variables, the latter have the advantage of modelling individual agents and accounting for disaggregated behaviour and heterogeneity. The use of "mesoeconomic" dataset, on the contrary, might allow to analyse the interactions between some macroeconomic policy variables and the behaviour of variables associated to different categories of agents. The purpose of this paper is twofold: first, performing a simple analysis (both descriptive and econometric) on the possible disturbances affecting the link between policy rate and interest rates on bank credit. Since we are interested in heterogeneity, the second purpose of the paper aims at investigating a very relevant element of heterogeneity, i.e. verifying whether the behaviour of the largest size class of loans is demand-determined. To do that we will focus on the share of the largest size class of loans over the total: if the behaviour of this variable appears to be demand-determined, then, for a given level of credit supply, the share of the other size classes is a sort of "residual" variable, and bank credit would be allocated according to a sort of implicit hierarchy according to the size class of loans.

All the analyses are performed with a "mesoeconomic" data set acquired from the Bank of Italy, whose main characteristics are explained in detailed in the appendix. The next section briefly discusses the motivations for this methodological choice, after presenting a brief survey on the empirical research on agents' heterogeneity in the transmission mechanism of monetary policy for Italy. Section 3 and its subsections contains a preliminary and descriptive analysis of the dataset employed here. Section 4 and its subsections contain the econometric analyses. Section 5 contains a few concluding remarks.

2. Empirical research on monetary policy transmission in Italy

A common feature of the Italian empirical analyses on monetary policy transmission is the emphasis on agents' heterogeneity, credit market structure and, to a lesser extent, geographic differences

and inequalities among different regions. A great deal of this research has been performed by economists from the Research Department of the Bank of Italy and published on "Temi di Discussione", a publication from the Research Department of the Bank of Italy (for instance, Angeloni *et al.*, 1995, Baffigi *et al.*, 1999, Buttiglione *et al.*, 1994, Cottarelli *et al.*, 1997, De Bonis *et al.*, 1997, Focarelli *et al*, 1998, Rinaldi Russo *et al*, 1999), which, apart from being a prestigious Italian research institution, enjoys a privileged access to the generality of individual banking data for research purpose while guaranteeing, at the same time, strict confidentiality of the data, according to the existing regulations. Angeloni *et al.* (1995), by performing impulse response functions with aggregate time-series data referred to different size classes of banks show (for the sample period from 1987,1 to 1993, 12) that large-size banks tend to raise their lending rates more than small banks in periods of tight money and associate this phenomenon to monopoly power in local markets and customer relationships. Surprisingly they also find that the impact of monetary policy seems to be stronger in large companies than in the smaller ones, due, again, to the peculiar kind of customer relationships existing in local credit markets. Apart from these peculiar results, Angeloni *et al.* obtain evidence consistent with the credit view: the interbank market is weakly exogenous to the bond market, the interbank and bond market are weakly exogenous to the loan and deposit markets, and, similarly to the results by Buttiglione and Ferri (1994), the spread between bank loan and long term Government bond is influenced by the fact that lending rates tend to overshoot bond market rates. A certain influence on this kind of literature has been played by Cottarelli and Kourelis (1994) methodology in analysing how the degree of stickiness of bank rates varies significantly from country to country. Cottarelli and Kourelis also find that interest rates stickiness does not seem to be affected by the credit market structure. Cottarelli *et al.* (1997), after a detailed analysis of Italian structural data for the banking sector, apply Cottarelli and Kourelis (1994) methodology to analyze the degree of stickiness of the interest rates in various Italian provinces, by taking into consideration the possible non-stationarity of lending rates and using individual bank data. Again, like Cottarelli and Kourelis (1994), they find that Italian lending rates are indeed very sticky. Significant differences in the amount of bad debts among different geographic areas are found by De Bonis and Ferrando (1997), who also show that the lending rates in the different Italian provinces are higher the more concentrated are the credit markets, the higher the market shares of the largest banks, the more risky each single credit intermediary and the higher the bank operational costs. Focarelli and Rossi (1998) estimate with cointegration techniques a bank credit demand function (which is assumed to depend negatively on the cost of bank credit and operational cash flow, and positively on the firms' investments and on an alternative interest rate) which turns out to be very stable even in times of deep and frequent institutional changes. On the other hand, more difficult and subject to different heterogeneous influences seems to be the demand for bank credit in the various Italian region: for instance, in the North-East, real variables seem to determine a strong effect, while elasticity with

respect to the opportunity cost seems to be lower. The relevance of geographic areas is again emphasized by Finaldi Russo and Rossi (1999), who find localization in industrial districts to be a relevant and significant variable.

The focus of most empirical contributions in this research field is on agents' heterogeneity and its implications for the transmission of monetary shocks and for the process of aggregation of different observable variables. Obviously, all this does not seem to match with the "new econometrics" methodological approach, which postulates that the macroeconomic relations to be estimated have to be microfounded on the basis of a representative agent model. Since it is very hard to capture any heterogeneity within the representative agent framework, at least three theoretical attitudes seem to be possible in this regard. The first one consists of not taking too literally the "new econometrics" approach and still performing empirical analyses with aggregate time series based on theoretical assumptions only defined in aggregate terms. A good argument in this regard is provided by Blinder (1986) who claims that the use of specific properties associated to the representative agent's utility function may cause serious bias in the estimates, since "*for many goods, the primary reason for a downward sloping market demand curve may be that more people drop out of the market as the price rises, not that each individual consumer reduces his purchases*"[1]. Another argument lies in the fact that the utility function of a representative agent is actually a "non-microfounded macroeconomic function": it could be theoretically obtained by integration on the basis of an aggregate consumption, and its analitycal form is simply based on "*ad hoc*" assumptions[2].

Of course, a second (and very popular) theoretical attitude consists of only performing empirical studies with individual microdata, in order to properly capture the different and asymmetric effects that might be generated by heterogeneous agents and – at the same time – avoid any Lucas' critique objection. There is no doubt that this approach is very appropriate, but some residual (although relevant) problems might arise from sampling bias, since it is very difficult to exclude that some specific categories of individuals can be underrepresented (for instance, very small firms, in case one wishes to study the impact of monetary policy on the industrial sector of an economy). For all these reasons, we follow a third approach and perform empirical analyses with an intermediate or "mesoeconomic" level of data aggregation might provide a relevant source of information. Some goods arguments in this regard might also be provided by the recent literature on the statistical properties of aggregated and disaggregated data. Forni and Lippi (1997), for instance, show that the conventional mainstream econometric assumption on

[1] Blinder, cit., p. 76

[2] In addition Benartzi and Thaler (1995), Kahneman (1994), Shafir, Diamond and Tversky (1997) report a very extended experimental evidence showing that the actual behaviour of individuals choosing in conditions of uncertainty is characterized by the so-called "status quo bias" and can be modelled with a "kinked utility function", extremely different from any analytical form commonly employed to model a "nicely behaved" utility function.

the fact that only one macroeconomic source of shocks is common to heterogeneous agents is rejected by very extended empirical analyses. In addition, they show that many statistical properties (like, for instance, Granger causality) existing at the level of individual agents do not survive aggregation, while aggregated time series show statistical properties that are absent in the individual data that constitute them. All this suggests that "mesoeconomic" empirical analyses can be as informative as the more conventional microeconometric and aggregate time series analyses, by providing a different perspective to investigate the interaction between macroeconomic policy variables and heterogeneous typologies of agents.

3. A preliminary descriptive analysis

The graphics reported in the next sub-section and the descriptive statistics of the appendix allow already to identify some relevant structural phenomena. In the dataset, lenders are divided in three size classes: large and major banks, average size banks and small and minor banks. Loans are divided into 5 size classes. The smaller categories have been aggregated into the class "C1", which includes all loans smaller than 250 millions lira; class "C3" includes loans from 250 to 500 millions lira; class "C4" from 500 millions to 1 billion liras; class "C5" all loans larger than one billion liras. In most cases, the comparisons will be made among the three larges class sizes because (as explained in the appendix) the dataset contains many discontinuities in the statistical criteria of sampling and in the definitions of some relevant variables. Nevertheless, the comparison among the three largest size class is rather informative.

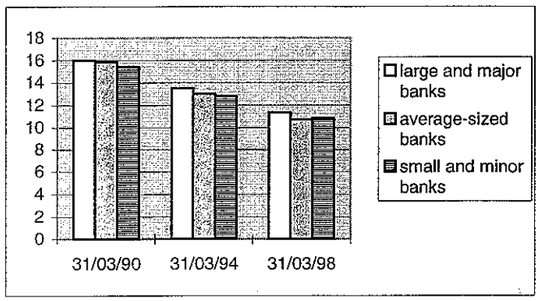
3.1 How heterogeneous are lending rates?

The first structural feature that will be considered here is the different behaviour of lending rates according to the different kinds of size classes of borrowers and geographic areas, for each given size class of borrowers. In this case, in order to make the graphics easier to read, we have compared the data referred to the first observation of each time series, the median observation and the final observation, by using histograms. This kind of graphical representation (usually not employed for data and observations of this kind, but rather to represent frequencies), although unusual, allows seeing more directly the structural differences analysed here. No precise or uniform relation can be detected between the lender size (for a given class size of loan) in the various areas, by simply observing the data and without recourse to multivariate analysis, given the potential effects of borrower risk and the demand expectations.

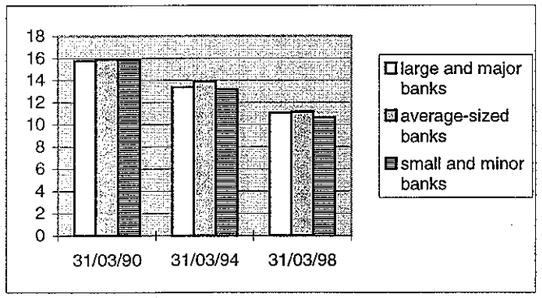
As one can see from the graphics, a higher interest rate from large and major banks is only detectable in "area 3" (corresponding to Tuscany, Marche and Umbria) for all the size classes of loans, while for the loan classes "C3" and "C4" is also detectable in "area 1" (Piedmont, Val d'Aosta and

Liguria) and in "area 5" (Abruzzi, Molise, Puglia and Basilicata). In all the other cases, there is no precise pattern (at least without using econometric methods) between the lender size and the level of the interest rates. This means that there seems to be no precise link between the lenders size and their market power. For this reason, other variables, different from the lender size are employed in the econometric analysis as proxies for the lender's market power, in particular, as shown in section 4.1, we employ the spread between maximum lending rate and minimum borrower's rate for each class size and in each geographic area.

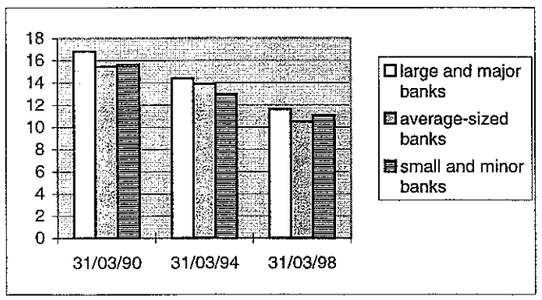
Lending rates to loan size class "c3" in area 1



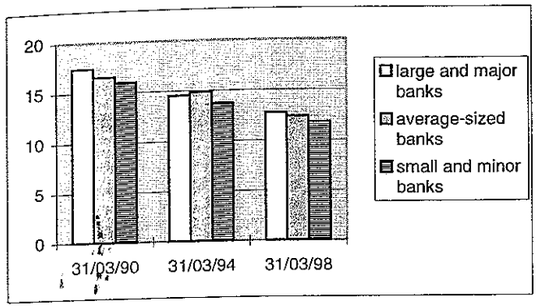
Lending rates to loan size class "c3" in area 2



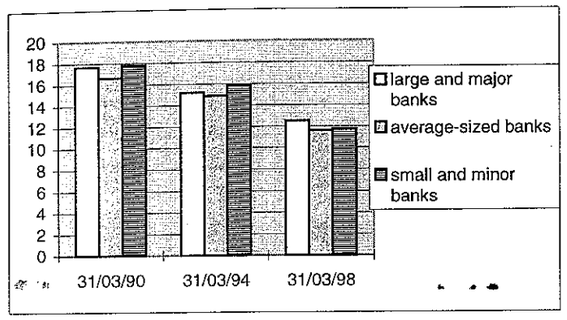
Lending rates to loan size class "c3" in area 3



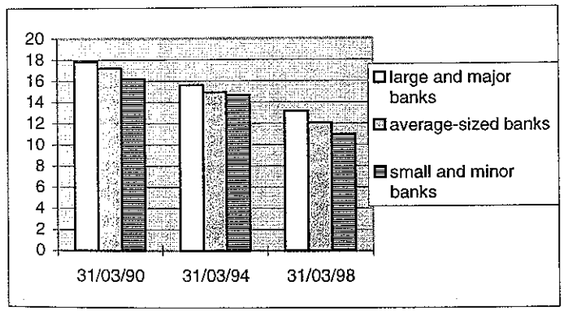
Lending rates to loan size class "c3" in area 4



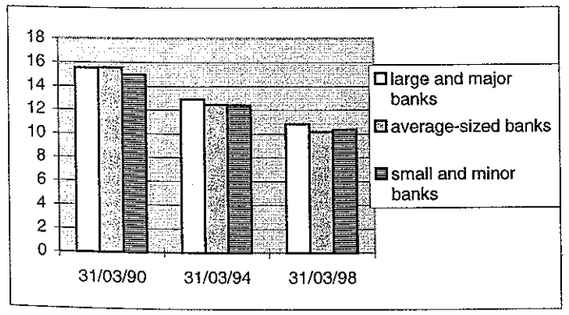
Lending rates to loan size class "c3" in area 5



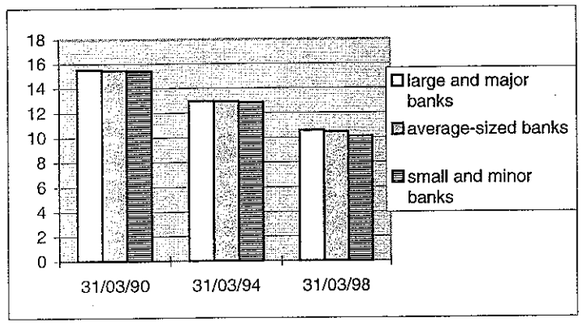
Lending rates to loan size class "c3" in area 6



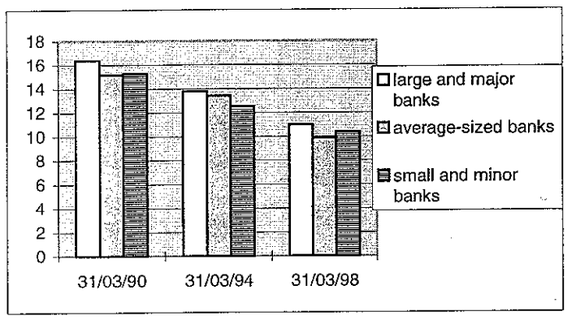
Lending rates to loan size class "c4" in area 1



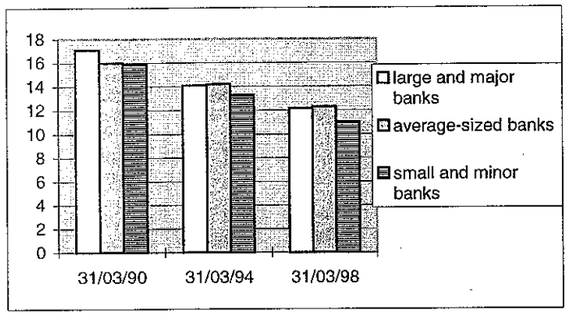
Lending rates to loan size class "c4" in area 2



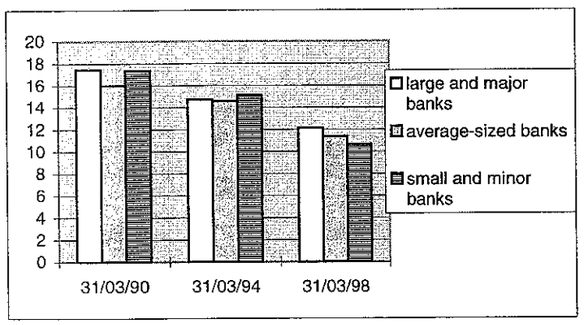
Lending rates to loan size class "c4" in area 3



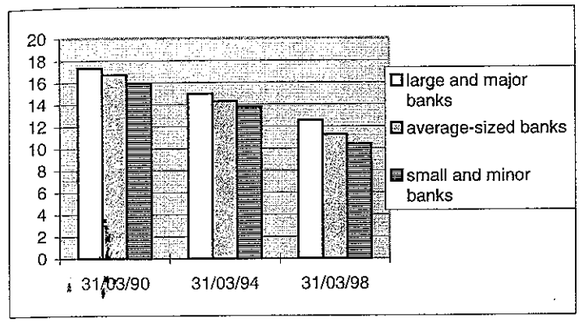
Lending rates to loan size class "c4" in area 4



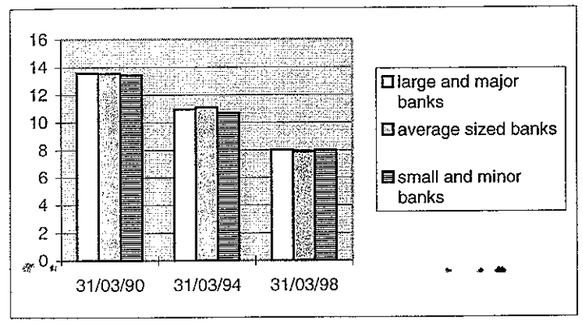
Lending rates to loan size class "c4" in area 5



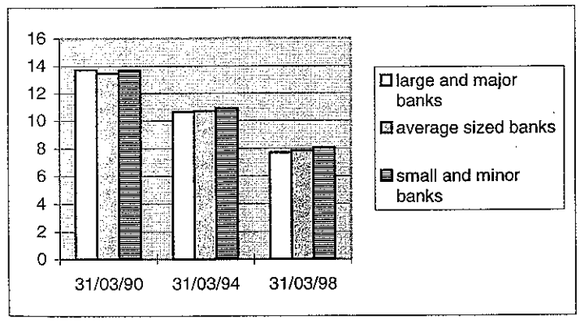
Lending rates to loan size class "c4" in area 6



