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Credit view and trade credit:
evidence from Italy

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Recent empirical studies on the credit view centre on the small firms' choice between bank and trade debt. The results hinge on an assumption of trade debt being more expensive untenable even in the U.S. case, because it neglects the sales promoting role of trade credit. A closer examination of this instrument is a prerequisite for an assessment of the credit view, especially in countries with different contractual features. Accordingly, the paper provides an econometric investigation on gross and net trade credit for a panel of more than 7600 Italian firms. The estimates show a significant negative relation between firm size and trade credit extended, support the sales promoting role and the complementarity with bank credit. Apart from its relevance *per se*, this empirical evidence raises doubts on a testing strategy of the lending view depending on the assumed substitutability between trade and (cheaper) bank debt.

Key words: trade credit, credit view, monetary transmission mechanism

JEL classification: E52, G32.

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1. Introduction

Empirical studies on the credit view of the monetary transmission mechanism have revived interest on interfirm credit, because they are centered on the trade-off between trade and bank credit taken by (mainly) small firms. The *pars destruens* of the paper argues that paying attention only to credit taken, neglecting credit given, and on the US contractual features raises some question marks, both theoretically and empirically, on the results so far attained in the literature. The *pars construens* shows that, building on recent theoretical work on the trade credit supply, rationales can be provided for the seeming paradox of small firms extending credit to the large ones. A better understanding of interfirm credit is thus a prerequisite for empirical investigations on its role in the credit view story, especially in countries other than the US. An econometric study of the receivables policy in a panel of more than 7600 Italian manufacturing firms substantiate the methodological point. The paper set up is the following. After a select review of some representative work on how firms determine payables (par. 2) and receivables (par. 3), paragraph. 4 provides a descriptive and an econometric investigation of trade credit In the Italian case using two panels, different for the time span and the cross-section dimension; paragraph 5 summarizes.

2. Trade debt and the credit view

The literature that empirically investigates the relevance of the credit view analyzing the choice between bank and trade debt pays attention almost exclusively to the financing side (and thus the availability and, above all, the cost) from the viewpoint of the funds recipient; neglect of the supply determinants, financial as well as real ones, however, raises considerable doubts on how to interpret some key findings. This paragraph shows how different are the views in the literature even considering only the liabilities side.

2.1. Theoretical contributions

According to the standard view (e.g. Jaffee-Stiglitz 1990), the choice of the trade debt is justified, given the cost hierarchy[1], only if the firm is rationed in the bank credit market. Payment delays are granted by large firms, unlikely to be rationed due to their creditworthiness, in order to insulate their suppliers from the effects of a restrictive monetary policy. An exception could arise, in a non rationing case, should the interest rates spread across debtors size create arbitrage opportunities, so that large firms could, through the exploitation of the inside information gathered in their business relationships, undercut banks in supplying to small business partners (Emery 1984).

Leaving aside (spot) cost considerations, small firms should prefer bank to trade credit because of the complementarity between the former and market finance stressed in the literature on the banks as producers of privileged information. With asymmetrical information, the more relevant the younger/the more innovative the

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[1] This assumption is motivated by the contractual features of trade credit in the U.S., namely d/D, n/N, where d = percent discount from its list price if payment is made within D days; otherwise the list price (n) must be paid within N days.

firm, external finance incorporates an agency cost which cannot be relieved via collateral due to asset illiquidity (because, for instance, of the production of immaterial output, such as services, or of the limited reputational capital). (Cheaper) funds availability in the future can be relied upon only through customer relationships with one house bank, thus minimizing monitoring costs; besides, bank lending renewals act as a positive signaling device to the capital market.

This conceptual framework is however questioned if, contrary to the implications of Diamond and Meyer's approach to financial intermediation, even small debtors usually take credit from several banks and several firms. The finding is particularly puzzling because "*trade creditors do not usually have a comparative advantage in assessing creditworthiness and moreover, in the event of bankruptcy, the rivalry between trade creditors and banks seems to be particularly costly. (...) If we accept some version of financial intermediation as delegated monitoring or financial intermediation as a commitment device, why do we observe so much additional finance that does not avail itself of the benefits of intermediation?*" (Hellwig 1991, 55). Hellwig suggests to investigate whether exclusive financial relationships turn out to be disadvantageous to debtors, because of their intrinsic monopolistic nature. Indeed, (costly) trade debt could be rationalized as one way to balance the benefits of exclusive (cheaper) bank financing with the risks of concentration of lending sources.

