COMPETITION E REGULATION IN THE BANKING AND QUASI-BANKING INDUSTRIES: EVIDENCE FROM ITALY

di

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1. Introduction

The evolution of the credit system over the past 30 years has modified the intermediation process: new types of credit institutions have been developed and new forms of intermediation have succeeded in establishing themselves as a major source of finance for a growing number of companies[1]. Since the 1980s, leasing, factoring and consumer credit companies (collectively labelled «quasi-banking» or «non-banking credit institutions» or, simply, «financial institutions») have developed alongside banks. Non-banking credit institutions substantially differ from banks: leasing, factoring and consumer credit operations are not simply credit operations, but usually involve other services and have different management characteristics and profiles. Figure 1

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[1] Quasi-banking industries are an important part of the Italian financial system. The leasing market was in 1999 the fourth largest European market, with 21.88 billion euros of assets financed and a 14% market share. Distinguishing between equipment leasing and real estate leasing, the first held a 107% share of the European market, with 14.12 billion assets financed, while the second (which is Europe's largest market) has a 31.1% market share, with 7.76 billion euros of assets financed (Source: *Leaseurope)*. The Italian factoring industry registered in 1999 an overall turnover of 25.1 billion euros: the turnover "without recourse" (i.e. the factor is subject to the credit risk) was 13.1 billion euros, while the turnover "with recourse" (i.e. the creditor is subject to the credit risk and the factor is free from the credit risk) was 12.0 billion euros *(Source: Assifact)*. In 1999, the consumer credit market registered an overall loan turnover (i.e. the most common volume indicator, defined as the total amount of loans given over the year) of 20.4 billion euros, which is 30% higher than in 1998 *(Source: Assofin)*

summarises banking, factoring, leasing and consumer credit operations.

Leasing is a complex asset finance transaction. A lease may be simply defined as a contract between the lessor and the lessee that gives the lessee the possession and use of a specific asset for a period of time, in return of a stream of rental payments. Leasing becomes a complex transaction, depending on the specific provisions of the leasing agreement (e.g. the amount of rent, as well as the types of options, if any, afforded to the lessee at the expiration of the lease term), and the context in which the type is to be determined (i.e. industry, accounting, taxation and commercial law). Although leasing products are defined differently among countries[2], two broad categories can be always identified: finance leases and operating leases. A finance lease is a full payout operation for the lessor: the lessee is the substantive owner of the leased asset, because he retains substantial proportion of the risks and rewards associated with the ownership of the asset. An operating lease is a non-full payout operation for the lessor, who takes the risk/reward associated with the ownership of the asset, thus becoming the substantive owner of the leased asset. Although a credit component is present in both operations, a finance lease is substantially a credit operation: because finance leases are the most widespread, leasing companies are considered in most credit institutions.

Factoring is a complete financial package which combines credit protection, credit management, accounts receivable book-keeping and collection services. Factoring is an agreement between the factor and the seller, where the former: 1) provides a

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[2] The definition of finance- and operating-leases differs in each country and depends on the point of view (accounting, taxation and market). In addition, there are several types of lease in each country: in the US, there are synthetic leases, TRAC leases etc; in the UK, there are also Hire Purchase, Conditional Sales, etc. leases; in France, besides *credit bail* and *location simple* there are *location avec l'option d'achat, location longue durée*, etc. For further details, see Carretta, Fiordelisi (2000)

2

computerised sales ledger service (credit management function); 2) may assume the responsibility for the debtor's financial ability to pay (warranty function) and 3) provides credits in advance (up to 80%) of the total sales invoices offered for factoring (credit facility function). The basic activities of the credit management and collection function are joined by other complementary activities such as the guarantee function and/or the financing function.

Figure 1

The essence of leasing, factoring and consumer credit operations
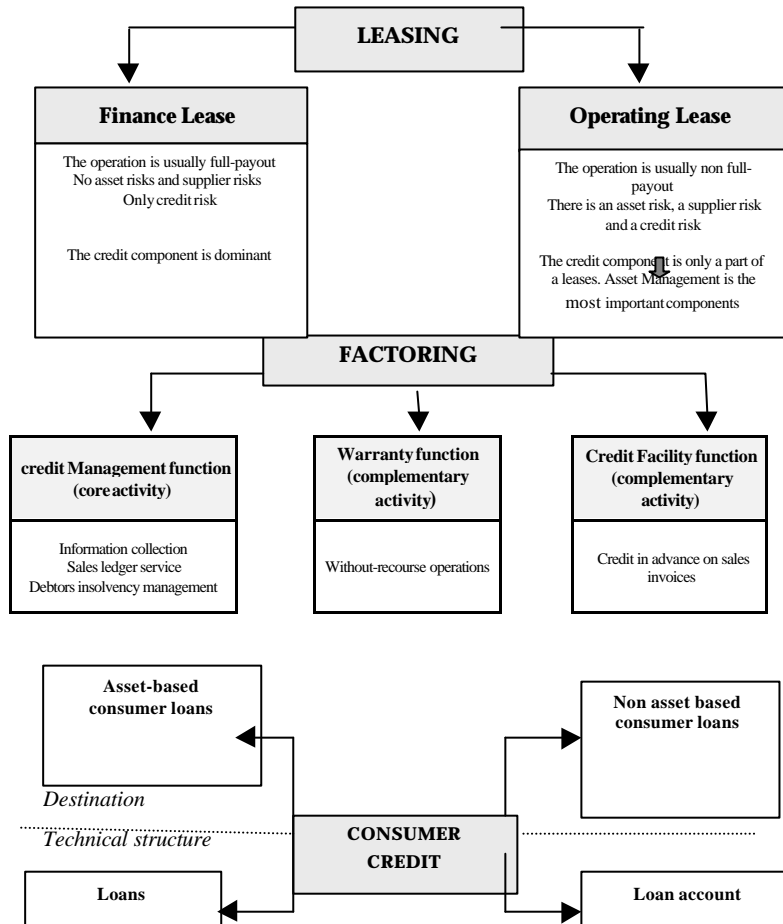
Unlike factoring and leasing, *consumer credit activities* are the closest to bank transactions because they present the same

technical structure (loans and loan accounts). Examining the loan destination, one may distinguish between "asset-based consumer loans" and "direct loans": in the first case, the borrower receives a loan in order to buy a specific asset (which is the condition to be financed); in the second, the borrower receives a loan, which is not conditioned to the acquisition of a specific asset.

The importance of non-banking credit activities and the establishment of *quasi-bank* competitors is highly relevant from the regulatory point of view and has produced a "regulation crowding-out effect". The aim of the study is to assess the importance of the management characteristics and profiles of quasi-banking institutions, for regulatory purposes, and to examine the relationship between the regulatory process and differing business behaviours. More explicitly, the business profiles have been surveyed by responding to the following questions: 1) how important are the management and organization structures of non-banking credit institutions and, therefore, their differing characteristics and behaviours, with respect to the regulatory process? 2) Does the recent development of controls ensure competitive equality among the financial institutions? 3) To what extent do the different institutions require specific and differential supervisory criteria and procedures, in view of achieving the goal of competitive equality?