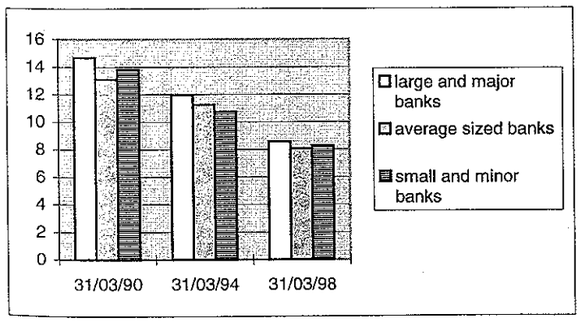
Lending rates to loan size class "c5" in area 1



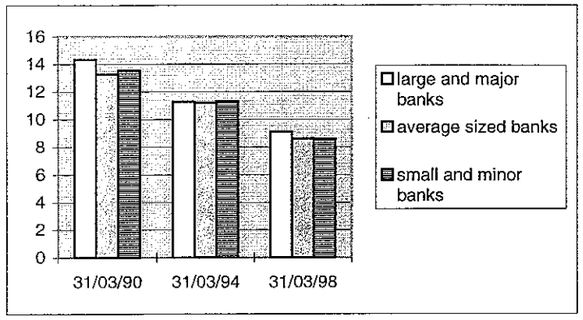
Lending rates to loan size class "c5" in area 2



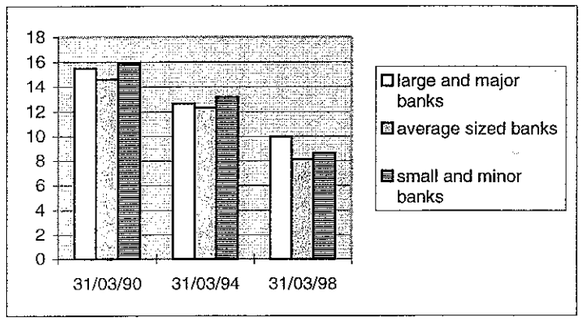
Lending rates to loan size class "c5" in area 3



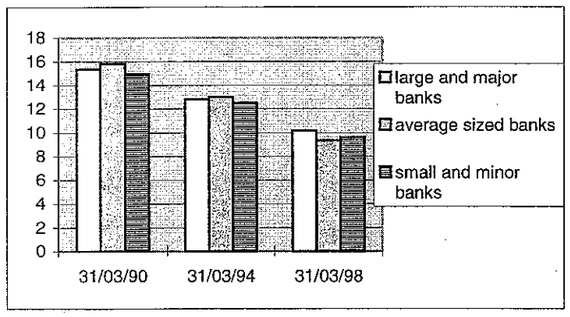
Lending rates to loan size class "c5" in area 4



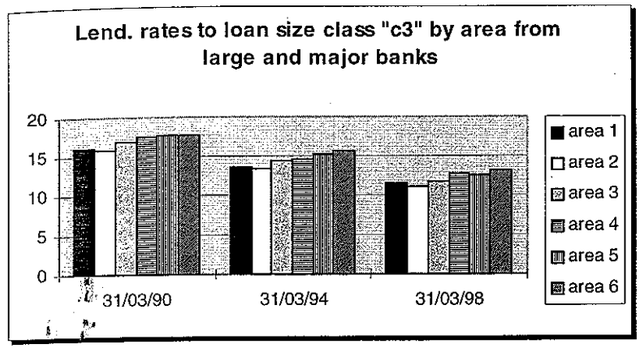
Lending rates to loan size class "c5" in area 5

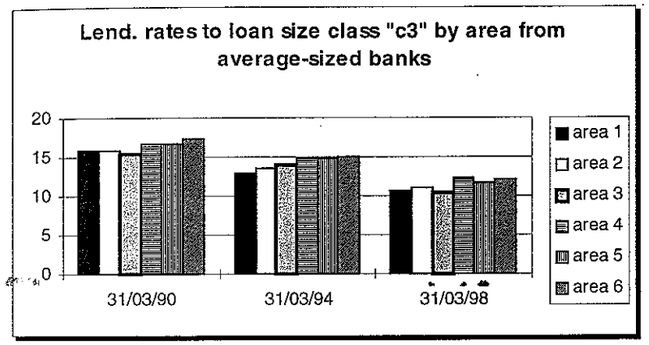


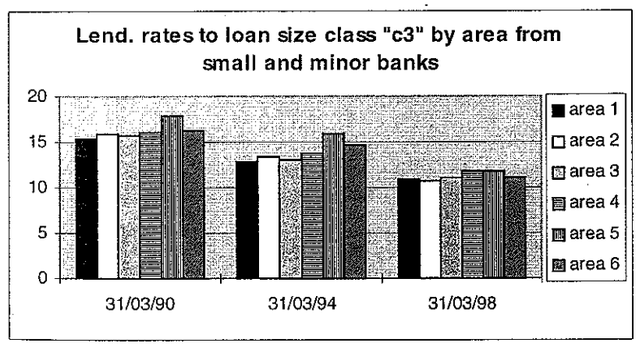
Lending rates to loan size class "c5" in area 6

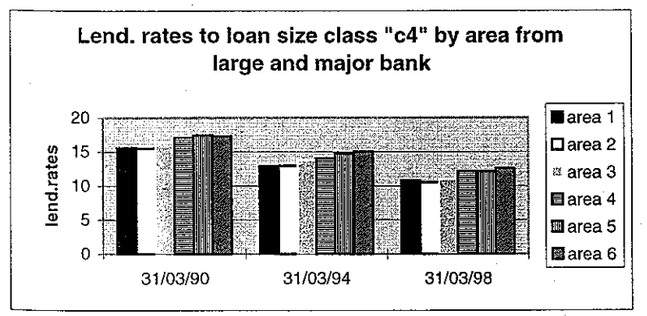


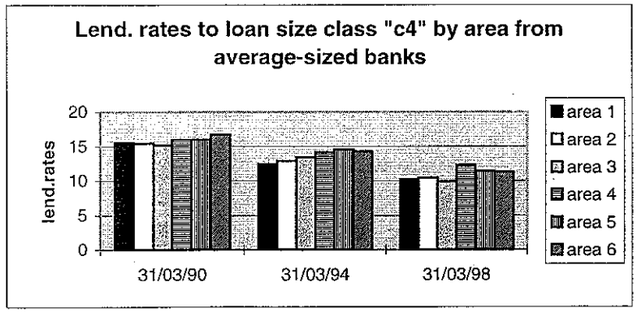
For what concerns the behaviour of interest rates for each class size of loans according to the different lenders sizes and geographic areas a certain "geographical pattern": "area 5" (Abruzzi, Molise, Puglia and Basilicata) and "area 6" (campania, Calabria, Sicilia and Sardinia) show almost constantly higher lending rates than the other areas. Also "area 4" (Lazio) would show higher lending rates than the other areas, excepting for the loan class "C5" including the loans larger than 1 billion liras.

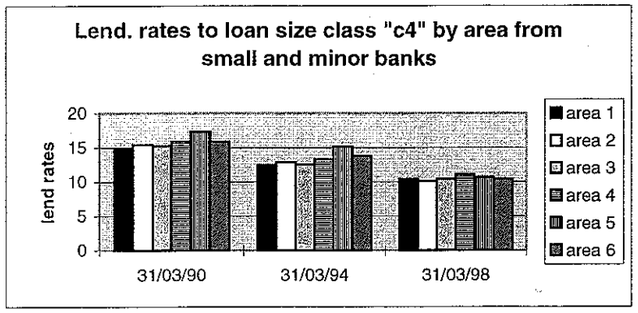


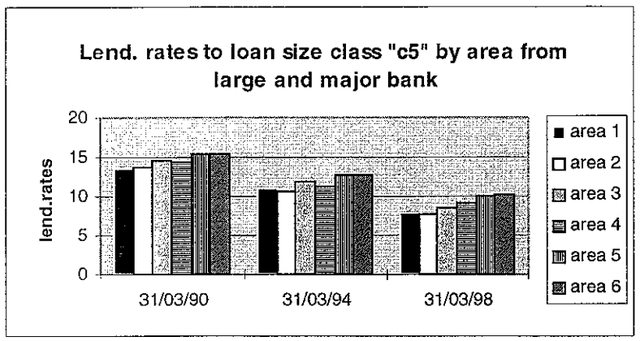


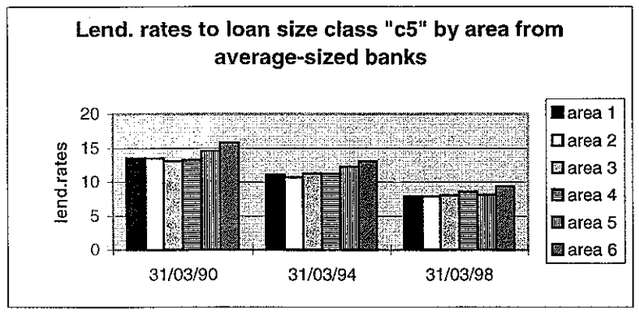


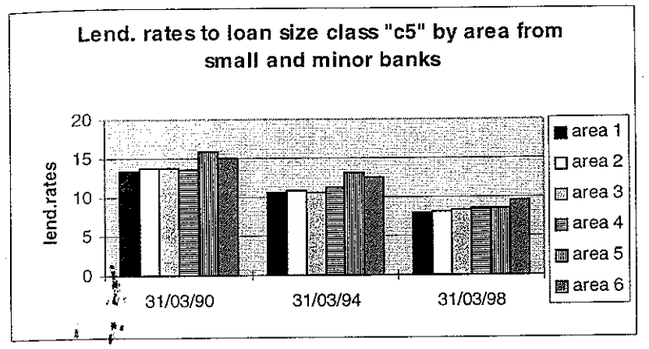






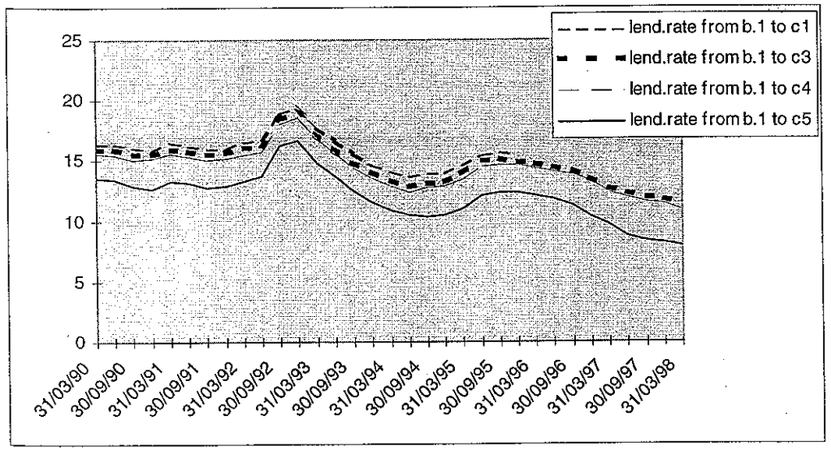




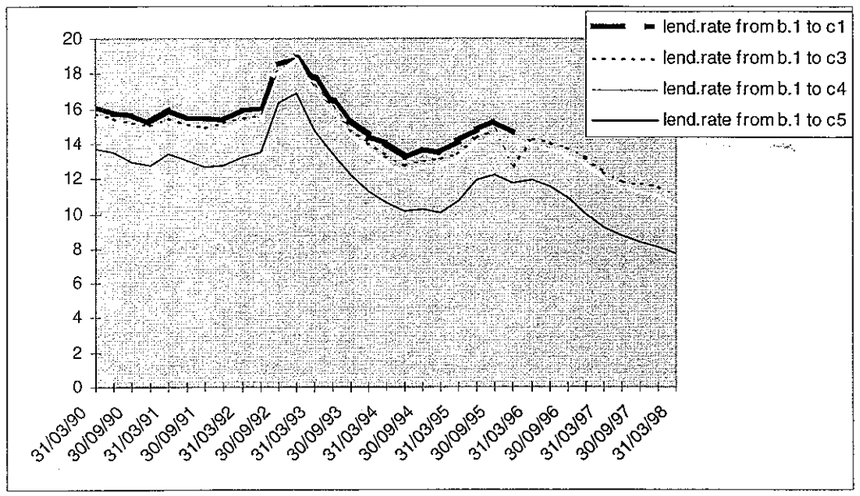


A very precise pattern, on the contrary is detectable in the behaviour of interest rates according to the different class sizes of loans in the various geographic areas (as observed for each given lender size class). In particular, the relation between the loan size class and the level of the interest rate is particularly evident if one compares the interest rate level between the loan class "C5" and the other categories. In addition, the interest rate to she smaller class size of loans is constantly higher than the interest rate to the other classes. An exception to this apparent negative relation between loan size class and lending rates is given by the lending rates from average size banks (B2) in areas 3, 5, 6 and from small and minor banks (B3) in "area 5" where the negative relation between lending rate and loan size does not exist for the intermediate size classes of loans, although it still exists between those and the two extreme loan size classes. All these data would be confirmed, and be also more evident in the descriptive statistical tables of the appendix.

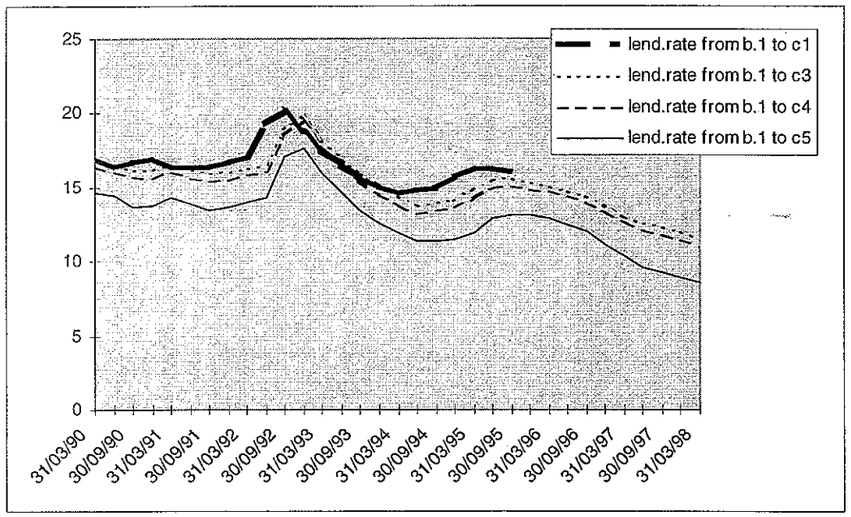
Of course, the relation between loan size and level of lending rate might just be apparent and explained by different theoretical variables, such as risk and demand expectations: this is shown in the very simple econometric analysis of the next sections, where the estimates with proxies "capturing" risk and the different market power of lenders and borrowers yield completely non-significant dummies for the loan size classes, in spite of what seems to appear from the graphics.