To sum up, these oft-quoted contributions highlight two key aspects of small firms' finance, arising out of capital market imperfections: 1. dependency on intermediated lending, due to the high agency costs required to directly collect funds; 2. forced (to Jaffee-Stiglitz) or willing (to Hellwig) substitutability between bank and trade credit in choosing the short term external funds mix.

The special attention devoted to the dichotomy small/large firms in analyzing the opportunities of raising external funds is a key component of the credit view. With banks unable to insulate the loans portfolio from the effects of a restrictive monetary policy through asset (via reducing securities) and/or liabilities management, the weak substitutability between bank loans and market funding introduces an additional channel in the monetary transmission mechanism via shocks to the loan supply (Bernanke-Blinder 1988; Kashyap *et al.* 1993). The monetary policy efficacy enhancement due to the dichotomy could however be lessened should larger firms extend trade credit *à la* Meltzer (1960), in order to relieve the smaller ones hit by reduced bank lending[2].

2.2. Empirical contributions

Because of well known identification problems of demand or supply shocks on aggregate data, empirical research on the credit view is increasingly investigating on micro data the different patterns in funds raising among small and large firms.

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[2] *"The credit view of the monetary policy has implications for the pattern of interfirm trade credit flows (...) For example, if loan supply is constricted, we might expect to see larger firms with access to public debt markets extending more trade credit to smaller firms "* (Kashyap *et al.*, 1993, 88).

Petersen and Rajan (1994), who use balance sheet data for around 3400 (12 % in the manufacturing sector) small (less than 500 employees) US firms, adopt the Jaffee-Stiglitz view, as they identify trade debt with the amount of the (cheaper) bank lending rationed; moreover, the percent of trade credit in arrears is interpreted as an indicator of rationing intensity. Their main findings can be summarized as follows. First, the more consolidated the customer relationships with banks, the less firms turn on trade credit. Second, some of the questions raised by Hellwig can be tentatively answered: *a)* in their sample, even larger firms obtain three quarters of their loans from just one bank. This concentration appears to be motivated by the increased credit availability and the reduced cost compared to the case of relationships with several banks; *b)* firms operating in areas with a more concentrated bank industry are less likely to be rationed, because an intermediary is willing to offer more and cheaper credit when involved in an exclusive customer relationship that allows him to ripe the expected benefits out of the firm growth. The absence of alternative sources of funds credibly binds the firm to this implicit contract.

Oliner and Rudebusch (1993) take issue with the finding, obtained on aggregate data by Kashyap *et al.* (1993), that in a monetary restriction, beside the traditional (money view) interest rate channel, a second one is active, as suggested by the credit view: total external funds fall, with a shrinking share of bank loans. Oliner and Rudebusch object that the result hinges, on the one hand, on having considered only two types of instruments (bank lending and commercial paper) and, on the other hand, on having overlooked a possible fallacy of composition effect, due to the different dependency on bank credit of large and small firms. In fact, taking into account also the trade and the long term debt and even considering aggregate balance sheet data for a dichotomy of small and large firms, they show that at the aggregate level not only there is no evidence of monetary policy induced changes in external funds composition, but also that, in periods of monetary stringency, there is an overall reallocation of funds from small to large firms.

This latter finding goes against the Jaffee-Stiglitz as well as the Meltzer theoretical frameworks, could be justified if the assumed cost hierarchy between trade and bank credit is significantly mitigated, or even reversed, when payment delays are positively related to the debtor's market power. Indeed, as Marotta (1992) and Petersen-Rajan (1994) remark, effective interest rates can be lower than the nominal ones if debtors take, as they frequently do (Gallinger-Healey 1987), an extra delay. The finding fits in with an earlier result by Davis and Yeoman (1974), who found on UK firm data support for the Galbraithian coercive hypothesis: trade credit taking ability depends on the relative market power, so that during a monetary restriction stronger (larger and more liquid) firms benefit by a relative shift in payables terms. Marotta (1992) reports similar results for Italy during the '80s.