This study deals with a specific (and probably secondary[3]) aspect of the regulation of financial systems. In any case, in the wide-ranging and animated discussions on regulation, recently there seems to be a growing interest in this specific issue, in respect of both the tendency (generally speaking) towards the harmonization of regulation, the implementation of which is showing a few difficulties, and (more specifically) of the extension of forms of control to sectors and/or activities which had previously been excluded. The field of investigation, which is objectively rather

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[3] However, the issue is certainly crucial for quasi-banks institutions

vast, has been restricted basically to credit (banking and non-banking) intermediaries. Such a delimitation, however, is not entirely risk-free, in relation to both the (already) broad despecialization of several of the above-mentioned intermediaries (in particular, banks) and to the prospect of the universal bank, which is necessary, in this approximation, to prevent unacceptable generalizations.

The paper is organised as follows. Section 2 summarises the current Italian regulation framework for quasi-banking institutions. Section 3, which is the key section of the paper, illustrates the relation between regulation and the behaviour of credit institutions, by answering the three above-mentioned research questions. First of all, the evolution of the regulatory process is summarised and the concept of competitive equality introduced. Secondly, the concept of competitive equality is analysed, in comparison to business supervision. Thirdly, the financial institutions' behaviour is considered, in respect of the financial intermediation theories. Subsequently, the co-operative regulation model with regard to quasi-banks' behaviour is examined. Next, the effects of regulation on the behaviour of credit institutions are presented and, lastly, the implications for regulators are examined. Section 4 contains a review of the literature on summary investigation techniques and results: firstly, the main empirical studies on the impact of regulation on the behaviour of bank are presented; secondly, the most important empirical studies dealing with non-banking credit institutions are summarised; on the basis of these reviews, an assessment is made of how the empirical investigation should be carried out. Section 5 presents the model adopted for the empirical investigation: the Multistage Data Envelopment Analysis (DEA) is employed to measure firm efficiency and identify corporate differences among different type of credit institutions. Section 6 presents data and section 7 summarises the empirical results. Section 8 contains the conclusions.

2. The Italian supervision framework for non banking credit institutions

Non-banking credit institutions are labelled in Italy as *'financial institutions''* and have to be entered in the register referred to in Article 107 of the Banking Law[4] (*special register*), kept by the Bank of Italy. According to Article 107 of the Bank Law, the *special register* "may" contain credit intermediaries offering[5] at least one of the following services, to the general public: loan operations of any kind; acquisitions and disposals of shareholdings; currency intermediation, payment services and credit card systems. Factoring, Leasing and Consumer Credit companies are explicitly mentioned as *financial institutions.* Registration for credit intermediaries is mandatory and subject to several precise conditions: regarding credit intermediaries granting loans (such as leasing, factoring and consumer credit companies), companies with a turnover of at least 200 billion lire, or a share capital of at least 10 ITL billion lire must also register. The Bank of Italy does not have discretionary authorising powers: its duty is to ensure that all the required conditions have been met. Once this has been successfully determined, the Bank of Italy is obliged to enter the institution in the special register.

Once entered in the *special register,* a *financial institution is* subject to the Bank of Italy's supervision. As noted by the Bank of Italy, the prudential supervisory body for *financial intermediaries* is being gradually set up, dealing with compliance of capital adequacy rules and aims to reduce risks (in its different configurations). First of all, the capital base is defined following the bank regulations: a distinction is made between two levels (Tier I and Tier II). Secondly, the current regulations, which seem

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[4] Testo Unico delle Leggi in materia Bancaria e Creditizia (D.Lgs 01/09/1993, n. 385)
[5] According to Treasury Minister's Decree of 6 July 1994, lending activities and currency intermediation are considered to be offered to the general public when they are carried out as a "professional activity".

to represent a first step in a long-term regulatory process, require capital adequacy rules related to three areas: large exposures, currency exposure[6] and derivatives exposures[7]. Focussing on the former, the excessive exposure to a single customer (or to a group of customers operating in the same business sector) is a significant risk incurred by banks. However, the risk can and must be reduced by ensuring that a credit institution's exposure is diversified, e.g. by customer, geographical spread or economic sector. For this reason, safeguarding against excessive concentration is one of the most important components in any supervisory system for credit institutions. Italian *financial institutions* have to limit: 1) total exposure to individual counterparts (or groups of closely related counterparts), in excess of 10% of its large exposure capital base, to a maximum of 800% of its large exposure capital base; 2) any exposure to individual counterparts (or groups of closely related counterparts) to a maximum of 25% of its capital base. According to whether the *financial intermediary* is the member of a banking group, the former limit does not apply and the latter is extended to 40% of the capital base. Like banks, *special intermediaries* are also subject to the supervisory and information regulations.

The supervisory body covers all *financial institutions* and does not take account of differences among non-banking credit institutions. In addition, these rules do not substantially differ from those applied to banks. Consequently, Italian regulatory authorities do not recognise differences among quasi-banks (i.e. leasing, factoring and consumer credit are considered to be

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[6] Concerning currency exposition, the "net currency exchange position" cannot exceed the double of the capital base. See Bank of Italy (2000b), chapter 5, section III

[7] Concerning derivatives operations, the Bank of Italy recognises that derivatives transaction may reduce company risks. However, derivatives operations may have a non hedging goal: the total amount of these operations cannot exceed 200% of the *financial institution*'s capital base. See Bank of Italy (2000b) , chapter 5, section II

8

similar), or between banks and quasi-banks (i.e. leasing, factoring, consumer credit and even banking activities are considered to be similar). The implementation of the same supervisory framework in respect of all credit institutions seems to be related to a common corporate aspect of these intermediaries: credit institutions traditionally have non-negotiable assets. In this manner, however, Italian regulators fail to consider the differences on the liability side: banks' payables are traditionally demand deposits (with a monetary role), while other credit institutions' payables usually consist of bonds or banks loans (without a monetary role). Similarly, technical differences among products offered and differences of corporate behaviours are not considered when setting supervision rules.

The supervisory process differs substantially from that in other countries[8]. In Germany, for example, there are no restrictions on the establishment and conducting of leasing activities by leasing companies. Leasing companies normally operate as registered limited liability companies (*GmbH*), or as joint stock companies (*Aktiengesellschaft= AG*). Non-captive leasing companies are not banks and are therefore not subject to regulation, including bank regulations. Bank-owned leasing companies, however, may fall indirectly within the scope of bank supervision, when their activities are consolidated in their parent companies' financial statements, for the purposes of group supervision. Not long ago, the trend was to include all leasing companies under direct bank supervision, for reporting financial transactions in excess of the threshold of 3 million DM (*large exposure regulation*). For German civil law purposes, this point of view is fundamentally

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[8] The French situation is the closest to the Italian. According to article 18 of the French Banking Law (*Loi bancaire)*, there are six types of credit institutions (*établissements of crédit*): banks, cooperative banks, *caisses d'épargne e de prévoyance, caisses de crédit municipal, sociétés financières* and *institutions financièrès spécialisées.* Consumer credit, leasing and factoring companies are considered as *sociétés financiers* and are subject to the supervision of the *Banque de France .*

wrong: leasing, in Germany, is not considered a form of credit and, therefore, it cannot be subject to bank supervision. In the meantime, legislators have adopted this point of view and have given up this plan. Similarly, in the UK leasing companies are not banks and are not subject to regulation; only bank-owned leasing companies fall indirectly within the scope of bank supervision when their activities are consolidated in their parent companies' financial statements, for the purpose of group supervision.