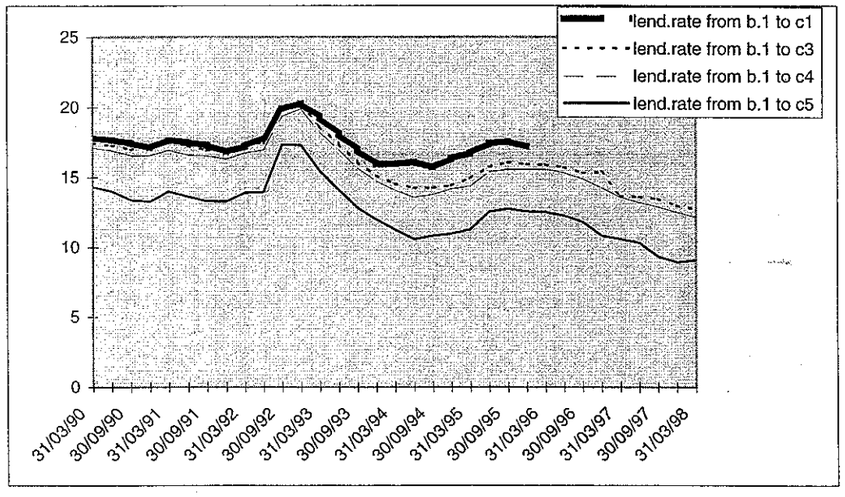
AREA 1



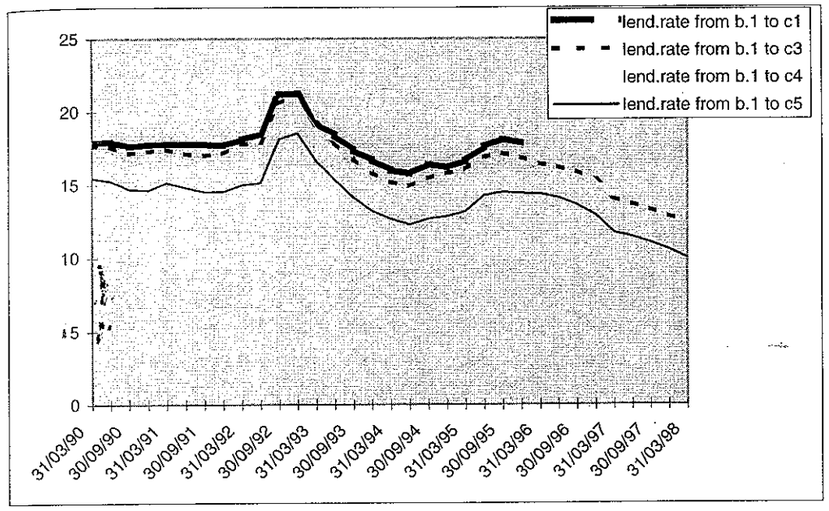
AREA 2



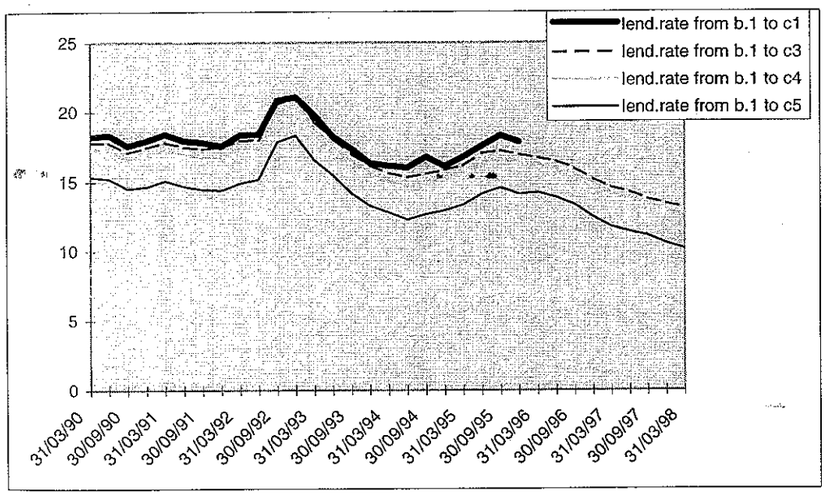
AREA 3



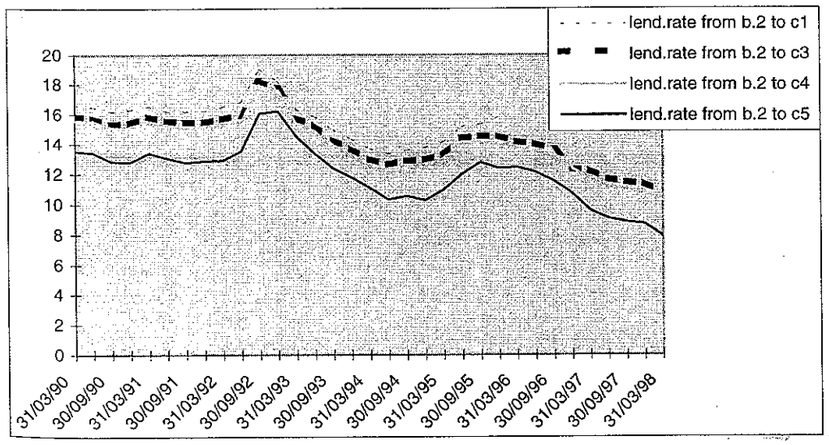
AREA 4



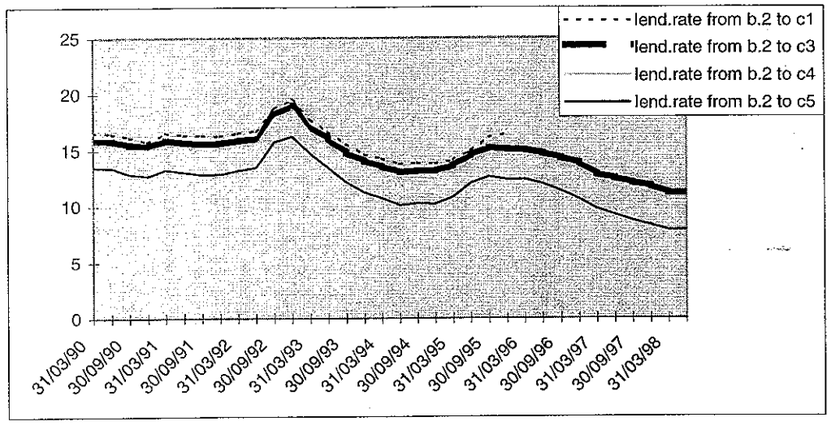
AREA 5



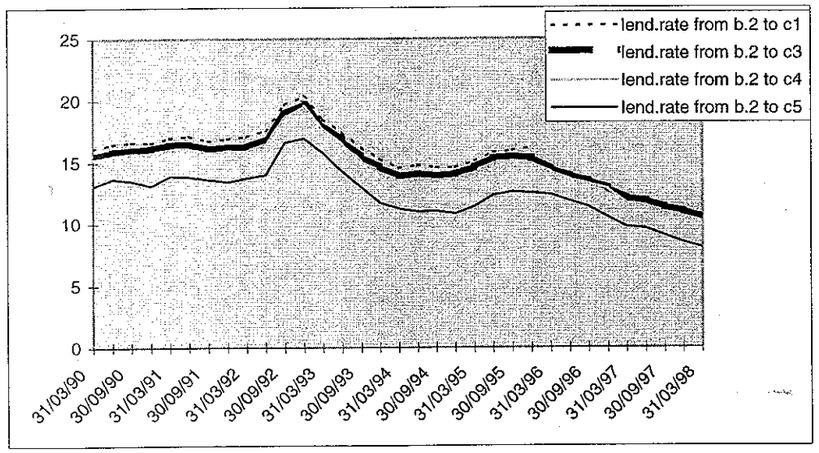
AREA 6



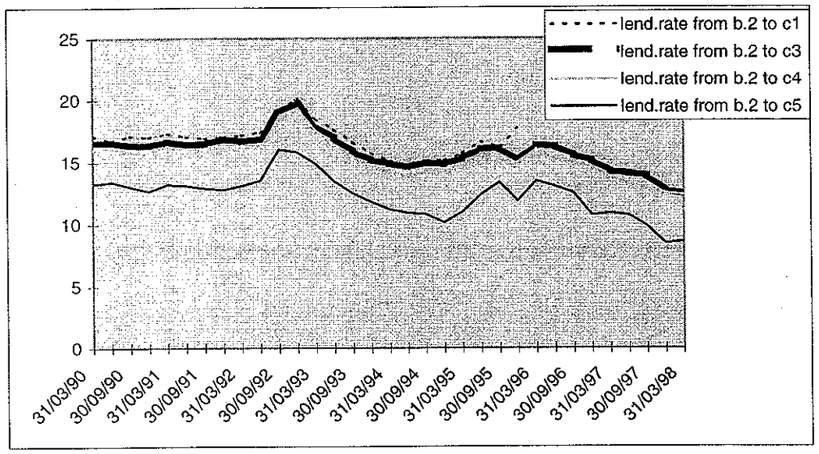
AREA 1



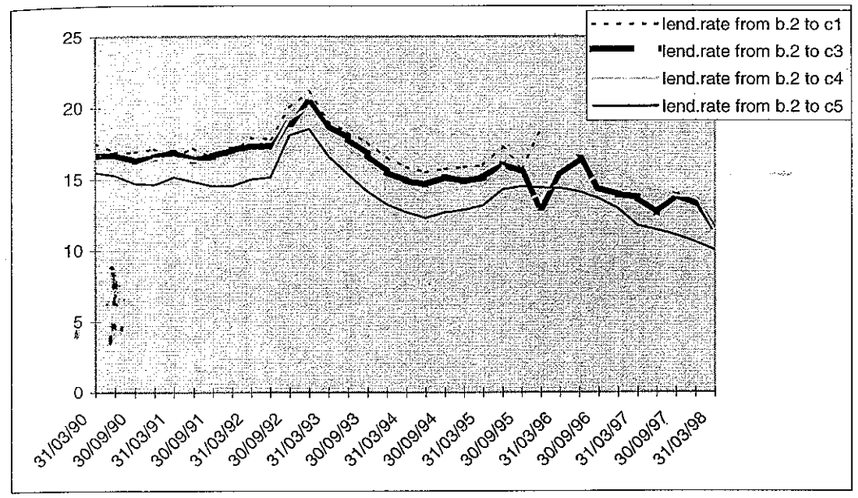
AREA 2



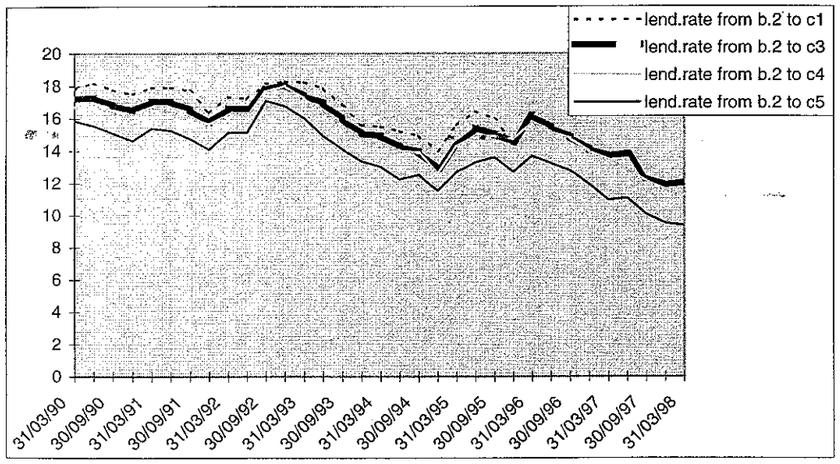
AREA 3



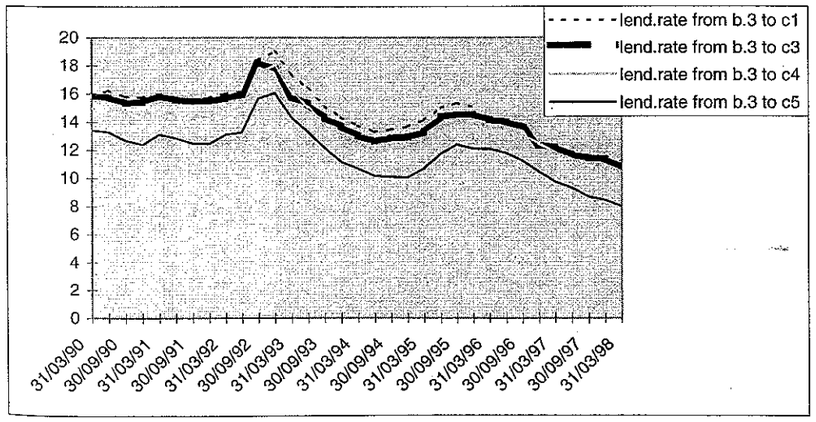
AREA 4



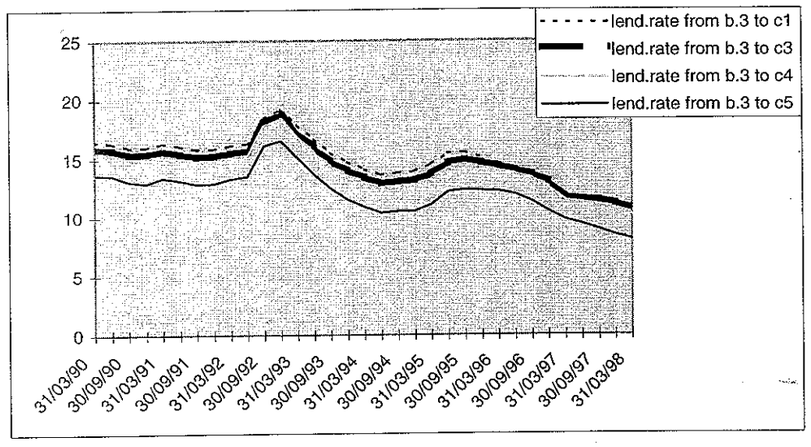
AREA 5



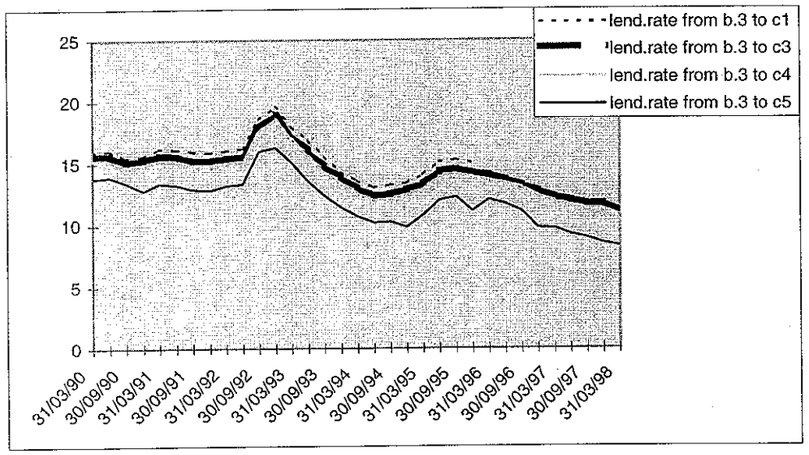
AREA 6



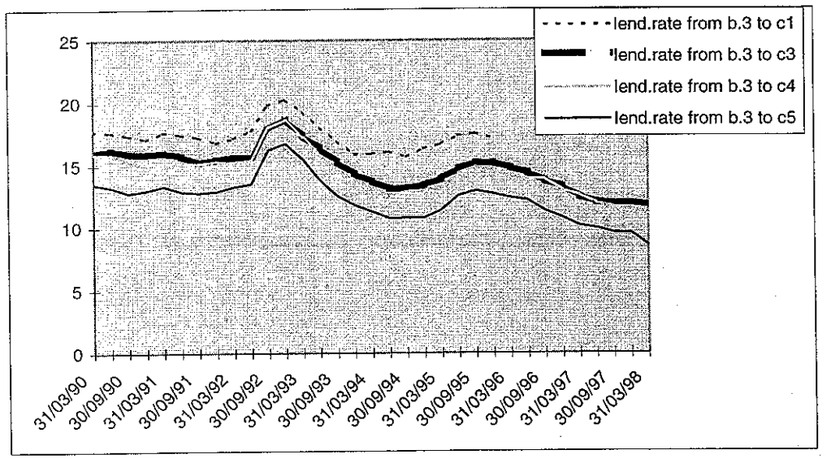
AREA 1



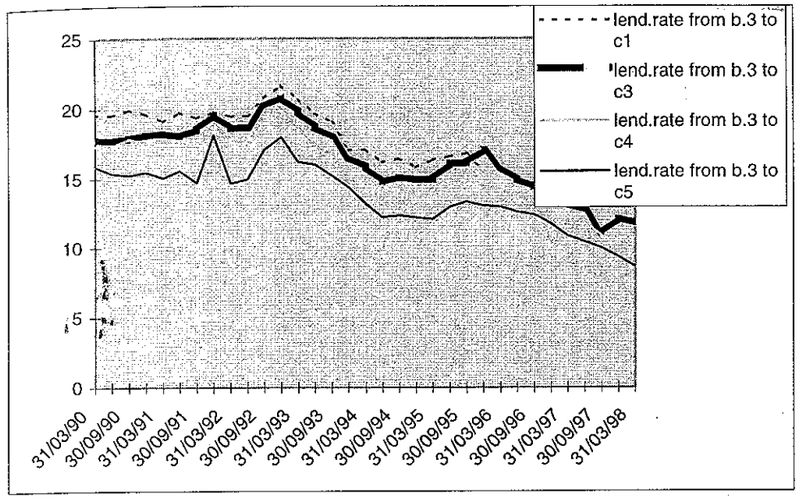
AREA 2



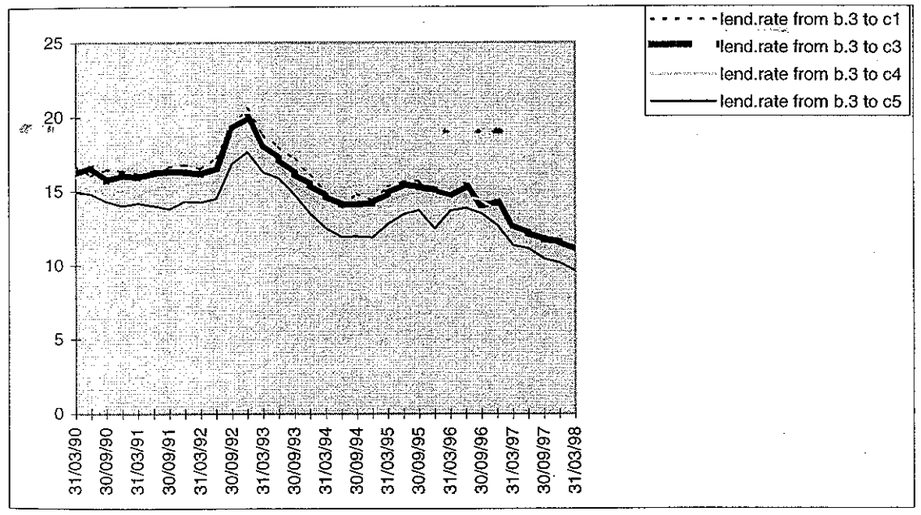
AREA 3



AREA 4



AREA 5



AREA 6

4. Some simple econometrics

Heterogeneity in bank credit and lending rates has been analysed in many different ways, as briefly discussed in section 2. The approach followed here is both unconventional and very simple. The first equation estimated (and shown in sub-section 4.1) is meant to investigate on the main determinants of heterogeneity in lending rates, for a given policy regime and is based on a simple "textbook" statement: when monetary policy is mainly based (like in the Italian context) on the control of interest rates, the rate of discount does not only display general attitude of the policy makers, but also constitutes a "topical" interest rate affecting the whole set of lending rates. The level of the latter will depend on the borrower risk, competitive context, and demand expectations. In other words, we study the spread between each specific lending rate (from each size class of lenders to each loan size class, in each geographic area and

for each quarter) and the discount rate in order to verify to what extent appropriate proxies for the category-specific risk, for the relative market power of lenders and borrowers, size dummies for lenders and loans, geographic dummies can explain heterogeneity in these categories of lenders. Most contributions in the literature briefly described in section 2 are based on *a priori* specifications or sometimes apply the "general-to-specific" methodology in a simplistic way by determining the lag structure of the model only on the basis of the t-statistics and without performing appropriate joint test for linear restrictions on a general "unrestricted" model. In this paper, we attempt to apply in a rigorous way Hendry (1985, 1988) and Harvey (1989) methodology: the final "parsimonious" specifications are strictly determined by applying joint "variable deletion tests" in a "general unrestricted" model with four time lags: The variables appearing in the estimates with lower levels of significance have not been eliminated because the zero-restrictions on their coefficient have been rejected in preliminary general "variable deletion tests". This does not strictly apply to the dummies, which have been tested jointly for the sake of our comments, in order to confront their values and level of significance. The appendix contains therefore the "general unrestricted" specifications of the models and the "variable deletion tests" performed to obtain the final specifications. Of course, by assessing the level of significance of the various regressors one has to consider that we are dealing with very volatile (and heterogeneous) financial variables. Also for this reason all the tests have been performed in the White "robust to heteroskedasticity" version (White, 1980, 1984). In a sense, the results of sub-section might be considered an extension of the descriptive analysis of section 3, since the point is not to identify a precise behaviour equation, but rather to measure and compare the impact of some theoretical and structural variables on the spread between lending rate and monetary policy rate.

The second equation estimated is meant to detect the possible existence of a hierarchy in lending behaviour and again is based on a very simple consideration. While it is certainly not possible to associate the loan size class to the size of the borrower, the largest loan size class is certainly more affected than the other two by the behaviour of large and powerful companies with higher market power. Therefore it seems reasonable to ask ourselves whether the share (and not the absolute amount) of loans granted to the largest class is demand determined. If so, for a given level of loans supplied by the banking system the share of loans to the whole of the other size classes is necessarily residually determined and cannot be demand-determined. For the sake of our estimates, we seek to verify whether the share of loans to the largest size class is negatively correlated to its price, positively correlated to the bad debts (since borrowers have obviously incentives to renegotiate them, or, at least, to seek an accommodative behaviour from the bank) and positively correlated to the demand expectations. This last point, while being consistent with a "demand-determined" lending behaviour, is not consistent with the phenomenon of "*flight-to-quality*".