Contractual clauses d/D n/N that in the US help eluding, when effectively implemented, the regulatory provision (Robinson-Patman act) aimed at protecting small firms from third degree pricing discriminatory policies by monopsonistic buyers of intermediate goods (Tirole 1988, 142), are almost unknown in Western European countries: the issue of the trade credit opportunity cost thus deserves to be investigated through a careful study of each country institutional aspects. As an example, in Italy discounts are not usually granted

4

nor interest rates penalties are imposed because of delays in payments, incidentally longer than in near countries (Dallocchio 1993, 31). Rules of thumb rules are thus bound to prevail when creditors can enforce contractual terms only through the very time consuming, and transactionally costly, formal judiciary way.

Finally, the empirical studies reviewed do not provide systematic evidence on net trade credit, though this variable, rather than the gross one, would seem better suited when analyzing firms' external finance. This outcome could be justified by the lack of an integrated framework on the trade credit demand and supply determinants; at any rate, neglecting the supply side could affect on theoretical grounds the supposed cost hierarchy even in the case of US-type contracts.

3. *Trade credit supply theories*

The gist of the arguments below is that financial motives account only partially for trade credit supply, whereas the main role is to be found in goods markets imperfections. Nadiri (1969) likened trade credit policy to an advertising investment decision; Schwartz-Whitcomb (1979) went further, viewing it not only as a tool for pursuing arbitrage opportunities, but most especially for implementing an implicit intertemporal (third degree) price discrimination policy, thus stressing the unique, among the array of financial instruments, sales promoting role in non competitive markets. Recent theoretical contributions provide useful hints on how to solve the puzzle of why a non-financial firm can have a comparative advantage with respect to an intermediary in extending credit, even in an asymmetrical information framework, and of why small firms can be funds givers rather than recipients.

Following Schwartz-Whitcomb line of reasoning, Brennan *et al.* (1988) show why a cost comparison between trade and bank credit can be confusing should the equivalence of a sale on credit to the bundling of the "good" and of the financial service be neglected. Bundling can be convenient to the seller if, given the demand elasticities for the two "goods", the ensuing profit is higher than the present value of the profit streams of separate sales. According to a well known result in bundling theory this happens when the implicit price for each good is lower than the one received if separately sold (see Tirole 1988, 159-60).

Brennan *et al.*'s approach has two important implications in the comparison between trade and bank credit.

1. Unlike the intermediary, a firm can exploit both sides, real and financial, of the transaction, and thus offset losses on the one side (e.g. in trade credit extension) with profits on the other side. Take for instance a potential buyer unable to pay on delivery because short of cash. The seller either sells nothing, thus giving up producer surplus, or accepts a delayed regulation of the transaction, even if the implicit rate of interest is lower than the return offered by a purely financial alternative investment; the same reasoning holds true, even in the no rationing case, if the producer surplus, net of the opportunity cost of the trade credit extension, is higher than in the alternative case of payment on delivery for a smaller quantity.

2. The intertemporal (third degree) price discrimination realized through selling on credit is further incentived if sunk costs incurred by the seller in establishing a customer relationship with the buyer are taken into

account: a trade off arises between the benefits of continuing the relationship (say because of the acquired information capital or of the advantage of not having to change the product type) with the cost of a longer payment delay.

In order to rationalize small firms extending trade credit to the large ones, the market power exploitation argument is thus not necessarily required: even with no credit rationing, the key issue is the trade off between the profit streams obtainable with and without payment delays. A large buying firm could postpone payments until the quality of the goods is checked; a small selling firm could willingly accept the cost of a payment extra-delay because of the benefit of avoiding information collection costs when dealing with a well established buyer (Smith 1987).

These considerations do not of course deny motives explaining trade credit extension from large to small firms. Privileged information on the small business partner, together with the superior management ability of a diversified trade credit portfolio, allows the large firm to implement a timely control, its credibility enhanced for instance by the threat of discontinuing the business. Moreover, a large firm can exploit its comparative advantages in the capital markets via captive factoring[3], though the scope for factoring is limited due to the linkages between the trade credit extension and type of sold goods, which confer a comparative advantage to the seller under two headings:

a) credit collection, if the collateral is to him more valuable than to a third subject in case of default;

b) credit evaluation, if debtor monitoring is enhanced due to the seller's concern with the buyer's quality level in order to indirectly protect its own brand name.