3.Regulation and quasi-banks' behaviour

This paper deals with a specific aspect of the regulation of financial systems by assessing the importance of the management characteristics and profiles of quasi-banking institutions, for regulatory purposes, and examines the relationship between the regulatory process and differing business behaviours.

The business profiles have been surveyed in this section by responding to the following questions: 1) how important are the management and organization structures of non-banking credit institutions and, therefore, their differing characteristics and behaviours, in respect of the regulatory process? 2) Does the recent development of controls ensure competitive equality among the different types *financial institutions*? 3) To what extent do the different institutions require specific and differential supervisory criteria and procedures, in view of achieving the goal of competitive equality?

The section has been organized as follows: in the first place, it focuses on the importance of the characteristics and behaviour of the institutions, in connection with the development and regulation of the financial system. This is the framework in which we address the issues of the competitive equality of the regulatory process, the regulatory process' focusing on the institutions or the functions, the consistency between the supervisory process and the behaviour of the operators. Secondly, it is necessary to

address the issue of the relationship between the regulatory process and the behaviour of the *financial institutions*, in respect of which we will discuss the sensitivity profiles of the various *financial institutions*, *vis-à-vis* the regulatory process, the (differential) effects the process has on them and, last but not least, the implications on the regulatory policies.

3.1 The development of regulation and competitive equality

The last three decades have witnessed a significant change in banking regulation. On the one hand, there has been a substantial relaxation in certain regulations, such as direct control on interest rates, fees and commissions, as well as restrictions on lines of business, ownership and portfolios. On the other hand, there has been a strengthening of prudential regulation focused on controls on the capital or "own funds" of banks, and an increase of the number and coverage of deposit insurance schemes. The supervisory authorities, however, have continuously been concerned about competition changing their attitudes over the time. Competition was initially considered a constraint, in order to ensure the soundness of the credit market; currently, it represents a supervisory target, in order to achieve the efficiency and, consequently, the soundness of the credit market. Structural regulation, which represents the maximum protection of market soundness and stability, was implemented up to the early 1990s. Supervisory tools were chartering and examination (employed as entry barriers), lender-of-last resort actions, restriction on assets holding and capital requirement. Throughout the 1990s, the supervisory authorities moved toward the adoption of a prudential supervisory process: unlike structural and functional regulation, this form of regulation does not deny competition, it only provides a more appropriate response to the regulatory needs descending from the

microeconomic conditions[9]. As stated in the Article 5 of the Italian Bank Law, "credit authorities shall excise the power of supervision, in respect of the sound and prudent management of the supervised institutions, to ensure the overall stability, efficiency and competitiveness of the financial system". Consequently, efficiency and competitiveness have become a precise supervisory target. Recent regulation reform efforts in the bank industry has focused on enhancing capital requirements, by establishing a minimum level of "equity" or "own funds" for banks, both to provide a buffer against adverse shocks and advise shareholders to act prudently. In principle the level of regulatory capital should depend on the risk of the bank which, in turn, depends on the portfolio of loans and other assets and liabilities held by the bank[10].

At the same time, regulatory authorities have emphasised the importance of levelling the playing field among various *financial institutions*. In the 1970s, the development of quasi-banks generated (unsolved) problems, in order to level the playing field

[9] Similarly to other forms of regulation, banking regulation is justified as necessary to correct a 'market failure'. (see, for example, Freixas and Rochet (1997). Market failures arise from the difficulty for banks to credibly demonstrate their level of risk to depositors and other lenders. As a result, in the absence of regulatory intervention, banks would take on more risk than is prudent, bank failures would be more common than is necessary and the financial system would be unstable. In some countries, banking regulations may also be separately justified in terms of social costs: it is argued that regulation is necessary to protect depositors from the consequences of bank failures or necessary to preserve the stability of the payments system.

[10] Under the 1988 Agreement among G-10 countries on minimal risk-based capital requirement for banks (1988 Basle accord)., bank loans are grouped into different classes. Banks must hold a different amount of capital for the different classes of loans, varying from zero per cent, in the case of loans to governments, to eight per cent in the case of normal business loan. This approach has been recently criticised because it does not take into account other forms of risk. Partly in response to these criticisms, the Basle Committee has recently accepted the use of a bank's own "in-house" models of overall risk to determine the "adequate" level of regulatory capital.

12

and ensure "competitive equality" among all credit intermediaries. The concept of competitive equality, which generally refers here to a characteristic of the regulatory process, aimed to ensure the equality of competitive conditions in the sectors affected by the regulation, although often mentioned is, nevertheless, hard to define. Perfect competitive equality is achieved when two institutions (absolutely identical in terms of history, geographical location, institutional organisation, management behaviour and the mix between product, market and know how) operate under the same regulations[11]. If the institutions are not identical, the definition of competitive equality becomes harder.

A first question is "do prudential supervisory tools facilitate competitive equality among credit intermediaries?" Prudential supervision is generally considered neutral on the institutions' management, and this certainly helps competitive equality. However, it is questionable whether "a suite of common prudential rules applicable to all credit intermediaries is sufficient to guarantee competitive equality". Examining the supervisory body implemented in Italy, the answer seems to be positive. On the theoretical ground, however, the answer is not straightforward. The issue is based on two factors: 1) in financial systems, it is necessary to ensure uniform controls; 2) the development of new credit intermediaries is worthwhile, since the demand of credit services becomes increasingly sophisticated. At first sight, these two aspects seem to be in conflict, supporting the application of a unique supervisory body (in this case, the banking-one). However, a positive answer is questioned when one considers that: a) a uniform treatment is not important in itself, but it becomes so as soon as it ensures competitive equality; b) differences among credit institutions cannot be assumed ex-ante, but should be assessed by examining the intermediaries' activities; c) prudential supervision produces

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[11] See Mayer (1980) and Gardener (1986)

13

direct results (i.e. those arising from the adjustment to the supervision rules) and indirect results, such as competitive advantages or disadvantages, arising from the asymmetric distribution of the direct effects[12]. Competitive equality cannot simply be guarantee by treating non-homogeneous institutions in a uniform manner, but requires the implementation of specific rules for sectors, activities and institutions. Whether supervision is "neutral" does not depend on the application of homogeneous controls, but on a deeper knowledge of the behaviour of credit institutions: only the absence of substantial differences among credit intermediaries can make "uniformity of controls" and "competitive equality" coincide.

3.2 Competitive equality and business regulation

At first approximation, the problem of competitive equality could be solved by shifting from institutional to *business regulation*. Generally speaking, the former is based on elements such as the legal category, the nature of ownership, the normative sources and references, while the latter is based on the business activities performed. Both seek to outline uniform rules of behaviour, in respect of each of the two above-mentioned dimensions.