The smallest loan size class ("c1", with less than 250 millions lira), as discussed in detail in the appendix, contains several elements of discontinuity in the time series and non-homogeneity in the definition of the relevant variables. For this reason this class could not be considered in the estimates, while, on the contrary, it has been included in the descriptive analysis of section 2. In any case, since this specific size class mainly includes credit to households and very small individual firms (like small shops), its exclusion does not affects the informational power of the second econometric analysis testing for the "demand-determined" behaviour of the largest size-class loans. The definition of the remaining loan size classes (c3, from 250 millions lira to 500 millions, c4, from 500 millions to 1 billion lira, c5, above 1 billion lira) have been "inherited" by our data set from the sampling criteria of the Bank of Italy and partly reflect (as discussed in the appendix) the constraint imposed by the norms on confidentiality of banking data.

3.1 The spread between lending rate and policy rate.

Since we cannot exclude simultaneity between some of the regressors and the dependent variables, the estimates have been performed with the method of instrumental variables. The software employed is DPD (Arellano-Bond, 1988 and further versions), the instrument employed for each variable (obviously excluding the dummies) is the lagged variable itself.

TABLE 1

VARIABLES INCLUDED IN THE ESTIMATES

CONST = intercept

I2 = dummy for the average-sized banks.

I3 = dummy for the "small and minors" banks (according to the Bank of Italy classification).

c3 = dummy for the loan size class "c3" (i.e. from 250 millions lira to 500 millions lira).

c4 = dummy for the loan size class "c3" (i.e. from 500 millions lira to 1 billion lira).

c5_t = ratio between the bank overdrafts granted to the category "c5" and the total sum of bank overdrafts granted to categories "c3", "c4" and "c5".

isco = expected demand for the next 3-4 months (ISCO data, based on entrepreneurs interviews). It is a proxy for the firms' forward-looking expectations and can assume positive or negative values, since it expresses expectations on the possible increase or decrease in demand.

so_u = ratio between bad debts and used credit, for each geographic area, for each year, from each size cathegory of banks to each size cathegory of loan facilities; because of the discontinuity in the criteria of statistical sampling followed by the Bank of Italy, (briefly discussed in the appendix) the ratio does not include the laon credit commitment. The variable has been used as a proxy for the "observation-specific" risk.

ta_d = tat - tan

tan = interest rate on loans by the Bank of Italy, inclusive of any additional charge.

tat = interest rate on loan facilities , for each geographic area, foer each year, from each class size of banks to each size class of loan facilities.

tdif = tma - tmi

tma = maximum oblservable alternative interest rate for the loans facilities of each size cathegory of banks for all the size cathegories of overdrafts, in each geographic area in each year..
tmi = minimum oblservable alternative interest rate for the customers demanding loans facilities of a given size from all the possible alternative size cathegories of banks in each geographic area, in each year.

Each observation unit is the credit (and interest rates) from each size class of lenders to each loans size class, in each geographic area, for each quarter. There are 3 size classes of lenders 3 loan size classes, 6 geographic areas, 33 quarters, which makes it 54 longitudinal units observed fo 33 periods. The variable "so_u" is a proxy for the risk specific to each specific class of borrower from each size class of lender, in each geographic area in a given year and quarter. Therefore its level (and possibly its increase) expected to be positively correlated with the spread "ta_d", since the lending rate must include a risk premium. The variable "tdif" is a proxy for the competitive context. A higher spread between the maximum lending rate available to the relevant size class of lenders and the minimum lending rate available to the relevant loan size class reflects a situation of higher competition among banks and larger possibilities of choice for the borrowers. The rationale for using this variable instead of only using more conventional "structural" variables or size variables to capture the market power of the counterparts lies in the fact that the competitive context might change much more quickly than structural variables, sometimes under the effect of strategies performed by medium-sized and even small firms and banks. This variable is then expected to be negatively correlated with the spread "ta_d". The variable "isco" represent the general expectations of the economy: if one accepted the assumption of rational expectations it should be common to all the agents (since, in particular, this variable is based on publically available interviews on entrepreneurs). It constitutes again an element of general risk evaluation, at a macroeconomic level, however it turns out to be totally non significant in the equation for "ta_d". On the basis of all the considerations made before, the following general unrestricted model has been estimated:

$$ta\_d_{ijt} = CONST + \sum_{k=1}^{4} \alpha_{t-k}\, ta\_d_{ijt-k} + \sum_{k=0}^{4} \beta_{t-k}\, tdif_{ijt-k} + \sum_{k=0}^{4} \gamma_{t-k}\, so\_u_{ijt-k} +$$

$$+ \sum_{k=1}^{4} \phi_{t-k}\, isco_{t-k} +$$

+ dummies for the loan sizes +

+ dummies for banks size +

+ dummies for the geographic area +

+ *white noise* **(1)**

The results of the estimates and the "variable deletion tests" which have determined the final and "parsimonious " specification are reported in the appendix. The final "parsimonious" specification yields the estimates of Table 2.

TABLE 2
FINAL "PARSIMONIOUS" SPECIFICATION
EQUATION FOR THE SPREAD BETWEEN INTEREST RATES ON BANK OVERDRAFT AND MONETARY POLICY RATE (INTEREST RATE ON LOANS BY THE BANK OF ITALY)
The data employed for the estimates cover the period 1990 QI - 1998 QIV

++

D.P.D. RESULTS

LEVELS IV

Number of firms: 54 Sample period is 1991 QII to 1998 QI
Observations: 1512 Degrees of freedom: 1497

Dependent variable is: ta_d

Instruments used are:
CONST ta-d(-2) so_u(-1) so_u(-2) tdif(-4) tdif(-5) c3 c4
a1 a3 a4 a5 a6 IND DUMS

ONE-STEP ESTIMATES WITH ROBUST TEST STATISTICS

Wald test of joint significance: 2230.202567 df = 12
Wald test - jt sig of ind dums: 1.571201 df = 2

Var	Coef	Std. Error	T-Stat	P-Value
CONST	1.302663	1.159927	1.123056	0.261414
ta_d(-1)	0.748006	0.124735	5.996774	0.000000
so_u	5.543778	6.650326	0.833610	0.404501
so_u(-1)	-5.534232	6.553838	-0.844426	0.398431
tdif(-3)	-0.958507	1.332951	-0.719086	0.472088
tdif(-4)	0.750205	0.976935	0.767917	0.442537
c3	0.057856	1.302231	0.044429	0.964563
c4	0.072287	1.034254	0.069893	0.944279
a1	-0.032614	0.085680	-0.380652	0.703462
a3	0.125009	0.094511	1.322695	0.185937
a4	0.249281	0.109245	2.281853	0.022498
a5	0.393597	0.210871	1.866527	0.061968
a6	0.303455	0.241046	1.258909	0.208063
I2	-0.247605	0.198526	-1.247216	0.212318
I3	-0.392050	0.325261	-1.205340	0.228072

Robust test for first-order serial correlation: -2.878 [54]
Robust test for second-order serial correlation: -0.386 [54]

The variables referred to the overdue bank credits ("so_u" and "so_u(t-1)") are only significant at a level of confidence of around 60%, while "tdiff(-3)" and "tdif(-4)" (capturing the bargaining power of the banks) are only significant at a level of confidence of 53% and 56% respectively, although they were much more significant in the "general unrestricted model", which also did not support a linear restriction

setting their coefficient equal to zero, in spite of their low level of significance shown by the t-statistics. Therefore, their low level of significance might be due to the contemporaneous presence of other dummies (which are also meant to "capture" other relevant effects associated to the specific behaviour of lenders in their approach to risk or investment strategies and the specific risk of some geographic areas). By looking at the coefficients of tdif(-3) and tdif(-4) one could interpret the dependent variable "ta_d" as negatively affected by the variable "tdif(-3)" (with a coefficient close to –0.20) and also negatively affected by the difference "tdif(-3)-tdif(-4)" (with a coefficient of close to –0.75), although these two variables are not very significant. The variable referred to the size dummies of the bank loans are not significant at all, although they were significant in the general unrestricted model with a level of confidence of 76% and 85%. However, since for the sake of our comments all the dummies have been considered jointly, the loan size dummies appear in the estimates. The results suggest that the persistently higher interest rate set by the banks on the smaller sized overdrafts might not be simply associated to the size of the credit contract, but could reflect the impact of other more conventional variables, associated to the riskiness of the borrower, the competitive context (captured by the variable "tdif"), the size of the lender, whose dummies turn out to be significant at a level of confidence of 77% and 79%, and, partly, to the geographic area (specially for what concerns the region Lazio, whose dummy is significant with the level of confidence of 97%, but also for the areas 3, 5 and 6, whose dummies are significant at the levels of confidence of 82%, 94% and 80% respectively). Finally, the final parsimonious specification marginally shows some marginal first-order residual correlation.

3.2 Are largest loans demand-determined?

As explained before, our conjecture is that the *share* of largest loans over the total amount of loans granted to the sum of the size classes "c3", "c4", "c5" is "*demand determined*" if it is negatively correlated with its own interest rate, positively correlated with the demand expectations, and reflect an accomodative behaviour from the banks. On the basis of the previous considerations, the following general unrestricted model has been estimated (see the appendix for the details and the variable deletion tests).

$$\mathbf{c5\_t}_{ijt}=\mathrm{CONST}+\sum_{k=1}^{4}\eta_{t-k}\mathbf{c5\_t}_{ijt-k}+\sum_{k=0}^{4}\varphi_{t-k}\mathbf{tat}_{t-k}+\sum_{k=0}^{4}\lambda_{t-k}\mathbf{tan}_{ijt}+\sum_{k=0}^{4}\theta_{t-k}\mathbf{so\_u}+\sum_{k=0}^{4}\xi_{t-k}\mathbf{tma}+$$

$$\mathbf{+\ dummies\ for\ banks\ size\ +}$$

$$\mathbf{+\ dummies\ for\ the\ geographic\ area\ +}$$

$$\mathbf{+\ \textit{white noise}} \qquad \mathbf{(2)}$$

As an alternative lending rate "tma" and not "tmi" has been employed: this constitute a

conservative choice to test for "dmand determined" behaviour of the dependent variable, since "tma" reflects the incentive of the banks rather than borrowers. By looking at the final "parsimonious" specification reported below, we see that the own interest rate with three lags "tat(-3)" is largely significant and has a negative coefficient, as expected. By looking at the lag structure of the variable "so_u" and at the values of its coefficient one could say that the share of loans to class c5 is roughly positively correlate with an increase of the bad debts over the last 2-3 quarters. However the second and third lag are significant at the level of confidence of 88% and 83% respectively, while the 4th lag is not very significant (although in preliminary a variable deletion test the zero-restriction on its coefficient was rejected). Nevertheless, by looking at the (very close in absolute value) coefficients of "so_u(-2)" and "so_u(-3)", what seems to be significant is rather the "increase" in the bad debts: this again is consistent with an accomodative behaviour of banks and, therefore, a demand determined share of "c5". Also the positive (and significant at the level of confidence of 83%) if the variable "isco" is consistent with a "*demand determined*" behaviour. None of the other variables are significant and it is interesting to remark in this case that no dummy variable turned out to be significant.

TABLE 3

FINAL "PARSIMONIOUS" SPECIFICATION
EQUATION FOR THE RATIO BETWEEN THE LARGEST SIZE CLASS OF LOAN CREDITS AND THE TOTAL CREDIT GRANTED FOR ALL SIZE CLASSES
The data employed for the estimates cover the period 1990 QI - 1998 QIV

++

D.P.D. RESULTS

LEVELS IV

Number of firms: 18 Sample period is 1991 QII to 1998 QI
Observations: 504 Degrees of freedom: 497

Dependent variable is: c5_t

Instruments used are:
CONST c5_t(-2) tat(-4) so_u(-3) so_u(-4) so_u(-5) isco(-1)

ONE-STEP ESTIMATES WITH ROBUST TEST STATISTICS

Wald test of joint significance: 31994.696540 df = 6

Var	Coef	Std. Error	T-Stat	P-Value
CONST	0.026569	0.009274	2.864828	0.004172
c5_t(-1)	0.977520	0.009422	103.745459	0.000000
tat(-3)	-0.000630	0.000262	-2.403433	0.016242
so_u(-2)	0.113115	0.072979	1.549970	0.121149
so_u(-3)	-0.103423	0.075927	-1.362147	0.173151
so_u(-4)	-0.011530	0.021300	-0.541309	0.588295
isco	0.000100	0.000073	1.373599	0.169566

Robust test for first-order serial correlation: -0.154 [18]
Robust test for second-order serial correlation: 1.412 [18]

4. Concluding remarks

This paper contains an empirical investigation on the various potential sources of heterogeneity in Italian bank lending rates, according to the lender size, the size class of bank loans, and the geographic area, for a period of observation going from 1990QI to 1998QIV, using a data set specifically acquired from the Bank of Italy.

The first econometric analysis investigates the behaviour of the spread between the lending rate (from each size class of lenders to each size class of loans in each of the six areas, in the estimating period) and the monetary policy rate, since in this context, the amount of the spread might be interpreted as a diversified and heterogeneous reaction to a given "policy measure", such as indicated by monetry policy interest rate. While the preliminary descriptive statistical analysis seems to show a clear and persistent negative correlation between the class sizes of bank loans and the level of lending rates, the econometric analysis shows that this correlation can be well explained by more conventional theoretical variables, such as the borrower-specific risk and a proxy for the relative bargaining power between lender and borrower. Like in other Italian contributions on this kind of literature, it is also found, for some geographic areas of the country, a persistently higher level of lending rates, while the significance of dummies for the lenders size is more dubious and the dummies for the loan size classes are certainly not significant

. The last empirical analysis finally identifies an interesting source of heterogeneity in the fact that that the share of loans to the largest size group acts consistently with a "demand-determined" behaviour.

Bibliography

ANGELINI, P., FERRI, G., VACCA, V. (1997), "Banche e sviluppo ecomomico in Italia: un'analisi a livello comunale", in Cesarini, F., Ferri, G., Giardino, M. (a cura di) "*Credito e sviluppo*", il Mulino, Bologna.

ANGELONI, I., BUTTIGLIONE, L., FERRI, G., GAIOTTI, E. (1995), "The Credit Channel for Monetary Policy Across Heterogeneous Banks: The Case of Italy", *Banca d'Italia, Temi di discussione*, n. 256.

ARELLANO, M., BOND, S., R., (1988) 'Dynamic Panel Data Estimation Using DPD - a Guide for Users' *Institute for Fiscal Studies Working Paper*, 88/15

BAFFIGI, A., PAGNINI, M., QUINTILIANI, F., (1999), "Industrial Districts and Local Banks: Do the Twins Ever Meet?"*Banca d'Italia, Temi di Discussione n. 347.*

BENARTZI, S. E THALER, R., H., [1995], "Myopic Loss Aversion and the Equity Premium Puzzle", *Quarterly Journal of Economics*, CX, 73-92

BERNANKE, B., S. (1990), 'On the Predictive Power of Interest Rates and Interest Rates Spread' , *New England Economic Review,* Federal Reserve Bank of Boston, November/December 1990, pp. 51-68.

BERNANKE, B., S., BLINDER, A., S. (1988), 'Is It Money or Credit, or Both, or Neither? - Credit Money and Aggregate Demand', *American Economic Review*, 78, pp.435-451

BERNANKE, B., S., BLINDER, A., S., (1992), 'The Federal Funds Rate and the Channels of Monetary Transmission' *American Economic Review*, 82, pp. 901-927

BERNANKE, B., S., GERTLER, M., GILCHRIST, S., (1994) 'The Financial Accelerator and the Flighto to Quality', *NBER Working Paper, no. 4789,* July

BLINDER, A., CANETTI, E., LEBOW, D., E., RUDD, J.B., (1998), "*Asking about prices: a new approach to understanding price stickiness*", Russell Sage, New York.

BLINDER, A., S., [1986], "A sceptical Note on the New Econometrics", in Preston, M., H., and Quandt, R., E., (eds.) "*Prices, Competition and Equilibrium*", pp.73-83, Oxford, Phillip Allan Publishers.

BUTTIGLIONE, L., FERRI, G., (1994), "Monetary Policy Transmission Via Lending Rates in Italy: Any Lessons From Recent Experiences?", *Banca d'Italia, Temi di discussione*, n. 224.

CANNARI, L., PELLEGRINI, G., SESTITO, P., (1996), "L'utilizzo di microdati d'impresa per l'analisi economica: alcune indicazioni metodologiche alla luce delle esperienze in Banca d'Italia", *Banca d'Italia, Temi di discussione*, n. 286.

COSCI, S., MATTESINI, F. (1997), "Credito e sviluppo nelle province italiane", in Cesarini, F., Ferri, G., Giardino, M. (a cura di) "*Credito e sviluppo*", il Mulino, Bologna.

COTTARELLI, C., FERRI, G., GENERALE, A., (1997), "Tassi bancari attivi e struttura finanziaria in Italia: un'analisi empirica", *Banca d'Italia, Temi di discussione*, n. 315.

DE BONIS, R., FERRANDO, A., (1997), "Da che cosa dipendono i tassi di interesse nelle province?", *Banca d'Italia, Temi di Discussione n. 319.*

FINALDI RUSSO, P., ROSSI, P., (1999), "Costo e disponibilità del credito per le imprese nei distretti industriali", *Banca d'Italia, Temi di discussione n. 360.*

FOCARELLI, D., ROSSI, P., (1998), "La domanda di finanziamenti bancari in Italia e nelle diverse aree del Paese (1984-1996)", *Banca d'Italia, Temi di discussione*, n. 333.

FORNI, M., LIPPI, M., (1997), "*Aggregation and the Microfoundations of Dynamic Macroeconomics*", Clarendon Press, Oxford and New York.

GAMBACORTA, L., (1998), "Heterogeneous 'Credit Channels' and Optimal Monetary Policy in a Monetary Union", *Banca d'Italia, Temi di discussione*, n. 340.

HARVEY, A., C. (1989), *'The Econometric Analysis of Time Series'*, Oxford: Philip Allan

HENDRY, D., F., (1985) 'Monetary Economic Myth and Economic Reality', *Oxford Review of Economic Policy* 1, 72-84

HENDRY, D., F., (1988) 'The Encompassing Implications of Feedback versus Feedforward Mechanisms in Econometrics' *Oxford Economic Papers* 40, 132-149

KAHNEMAN, D., (1994), "New Challenges to the Rationality Assumption", *Journal of Institutional and Theoretical Economics*, 150/1, 18-36

KAHNEMAN, D., TVERSKY, A., (1979), "Prospect Theory: An Analysis of Decision Under Risk", *Econometrica*, XXXXVII, 263-91

MAZZOLI, M., (1998), "Credit, Investments and the Macroeconomy", *Cambridge University Press*, CAMBRIDGE, UK.