To sum up, recent theoretical models on trade credit supply strengthen the Schwartz-Whitcomb insight on its being jointly determined by financial and real factors; in particular they provide explanations of why even large firms can be recipient and identify the comparative advantages of a non financial firm relative to a bank in extending credit. Neglect of these aspects when analyzing only the financial side of trade credit is one of the key reasons generating not easily interpretable empirical results, such as those reviewed in par. 2.2.

A sound understanding of both demand and supply sides of trade credit is thus a prerequisite for effectively assessing the relevance of the credit view using micro data, especially in countries with contractual institutions different from the US ones. In order to substantiate this methodological point, besides the positive one of a study of trade credit in the Italian experience, the following paragraph reports an empirical investigation for a large panel of manufacturing firms.

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[3] In the Italian case, large firms often impose not to factor out their receivables, unless to captive factors (Dallocchio 1993, 123).

4.   *The Italian experience*

Empirical investigations on interfirm credit are surprisingly rare even in the international literature, presumably because of data problems but also for the lack of a well defined testable model. Marotta (1992) provides the first rather comprehensive descriptive examination of trade credit in the Italian experience, especially during the '80s, relying on balance sheet data for two large panels of firms. Considering the longer Mediobanca panel (aggregate data for some 1000 large and 200 medium-sized private firms from 1968 to 1990) that paper elaborates on the possible accounting technicalities that could explain the, trough the '80s, negative correlation of the net trade credit to sales ratio across firm size, leading to a massive reallocation of funds from the small to the large firms. Of the three leading causes[4], that paper shows that the different dynamics in the share of sales abroad and in vertical integration can be excluded; the more intense use of *without recourse* factoring, that removes from the books the corresponding receivables, by largest firms could account only to a limited extent. Moreover, the temporal pattern of the inventories to sales ratio does not support the possible substitutability of larger net receivables with lower inventories (Figure 1, updated to 1993). That paper thus conjectures that the dramatic strengthening of the larger firms balance sheets (see Banca d'Italia 1988) was partly achieved through a widening differential in net trade credit extension across firm size, reversing the trend of the previous decade. Indeed, over a time span of a quarter of century, it can be easily detected that net trade credit to sale ratio has undergone significant swings, that is hard to explain as driven by changes in the transactions technology. The pattern on the Mediobanca panel is confirmed looking at receivables and payables separately in the shorter (beginning 1982) but larger (more than 7600 firms) Centrale dei Bilanci panel of private manufacturing firms, classified by 6 sales sizes and by 4 Pavitt macrosectors (Table 1). During the 1982-1989 period of recovery of the economy and of balance sheet restructuring, medium-sized and smaller firms kept on stretching trade credit terms relative to debt, reducing the beginning of period gap with larger firms; in the subsequent 1990-1992 period of cyclical downturn a further lengthening of both credit and debt terms was spread out, presumably because also larger firms had to struggle with a sagging demand. The econometric estimates in par. 4.1 with data drawn from the CB panel aim at providing a more structured assessment of the determinants of gross and, more tentatively, of net trade credit

4.1.   An econometric analysis on panel data

Building on Marotta (1992) we present the results of an econometric analysis of an equation explaining gross and net trade credit to sales ratio using balance sheet data of a balanced panel of private manufacturing firms. The simple multiplicative specification of the reduced form equation for the i-th firm class (with individual,γ_i , and temporal, f_t, fixed effects) is the following, for y = CRED, CREN:

$$y_{it} = \dim_{it}^{\alpha_k + \beta_0 \tau_t + \beta_1 g_{it-1}} \ mix_{it-1}^{\beta_2} \ \exp(u_{it}) \ ; \ u_{it} = f_t + \gamma_i + \varepsilon_{it} ; \ \varepsilon_{it} \sim ID(0,\sigma^2)$$

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[4]Net trade credit/sales = receivables/sales - payables/purchases * (1 - vertical integration index), where vertical integration = (sales-purchases)/sales.

where CRED and CREN are, respectively, the gross and net trade credit to sales ratio. The basic explanatory variable for CRED is the per firm class sales, *dim*. The exponent of this variable is a function, in addition to the k-th macrosector the firms belongs to, in order to account for the industry's own characteristics, of past year sales growth rate, g_{t-1}, and of loan interest rates scatter range, r. For given firm size, an additional determinant is the end-of-period bank-trade debt composition, mix_{t-1}.