The problem of *business regulation* has become an important issue, in the wake of a trend towards despecialization by the *financial institutions*, while a process of marked business specialization leads to the substantial coinciding of the two approaches, producing, moreover, a contrast between institutional and objective-based regulation. If there is a relative freedom of choice of the areas of intervention, in fact, too rigid an institutional regulatory process could lead to forms of competitive inequality, fuelling forms of institutional arbitration (transfer of activities to operators who are less regulated, or not at all). On the other hand, the problem of arbitration has been posed also in

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[12] See Thomas (1990) and Goodhart (1988)

14

relation to *business regulation*. In this case, however, it is more difficult to resort to the concept of arbitration, except where the activities concerned are equivalent, with regard to both the *financial institution* and the customer base. Moreover, if such an equivalence exists, *business regulation*, if truly such, should be the same for both the activities, thus making arbitration useless.

As a rule, however, *business regulation* appears to be more suitable than institutional regulation to tackle the problems related to competitive equality, by virtue of its greater flexibility and adaptability to the significant differences between the institutions[13]. The effective implementation of *business regulation*, however, features logical and practical obstacles. Suffice it to mention, first of all, the difficulties inherent in the co-existence of business rules within the same institution performing a number of activities, also in relation to the possible correlation between the different activities, which might produce, for example, significant alterations in the level and variableness of the overall income, or considerable conflicts of interest, such as to cause the appearance of unexpected risks[14].

The adoption of a strictly business outlook should also somehow restore to the supervisory process those financial activities carried on by non-financial undertakings. This would also require legislation clearly aimed to frame the activities (or even the single financial products); this appears to be hardly achievable if, for example, one looks to the Italian situation on the issue of the rules governing so-called "atypical" contracts, but it is also questionable in consideration of the fact that, ultimately, the actors, and not the activities, are exposed to the risk of instability, limited by the regulation[15]. Lastly, to this one must add the fact

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[13] Herring and Santomero (1990) express the same idea focussing on financial conglomerates.
[14] For further details, see Schaefer (1990) and Onado (1991 and 2000) which, however, focus on the co-existence between security and credit activities.
[15] See Costi (1991) and Bollino et al., (1991).

that the equity coefficients, the typical instruments of prudential regulation, find their ideal field of application at the overall institutional level, while their use, differentiated according to the various functions, is technically more complex and requires the breaking down of the corporate aggregates, which may turn out to be risky and contrary to the principle of management unity.

The option for the actual *business regulation*, in fact, is limited and circumscribed to certain ambits, while combinations of the two (institutional-business) are more frequent. As a rule, however, the considerations made highlight how the tendency to control the functions, rather than the intermediaries, although it may, perhaps, be more suited to the constraints of competitive equality, does not eliminate the need of an in-depth knowledge of the behaviour of the *financial institutions*; on the contrary, it increases this necessity.

3.3 Regulation, theories of intermediation and the behaviour of the financial institutions

The literature on regulation has never paid much attention to the behaviour of quasi-banking institutions, from the point of view of their distinctive characteristics and management peculiarities. The issue of supervision has been tackled, obviously with different objectives, approaches and results, by historians of economics (especially with regard to the presuppositions, grounds and consequences of financial crises), by jurists (especially with regard to the evolution and adequacy of the regulations, also in the light of the existence of a number of legislative instruments and supervisory bodies), and by economists (especially from the point of view of the "supervisors", and of the overall effects on the financial system, often represented by an "ideal" institution). In these ambits, the multiplicity of the types of *financial intermediary* has often been seen as the consequence of a historical evolutionary process, or as an institutional peculiarity

and, ultimately, as a circumstance which could be disregarded by theoretical analysis.

Within the theories on intermediation, the distinction between the different categories of *financial institutions* has been considered, by denying the banks' capacity to create money (*New View*) and ascribing the presence of a multiplicity of institutions to the imposition of external restrictions (Legal Restriction theory), primarily related to monetary policy or the need for protecting the (monetary) functions of some intermediaries. Even in recent literature[16], which has given an enormous contribution to the regulatory process' *raison d'etre*, the issue of the distinctive characteristics of *financial intermediaries* is addressed more with a view to justifying their presence *vis-à-vis* the capital market and, in connection therewith, to operate a distinction between credit intermediaries and other forms of intermediation, justified by the contribution of the problem of transaction costs and risk diversification, rather than to actually tackle the problem within the same typology[17].

Therefore, it is not sufficient to highlight that the institutions in question perform the key functions of the achievement of economies in transaction costs (or, in the more recent literature, partecipation costs), risk diversification and the production of information, present in (and, probably, complementary to) all the

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[16] In the literature in 1980s and early 1990s, *financial intermediaries* were considered as the giver of an external credibility to the activities of credit institutions, making it possible to circumvent the problem of the asymmetrical distribution of information between end creditors and debtors [(see, for example, Diamond (1984) and Bhattacharya and Thankor (1993) and Bhattacharya et al., (1995)]. In late 1990s, Allen and Santomero (1997) explained the existence of financial in terms of facilitator in risk transforming and partecipation costs to the capital markets, rather than asymmetric information and transaction costs.

[17] The literature has only focussed on banks. For example, concerning the solvency regulations, three main approaches have been developed for banks: the portfolio approach, the incentive approach and the incomplete contract approach. However, these approaches do not seems to be able to capture the reality of quasi-banking institution.

typologies[18], in order to infer a relative uniformity, which could only be the result of the analysis of the specific production functions[19]. In a nutshell, there is a limited integration between regulation theories and the management behaviour of the credit institutions, which might be improved, in relation to the new orientations of supervision and the deeper knowledge of the peculiar characteristics and management processes of the credit institutions, which must find greater space in the knowledge base of the theorists of regulation and the supervisory authorities themselves.

3.4 Quasi-banks' behaviour and the cooperative supervisory model

Irrespective of the profile of competitive equality, the quasi-banks' behaviour may become an important reference for the supervisory authorities, in respect of the more general viewpoint of the effectiveness of the regulatory process. This may, in fact, depend on the compatibility between the goals of the supervisory authorities and the supervised institutions[20].

The presence of different priority scales and trade-offs makes it difficult to imagine the "natural" convergence of the goals expressed by the two parties concerned. It is likely, moreover, that the target functions of the financial institutions do not contain references to the system quantities, which, on the contrary, are the key reference of the end objectives of the supervisory authorities, but rather to the variables that contribute to defining the former's intermediate objectives. A self-regulatory process, therefore,

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[18] See Campbell and Kracaw (1980)

[19] Tagliavini (1989) and De Laurentis (1998) have showed the peculiarity of credit risk management in leasing

[20] Similar conclusions can be obtained both by a theoretical analysis (see Dowen 1983) and by a critical investigation of the events of credit systems (see Nardozzi 1983)

might take place only in the (theoretical) case in which the target function of the credit system, basically encompassing the intermediate variables of the supervisors, were to coincide with the target function of the authorities including the end variables. In this case, the authorities' task would be to maintain this balance, by governing the mechanisms of transmission of the regulatory impulses between the intermediate and end variables.