MAZZOLI, M. (2000), "Canale creditizio, transizioni istituzionali e meccanismo di trasmissione della politica monetaria", Modena, settembre 2000, Dipartimento di Economia Politica dell'Università di Modena e Reggio Emilia, *Materiali di discussione*, n.324.

MAZZOLI, M., BALDASSI, L., (1998) "Banche, casse di risparmio e sistema produttivo: un'analisi disaggregata dell'offerta di credito bancario e delle sofferenze" in Fiorentini, G., (a cura di), "*Assetti istituzionali e mercato del credito: il ruolo delle fondazioni e delle casse di risparmio*", Bologna, Il Mulino.

SHAFIR, E., DIAMOND, P., TVERSKY, A., (1997), "Money Illusion", *Quarterly Journal of Eocnomics*, CXII, 341-374

STRAHAN, P. E., WESTON, J.P. (1998), "Small Business Lending and the Changing Structure of the Banking Industry", *Journal of Banking and Finance*, 821-45.

WHITE, H., (1980), "A heteroscedasticity consistent covariance matrix estimator and a direct test for heteroscedasticity", *Econometrica,* 48, pp.817-838.

WHITE, H., (1984), *"Asymptotic theory for Econometricians"*, New York, Acedemic Press.

APPENDIX

Sources and criteria for statistical surveys followed by the Bank of Italy

A) SOURCES

A detailed description of the classification criteria can be found in "Supplementi al Bollettino Statistico" , Banca d'Italia, Anno V Numero 32 - 16 June 1995. The dataset employed for this paper has been provided by the Statistical Bureau of the Bank of Italy, on the basis of a specific request and application. Therefore, although it has been structured and organized on the basis of our research plan, it is necessarily based on the criteria of sampling and aggregation employed by the Bank of Italy for what concerns the definitions of the different size classes of loans from different size classes of banks. In addition, the degree of disaggregation is conditioned by the Italian regulation on banking secrecy, stating that each disaggregated observation of credit flows from particular size classes of lenders, to particular size classes of borrowers, for given geographic areas must be based at least on three observations. The same applies to the data concerning interest rates, which are recorded by the Bank of Italy on the basis of a non-compulsory quarterly report produced by a sample of 80 banks in all the country. For these reasons, only a limited degree of disaggregation has been possible. The complete dataset employed for this empirical analysis is now available on the internet at the site

www.economia.unimo.it/worpap/RePEc/mod/modena/

The data on interbank and foreign deposits and securities held by banks in their portfolios are based on reports from each individual bank to the Board of Inspection of the Bank of Italy. The data on loan credit commitments, total used credit, total granted credit and bad debts are based on notice from each individual bank to "Centrale dei Rischi" (the Department of Bank of Italy charged with monitoring the system risk). The amounts are expressed in million lira and include both the operations in liras and in foreign currency.

The interest rates on loan credits and on deposits have been obtained from the respective quarterly statistical survey, which includes observations approximately 70 banks. The data on interest rates on bank lending and deposits are only referred to the operations in liras.

B) LIMITS FOR THE STATISTICAL SURVEYS

From January 1996 the obligation to signal risks to "Centrale dei Rischi" only concerns loan cash credits and credit commitments for amounts greater that 150 millions lira, while before that date the limit was 80 millions lira. This creates a relevant discontinuity in the time series referred to the smallest loan size, which, as a consequence, could not be employed for the econometric estimates and has been included only from 1990 until 1996 in the graphics and descriptive statistics.

For the bad debts reported to Centrale dei rischi, there is no lower limit from february 1991, while the limit was 10 millions lira before 1991. This creates yet another source of discontinuity in the time series referred to the smallest loan size.

For what concerns the interest rates on loan cash credits and loan credit commitments, the lower limits for the credit they are referred to is the same as the one for the credits reported to Centrale dei Rischi.

For the interest rates on deposits, the observations only refer to the deposits with amount larger than 20 millions Italian lira.

Loan cash credits until December 31st 1996 include overdue payments, while from from January 1997 the latter are reported separately. This generates another time discontinuity for all the loan sizes. data for net interbank deposits and foreign deposits include interbank transfers, while any other variable variable in the dataset does not include them.

C) SAMPLING AND CLASS CRITERIA FOR THE VARIABLES OF THE DATASE

All the size classes have been calculated on the basis of loan cash credits granted by the whole

banking ssystem to each customer (see tables below).

For bad debts, since 1997 the distribution of the borrowers among different classes is determined on the basis of the global amounts for which each borrower has overdue payments.

For what concerns loan credit commitments, since 1997 they have no longer been distributed (in the survey form the Bank of Italy) by class size of the credit lines. For this reason, since 1997 the only observation available from the Bank of Italy was the total credit to all of the borrowers, and this specific variable could not be used for the estimates. Therefore the data employed in the econometric analyses are only based on the loan cash credits.

The geographic areas (see tables below) refer to the localization of the local agency of the bank reporting the data to the statistical survey.

The distribution by size classes for banks (see tables below) has been updated in 1995 and also includes the former "long term credit special institutions" and "special credit sections" (see "Supplementi al Bollettino Statistico" , Banca d'Italia, Anno V Numero 32 - 16 June 1995). For the previous periods the size classification only concerned ordinary banks, which broadly correspond to the present "banks with short run deposits".

We report below a few tables summarizing all the criteria of the statistical surveys form the Bank of Italy and all the definitions concerning the size classes and geographic areas.

Because of the discontinuities of the definitions in the Bank of Italy dataset, the Bank of Italy size classes "1" and "2" have been aggregated into the size class "c1" for the analyses performed here. This means that the corresponding interest rate is the weighted average of the interest rates of the two corresponding classes. A similar aggregation has been done for the bank deposits and the corresponding interest rates, which, in any case, turned out to be always non significant in preliminary econometric analyses referred to the interest rate on bank credit and to the overdrafts granted to the largest size class of customers. Furthermore, since the interest rate on deposits are (in Italy) very stable and show very little variability, they have not been the object of specific descriptive analyses.

Size classes of loan credits (DEFINITIONS OF THE BANK OF ITALY)	Description of the size classes employed by the Bank of Italy	Observed variable	Definition for the corresponding classes of loans included in the tables and graphics and for the dummy variable included in the estimates
1	Less than 80 million lira (between 1990 and 1995); less than 150 million lira (between 1996 and 1998)	outstanding amount of loan credit	c1 (in our tables the class c1 includes the sum of the Bank of Italy size classes "1" and "2")
2	From 80 to 250 millions lira (until 1995); from 150 to 250 million lira (between 1996 and 1998)	outstanding amount of loan credit	c1 (in our tables the class c1 includes the sum of the Bank of Italy size classes "1" and "2")
3	From 250 to 500 million lira	outstanding amount of loan credit	c3
4	From 500 million lira to 1 billion	outstanding amount of loan credit	c4
5	over 1 billion	outstanding amount of loan credit	c5

Size classes of loan credits to which the interest rates are referred (DEFINITIONS OF THE BANK OF ITALY)	Description of the size classes employed by the Bank of Italy	Observed variable	Definition for the corresponding classes of loan credits to which the interest rates refer in the tables and graphics
1	Less than 100 million lira (until 1996); less than 150 million lira (from 1997)	Average interest rate on loan credits of the given size class	c1
2	From 100 to 250 million lira (until 1996); from 150 to 250 million lira (form 1997)	Average interest rate on loan credits of the given size class	c1
3	From 250 to 500 million lira	Average interest rate on loan credits of the given size class	c3
4	From 500 million lira to 1 billion	Average interest rate on loan credits of the given size class	c4
5	over 1 billion	Average interest rate on loan credits of the given size class	c5

Size Classes of Banks	Description of the exact definition employed by the Bank of Italy	Definition for the corresponding size classes of banks included in the tables and for the dummy variable included in the estimates
1	major banks and large sized banks	I1
2	Average sized banks	I2
3	Small and minor sized banks	I3

Geographic area according to the	Regions included in the geographic area	Definition for the dummy variable included in the estimates
1	Piemonte, Val d'Aosta, Liguria	a1
2	Lombardia, Triveneto, Emilia Romagna	a2
3	Toscana, Marche, Umbria	a3
4	Lazio	a4
5	Abruzzi, Molise, Puglia, Basilicata	a5
6	Campania, Calabria, Sicilia, Sardegna	a6

Size classes of bank deposits the observed interest rates are referred to	Description of the size classes employed by the Bank of Italy	Observed variable
1	Less than 100 million lira	Average interest rate on bank deposits of the given size class
2	From 100 to 250 million lira	Average interest rate on bank deposits of the given size class
3	From 250 to 500 million lira	Average interest rate on bank deposits of the given size class
4	From 500 million lira to 1 billion	Average interest rate on bank deposits of the given size class
5	Over 1 billion	Average interest rate on bank deposits of the given size class

D) A BRIEF SUMMARY OF DESCRIPTIVE STATISTICS

MEAN AND VARIANCE OF THE INTEREST RATES SET ON AVERAGE BY THE BANKS OF VARIOUS SIZE FOR THE VARIOS SIZE CLASSES OF LOAN CREDITS IN ALL THE GEOGRAPHIC AREAS

	loans from l1 to c1	loans from l2 to c1	loans from l3 to c1
average interest rate for c1 for all the areas	16.86705	16.52475	15.91545
variance for c1 for all the areas	2.541764	2.170026	3.577675
	loans from l1 to c3	**loans from l2 to c3**	**loans from l3 to c3**
average interest rate for c3 for all the areas	15.60936	15.15257	14.89092
variance for c3 for all the areas	4.048736	3.552005	4.42039
	loans from l1 to c4	**loans from l2 to c4**	**loans from l3 to c4**
average interest rate for c4 for all the areas	15.16653	14.72696	14.27933
variance for c4 in all the areas	3.9862	3.599013	4.3118
	loans from l1 to c5	**loans from l2 to c5**	**loans from l3 to c5**
average interest rate for c5 in all the areas	12.85701	12.54965	12.55033
variance for 5 in all the areas	4.734899	4.039671	4.500353

N.B. mean and variance referred to the size class "c1" cannot be compared with the other because it refers to a different and shorter observation period, where the interest rates have been, on average, higher.

MEAN AND VARIANCE OF THE INTEREST RATES SET ON AVERAGE BY THE BANKS OF VARIOUS SIZE FOR THE VARIOS SIZE CLASSES OF LOAN CREDITS IN AREA 1

	all bank size	from l1	from l2	from l3
average interest rate for c1 in a1	15.7431	15.95678	15.72506	15.54746
var. for c1 in a1	1.979536	2.012298	2.008203	2.002315
average interest rate for c3 in a1	14.40492	14.78237	14.26627	14.16611
var. for c3 in a1	3.162326	3.204932	3,.63162	2.990966
average interest rate for c4 in a1	13.93973	14.31103	13.84119	13.66697
var. for c4 in a1	3.288572	3.181843	3.54873	3.111772
average interest rate for c5 in a1	11.93172	11.99015	12.01479	11.79021
var. for c5 in a1	3.848068	4.354332	3.788413	3.610673

N.B. mean and variance referred to the size class "c1" cannot be compared with the other because it refers to a different and shorter observation period, where the interest rates have been, on average, higher.

MEAN AND VARIANCE OF THE INTEREST RATES SET ON AVERAGE BY THE BANKS OF VARIOUS SIZE FOR THE VARIOS SIZE CLASSES OF LOAN CREDITS IN AREA 2

	all bank size	from l1	from l2	from l3
average interest rate for c1 in a2	15.77032	15.50911	15.98415	15.81769
var. for c1 in a2	2.022209	2.016239	2.150746	1.916452
average interest rate for c3 in a2	14.50204	14.37267	14.71491	14.41854
var. for c3 in a2	3.301466	3.298332	3.07674	3.664488
average interest rate for c4 in a2	13.87443	14.11513	14.14424	13.95566
var. for c4 in a2	3.426298	3.450414	3.294419	3.726946
average interest rate for c5 in a2	11.94183	11.83155	11.92504	12.0689
var. for c5 in a2	4.147299	4.731783	3.950131	3.989705

N.B. mean and variance referred to the size class "c1" cannot be compared with the other because it refers to a different and shorter observation period, where the interest rates have been, on average, higher.

MEAN AND VARIANCE OF THE INTEREST RATES SET ON AVERAGE BY THE BANKS OF VARIOUS SIZE FOR THE VARIOS SIZE CLASSES OF LOAN CREDITS IN AREA 3

	all bank size	from l1	from l2	from l3
average interest rate for c1 in a3	16.26506	16.62611	16.54421	15.62488
var. for c1 in a3	2.341941	1.759564	2.220764	2.604152
average interest rate for c3 in a3	14.86557	15.31585	14.95864	14.32222
var.for c3 in a3	3.951888	3.490071	4.638095	3.452015
average interest rate for c4 in a3	14.4187	14.83658	14.56143	13.85808
var.for c4 in a3	4.103046	3.676795	4.779664	3.583915
average interest rate for c5 in a3	12.38576	12.8429	12.37386	11.94053
var.for c5 in a3	4.419008	4.480293	4.474449	4.158398

N.B. mean and variance referred to the size class "c1" cannot be compared with the other because it refers to a different and shorter observation period, where the interest rates have been, on average, higher.

MEAN AND VARIANCE OF THE INTEREST RATES SET ON AVERAGE BY THE BANKS OF VARIOUS SIZE FOR THE VARIOS SIZE CLASSES OF LOAN CREDITS IN AREA 4

	all bank size	from l1	from l2	from l3
average interest rate for c1 in a4	16.792	17.39481	16.87112	16.11008
var. for c1 in a4	1.747248	1.325765	1.652238	1.544723
average interest rate for c3 in a4	15.52946	15.9933	15.83293	14.76216
var. for c3 in a4	3.169065	3.361136	2.390434	3.029693
average interest rate for c4 in a4	15.04198	15.52703	15.2425	14.3564
var. for c4 in a4	3.163659	3.426189	2.334444	3.159273
average interest rate for c5 in a4	12.38232	12.55527	12.26988	12.32182
var.for c5 in a4	3.458965	4.094882	3.051656	3.398884

N.B. mean and variance referred to the size class "c1" cannot be compared with the other because it refers to a different and shorter observation period, where the interest rates have been, on average, higher.

MEAN AND VARIANCE OF THE INTEREST RATES SET ON AVERAGE BY THE BANKS OF VARIOUS SIZE FOR THE VARIOS SIZE CLASSES OF LOAN CREDITS IN AREA 5

	all bank size	From l1	from l2	from l3
average interest rate for c1 in a5	17.86528	17.79964	17.24831	18.5479
var. for c1 in a5	2.558648	1.794134	1.957937	3.258426
average interest rate for c3 in a5	16.21687	16.47638	15.74477	16.42947
var. for c3 in a5	4.609047	3.741485	3.652608	6.375212
average interest rate for c4 in a5	15.63421	16.04618	15.51343	15.34301
var.for c4 in a5	4.753072	3.643787	3.088822	7.546154
average interest rate for c5 in a5	13.61227	13.98716	13.1621	13.68754
var. for c5 in a5	4.242804	3.608241	3.388026	5.637557

N.B. mean and variance referred to the size class "c1" cannot be compared with the other because it refers to a different and shorter observation period, where the interest rates have been, on average, higher.

MEAN AND VARIANCE OF THE INTEREST RATES SET ON AVERAGE BY THE BANKS OF VARIOUS SIZE FOR THE VARIOS SIZE CLASSES OF LOAN CREDITS IN AREA 6

	all bank size	from l1	from l2	from l3
average interest rate for c1 in a6	17.04591	17.91583	16.77564	16.44625
var. for c1 in a6	2.309148	1.699835	1.792189	2.395098
average interest rate for c3 in a6	15.78683	16.71556	15.39789	15.24702
var. for c3 in a6	3.761436	3.68598	2.898527	4.006274
average interest rate for c4 in a6	15.23935	16.16324	15.05896	14.49585
var. for c4 in a6	3.62321	3.197539	2.897184	3.517479
average interest rate for c5 in a6	13.66008	13.93501	13.55223	13.49301
var.for c5 in a6	3.55933	3.410671	3.983223	3.387823

N.B. mean and variance referred to the size class "c1" cannot be compared with the other because it refers to a different and shorter observation period, where the interest rates have been, on average, higher.