Drawing on the various partial theoretical insights potentially fit for the Italian case, the conceptual framework motivating the chosen, admittedly simple, specification for the equation 'explaining' gross trade credit to sales ratio is the following. Due to its sales promoting and financing aspects, both real and financial determinants should be taken into account. On the real side, the negative relation between firm size and trade credit extension, interpretable as the realization of a (third degree) intertemporal price discrimination policy, not necessarily motivated by market power exploitation, should produce, *coeteris paribus*, a negatively signed α_k. This core effect should however be tempered by other, though, minor ones. First, an anticyclical sales promoting role ($\beta_1 < 0$); second, on the financial side, wider interest rates scattering should allow more room for arbitrage opportunities mutually convenient to large (lenders) and small (recipient) firms ($\beta_0 > 0$). A further financial determinant, stressed in the literature on the credit view, is the share of bank debt on total short term liabilities, which in the Italian case, due to the absence of commercial paper, amount simply to bank and trade debt. Following standard arguments in the literature on financial intermediation, it could be argued that the higher the share, the higher the recipient's creditworthiness and thus the lower the likelihood of incurring liquidity risks, with the end result of making the firm more willing to accept payments delays ($\beta_2 > 0$). I am not aware of any theoretical investigations on net trade credit: in order to at least conduct an exploratory analysis of it the same reduced form specification is used, so to pick up, though indirectly, the effects of different, across firm size, debt trade policies[5]. If larger firms are more able to obtain longer delays, the expected absolute values of the coefficients should be larger, though with the same sign, than in the gross trade equation, except for the possibly insignificant β_1, because of the absence of a well determined theoretical link between net trade credit and sales policy.

The fixed (individual and time), instead of the random, effects panel data estimation procedure is motivated by the likely correlation of intercepts terms, picking up time invariant individual characteristics, with the regressors. Due to the short term nature of trade credit a lagged dependent variable specification with annual data was excluded *a priori* (though statistically checked *ex post*). In fact, allowing for fixed individual effects should suffice to capture inertial components, due to the institutional specific context, contrary to Chiplin-Wright (1985) justification for a lagged dependent specification.

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[5] The aims of realizing an exploratory investigation and of easing results interpretation through the comparison with the gross trade credit equation justify why, even with a potentially negative dependent variable, the adopted specification is a logarithmic one.

Estimation results for the period 1983-1992 under many aspects do provide empirical support to the suggested 'explanation' of gross and net trade credit, though the low DW, especially for the gross trade credit equation, points to some unspecified misspecification in a panel data context (Table 2, part A):

1. The dimensional effect comes out strongly: coefficients, though varying across macrosectors, are negative and larger, in absolute values, going from gross to net credit equation, as a likely consequence of a trade debt reallocation towards larger firms. Only the traditional macrosector seems to behave significantly differently[6].

2. All the remaining regressors turn out correctly signed and statistically highly significant, except for the sales growth rate ($t < 1$) in the net trade credit equation. The last result is not surprising, having the theory attributed a sales promoting role only to gross trade credit.

In order to further (see footnote 6) check how robust are these results, estimates were replicated for the shorter 1986-92 interval. The choice of the beginning year is motivated by the availability of a more proper proxy for interest rates scattering, namely a standard deviation to mean ratio computed across loan commitment size classes (see Data Appendix). It is interesting to notice that excluding the 1983 to 85 years amounts to remove from the sample the period when large firms were more dedicated to strengthen their financial position not only to the expense of smaller ones, but also, to some extent, of banks, with an implied structural change in loan demand pattern, because of the contractual power shift away from intermediaries soon after Bank of Italy lifted the credit ceiling regulation in 1983 (Banca d'Italia 1988). As of 1987, the ensued intensifying of the credit supply competition created an environment favorable to the working of the credit view. Buttiglione and Ferri (1994) notice that, lacking the bank-firm customer relationships that should help insulating debtors from credit supply shocks, due to the practice of multiple (fees free) loan commitments: *a*) between 1987 and 1991 a positive supply shock hit the Italian banking system, because of the intense competition in the loan market and of the readjusting of asset portfolio via the shrinking of securities held; *b*) as a consequence, with a reduced room for asset management policies and unable to implement alternative manoeuvres through liabilities management, banks could not help avoiding repercussions of the 1992 monetary restriction on loans offered.