The above-mentioned balance hypothesis, however, is not compatible with the existence of "non-aligned" businesses, i.e. those with divergent objectives. Moreover, the latter are the result of a vast range of intermediate variables, in terms of competitive position, corporate economic balance, comprising profitability, solvency and liquidity, flexibility, satisfaction of the parties concerned, for which it is possible to define the business' target function, thus constituting the element that may characterize the different behaviour of the businesses. In any case, the attention paid to the behaviour of the *financial institutions* may allow an easier "involvement" of the latter in "calibrating" the intermediate variables of regulation and, by launching virtuous circles in the mechanisms of transmission of the supervisory impulses, the suitable achievement of the end objectives.

This requirement may be understood also by making reference to the more radical and, for some aspects, opposing key concepts of the relations between the supervisory body and the supervised businesses, i.e. the so-called "capture" theory of regulation, according to which the regulatory process is a complex process in which the authorities progressively converge towards the interests of the more influent businesses, who try to "capture" the regulatory process in order to obtain benefits[21]; this is the view of a "remote controlled" financial innovation, i.e. in which the supervisory authorities intend to exploit the innovation-

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[21] See Stigler (1971)

supervision dialectic to guide it towards the desired direction of the evolution of the financial system[22].

Sharing-based supervisory actions would limit the risks of avoiding unwanted provisions, which are reasonably higher in those cases where there is a strong divergence in the useful functions of the financial authorities and institutions[23]. An examination of the development of the supervisory policies may easily lead one to conclude that the growing attention of the supervisory authorities towards the greater articulation of the regulation objectives has not been oriented, until recently, by the impact of their actions on corporate behaviours, but by the effect that may be produced on the system as a whole, according to the adopted theoretical models. The reviewing of the models and the move from actions directly aimed to the achievement of the end objectives, and indirect actions, which, logically, "pass" through the behaviour of the *financial institutions*, allows one to consider the relations between supervisory bodies and supervised businesses within the framework of a *cooperative supervisory model*, in which the key actors are the authorities, the *financial institutions* and the market[24]. In this ambit, knowledge of the different characteristics and behaviours of the *financial institutions* is obviously an essential element for the success of the supervisory policies.

3.5 The effects of regulation on credit institutions' behaviour

The issue of the effects of regulation on the behaviour of *financial institutions* is traditionally addressed with reference to the explanatory variables of the structural characteristics of the

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[22] See Kane (1981) and Onado (2000)
[23] See Dowen (1983)
[24] For an analysis from different point of view, see: Gardener (1985), Barnett (1991), Gunderson and Spang (1986), Lobuono (1990), Pattison (1991), Bruni and Porta (1976)

markets of reference, from which the supervisory implications may be drawn, through the customary relations with the competitive behaviour of the businesses, as a whole. In actual fact, however, credit institutions feature a differential sensitivity in the face of regulation, depending on the relative characteristics and management behaviour. As a rule, one may imagine that the sensitivity in question varies depending on the nature and the characteristics of the business, in terms of the objectives pursued, the composition of the management, the institutional structures; on the institution's market position, in terms of selected action areas and the ensuing (absolute and relative) competitive positions; on the organizational factors; on the conditions of economic and financial balance, which contribute, *inter alia*, to determine the "production process" implemented by the business.

Therefore, the corporate variables interact with the institutional and market variables, to define the actual behaviour of the businesses, which are also important in examining the effects of regulation[25]. This approach, in fact, seems to significantly contribute to the enhanced understanding of the manner of operation of the credit markets, progressively less subject to a "forced" segmentation by the action of outside parties on their structures, but characterized by a more complex and heterogeneous competitive logic. The same assessment of phenomena that are being studied for a long time now, such as economies of scale, have apparently recently benefited from the consideration of the diversity of businesses in question.

The appraisal of the influence of the above-mentioned variables, in configuring the sensitivity to regulation of the various credit institutions entails a punctual and systematic analysis, which may benefit, *inter alia*, from the reference to different regulatory approaches, in relation also to the degree of consensus between the authorities and the supervised businesses. This analysis,

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[25] See Yarbrough and Yarbrough (1988)

moreover, highlights how the hypothesis of a differential sensitivity is conceptually acceptable and realistic, in consideration of the specificity of the institutions in question, and may be useful especially in an ambit of indirect regulation[26]. Furthermore, the assumption of a different sensitivity leads one to imagine that the reaction of the institutions in question to regulation - as mentioned above, often considered to be neutral - may differ, precisely in relation to the characteristics entailed by these sensitivities.

The introduction of prudential regulation seems to produce changes in the behaviour of credit institutions, in respect of the propensity to the relative growth of their own means, achieved through the increase thereof and/or the adaptation of their overall growth. As may be expected, this concerns the undercapitalized businesses in particular, even though, at times, the behavioural differences compared to the globality of institutions is significant if measured at the book value level, but not of the market value of the capital[27]. In any cases, there is proof of different reactions by the institutions, in relation to their geographical location[28], development, competitive status, profitability[29].

Other interesting ideas come from the contributions analysing another traditional problem, namely, the effects produced by the introduction of relative capitalization restraints on the risk level of the credit institution. In first approximation, it would seem logical to expect that, lacking effective rules for controlling risk levels, the institution subjected to prudential capitalization restraints will behave so as to offset the relative reduction of its assets by means of portfolio adjustment, by increasing its risk level, aimed to preserve its overall profitability unchanged.

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[26] See Gabbi (1998)

[27] See Keeley (1988), Ronn and Verma (1989) and Kane (1991)

[28] See Pettway et al., (1991), Cooper et al., (1991)

[29] See Dahl and Shrieves (1990), Jacques and Nigro (1997) , Aggarwal and Jacques (1998)

22

Yet again, this behaviour manifests itself differently in relation to the characteristics of the businesses in question: of considerable importance, in this respect, are the degree of aversion to risk, the initial leverage, and the fact that its alteration, produced by the introduction of the restraint, might alter the credit institution's propensity to search for riskier investments. The development of prudential rules, therefore, cannot be separated from the careful examination of the risks inherent in the various types of credit institutions; the effectiveness of these rules compared, for example, to structural supervision, appears to be related to the knowledge and actual monitoring capacity of the risks by the supervisory authorities.

Lastly, although the imposition of prudential rules may, theoretically, reduce risks, in a short-term perspective, one cannot disregard the effects it may have on profitability, in the light of the income-risk combination, characterizing the activities carried out by the supervised business. A reduction of its profitability, in fact, may represent a constraint on development, especially if the institution is at maximum leverage, and may have undesired negative effects on self-financing and on the capacity to attract future capital contributions [30].

All this appears to be consistent with the management balance conditions of a *financial institution* and, in particular, with the relationship between leverage, risk and lending and borrowing rates. The characteristics of financial management are not independent of the organization of each institution. The application of prudential rules, therefore, cannot disregard the relations between profitability, solvency and liquidity, compared to the manifestation of risks in their various configurations. In this respect, a contrast may be found between the risk weighting procedure inherent in the prudential rules, which must necessarily envisage a set of relative simple and schematic cases, and the

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[30] See Gardener (1986)

actual nature of the risk, which, on the contrary, is continuous, with the ensuing threat of distorsions in the allocation of resources and relative price determination.