GENERAL UNRESTRICTED MODEL
EQUATION FOR THE SPREAD BETWEEN INTEREST RATES ON BANK OVERDRAFT AND MONETARY POLICY RATE (INTEREST RATE ON LOANS BY THE BANK OF ITALY)
The data employed for the estimates cover the period 1990 QI - 1998 QIV

++

D.P.D. RESULTS

LEVELS IV

Number of firms: 54 Sample period is 1991 QII to 1998 QI
Observations: 1512 Degrees of freedom: 1487

Dependent variable is: ta_d

Instruments used are:
CONST ta_d(-2) ta_d(-3) ta_d(-4) ta_d(-5) so_u(-1) so_u(-2) so_u(-3)
so_u(-4) so_u(-5) isco(-1) tdif(-1) tdif(-2) tdif(-3) tdif(-4) tdif(-5)
c3 c4 a1 a3 a4 a5 a6 IND DUMS

ONE-STEP ESTIMATES WITH ROBUST TEST STATISTICS

Wald test of joint significance: 505.422951 df = 22
Wald test - jt sig of ind dums: 0.341599 df = 2
Wald test selected by user: 10.299139 df = 10
Testing:ta_d(-2) ta_d(-3) ta_d(-4) so_u(-2) so_u(-3) so_u(-4) isco
tdif tdif(-1) tdif(-2)

Var	Coef	Std. Error	T-Stat	P-Value
CONST	0.918082	5.373138	0.170865	0.864330
ta_d(-1)	3.237775	3.886986	0.832978	0.404857
ta_d(-2)	-0.970432	1.540478	-0.629955	0.528724
ta_d(-3)	-0.157001	0.433125	-0.362485	0.716989
ta_d(-4)	-0.396844	0.909495	-0.436335	0.662594
so_u	5.501375	3.635302	1.513320	0.130198
so_u(-1)	-3.951405	3.237292	-1.220590	0.222241
so_u(-2)	-1.606319	3.287958	-0.488546	0.625163
so_u(-3)	1.047737	2.816219	0.372037	0.709866
so_u(-4)	-3.611479	3.118469	-1.158093	0.246826
isco	0.046276	0.125520	0.368677	0.712369
tdif	-2.573195	3.468352	-0.741907	0.458144
tdif(-1)	0.662969	2.671158	0.248196	0.803983
tdif(-2)	0.474065	0.452225	1.048293	0.294504
tdif(-3)	0.283370	0.289738	0.978022	0.328063
tdif(-4)	0.339537	0.287402	1.181402	0.237443
c3	-3.979281	2.735695	-1.454577	0.145786
c4	-3.158094	2.214824	-1.425889	0.153900
a1	0.022598	0.234861	0.096217	0.923349
a3	-0.057324	0.479939	-0.119441	0.904926
a4	-0.255889	0.967343	-0.264527	0.791374
a5	-0.694210	1.738182	-0.399389	0.689607
a6	-0.911166	1.378700	-0.660888	0.508684
I2	-0.140736	0.608300	-0.231359	0.817036
I3	-0.416781	1.109827	-0.375536	0.707262

Robust test for first-order serial correlation: -0.814 [54]
Robust test for second-order serial correlation: 0.620 [54]

GENERAL UNRESTRICTED MODEL
EQUATION FOR THE SHARE OF CREDIT GRANTED TO THE LARGEST SIZE CLASS ("CLIENTS 5")
The data employed for the estimates cover the period 1990 QI - 1998 QIV
++

D.P.D. RESULTS

LEVELS IV

Number of firms: 18 Sample period is 1991 QII to 1998 QI
Observations: 504 Degrees of freedom: 473

Dependent variable is: c5_t

Instruments used are:
CONST c5_t(-2) c5_t(-3) c5_t(-4) c5_t(-5) tat(-1) tat(-3) tat(-4)
tat(-4) tat(-5) so_u(-1) so_u(-2) so_u(-3) so_u(-4) so_u(-5) tan(-1)
tan(-2) tan(-3) tan(-4) tan(-5) isco(-1) tma(-1) tma(-2) tma(-3)
tma(-4) tma(-5) a1 a3 a4 a5 a6

ONE-STEP ESTIMATES WITH ROBUST TEST STATISTICS

Wald test of joint significance: 4431.770670 df = 30
Wald test selected by user: 7.462959 df = 24
Testing:c5_t(-2) c5_t(-3) c5_t(-4) tat tat(-1) tat(-2) tat(-4)
so_u so_u(-1) tan tan(-1) tan(-2) tan(-3) tan(-4) tma
tma(-1) tma(-2) tma(-3) tma(-4) a1 a3 a4 a5
a6

Var	Coef	Std. Error	T-Stat	P-Value
CONST	-0.138288	0.156984	-0.880902	0.378371
c5_t(-1)	2.942707	2.112914	1.392725	0.163703
c5_t(-2)	-2.005299	2.092366	-0.958388	0.337867
c5_t(-3)	0.174508	0.296365	0.588829	0.555976
c5_t(-4)	-0.011989	0.141317	-0.084839	0.932390
tat	0.027344	0.027825	0.982712	0.325749
tat(-1)	-0.013846	0.014940	-0.926768	0.354047
tat(-2)	0.004455	0.010317	0.431821	0.665872
tat(-3)	-0.003635	0.005215	-0.697092	0.485745
tat(-4)	-0.003304	0.006173	-0.535252	0.592476
so_u	-0.081250	0.166762	-0.487221	0.626102
so_u(-1)	0.120028	0.180136	0.666317	0.505209
so_u(-2)	-0.060010	0.052729	-1.138082	0.255086
so_u(-3)	0.084269	0.064958	1.297276	0.194536
so_u(-4)	-0.119746	0.099812	-1.199712	0.230251
tan	-0.007168	0.014392	-0.498050	0.618448
tan(-1)	0.008115	0.013108	0.619095	0.535854
tan(-2)	0.001665	0.004124	0.403840	0.686330
tan(-3)	0.000392	0.001968	0.199169	0.842131
tan(-4)	0.001837	0.002366	0.776374	0.437528
isco	0.001490	0.001720	0.866275	0.386339
tma	-0.024440	0.023699	-1.031243	0.302427
tma(-1)	0.007476	0.009783	0.764128	0.444791
tma(-2)	0.002505	0.006351	0.394353	0.693320
tma(-3)	-0.001077	0.003461	-0.311090	0.755733
tma(-4)	0.005157	0.006172	0.835599	0.403381
a1	0.000255	0.003423	0.074583	0.940547
a3	0.006086	0.007869	0.773465	0.439247
a4	0.003671	0.004724	0.777195	0.437044
a5	0.010938	0.013995	0.781585	0.434458
a6	0.002276	0.009911	0.229597	0.818405

Robust test for first-order serial correlation: -0.978 [18]
Robust test for second-order serial correlation: 1.005 [18]

1. Maria Cristina Marcuzzo [1985] "Joan Violet Robinson (1903-1983)", pp. 134

2. Sergio Lugaresi [1986] "Le imposte nelle teorie del sovrappiù", pp. 26

3. Massimo D'Angelillo e Leonardo Paggi [1986] "PCI e socialdemocrazie europee. Quale riformismo?", pp. 158

4. Gian Paolo Caselli e Gabriele Pastrello [1986] "Un suggerimento hobsoniano su terziario ed occupazione: il caso degli Stati Uniti 1960/1983", pp. 52

5. Paolo Bosi e Paolo Silvestri [1986] "La distribuzione per aree disciplinari dei fondi destinati ai Dipartimenti, Istituti e Centri dell'Università di Modena: una proposta di riforma", pp. 25

6. Marco Lippi [1986] "Aggregations and Dynamic in One-Equation Econometric Models", pp. 64

7. Paolo Silvestri [1986] "Le tasse scolastiche e universitarie nella Legge Finanziaria 1986", pp. 41

8. Mario Forni [1986] "Storie familiari e storie di proprietà. Itinerari sociali nell'agricoltura italiana del dopoguerra", pp. 165

9. Sergio Paba [1986] "Gruppi strategici e concentrazione nell'industria europea degli elettrodomestici bianchi", pp. 56

10. Nerio Naldi [1986] "L'efficienza marginale del capitale nel breve periodo", pp. 54

11. Fernando Vianello [1986] "Labour Theory of Value", pp. 31

12. Piero Ganugi [1986] "Risparmio forzato e politica monetaria negli economisti italiani tra le due guerre", pp. 40

13. Maria Cristina Marcuzzo e Annalisa Rosselli [1986] "The Theory of the Gold Standard and Ricardo's Standard Comodity", pp. 30

14. Giovanni Solinas [1986] "Mercati del lavoro locali e carriere di lavoro giovanili", pp. 66

15. Giovanni Bonifati [1986] "Saggio dell'interesse e domanda effettiva. Osservazioni sul cap. 17 della General Theory", pp. 42

16. Marina Murat [1986] "Betwin old and new classical macroeconomics: notes on Lejonhufvud's notion of full information equilibrium", pp. 20

17. Sebastiano Brusco e Giovanni Solinas [1986] "Mobilità occupazionale e disoccupazione in Emilia Romagna", pp. 48

18. Mario Forni [1986] "Aggregazione ed esogeneità", pp. 13

19. Sergio Lugaresi [1987] "Redistribuzione del reddito, consumi e occupazione", pp. 17

20. Fiorenzo Sperotto [1987] "L'immagine neopopulista di mercato debole nel primo dibattito sovietico sulla pianificazione", pp. 34

21. M. Cecilia Guerra [1987] "Benefici tributari nel regime misto per i dividendi proposto dalla commissione Sarcinelli: una nota critica", pp. 9

22. Leonardo Paggi [1987] "Contemporary Europe and Modern America: Theories of Modernity in Comparative Perspective", pp. 38

23. Fernando Vianello [1987] "A Critique of Professor Goodwin's 'Critique of Sraffa'", pp. 12

24. Fernando Vianello [1987] "Effective Demand and the Rate of Profits. Some Thoughts on Marx, Kalecki and Sraffa", pp. 41

25. Anna Maria Sala [1987] "Banche e territorio. Approccio ad un tema geografico-economico", pp. 40

26. Enzo Mingione e Giovanni Mottura [1987] "Fattori di trasformazione e nuovi profili sociali nell'agricoltura italiana: qualche elemento di discussione", pp. 36

27. Giovanna Procacci [1988] "The State and Social Control in Italy During the First World War", pp. 18

28. Massimo Matteuzzi e Annamaria Simonazzi [1988] "Il debito pubblico", pp. 62

29. Maria Cristina Marcuzzo (a cura di) [1988] "Richard F. Kahn. A discipline of Keynes", pp. 118

30. Paolo Bosi [1988] "MICROMOD. Un modello dell'economia italiana per la didattica della politica fiscale", pp. 34

31. Paolo Bosi [1988] "Indicatori della politica fiscale. Una rassegna e un confronto con l'aiuto di MICROMOD", pp. 25

32. Giovanna Procacci [1988] "Protesta popolare e agitazioni operaie in Italia 1915-1918", pp. 45

33. Margherita Russo [1988] "Distretto Industriale e servizi. Uno studio dei trasporti nella produzione e nella vendita delle piastrelle", pp. 157

34. Margherita Russo [1988] "The effect of technical change on skill requirements: an empirical analysis", pp. 28

35. Carlo Grillenzoni [1988] "Identification, estimations of multivariate transfer functions", pp. 33

36. Nerio Naldi [1988] "'Keynes' concept of capital", pp. 40

37. Andrea Ginzburg [1988] "locomotiva Italia?", pp. 30

38. Giovanni Mottura [1988] "La 'persistenza' secolare. Appunti su agricoltura contadina ed agricoltura familiare nelle società industriali", pp. 40

39. Giovanni Mottura [1988] "L'anticamera dell'esodo. I contadini italiani della 'restaurazione contrattuale' fascista alla riforma fondiaria", pp. 40

40. Leonardo Paggi [1988] "Americanismo e riformismo. La socialdemocrazia europea nell'economia mondiale aperta", pp. 120

41. Annamaria Simonazzi [1988] "Fenomeni di isteresi nella spiegazione degli alti tassi di interesse reale", pp. 44

42. Antonietta Bassetti [1989] "Analisi dell'andamento e della casualità della borsa valori", pp. 12

43. Giovanna Procacci [1989] "State coercion and worker solidarity in Italy (1915-1918): the moral and political content of social unrest", pp. 41

44. Carlo Alberto Magni [1989] "Reputazione e credibilità di una minaccia in un gioco bargaining", pp. 56

45. Giovanni Mottura [1989] "Agricoltura familiare e sistema agroalimentare in Italia", pp. 84

46. Mario Forni [1989] "Trend, Cycle and 'Fortuitous cancellation': a Note on a Paper by Nelson and Plosser", pp. 4

47. Paolo Bosi , Roberto Golinelli , Anna Stagni [1989] "Le origini del debito pubblico e il costo della stabilizzazione", pp. 26

48. Roberto Golinelli [1989] "Note sulla struttura e sull'impiego dei modelli macroeconometrici", pp. 21

49. Marco Lippi [1989] "A Shorte Note on Cointegration and Aggregation", pp. 11

50. Gian Paolo Caselli e Gabriele Pastrello [1989] "The Linkage between Tertiary and Industrial Sector in the Italian Economy: 1951-1988. From an External Dependence to an International One", pp. 40

51. Gabriele Pastrello [1989] "Francois quesnay: dal Tableau Zig-zag al Tableau Formule: una ricostruzione", pp. 48

52. Paolo Silvestri [1989] "Il bilancio dello stato", pp. 34

53. Tim Mason [1990] "Tre seminari di storia sociale contemporanea", pp. 26

54. Michele Lalla [1990] "The Aggregate Escape Rate Analysed throught the Queueing Model", pp. 23

55. Paolo Silvestri [1990] "Sull'autonomia finanziaria dell'università", pp. 11

56. Paola Bertolini, Enrico Giovannetti [1990] "Uno studio di 'filiera' nell'agroindustria. Il caso del Parmigiano Reggiano", pp. 164

57. Paolo Bosi, Roberto Golinelli, Anna Stagni [1990] "Effetti macroeconomici, settoriali e distributivi dell'armonizzazione dell'IVA", pp. 24

58. Michele Lalla [1990] "Modelling Employment Spells from Emilia Labour Force Data", pp. 18

59. Andrea Ginzburg [1990] "Politica Nazionale e commercio internazionale", pp. 22

60. Andrea Giommi [1990] "La probabilità individuale di risposta nel trattamento dei dati mancanti", pp. 13

61. Gian Paolo Caselli e Gabriele Pastrello [1990] "The service sector in planned economies. Past experiences and future prospectives", pp. 32

62. Giovanni Solinas [1990] "Competenze, grandi industrie e distretti industriali,. Il caso Magneti Marelli", pp. 23

63. Andrea Ginzburg [1990] "Debito pubblico, teorie monetarie e tradizione civica nell'Inghilterra del Settecento", pp. 30

64. Mario Forni [1990] "Incertezza, informazione e mercati assicurativi: una rassegna", pp. 37

65. Mario Forni [1990] "Misspecification in Dynamic Models", pp. 19

66. Gian Paolo Caselli e Gabriele Pastrello [1990] "Service Sector Growth in CPE's: An Unsolved Dilemma", pp. 28

67. Paola Bertolini [1990] "La situazione agro-alimentare nei paesi ad economia avanzata", pp. 20

68. Paola Bertolini [1990] "Sistema agro-alimentare in Emilia Romagna ed occupazione", pp. 65

69. Enrico Giovannetti [1990] "Efficienza ed innovazione: il modello "fondi e flussi" applicato ad una filiera agro-industriale", pp. 38

70. Margherita Russo [1990] "Cambiamento tecnico e distretto industriale: una verifica empirica", pp. 115

71. Margherita Russo [1990] "Distretti industriali in teoria e in pratica: una raccolta di saggi", pp. 119

72. Paolo Silvestri [1990] " La Legge Finanziaria. Voce dell'enciclopedia Europea Garzanti", pp. 8

73. Rita Paltrinieri [1990] "La popolazione italiana: problemi di oggi e di domani", pp. 57

74. Enrico Giovannetti [1990] "Illusioni ottiche negli andamenti delle Grandezze distributive: la scala mobile e l''appiattimento' delle retribuzioni in una ricerca", pp. 120

75. Enrico Giovannetti [1990] "Crisi e mercato del lavoro in un distretto industriale: il bacino delle ceramiche. Sez I", pp. 150

76. Enrico Giovannetti [1990] " Crisi e mercato del lavoro in un distretto industriale: il bacino delle ceramiche. Sez. II", pp. 145

78. Antonietta Bassetti e Costanza Torricelli [1990] "Una riqualificazione dell'approccio bargaining alla selezioni di portafoglio", pp. 4

77. Antonietta Bassetti e Costanza Torricelli [1990] "Il portafoglio ottimo come soluzione di un gioco bargaining", pp. 15

79. Mario Forni [1990] "Una nota sull'errore di aggregazione", pp. 6

80. Francesca Bergamini [1991] "Alcune considerazioni sulle soluzioni di un gioco bargaining", pp. 21

81. Michele Grillo e Michele Polo [1991] "Political Exchange and the allocation of surplus: a Model of Two-party competition", pp. 34

82. Gian Paolo Caselli e Gabriele Pastrello [1991] "The 1990 Polish Recession: a Case of Truncated Multiplier Process", pp. 26

83. Gian Paolo Caselli e Gabriele Pastrello [1991] "Polish firms: Pricate Vices Pubblis Virtues", pp. 20

84. Sebastiano Brusco e Sergio Paba [1991] "Connessioni, competenze e capacità concorrenziale nell'industria della Sardegna", pp. 25

85. Claudio Grimaldi, Rony Hamaui, Nicola Rossi [1991] "Non Marketable assets and hauseholds' Portfolio Choice: a Case of Study of Italy", pp. 38

86. Giulio Righi, Massimo Baldini, Alessandra Brambilla [1991] "Le misure degli effetti redistributivi delle imposte indirette: confronto tra modelli alternativi", pp. 47

87. Roberto Fanfani, Luca Lanini [1991] "Innovazione e servizi nello sviluppo della meccanizzazione agricola in Italia", pp. 35

88. Antonella Caiumi e Roberto Golinelli [1992] "Stima e applicazioni di un sistema di domanda Almost Ideal per l'economia italiana", pp. 34

89. Maria Cristina Marcuzzo [1992] "La relazione salari-occupazione tra rigidità reali e rigidità nominali", pp. 30

90. Mario Biagioli [1992] "Employee financial participation in enterprise results in Italy", pp. 50

91. Mario Biagioli [1992] "Wage structure, relative prices and international competitiveness", pp. 50

92. Paolo Silvestri e Giovanni Solinas [1993] "Abbandoni, esiti e carriera scolastica. Uno studio sugli studenti iscritti alla Facoltà di Economia e Commercio dell'Università di Modena nell'anno accademico 1990/1991", pp. 30

93. Gian Paolo Caselli e Luca Martinelli [1993] "Italian GPN growth 1890-1992: a unit root or segmented trend representatin?", pp. 30

94. Angela Politi [1993] "La rivoluzione fraintesa. I partigiani emiliani tra liberazione e guerra fredda, 1945-1955", pp. 55

95. Alberto Rinaldi [1993] "Lo sviluppo dell'industria metalmeccanica in provincia di Modena: 1945-1990", pp. 70

96. Paolo Emilio Mistrulli [1993] "Debito pubblico, intermediari finanziari e tassi d'interesse: il caso italiano", pp. 30

97. Barbara Pistoresi [1993] "Modelling disaggregate and aggregate labour demand equations. Cointegration analysis of a labour demand function for the Main Sectors of the Italian Economy: 1950-1990", pp. 45

98. Giovanni Bonifati [1993] "Progresso tecnico e accumulazione di conoscenza nella teoria neoclassica della crescita endogena. Una analisi critica del modello di Romer", pp. 50

99. Marcello D'Amato e Barbara Pistoresi [1994] "The relationship(s) among Wages, Prices, Unemployment and Productivity in Italy", pp. 30

100. Mario Forni [1994] "Consumption Volatility and Income Persistence in the Permanent Income Model", pp. 30

101. Barbara Pistoresi [1994] "Using a VECM to characterise the relative importance of permanent and transitority components", pp. 28

102. Gian Paolo Caselli and Gabriele Pastrello [1994] "Polish recovery form the slump to an old dilemma", pp. 20

103. Sergio Paba [1994] "Imprese visibili, accesso al mercato e organizzazione della produzione", pp. 20

104. Giovanni Bonifati [1994] "Progresso tecnico, investimenti e capacità produttiva", pp. 30

105. Giuseppe Marotta [1994] "Credit view and trade credit: evidence from Italy", pp. 20

106. Margherita Russo [1994] "Unit of investigation for local economic development policies", pp. 25

107. Luigi Brighi [1995] "Monotonicity and the demand theory of the weak axioms", pp. 20

108. Mario Forni e Lucrezia Reichlin [1995] "Modelling the impact of technological change across sectors and over time in manufactoring", pp. 25