Expected estimation results over the reduced period 1986-92 should thus show a mitigation of the dimensional effect (because of the reduced intensity in the restructuring process among the large firms), of the arbitrage effect (because of reduced room for round tripping when banks acted more competitively) and of the bank/trade debt mix effect (because of the reduced likelihood of facing difficulties in getting loans by banks struggling for market shares); the anticyclical effect should instead show up stronger (because of the higher influence of the cycle downturn in the early '90s).

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[6]Estimated coefficients are indeed remarkably close to the ones obtained in Marotta (1992) in a simplified specification omitting sales growth rate, bank/trade debt mix and adopting as a proxy for the rates scatter the same interest rate (-.286 vs -.317 and -.92 vs -1.031 for LSAL, -.143 vs -.137 and -.631 vs -.568 for LSAL3 in the gross and net trade equations, respectively). This robustness is the more remarkable because the panel, though identical as to the classification, differs both in the temporal (end-year 1992 vs 1989) and cross-sectional (7625 vs 9648 firms) dimensions.

The estimates, definitely better judging from the DW statistic as an indicator of unspecified misspecification, though robust to the sample reduction and to the change in the interest rates scatter proxy, fit in quite well the *a priori* (Table 2, part B). Though the dimensional effect sign is reversed in the gross trade credit equation for the traditional macrosector, it keeps being negatively signed for all sectors in the net trade credit equation. A puzzling result is the now significant coefficient of sales growth rate in the net trade credit equation.

5.   Concluding remarks

Empirical studies on the credit view of the monetary transmission mechanism have revived interest on interfirm credit, because they are centered on the trade-off between trade and bank credit taken by (mainly) small firms. The *pars destruens* of the paper argues that paying attention only to credit taken, neglecting credit given, and on the US contractual features raises some question marks on the results so far attained, both theoretically and empirically. A better understanding of trade credit is thus a prerequisite for a meaningful research strategy aimed at testing the credit view in the US and, *a fortiori*, in countries with different contractual institutions. In the *pars construens* of the paper, in order to substantiate the methodological point, an econometric study with a panel of more than 7600 Italian manufacturing firms, classified by sales size and by Pavitt macrosectors, during the 1983-92 period indeed shows, using a reduced form specification, that financial as well real determinants impact on gross trade credit: the receivables to sales ratio is related negatively to firm size and to the bank loans to total short term liabilities ratio and positively to the interest rates scatter range and to past year sales growth rate. More tentatively, the same econometric specification for the net trade credit to sales ratio helps detecting an higher responsiveness to the same determinants, suggesting that the trade debt temporal and cross-sectional pattern has magnified, rather than offset, the effects of the gross trade credit on the financial structure of larger and smaller firms.

Leaving aside the contribution to a better understanding of trade credit in the Italian case, the empirical evidence presented questions the assumption of substitutability between trade and (cheaper) bank debt among small firms as a cornerstone of a research strategy on the credit view using micro data.

6.   Data Appendix

Data computed as weighted averages for all firms belonging to 24 subsets (6 by 1992 sales size times 4 by Pavitt macrosectors), published in Centrale dei Bilanci (1994), refer to a balanced panel of 7625 private manufacturing firms (with balance sheet data reconstructed in case of mergers or acquisitions) over the 1982-1992 interval. The 7625 firms are allocated to the 24 subsets as follows:

sales size\macrosector	HIGH TECH	SPECIALIZATION	SCALE	TRADITIONAL
1-5 billion It lire	29	314	263	719
5-10 billion It lire	40	420	423	873
10-25 billion It lire	99	591	576	1124
25-50 billion It lire	55	227	259	486
50-100 billion It lire	36	127	191	238
>100 billion It lire	79	81	206	169

Trade credit includes short and long term receivables; trade debt includes short and long term payables, net of debt to plant suppliers and of customers' advances.

Average and minimum rates of interest on Italian lira denominated bank loans are published in the Bank of Italy Annual Reports. The annual series from 1986 of the standard deviation to mean ratio for lending rates, computed across 7 credit lines sizes for domestic and foreign currency denominated loans, was kindly provided by Giovanni Ferri.