3.6 Implications for regulators

The main consequence of the considerations made hereto is that the knowledge of the behaviour of the credit institutions must constitute a key element of the regulatory process. This affirmation however, which may be taken for granted, entails the acknowledgement that these behaviours may differ considerably, in relation to specific corporate characteristics. To sanction the uniformity of supervisory procedures and, in particular, the prudential controls, often postulated *a priori*, therefore, does not mean to ensure their neutrality in respect of the *financial institutions*. The neutrality of the supervisory actions, moreover, is functional to the achievement of the principle of competitive equality, which apparently will become an important reference point for the regulatory process. This neutrality may be assured solely by articulating the supervisory process capable of recognising and respecting the particularities of the institutions subject to regulation. This imposes the knowledge of said particularities by the supervisory authorities and the adoption of supervision techniques capable of ensuring neutrality, for example, by assuring the discriminating capacity of the selected coefficient (in terms of the variables used and of the guiding values), compared to the conditions of management balance of the various types of institutions.

In this profile, supervision differs from monetary policy in that it may ground its actions on "prevailing behaviours" or on the result of contrasting action vectors, since the existence of a number of non-aligned subjects (even if limited) can cancel the entire regulatory effort. In terms that are, perhaps, slightly too extreme, a significant variance compared to the above-mentioned desired

24

regulatory behaviour may depend on the difficulty of knowing the peculiar characteristics of the supervised businesses, or may be intentional. In the latter case, prudential supervision tend to lose their aspect of neutrality, by becoming an instrument to guide the evolution of the system's structure towards the arrangement desired by the supervisory authorities and, ultimately, into an instrument of structural control.

This hypothesis appears likely if one considers the unquestionable contrast between the growing complexity of the financial system and the undoubted impoverishment, at least in the phase of transition from direct controls to the completion of the arrangement of the indirect controls, of the instruments at the disposal of the supervisory body. This transition, in fact, seems characterized, on the one hand, by the fact that the effects of the abandonment of structural controls of competition may be scarcely felt, also because the processes of competitive adaptation are not at all instantaneous, and, on the other, by the fact that the effectiveness of the prudential rules may be seen only in the long term, in relation to information asymmetries and long-term relations with the customers.

To confirm the assumption of the structural use of prudential controls, suffice it to mention the introduction of rules entailing considerable fixed adaptation costs for the institutions (e.g., for preparing the required information), thus constituting an overwhelming barrier to the carrying on of certain activities. Suffice it also to mention the imposition of uniform equity coefficients in different sectors, characterized by differing absolute mean business dimensions, in relation to plant costs and economies of dimension, if any, and by differing income-risk combinations and interest margin policies too. In this case, as easily demonstrable, fixed costs and the leeway with regard to differing spreads entail enormously different own capital requirements, in relation to the presence of a prudential coefficient, which are not always justified by the level of

operating risk and are unrelated to the formal minimum capital endowments. As one may expect, the own capital requirement increases with the increase of fixed costs and decreases with the increase of the available margin for covering the fixed costs, the two elements reaching a balance at a certain level of activity, in terms of capital investments, which, by means of the mandatory equity coefficient, "drags" with it suitable own means, thus confirming the distorsions that may be created by a univocal equity coefficient.

The different credit activities, in fact, have features that may differ enormously, especially in connection with the market characteristics, income-risk combinations, capitalization policies. In these situations, the distorsions produced by uniform, albeit non-neutral, regulations, also due to competitive inequality, which alters the equality of competitive conditions, may determined institutional and business arbitrations[31] and/or the progressive levelling of the peculiarities of the various institutions, such as to alter the morphology of the financial system. The regulations on banking groups can, in fact, be interpreted in this manner, in relation, first of all, to the use of the rules on shareholding and moral persuasion as instruments to influence the behaviour of the non-banking affiliates, thus creating an obvious competitive inequality compared to "non-banking" competition and, secondly (from the Law No. 114/86 on consolidated supervision, to the recent provisions contained in the Single Act on banking and credit laws) to the (probably inevitable) prevalence of the protection of the group's credit entity, compared with the non-banking affiliates, such as to determine the profound rethinking, by the promoting parties, still under way, of the actual effectiveness of these initiatives, compared with the supervision costs, which do not appear to be

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[31] Bank for International Settlements (1999) assessed this issue regarding: banks, securities markets and non-banking securities house.

balanced by any corresponding benefits, at least within the same time horizons.

In different circumstances, therefore, prudential rules may also perform the function of effective input control, achieved through the necessary capital requirements and/or the influence on the costs to be incurred, the price policies and, therefore, the achievable profitability.

In conclusion, therefore, the supervisory authorities may use competitive inequality to guide the structure of the financial system towards the desired configuration, where the stress on prudential supervision does not rule out the need for structural reorganization. In the former case, i.e. where the insufficient attention paid to management behviour descends from the scarce knowledge of the institutions' peculiarities, it is the selfsame nature of the prudential instrument employed that urges improvements in this direction, in order to avoid the unpleasant feeling, evoked in the literature, of "shooting in the dark". One must not forget, in fact, that the concept of information asymmetries may certainly be referred also to the relations between supervisory authorities and *financial institutions*.

A significant contribution to the problem of the adaptation of the prudential rules to the peculiarities of the institutions could come from the major articulation of the instruments employed, (i) to govern corporate risk components other than credit risks, (ii) to treat the latter in a more suitable manner, in the light of the criteria of diversification and fractioning, and (iii) to operate a distinction between the various types and intensity of credit risks. The dissimilar combinations of risks, in fact, is one of the key elements on which the peculiarity of the *financial institutions* is based; if it is physiological, it must not be altered, on the contrary, it must be respected and, if necessary, promoted.

The success of regulation policies may undoubtedly be assessed only in the framework of a "full supervisory cycle", such as to

allow the appreciation of the implications of the use of the complete range of available instruments in a multidisciplinary approach (relations between regulations and financial brokerage management); moreover, it seems to require the "fine tuning" of the actions in accordance with the speedy development of the financial system and businesses. In other words, there seem to be no valid reasons why the environment-strategy-structure paradigm cannot be applied to the supervisory authorities, which are also experimenting different scenarios and strategies compared to the past, even the recent past.

From the point of view of the supervisory bodies, all this entails the expediency of adopting a style of regulation and operating behaviour consistent with the need of a deeper knowledge of the management profiles and organizations of the *financial institutions*, deemed a critical lever for the implementation of the corporate strategies and as prerequisites for efficiency, flexibility and development, instead of solely as structures and mechanisms aimed to ensure the reliability of the behaviour of the *financial institutions* subject to supervision.

4 The empirical evidence in literature

The impact of regulation on credit institutions has focused on banking intermediaries: the main aim has been to assess the impact of capital adequacy requirements on the behaviour of banks. The issue of competitive equality among different types of credit institutions has scarcely been analysed, even in the literature dealing with non-banking credit intermediaries. This section presents a review of the most relevant literature, in order to summarise the investigation techniques and results. Firstly, the review focuses on empirical analyses assessing the impact of regulation on banks; secondly, the empirical studies with non-banking credit intermediaries are summarised.