109. Marcello D'Amato and Barbara Pistoresi [1995] "Modelling wage growth dynamics in Italy: 1960-1990", pp. 38

110. Massimo Baldini [1995] "INDIMOD. Un modello di microsimulazione per lo studio delle imposte indirette", pp. 37

111. Paolo Bosi [1995] "Regionalismo fiscale e autonomia tributaria: l'emersione di un modello di consenso", pp. 38

112. Massimo Baldini [1995] "Aggregation Factors and Aggregation Bias in Consumer Demand", pp. 33

113. Costanza Torricelli [1995] "The information in the term structure of interest rates. Can stocastic models help in resolving the puzzle?" pp. 25

114. Margherita Russo [1995] "Industrial complex, pôle de développement, distretto industriale. Alcune questioni sulle unità di indagine nell'analisi dello sviluppo." pp. 45

115. Angelika Moryson [1995] "50 Jahre Deutschland. 1945 - 1995" pp. 21

116. Paolo Bosi [1995] "Un punto di vista macroeconomico sulle caratteristiche di lungo periodo del nuovo sistema pensionistico italiano." pp. 32

117. Gian Paolo Caselli e Salvatore Curatolo [1995] "Esistono relazioni stimabili fra dimensione ed efficienza delle istituzioni e crescita produttiva? Un esercizio nello spirito di D.C. North." pp. 11

118. Mario Forni e Marco Lippi [1995] "Permanent income, heterogeneity and the error correction mechanism." pp. 21

119. Barbara Pistoresi [1995] "Co-movements and convergence in international output. A Dynamic Principal Components Analysis" pp. 14

120. Mario Forni e Lucrezia Reichlin [1995] "Dynamic common factors in large cross-section" pp. 17

121. Giuseppe Marotta [1995] "Il credito commerciale in Italia: una nota su alcuni aspetti strutturali e sulle implicazioni di politica monetaria" pp. 20

122. Giovanni Bonifati [1995] "Progresso tecnico, concorrenza e decisioni di investimento: una analisi delle determinanti di lungo periodo degli investimenti" pp. 25

123. Giovanni Bonifati [1995] "Cambiamento tecnico e crescita endogena: una valutazione critica delle ipotesi del modello di Romer" pp. 21

124. Barbara Pistoresi e Marcello D'Amato [1995] "La riservatezza del banchiere centrale è un bene o un male? ‚Effetti dell'informazione incompleta sul benessere in un modello di politica monetaria." pp. 32

125. Barbara Pistoresi [1995] "Radici unitarie e persistenza: l'analisi univariata delle fluttuazioni economiche." pp. 33

126. Barbara Pistoresi e Marcello D'Amato [1995] "Co-movements in European real outputs" pp. 20

127. Antonio Ribba [1996] "Ciclo economico, modello lineare-stocastico, forma dello spettro delle variabili macrocconomiche" pp. 31

128. Carlo Alberto Magni [1996] "Repeatable and una tantum real options a dynamic programming approach" pp. 23

129. Carlo Alberto Magni [1996] "Opzioni reali d'investimento e interazione competitiva: programmazione dinamica stocastica in optimal stopping" pp. 26

130. Carlo Alberto Magni [1996] "Vaghezza e logica fuzzy nella valutazione di un'opzione reale" pp. 20

131. Giuseppe Marotta [1996] "Does trade credit redistribution thwart monetary policy? Evidence from Italy" pp. 20

132. Mauro Dell'Amico e Marco Trubian [1996] "Almost-optimal solution of large weighted equicut problems" pp. 30

133. Carlo Alberto Magni [1996] "Un esempio di investimento industriale con interazione competitiva e avversione al rischio" pp. 20

134. Margherita Russo, Peter Börkey, Emilio Cubel, François Lévêque, Francisco Mas [1996] "Local sustainability and competitiveness: the case of the ceramic tile industry" pp. 66

135. Margherita Russo [1996] "Camionetto tecnico e relazioni tra imprese" pp. 190

136. David Avra Lane, Irene Poli, Michele Lalla, Alberto Roverato [1996] "Lezioni di probabilità e inferenza statistica" pp. 288

137. David Avra Lane, Irene Poli, Michele Lalla, Alberto Roverato [1996] "Lezioni di probabilità e inferenza statistica - Esercizi svolti - " pp. 302

138. Barbara Pistoresi [1996] "Is an Aggregate Error Correction Model Representative of Disaggregate Behaviours? An example" pp. 24

139. Luisa Malaguti e Costanza Torricelli [1996] "Monetary policy and the term structure of interest rates" , pp. 30

140. Mauro Dell'Amico, Martine Labbé, Francesco Maffioli [1996] "Exact solution of the SONET Ring Loading Problem", pp. 20

141. Mauro Dell'Amico, R.J.M. Vaessens [1996] "Flow and open shop scheduling on two machines with transportation times and machine-independent processing times in NP-hard, pp. 10

142. M. Dell'Amico, F. Maffioli, A. Sciomechen [1996] "A Lagrangean Heuristic for the Pirze Collecting Travelling Salesman Problem", pp. 14

143. Massimo Baldini [1996] "Inequality Decomposition by Income Source in Italy - 1987 - 1993", pp. 20

144. Graziella Bertocchi [1996] "Trade, Wages, and the Persistence of Underdevelopment" pp. 20

145. Graziella Bertocchi and Fabio Canova [1996] "Did Colonization matter for Growth? An Empirical Exploration into the Historical Causes of Africa's Underdevelopment" pp. 32

146. Paola Bertolini [1996] "La modernization de l'agricolture italienne et le cas de l'Emilie Romagne" pp. 20

147. Enrico Giovannetti [1996] "Organisation industrielle et développement local: le cas de l'agroindutrie in Emilie Romagne" pp. 18

148. Maria Elena Bontempi e Roberto Golinelli [1996] "Le determinanti del leverage delle imprese: una applicazione empirica ai settori industriali dell'economia italiana" pp. 31

149. Paola Bertolini [1996] "L'agriculture et la politique agricole italienne face aux recents scenarios", pp. 20

150. Enrico Giovannetti [1996] "Il grado di utilizzo della capacità produttiva come misura dei costi di transazione: una rilettura di 'Nature of the Firm' di R. Coase", pp. 75

151. Enrico Giovannetti [1996] "Il I° ciclo del Diploma Universitario Economia e Amministrazione delle Imprese", pp. 25

152. Paola Bertolini, Enrico Giovannetti, Giulia Santacaterina [1996] "Il Settore del Verde Pubblico. Analisi della domanda e valutazione economica dei benefici", pp. 35

153. Giovanni Solinas [1996] "Sistemi produttivi del Centro-Nord e del Mezzogiorno. L'industria delle calzature", pp. 55

154. Tindara Addabbo [1996] "Married Women's Labour Supply in Italy in a Regional Perspective", pp. 85

155. Paolo Silvestri, Giuseppe Catalano, Cristina Bevilacqua [1996] "Le tasse universitarie e gli interventi per il diritto allo studio: la prima fase di applicazione di una nuova normativa" pp. 159

156. Sebastiano Brusco, Paolo Bertossi, Margherita Russo [1996] "L'industria dei rifiuti urbani in Italia", pp. 25

157. Paolo Silvestri, Giuseppe Catalano [1996] "Le risorse del sistema universitario italiano: finanziamento e governo" pp. 400

158. Carlo Alberto Magni [1996] "Un semplice modello di opzione di differimento e di vendita in ambito discreto", pp. 10

159. Tito Pietra, Paolo Siconolfi [1996] "Fully Revealing Equilibria in Sequential Economies with Asset Markets" pp. 17

160. Tito Pietra, Paolo Siconolfi [1996] "Extrinsic Uncertainty and the Informational Role of Prices" pp. 42

161. Paolo Bertella Farnetti [1996] "Il negro e il rosso. Un precedente non esplorato dell'integrazione afroamericana negli Stati Uniti" pp. 26

162. David Lane [1996] "Is what is good for each best for all? Learning from others in the information contagion model" pp. 18

163. Antonio Ribba [1996] "A note on the equivalence of long-run and short-run identifying restrictions in cointegrated systems" pp. 10

164. Antonio Ribba [1996] "Scomposizioni permanenti-transitorie in sistemi cointegrati con una applicazione a dati italiani" pp. 23

165. Mario Forni, Sergio Paba [1996] "Economic Growth, Social Cohesion and Crime" pp. 20

166. Mario Forni, Lucrezia Reichlin [1996] "Let's get real: a factor analytical approch to disaggregated business cycle dynamics" pp. 25

167. Marcello D'Amato e Barbara Pistoresi [1996] "So many Italies: Statistical Evidence on Regional Cohesion" pp. 31

168. Elena Bonfiglioli, Paolo Bosi, Stefano Toso [1996] "L'equità del contributo straordinario per l'Europa" pp. 20

169. Graziella Bertocchi, Michael Spagat [1996] "Il ruolo dei licei e delle scuole tecnico-professionali tra progresso tecnologico, conflitto sociale e sviluppo economico" pp. 37

170. Gianna Boero, Costanza Torricelli [1997] "The Expectations Hypothesis of the Term Structure of Interest Rates: Evidence for Germany" pp. 15

171. Mario Forni, Lucrezia Reichlin [1997] "National Policies and Local Economies: Europe and the US" pp. 22

172. Carlo Alberto Magni [1997] "La trappola del Roe e la tridimensionalità del Van in un approccio sistemico", pp. 16

173. Mauro Dell'Amico [1997] "A Linear Time Algorithm for Scheduling Outforests with Communication Delays on Two or Three Processor"pp. 18

174. Paolo Bosi [1997] "Aumentare l'età pensionabile fa diminuire la spesa pensionistica? Ancora sulle caratteristiche di lungo periodo della riforma Dini" pp. 13

175. Paolo Bosi e Massimo Matteuzzi [1997] "Nuovi strumenti per l'assistenza sociale" pp 31

176. Mauro Dell'Amico, Francesco Maffioli e Marco Trubian [1997] "New bounds for optium traffic assignment in satellite communication" pp. 21

177. Carlo Alberto Magni [1997] "Paradossi, inverosimiglianze e contraddizioni del Van: operazioni certe" pp. 9

178. Barbara Pistoresi e Marcello D'Amato [1997] "Persistence of relative unemployment rates across italian regions" pp. 25

179. Margherita Russo, Franco Cavedoni e Riccardo Pianesani [1997] "Le spese ambientali dei Comuni in provincia di Modena, 1993-1995" pp. 23

180. Gabriele Pastrello [1997] "Time and Equilibrium, Two Elisive Guests in the Keynes-Hawtrey-Robertson Debate in the Thirties" pp. 25

181. Luisa Malaguti e Costanza Torricelli [1997] "The Interaction Between Monetary Policy and the Expectation Hypothesis of the Term Structure of Interest rates in a N-Period Rational Expectation Model" pp. 27

182. Mauro Dell'Amico [1997] "On the Continuous Relaxation of Packing Problems – Technical Note" pp. 8

183. Stefano Bordoni [1997] "Prova di Idoneità di Informatica Dispensa Esercizi Excel 5" pp 49

184. Francesca Bergamini e Stefano Bordoni [1997] "Una verifica empirica di un nuovo metodo di selezione ottima di portafoglio" pp. 22

185. Gian Paolo Caselli e Maurizio Battini [1997] "Following the tracks of atkinson and micklewright the changing distribution of income and earnings in poland from 1989 to 1995".pp 21

186. Mauro Dell'Amico e Francesco Maffioli [1997] "Combining Linear and Non-Linear Objectives in Spanning Tree Problems" pp. 21

187. Gianni Ricci e Vanessa Debbia [1997] "Una soluzione evolutiva in un gioco differenziale di lotta di classe" pp.14

188. Fabio Canova e Eva Ortega [1997] "Testing Calibrated General Equilibrium Model" pp 34

189. Fabio Canova [1997] "Does Detrending Matter for the Determination of the Reference Cycle and the Selection of Turning Points?" pp. 35

190. Fabio Canova e Gianni De Nicolò [1997] "The Equity Premium and the Risk Free Rate: A Cross Country, Cross Maturity Examination" pp. 41

191. Fabio Canova e Angel J. Ubide [1997] "International Business Cycles, Financial Market and Household Production" pp. 32

192. Fabio Canova e Gianni De Nicolò [1997] "Stock Returns, Term Structure, Inflation and Real Activity: An International Perspective" pp. 33

193. Fabio Canova e Morten Ravn [1997] "The Macroeconomic Effects of German Unification: Real Adjustmentsand the Welfare State" pp. 34

194. Fabio Canova [1997] "Detrending and Business Cycle Facts" pp. 40

195. Fabio Canova e Morten O. Ravn [1997] "Crossing the Rio Grande: Migrations, Business Cycle and the Welfare State" pp. 37

196. Fabio Canova e Jane Marrinan [1997] "Sources and Propagation of International Output Cycles: Common Shocks or Transmission?" pp. 41

197. Fabio Canova e Albert Marcet [1997] "The Poor Stay Poor: Non-Convergence Across Countries and Regions" pp. 44

198. Carlo Alberto Magni [1997] "Un Criterio Strutturalista per la Valutazione di Investimenti" pp. 17

199. Stefano Bordoni [1997] "Elaborazione Automatica dei Dati" pp. 60

200. Paolo Bertella Farnetti [1997] "The United States and the Origins of European Integration" pp. 19

201. Paolo Bosi [1997] "Sul Controllo Dinamico di un Sistema Pensionistico a Ripartizione di Tipo Contributivo" pp 17

202. Paola Bertolini [1997] "European Union Agricultural Policy: Problems and Perspectives" pp18

203. Stefano Bordoni [1997] "Supporti Informatici per la Ricerca delle soluzioni di Problemi Decisionali" pp30

204. Carlo Alberto Magni [1997] "Paradossi, Inverosimiglianze e Contraddizioni del Van: Operazioni Aleatorie" pp10

205. Carlo Alberto Magni [1997] "Tir, Roe e Van: Distorsioni linguistiche e Cognitive nella Valutazione degli Investimenti" pp 17

206. Gisella Facchinetti, Roberto Ghiselli Ricci e Silvia Muzzioli [1997] "New Methods For Ranking Triangular Fuzzy Numbers: An Investment Choice" pp 9

207. Mauro Dell'Amico e Silvano Martello [1997] "Reduction of the Three-Partition Problem" pp16

208. Carlo Alberto Magni [1997] "IRR, ROE and NPV: a Systemic Approach" pp. 20

209. Mauro Dell'Amico, Andrea Lodi e Francesco Maffioli [1997] "Solution of the cumulative assignment problem with a well-structured tabu search method" pp. 25

210. Carlo Alberto Magni [1997] "La definizione di investimento e criterio del Tir ovvero: la realtà inventata" pp.16

211. Carlo Albero Magni [1997] "Critica alla definizione classica di investimento: un approccio sistemico" pp17

212. Alberto Roverato [1997] "Asymptotic prior to posterior analysis for graphical gaussian models" pp.8

213. Tindara Addabbo [1997] "Povertà nel 1995 analisi statica e dinamica sui redditi familiari" pp 64

214. Gian Paolo Caselli e Franca Manghi [1997] "La transizione da piano a mercato e il modello di Ising" pp15

215. Tindara Addabbo [1998] "Lavoro non pagato e reddito esteso: un'applicazione alle famiglie italiane in cui entrambi i coniugi sono lavoratori dipendenti" pp 54

216. Tindara Addabbo [1998] "Probabilità di occupazione e aspettative individuali" pp 36

217. Lara Magnani [1998] "Transazioni, contratti e organizzazioni: una chiave di lettura della teoria economica dell'organizzazione pp 39

218. Michele Lalla, Rosella Molinari e Maria Grazia Modena [1998] "La progressione delle carriere: i percorsi in cardiologia" pp 46

219. Lara Magnani [1998] "L'organizzazione delle transazioni di subfornitura nel distretto industriale" pp 40

220. Antonio Ribba [1998] "Recursive VAR orderings and identification of permanent and transitory shocks" pp12

221. Antonio Ribba [1998] "Granger-causality and exogeneity in cointegrated Var models" pp 5

222. Luigi Brighi e Marcello D'Amato [1998] "Optimal Procurement in Multiproduct Monopoly" pp 25

223. Paolo Bosi, Maria Cecilia Guerra e Paolo Silvestri [1998] "La spesa sociale nel comune Modena" Rapporto intermedio pp 37

224. Mario Forni e Marco Lippi [1998] "On the Microfoundations of Dynamic Macroeconomics" pp 22

225. Roberto Ghiselli Ricci [1998] "Nuove Proposte di Ordinamento di Numeri Fuzzy.Una Applicazione ad un Problema di Finanziamento pp 7

226. Tommaso Minerva [1998] "Internet Domande e Risposte" pp 183

227. Tommaso Minerva [1998] "Elementi di Statistica Computazione. Parte Prima: .Il Sistema Operativo Unix ed il Linguaggio C" pp. 57

228. Tommaso Minerva and Irene Poli [1998] "A Gennetic Algorithms Selection Method for Predictive Neural Nets and Linear Modenls" pp. 60

229. Tommaso Minerva and Irene Poli [1998] "Building an ARMA Model by using a Genetic Algorithm" pp. 60

230. Mauro Dell'Amico e Paolo Toth [1998] "Algorithms and Codes for Dense Assignment Problems: the State of the Art" pp 35

231. Ennio Cavazzuti e Nicoletta Pacchiarotti [1998] "How to play an hotelling game in a square town" pp 12

232. Alberto Roverato e Irene Poli [1998] "Un algoritmo genetico per la selezione di modelli grafici" pp 11

233. Marcello D'Amato e Barbara Pistoresi [1998] "Delegation of Monetary Policy to a Central Banker with Private Information" pp 15.

234. Graziella Bertocchi e Michael Spagat [1998] "The Evolution of Modern Educational Systems. Technical vs. General Education, Distributional Conflict, and Growth" pp 31

235. André Dumas [1998] "Le systeme monetaire Europeen" pp 24.

236. Gianna Boero, Gianluca Di Lorenzo e Costanza Torricelli [1998] "The influence of short rate predictability and monetary policy on tests of the expectations hypothesis: some comparative evidence" pp 30

237. Carlo Alberto Magni [1998] "A systemic rule for investment decisions: generalizations of the traditional DCF criteria and new conceptions" pp 30

238. Marcello D'Amato e Barbara Pistoresi [1998] "Interest Rate Spreads Between Italy and Germany: 1995-1997" pp 16

239. Paola Bertolini e Alberto Bertacchini [1998] "Il distretto di lavorazioni carni suine in provincia di Modena" pp 29

240. Costanza Torricelli e Gianluca Di Lorenzo [1998] "Una nota sui fondamenti matematico-finanziari della teoria delle aspettative della struttura della scadenza" pp. 15

241. Christophe Croux, Mario Forni e Lucrezia Reichlin [1998] "A Measure of Comovement for Economic Indicators: Theory and Empirics"pp 23.