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Table 1   *Trade credit and debt (days)*

(360 days * credit/sales and debt/purchases; manufacturing firms by Pavitt macrosectors and sales size)

	credit days			debt days		
	1982	1989	1992	1982	1989	1992
1-5 billion It lire						
-high tech	98,1	150,2	150,3	108	133,5	136,5
-specialization	112,6	129,8	144,6	125,1	125,8	134,3
-scale	99,7	117	126,5	118,4	122,6	132,4
-traditional	79,2	106,3	117,6	97,1	109,4	113,8
5-10 billion It lire						
-high tech	114,9	124	121,6	107,1	112,1	114
-specialization	107	137,1	137,2	111,7	117,9	121
-scale	100,9	123,3	129	114,3	118,4	129,6
-traditional	81,5	102,9	109,4	96,8	104,9	109
10-25 billion It lire						
-high tech	107,8	128,6	145,1	94,4	107,6	116,6
-specialization	117,9	137,4	142,3	112,9	119,1	123,2
-scale	105,2	119,5	127,6	113,3	119,2	124,6
-traditional	86,3	111	119,3	89,3	100,5	101,5
25-50 billion It lire						
-high tech	132	139,7	133	100	99,6	96,4
-specialization	133,3	151	156,3	108,2	116,5	119,1
-scale	107,3	126,3	130	107,2	112,2	119,2
-traditional	81,6	107,2	114,3	80,3	91,4	91,2
50-100 billion It lire						
-high tech	127,2	124	125,4	110,6	107,2	111,2
-specialization	147,1	151,8	164,3	103,6	115,5	120,4
-scale	109,2	120	123,6	95,5	105,7	118,4
-traditional	89,8	107,6	112,6	83,2	91,3	92,9
>100 billion It lire						
-high tech	157,9	149,8	156	112,4	111,1	109,5
-specialization	143,9	136,8	143	98,5	100,6	103
-scale	112,3	107,6	122,3	113,7	117,6	116,6
-traditional	78,9	97,2	99	61,3	75,7	77,1

Source: Centrale dei Bilanci (1994). See Data Appendix for the classification cell size and for the definition of the variables.

13

Table 2   ***Panel data estimation (individual and time fixed effects coefficients omitted)***
White heteroscedasticity consistent t-ratios in brackets
A - 1983-1992; observations = 240; regressors = 40 in unrestricted equations

	LCRE unrestricted	LCRE restricted	LCREN unrestricted	LCREN restricted
LSAL	-.272	-.286	-.965	-.920
	(-4.7)	(-5.8)	(-5.1)	(-5.5)
LSAL1	-.002	-	.019	-
	(-.07)		(.25)	-
LSAL2	-.013	-	.046	-
	(-.49)		(.65)	-
LSAL3	.137	.143	.311	.289
	(6.0)	(6.9)	(3.5)	(5.3)
diff	.013	.013	.082	.089
	(1.6)	(2.7)	(3.5)	(4.5)
g_{t-1}	-.047	-.039	-.066	-.057
	(-2.0)	(-1.7)	(-1.1)	(-.90)
mix_{t-1}	.196	.174	.366	.396
	(4.0)	(3.8)	(2.9)	(3.3)
SER	.017	.017	.048	.048
R^2c	.936	.936	.87	.87
DW	1.31	1.31	1.53	1.55
Hausman χ^2 (7)	27.94		151.79	
zero restr. $\chi^2 (n)$		5.33 (n=5)		2.6 (n=4)

B - 1986-1992; observations = 168, regressors = 37 in unrestricted equations

	unrestricted	restricted	unrestricted	restricted
LSAL	-.147	-.134	-.530	-.480
	(-2.8)	(-5.7)	(-3.6)	(-14.4)
LSAL1	.070	.051	.152	.182
	(1.3)	(13.9)	(1.2)	(16.5)
LSAL2	-.033	-	.060	-
	(-.83)		(.54)	-
LSAL3	.191	.194	.285	.276
	(5.4)	(5.7)	(2.7)	(3.2)
disp	.002	.003	-.003	-
	(1.6)	(1.9)	(-.57)	-
g_{t-1}	-.060	-.063	-.149	-.158
	(-2.1)	(-2.2)	(-1.7)	(-2.1)
mix_{t-1}	.121	.113	.285	.273
	(1.9)	(1.8)	(2.1)	(2.2)
SER	.014	.014	.036	.036
R^2c	.95	.95	.91	.91
DW	1.83	1.76	1.89	1.89
Hausman χ^2 (7)	53.40		33.07	
zero restr. $\chi^2 (n)$		2.15 (n=3)		2.6 (n=6)