4.1 The impact of supervision on the behaviour of banks

In most countries, banking regulations focus on controlling the capital or "own funds" of banks, typically following the Core Principles established by the 1988 Basle Accord[32]. Consequently, a considerable number of researches[33] have assessed the impact of supervision by examining the influence of capital standard requirements on the behaviour of banks. Most of these researches focus on the U.S. bank system: the seminal study is by Shrieves and Dahl (1992), which applied a simultaneous equation model with partial adjustment. Jacques and Nigro (1997) e Aggarwal and Jacques (1998) subsequently extended this method, for example. Among the European studies, suffice it to mention Ediz et al., (1998), for U.K. banks and Japanese banks, and Rime (1999), for Swiss banks. The main objective of these studies was to assess how the risk-based capital standards have influenced both capital and risk.

Shrieves and Dahl (1992) developed the following simultaneous equation model:

$$\ddot{A}Cap_{j,t} = \ddot{A}^d Cap_{j,t} + E_{j,t} \qquad (1)$$

$$\ddot{A}Risk_{j,t} = \ddot{A}^d Risk_{j,t} + S_{j,t} \qquad (2)$$

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[32] We refer to the 1988 Agreement among G-10 countries on minimal risk-based capital requirement for banks. The Basle Committee has currently launched a consultation for a fundamental revision of the 1988 accord. There are some earlier papers [such as Peltzman (1970), Mingo (1975) e Dietrich and James (1983)], which showed that informal capital requirement has a slight impact on bank behaviour. These studies established a basic approach (followed by most of the successive analysis) based on a regression analysis: percentage growth in capital (response variable) was regressed on conditioning variable describing the bank's financial state and the nature of its business.

[33] An interesting assessment on the relationship between capital adequacy requirements and risk is proposed by Blum (1999). In this section, however, the focus is on the empirical investigation techniques.

where observed changes in bank capital and risk ($\Delta Cap_{j,t}$, $\Delta Risk_{j,t}$) are broken down into two components: a discretionary adjustment ($\Delta^d Cap_{j,t}$, $\Delta^d Risk_{j,t}$) and a change caused by factors external to the bank ($E_{j,t}$, $S_{j,t}$). In order to take into account the fact that banks may be unable to instantaneously adjust capital and risk to achieve the desired level, Shrieves and Dahl (1992) modelled changes in capital and risk using the partial adjustment framework as follows:

$$\Delta^d Cap_{j,t} = á\,(Cap^*_{j,t} - Cap_{j,t-1}) \quad (3)$$

$$\Delta^d Risk_{j,t} = â\,(Risk^*_{j,t} - Risk_{j,t-1}) \quad (4)$$

where the discretionary changes in capital and risk ($\Delta^d Cap_{j,t}$, $\Delta^d Risk_{j,t}$) are proportional to the difference between the target levels ($Cap^*_{j,t}$, $Risk^*_{j,t}$) and the levels existing in period t-1 ($Cap_{j,t-1}$, $Risk_{j,t-1}$,). Now, substituting the equations (3) and (4) into the equations (1) and (2), the model becomes:

$$\Delta Cap_{j,t} = á\,(Cap^*_{j,t} - Cap_{j,t-1}) + E_{j,t}$$

$$\Delta Risk_{j,t} = â\,(Risk^*_{j,t} - Risk_{j,t-1}) + S_{j,t}$$

where the observed changes in capital and risk in period *t* are a function of the target capital and risk levels, the lagged capital and risk levels and any external factors. Concerning the definitions of capital and risk, Shrieves and Dahl (1992) used the ratio of capital to total assets for capital and the ratio of risk-weighted assets to total assets.

Shrieves and Dahl (1992) found that risk exposure and capital are simultaneously related: most banks face an increased capital level by increasing their risk. Because this relation was found also in connection with banks exceeding the minimum required capital, Shrieves and Dahl (1992) concluded that the positive relation

between risk and capital is not strictly due to the regulation requirement, but rather "reflects the view that risk-taking behaviour tends to be constrained by bank owners' and/or managers' private incentives".

Jacques and Nigro (1997) modified the simultaneous equation model originally developed by Shrieves and Dahl (1992), in order to consider risk-based capital standards. The target capital ratio (CAP*) is defined as a function of the bank size (SIZE), multi-bank holding status (BHC), income (INC), the bank's leverage ratio (LEVD) and changes in risk ($\Delta Risk_{i,t}$). Likewise, the target risk ratio (Risk*) is defined as a function of the bank size (SIZE), multi-bank holding status (BHC), income (INC), the bank's leverage ratio (LEVD) and changes in capital ($\Delta Cap_{i,t}$). Jacques e Nigro's model (1997) is the following:

$$\ddot{A}Cap_{j,t} = \tilde{A}_0 + \tilde{A}_1 SIZE_{j,t} + \tilde{A}_2 BHC_{j,t} + \tilde{A}_3 LEVD_{j,t} + \tilde{A}_4 \ddot{A}RISK_{j,t} +$$
$$+ \tilde{A}_5 INC_{j,t} - \tilde{A}_6 CAP_{j,t-1} + \tilde{A}_7 RPG_{j,t} + \tilde{A}_8 RPL_{j,t} + \grave{\imath}_{j,t}$$

$$\ddot{A}Risk_{j,t} = \grave{e}_0 + \grave{e}_1 SIZE_{j,t} + \grave{e}_2 BHC_{j,t} + \grave{e}_3 LEVD_{j,t} + \grave{e}_4 \ddot{A}CAP_{j,t} -$$
$$- \grave{e}_5 RISK_{j,t-1} + \grave{e}_6 RPG_{j,t} + \grave{e}_7 RPL_{j,t} + v_{j,t}$$

The empirical estimate of this model requires measures of both capital and risk. Capital is given by the ratio of capital to risk-weighted asset; risk is measured as in Shrieves and Dahl (1992), by the ratio of risk-weighted assets to total assets. The main emphasis of Jacques and Nigro (1997) is on the variable RPG and RPL, which express the degree of regulatory pressure brought about by the risk-based capital standard.

The regulatory pressure variables are defined as the difference between the inverse of bank j's total risk based capital ratio (RBC_j) and the inverse of the regulatory minimum risk based ratio of 7,25%. The regulation pressure is based on two variables

(RPG and RPL), because banks with a total risk based capital ratio other than 7.25% may react differently. In details, the variables are defined as follows:

$$RPL \begin{cases} \dfrac{1}{RBC_j} - \dfrac{1}{7.25} & \text{if total risk based capital ratio} <7.25\% \\[2ex] 0 & \text{if total risk based capital ratio} >7.25\% \end{cases}$$

$$RPG \begin{cases} \dfrac{1}{RBC_j} - \dfrac{1}{7.25} & \text{if total risk based capital ratio} > 7.25\% \\[2ex] 0 & \text{if total risk based capital ratio} < 7.25\% \end{cases}$$

According to Jacques and Nigro's findings (1997), risk-based capital standards increased the capital ratio and decreased the portfolio risk of banks already meeting the new risk based standard. The same effect was also found for risk-based capital constrained-banks, although their responses on the new capital risk-based capital standard was found to be slightly connected to the degree to which they fell short of the standards.