242. Carlo Alberto Magni [1998] "Note sparse sul dilemma del prigioniero (e non solo) pp 13.

243. Gian Paolo Caselli [1998] The future of mass consumption society in the former planned economies: a macro approach pp 21.

244. Mario Forni, Marc Hallin, Marco Lippi e Lucrezia Reichlin [1998] "The generalized dynamic factor model: identification and estimation pp 35.

245. Carlo Alberto Magni [1998] "Pictures, language and research: the case of finance and financial mathematics" pp 35.

246. Luigi Brighi [1998] "Demand and generalized monotonicity" pp 21.

247. Mario Forni e Lucrezia Reichlin [1998] "Risk and potential insurance in Europe" pp 20.

248. Tommaso Minerva, Sandra Paterlini e Irene Poli [1998] "A Genetic Algorithm for predictive Neural Network Design (GANND). A Financial Application" pp 12.

249. Gian Paolo Caselli Maurizio Battini [1998] "The Changing Distribution of Earnings in Poland from 1989 to 1996 pp. 9.

250. Mario Forni, Sergio Paba [1998] "Industrial Districts, Social Environment and Local Growth" Evidence from Italy pp. 27.

251. Lara Magnani [1998] "Un'analisi del distretto industriale fondata sulla moderna teoria economica dell'organizzazione" pp. 46.

252. Mario Forni, Lucrezia Reichlin [1998] "Federal Policies and Local Economies: Europe and the US" pp. 24.

253. Luigi Brighi [1998] "A Case of Optimal Regulation whit Multidimensional Private Information" pp 20.

254. Barbara Pistoresi, Stefania Luppi [1998] "Gli investimenti diretti esteri nell'America Latina e nel Sud Est Asiatico: 1982-1995" pp 27.

255 Paola Mengoli, Margherita Russo [1998] "Technical and Vocational Education and Training in Italy: Structure and Changes at National and Regional Level" pp 25.

256 Tindara Addabbo [1998] "On-the-Job Search a Microeconometric Analysis on Italian Data" pp. 29.

257 Lorenzo Bertucelli [1999] "Il paternalismo industriale: una discussione storiografica" pp.21.

258 Mario Forni e Marco Lippi [1999] "The generalized dynamic factor model: representation theory" pp. 25.

259 Andrea Ginzburg e Annamaria Simonazzi [1999] "Foreign debt cycles and the 'Gibson Paradox': an interpretative hypothesis" pp. 38.

260 Paolo Bosi [1999] "La riforma della spesa per assistenza dalla Commissione Onofri ad oggi: una valutazione in corso d'opera" pp. 56.

261 Marcello D'Amato e Barbara Pistoresi [1999] "Go and soothe the row. Delegation of monetary policy under private information" pp. 23.

262 Michele Lalla [1999] "Sampling, Maintenance, and Weighting Schemes for Longitudinal Surveys: a Case Study of the Textile and Clothing Industry" pp. 27.

263 Pederzoli Chiara e Torricelli Costanza [1999] "Una rassegna sui metodi di stima del Value at Risk (Var)".

264 Paolo Bosi, Maria Cecilia Guerra e Paolo Silvestri [1999] "La spesa sociale di Modena . La valutazione della condizione economica" pp 74.

265 Graziella Bertocchi e Michael Spagat [1999] "The Politics Co-optation" pp 14.

266 Giovanni Bonifati [1999] "The Capacity to Generate Investment. An analysis of the long-term determinants of investiment" pp.22.

267 Tindara Addabbo e Antonella Caiumi [1999] "Extended Income and Inequality by Gender in Italy" pp. 40.

268 Antonella Caiumi e Federico Perali [1999] "Children and Intrahousehold Distribution of Resources: An Estimate of the Sharing Rule of Italian Households" pp.24

269 Vincenzo Atella, Antonella Caiumi e Federico Perali [1999] "Una scala di equivalenza non vale l'altra" pp.23.

270. Tito Pietra e Paolo Siconolfi [1999] "Volume of Trade and Revelation of Information" pp. 31

271. Antonella Picchio [1999] "La questione del lavoro non pagato nella produzione di servizi nel nucleo domestico (Household)" pp.58

272. Margherita Russo [1999] "Complementary Innovations and Generative Relationships in a Small Business Production System: the Case of Kervit" pp. 27

273. André Dumas [1999] "L'Economie de la drouge" pp. 12

274. André Dumas [1999] "L'Euro à l'heure actuelle" pp. 12

275. Michele Lalla Gisella Facchinetti [1999] "La valutazione della attività didattica: un confronto tra scale di misura e insiemi sfocati" pp.32

276. Mario Biagioli [1999] "Formazione e valorizzazione dei capitale umano: un' indagine sui paesi dell'Unione Europea" pp.21

277. Mario Biagioli [1999] "Disoccupazione, formazione del capitale umano e determinazione dei salari individuali: un' indagine su microdati nei paesi dell'Unione Europea" pp. 15

278. Gian Paolo Caselli e Giulia Bruni [1999] "Il settore petrolifero russo, il petrolio del Mar Caspio e gli interessi geopolitici nell'area" pp. 28

279. Luca Gambetti [1999] "The Real Effect of Monetary Policy: a New Var Identification Procedure" pp. 22

280. Marcello D'Amato Barbara Pistoresi [1999] "Assessing Potential Targets for Labour Market Reforms in Italy" pp. 8

281. Gian Paolo Caselli, Giulia Bruni e Francesco Pattarin [1999] "Gaddy and Ickes Model of Russian Barter Economy: Some Criticisms and Considerations" pp. 10

282. Silvia Muzzioli Costanza Torricelli [1999] "A Model for Pricing an Option with a Fuzzy Payoff" pp. 13

283. Antonella Caiumi Federico Perali [1999] "Povertà e Welfare in Italia in Relazione alla Scelta della Scala di Equivalenza" pp.25

284. Marcello Galli Tommaso Minerva [1999] "Algoritmi Genetici per l'Evoluzione di Modelli Lineari *Metodologia ad Applicazioni"* pp. 36

285. Mario Forni Sergio Paba [1999] "Knowledge Spillovers and the Growth of Local Industries" pp. 20

286. Gisella Facchinetti Giovanni Mastroleo [1999] "Un confronto tra uno score card ed un approccio fuzzy per la concessione del credito personale" pp.27

287. Gisella Facchinetti Giovanni Mastroleo e Sergio Paba [1999] "A Statistical and Fuzzy Algorithm for the Identification of Industrial Districts" pp. 6

288. Tommaso Minerva [1999] "Didattica e Informatica- *Una indagine Statistica relativa alla Provincia di Modena sul rapporto tra Insegnanti e Nuove Tecnologie" pp.* 46

289. Andrea Ginzburg [1999] "Sraffa e l'analisi sociale: alcune note metodologiche" pp. 37

290. Consolato Pellegrino Carla Fiori [1999] "Piani Formalmente Euclidei" pp. 11

291. Nicolina A. Malara, Maria Teresa Brandoli e Carla Fiori [1999] "Comportamenti di Studenti in Ingresso all'Università di Fronte allo Studio di Disequazioni" pp. 15

292. Consolato Pellegrino Maria Teresa Brandoli [1999] "Il Principio D'Induzione Euristica-Mente Parlando" pp. 11

293. Paolo Bertella Farnetti [1999] "Winston Churchill e l'unità europea" pp. 25

294. Tindara Addabbo Massimo Baldini [1999] "Safety net and poverty dynamics in Italy in the early nineties" pp. 23

295. Margherita Russo [2000] "Innovation Dynamics and Industrial Dynamics
Agents/Artifacts Space in Tile Decoration: from Silk Screen to Laser Engraved Silicon Cylinder" pp. 45

296. Gianluca Masci e Margherita Russo [2000] "L'attività brevettale nel distretto ceramico, 1971-1998" pp. 41

297. Paola Mengoli e Margherita Russo [2000] "Competenze, innovazione e sviluppo locale" pp. 31

298. Gian Paolo Caselli e Tommaso Minerva [2000] "The Transition Process in Russia and China and the Ising Model" pp. 30

299. Gisella Facchinetti, Giovanni Mastroleo e Sergio Paba (2000] "A Fuzzy Approach to the Empirical Identification of Industrial Districts" pp. 7

300. Tommaso Minerva, Irene Poli and Sebastiano Brusco [2000] "A Cellular Automaton as a Model to Study the Dynamics of an Industrial Distrief" pp. 6

301. Gisella Facchinetti [2000] "Il problema della misurazione del rischio di credito: una rassegna critica di metodologie" pp. 13

302. Marco Mazzoli [2000] "Investiments and Financial Structure with Imperfect Financial Markets: an Intertemporal Discrete-Time Framework" pp.13

303. Giuseppe Marotta [2000] "Il credito commerciale in Italia: evidenza su dati d'imprese" pp. 29

304. Marco Mazzoli [2000] "Credit Channel and Industrial Firms' Market power" pp. 15

305. Gisella Facchinetti e Giovanni Mastroleo [2000] "The Mamdani and the γ -operator in a Fuzzy Logic Control System" pp. 17

306. Giovanni Solinas e Giovanni Mastroleo [2000] "Benchmarking certificazione della qualità e piccole imprese. La sperimentazione di un modello europeo nelle piccole imprese in Emilia Romagna" pp. 45

307. Margherita Russo, Giorgio Allari, Silvano Bertini, Paolo Bonaretti, Elio De Leo, Giuseppe Fiorani and Gianni Rinaldini [2000] "The Challenges for the Next Debate: Notes for a debite on the Development of the Emilia-Romagna Region" pp. 27

308. Giovanni Mastroleo [2000] "L' integrazione dell'indagine statistica con l' approccio fuzzy nel controllo di efficacia: il monitoraggio sugli obiettivi raggiunti nell'ambito di un P.O.M" pp. 24

309. Gisella Facchinetti, Stefano Bordoni e Giovanni Mastroleo [2000] "Bank Creditworthiness Using Fuzzy Systems: A Comparison whit a Classical Analysis Approach[1]" pp. 13

310. Margherita Russo e Raffaele Giardino [2000] "Struttura e cambiamento nelle relazioni tra le imprese meccaniche.
I. La popolazione di imprese meccaniche della provincia di Modena procedure impiegate per integrare le informazioni amministrative del Registro Imprese e dell'Inps" pp. 32

311. Tommaso Minerva e Sandra Paterlini [2000] "Tecniche Computazionali per la Statistica, l' Economia e la Finanza, *Materiale Didattico a Supporto del Corso di Statistica Computazionale*" pp.52

312. Costanza Torricelli e Silvia Muzzioli [2000] "Combining the Theory of Evidence with Fuzzy Sets for Binomial Option Pricing" pp.20

313. Marco Mazzoli e Roberto Negrini [2000] "Strumenti finanziari negoziabili e incentivo-compatibili per le imprese cooperative. *Alcune considerazioni teoriche e di policy"* pp. 32

314. Giacomo Galeotti e Tommaso Minerva [2000] "Ajgoritmi ibridi per l' ottimizzazione di un Portafoglio Azionario. *Simulazione stocastica filtrata mediante wavelet decomposition"* pp.33

315. Alberto Roverato [2000] "Hyper Inverse Wishart Distribution for Non-Decomposable Graphs and its Application to Bayesian Inference for Gaussian Graphical Models" pp. 29

316. Carlo Alberto Magni [2000] "Scomposizione di sovrapprofitti: Economic Value Added e valore aggiunto sistematico" pp. 25

317. Carlo Alberto Magni [20001 "Decomposition of a Certain Cash Flow Stream: Systemic Value Added and Net Final Value" pp. 30

318. Carlo Alberto Magni [2000) "Systemic Value Added, Residual Income and Decomposition of a Cash Flow Stream" pp 27

319. Gisella Facchinetti e Giovanni Mastroleo [2000] "La valutazione del rischio di frode nel ramo assicurativo R.C. auto: una proposta in logica Fuzzy" pp. 16

320. Gian Paolo Caselli e Gabriele Pastrello [2000] "Eltsin: Dimissioni o Licenziamento?" pp. 18

321. Gisella Facchinetti, Carlo Alberto Magni e Giovanni Mastroleo [2000] "Real Options: a Fuzzy Approach for Strategic Investments" pp.44

322. Stefano Bordoni [2000] "Applicazione Fuzzy per la determinazione del premio assicurativo" pp. 35

323. Gabriele Pastrello [2000] "Una distrazione di Marx" pp. 17

324. Marco Mazzoli [2000] "Canale creditizio, struttura di mercato, modifiche istituzionali e meccanismo di trasmissione della politica monetaria" pp. 18

325. Paola Bertolini e Luca Riazzi [2000] "L'applicabilità dello strumento futures al Mediterraneo riflessioni su un fallimento" pp.28

326. Enrico Giovanetti [2000] "Istituzioni e costi transattivi: l'impatto della regolazione dell'offerta nelle filiere agroindustriali" pp. 26

327. Gian Paolo Caselli e Marta Rosso [2000] "La moneta elettronica: aspetti di regolamentazione finanziaria".

328. Barbara Pistoresi e Chiara Strozzi [2000] "Labor Productivity and Labor Cost Dynamics in Italy: the Role of Wage Bargaining"pp. 23

329. Carlo Alberto Magni [2000] "Valore Aggiunto Sistemico: un'alternativa all'EVA quale indice di sovraprofitto periodale" pp.11

330. Carlo Alberto Magni [2000] "Ori Decomposing Net Final Values: Svstemic Value Added and Shadow Project" pp. 26

331. Massimo Baldini [2000] "MAPP98: un Modello di Analisi delle Politiche Pubbliche" pp. 24

332. Paolo Bosi, Massimo Baldini, Maria Cecilia Guerra e Paolo Silvestri [2000] "La scelta tra ICI e Addizionale all'Irpef nella Politica tributaria locale: aspetti distributivi" pp. 27

333. Marina Murat e Sergio Paba [2000] "Flussi migratori e modelli di sviluppo industriale- *L'esperienza italiana dal dopoguerra agli anni novanta"* pp. 32

334. Marco Mazzoli e Roberto Negrini [2000] "Incentive-Compatible Financial Instruments for Co-Operative Firms: a Few Policy Considerations" pp. 27

335. Massimo Baldini e Paolo Bosi [2000] "Riforme trasparenti e proposte opache" pp. 10

336. Paolo Bosi [2000] "La selettività nelle politiche sociali in Italia: riflessioni sull'esperienza dell'Ise" pp. 16

337. Massimo Baldini, Paolo Bosi e Stefano Toso [2000] "Targeting Welfare in Italy: Old Problems and Perspectives of Reform" pp. 21

338. Tindara Addabbo e Massimo Baldini [2000] "The Gender Impact of Workfare Policies in Italy and the Effect of Unpaid Work" pp. 15

339. Gian Paolo Caselli e Thoma Grid [2000] "La storia economica albanese 1912-1939 e lo stabilirsi dell'egemonia italiana" pp. 46

340. Tommaso Minerva [2000] "La costruzione di modelli con algoritmi genetici" pp. 183

341. Giovanni Bonifati [2000] -PRODUZIONE, INVESTIMENTI E PRODUTTIVITA'. Rendimenti crescenti e cambiamento strutturale nell'industria manifatturiera americana (1960-1994)" pp. 43

342. Luciano Messori [2000] "Struttura e quantificazione di una imposizione fiscale Pigouviana sulla benzina" pp. 20

343. Carlo Alberto Magni [2000] "Zelig and the Art of Measuring Residual Income" pp. 18

344. Sandra Paterlini, Stefano Favaro e Tommaso Minerva [2001] "Genetic Approaches for Data Clustering" pp. 4

345. Enrico Giovanetti [2001] "Processi di vita delle imprese cooperative: mezzo secolo di cooperazione a Modena, dal dopoguerra a oggi" pp. 34

346. Giuseppe Marotta [2001] "Is Trade Credit More Expensive Than Bank Loans? Evidence from Italian Firm-level Data" pp. 26

347. Massimo Baldini e Paolo Bosi [2001] "Flat Rate Tax, Dividendo sociale e riforma dei programmi di spesa di assistenza" pp. 34

348. Paolo Bosi e Maria Cecilia Guerra [2001] "Meno Tasse per tutti:lusinghe e ambiguità di uno slogan" pp. 17

349. Danilo Mercurio e Costanza Torricelli [2001] "Estimation and Arbitrage Opportunities for Exchange Rate Baskets" pp. 27

350. Caselli e Grid Thoma [2001] "L'economia Albanese durante il secondo conflitto mondiale e il primo tentativo di pianificazione" pp n. 33

351. Massimo Baldini e Carlo Mazzaferro [2001] "Sistema pensionistico e distribuzione dei redditi in italia dal 1997 al 1998: un'analisi sull'archivio storico dell'indagine campionaria della banca d'Italia" pp.16

352. Silvia Giannini [2001] " La tassazione del reddito d'impresa e le scelte di investimento, finanziamento e localizzazione dell'attività produttiva" pp.

353. Michele Baccarini [2001] "Un quadro normativo delle fattispecie contrattuali "atipiche" in Italia: *Disciplina legislativa e definizioni statistiche del lavoro a tempo parziale"* pp. 29

354. Michele Baccarini [2001] "Sul grado di volontarietà e di sottoccupazione del lavoro dipendente "atipico". *Un'analisi delle valutazioni dei lavoratori"* pp. 43

355. Maria Cecilia Guerra [2001] "La Previdenza Complementare deve essere incentivata fiscalmente?" pp. 22

356. Gabriele Pastrello [2001] "An Oversight of Marx's" pp. 66

357. Alberto Roverato e Consonni Guido [2001] "Compatible prior distributions for DAG models" pp. 28

358. Luigi Brighi e Reinhard John [2001] "Characterizations of Pseudomonotone Maps and Economic Equilibrium" pp.25

359. Luigi Brighi [2001] "A Stronger Criterion for the Weak Weak Axiom" pp.16

360. Luigi Brighi [2001] "The Weak Axiom, the σ-Axiom and Complete Non-Transitive Rationality" pp.14

361. Luigi Brighi e Reinhard John [2001] "Some Conditions for Wald's Weak Axiom" pp. 10

362. Sebastiano Brusco, Tommaso Minerva e Giovanni Solinas [2001] "Un automa cellulare per lo studio dei distretti industriali" pp. 30

363. Nicola Walter Calmieri [2001] "Internet e la libertà di espressione" pp. 65