Legenda:

LCRE = trade credit to sales ratio (logs)

LCREN = net trade credit to sales ratio (logs)

LSAL = per firm sales (logs)

LSALk = LSAL*dummy$k$, k=1 (high tech macrosector), k=2 (specialization macrosector), k=3 (traditional macrosector)

diff = LSAL * Italian lira denominated loans average-minimum interest rate differential

g_{t-1} = LSAL * past year sales growth rate

mix_{t-1} = end-of-year short term bank debt to short term bank and trade debt ratio (logs)
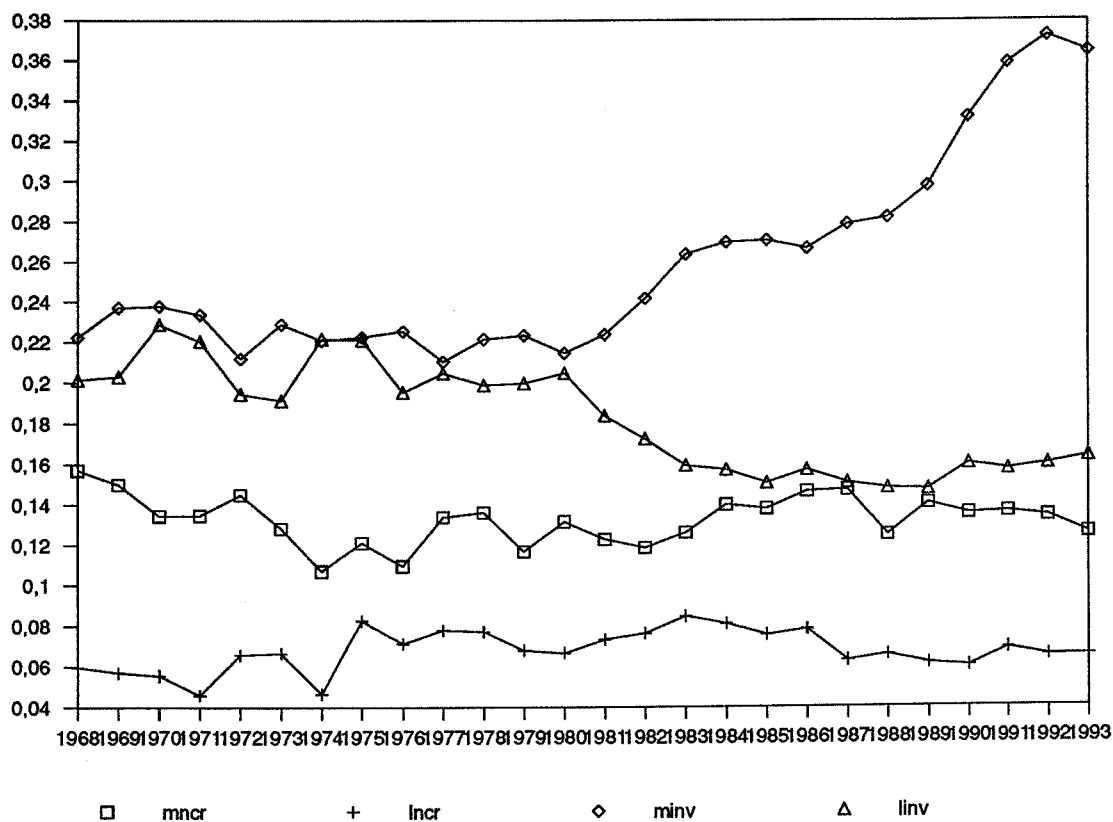
disp = LSAL * standard deviation to mean per cent ratio for interest rates on domestic and foreign currency denominated loans

Hausman test statistic = tests for the null hypothesis of random against the alternative of fixed effects model.

See Data Appendix for further

14

Figure 1

Net trade credit and inventories to sales ratios

Legenda:
    m(l)ncr = net trade credit to sales ratio for medium-sized(large) firms
    m(l)inv = inventories to sales ratio for medium-sized(large) firms

Source: Mediobanca(1994)

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