The model applied in Aggarwal and Jacques (1998)[34] is very close to the one used by Jacques e Nigro (1997) and Shrieves and Dahl (1992). Changes in bank's capital ratio are modelled in terms of bank size (SIZE), multi-bank holding status (BHC), net income (INC), changes in risk ($\Delta Risk_{i,t}$) and capital ratio ($\Delta Cap_{i,t}$), lagged capital ratio ($Cap_{i,t-1}$) and risk levels ($Risk_{i,t-1}$) and the degree of regulatory pressure. The model used by Aggarwal e Jacques (1998) differs from the previous literature

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[34] Aggarwal and Jacques (1998) used cross-sectional US data for 1991, 1992 and 1993,

because regulatory pressure is measured using dummy variables (PCCA and PCAU)[35]. The model is the following:

$$Cap_{j,t} = {}_0 + {}_1 Size_{j,t} + {}_2 BHC_{j,t} + {}_3 INC_{j,t} + {}_4 Risk_{j,t} + {}_5 PCAA +$$
$${}_6 PCAU - {}_7 CAP_{j,t-1} - {}_8 PCAA \times CAP_{j,t-1} - {}_9 PCAU \times CAP_{j,t-1} + {}_{j,t}$$

$$Risk_{j,t} = {}_0 + {}_1 Size_{j,t} + {}_2 BHC_{j,t} + {}_3 CAP_{j,t} + {}_4 Risk_{j,t-1} + {}_5 PCAA + {}_6 PCAU + \mathbf{v}_{j,t}$$

Aggarwal and Jacques (1998) found that all US banks (both under capitalised and adequately capitalised) increased their capital ratios in 1992 and 1993: the speed of capital adjustment was found to be higher than in the past. US banks also reduced their level of portfolio risk, in response to the US new capital standard requirement (Prompt Corrective Action, PCA). Aggarwal and Jacques (1998) concluded that PCA has been successful in increasing capital without an offsetting increase in bank portfolio risk.

Ediz et al., (1998) formulated a dynamic, multi-variate panel regression model: changes in capital ratio was used as response variable; the lagged level of the ratio, a set of conditioning variables describing the nature of the bank's business, its current financial health and the regulatory pressures were employed as predictors. As noted by ?, the Regulatory pressures were measured by using the two following dummy variables:

$$
\text{Dummy 1} \begin{cases} 1 & \text{if the bank experienced an upward adjustment} \\ & \text{in its trigger ratio} \\ 0 & \text{otherwise} \end{cases}
$$

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[35] PCAA is 1 if the bank is classified as adequately capitalised, 0 otherwise. PCAU is 1 if the bank is classified in one of the three undercapitalised zones, 0 otherwise

$$\text{Dummy 2} \begin{cases} 1 & \text{RAR } -1 < 1 \text{ standard deviation} \\ 0 & \text{otherwise} \end{cases}$$

Ediz et al., (1998) found that capital requirements substantially influence banks' capital ratio decision: "banks increase their RAR by one half of a percentage point when their capital ratio approaches the regulatory minimum. Furthermore, when supervisors impose a discretionary increase on a bank's trigger ratio, the banks responded, on average, by increasing their RAR by one third of a percentage point per quarter". According to Ediz, Perraudin and Michael (1998), when a bank is close to the level of capital required, the effect produced by an increase in the target ratio is particularly large. In addition, UK banks seem to increase their capital by issuing more capital, rather than by reducing risky assets.

The model applied in Rime (1999) is based on the previous studies. The model used is the simultaneous equation model of Shrieves and Dahl (1992). Two definitions of capital are used: the ratio of capital to total assets [see Shrieves and Dahl (1992)] and the ratio of capital to risk-weighted assets [see Ediz et al., (1998), Aggarwal and Jacques (1998), Jacques and Nigro (1997)]. Regulatory pressure is expressed in two ways: the first is the probabilistic model used by Ediz et al., (1998); the second is the method applied in Aggarwal and Jacques (1998). Rime found that the regulatory pressure produces the desired effect: banks close to the regulatory capital requirement tend to increase their ratio of capital to risk-weighted assets. The effect of the regulatory pressure is estimated to be substantially equal in amplitude to that reported in the other studies for the US and UK. Similarly to UK banks, Swiss banks seem to prefer adjusting their capital ratio by issuing more capital, rather than by reducing risky assets.

4.2 Empirical studies of non-banking credit institutions

34

Few empirical studies have focused on non-banking credit institutions and most of them concern the Italian market[36]. Among them, the most relevant papers are by Ferretti and Vezzani (1992), who analysed the cost efficiency and profitability of the Italian factoring and leasing sectors at the end of the 1980s[37]; by Tagliavini (1995), who analysed economies of scale in four Italian non-banking industries, by applying econometric models; by Faroldi and Tagliavini (1996), who applied the Data Envelopment Analysis to the Italian consumer credit industry; by Fiordelisi and Molyneux (1999), who employed DEA to assess efficiency and productivity of the Italian factoring industry; and by Monferrà (1998b).

Ferretti and Vezzani (1992) proposed "a regression analysis applied to the accounting data of leasing and factoring companies, in order to identify the elements which may explain the significant dispersion of corporate performance". The following profitability and efficiency measures were employed:

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[36] There are two main reasons. First, data collection is difficult since there are no database for non-banking credit institutions. Most of the Italian studies uses OSSFIN (i.e. a database managed by the Scuola di Direzione Aziendale (SDA) of the Milan based, Bocconi University), which data is the only source available at present. Secondly, in other countries (e.g. UK; Germany and US), lessors and factors are not considered credit institutions.

[37] Other studies are: Carretta, Monferrà (1994) and the OSSFIN annual repots [i.e. Zorzoli (1994-87) and Ferrari (1998-1999a,b)]

$$\textit{Factoring} \begin{cases} \mathrm{Eff} = \dfrac{\text{Operating expences}}{\text{Average Outstanding Credits}} \qquad \mathrm{Prof} = \dfrac{\text{Operating gross profit}}{\text{Average net worth}} \\ \\ \end{cases}$$

$$\textit{Leasing} \begin{cases} \mathrm{Eff} = \dfrac{\text{Operating costs} + \text{depreciation on L.A.} + \text{net profits from remarketing of L.A}}{\text{Average L.A}} \\ \\ \mathrm{Prof} = \dfrac{\text{Operating gross profit}}{\text{Average net worth}} \\ \\ \textit{where L.A. is Leased Asset} \\ \\ \end{cases}$$

The data revealed a high degree of variability among Italian factoring companies, both in efficiency and profitability. In order to investigate the elements underlying this phenomenon, Ferretti and Vezzani (1992) proposed two separate investigations for efficiency and profitability. The efficiency and the profitability assessment were carried out by means of the following four linear regression analyses[38]:

$$\begin{aligned} \mathrm{eff} &= k_0 + k_1 \, \mathrm{Size}_1 + k_2 \, \mathrm{MX}_1 + k_3 \, \mathrm{CC} + k_4 \, \mathrm{D} + z \\ \mathrm{eff}_1 &= w_0 + w_1 \, \mathrm{Size}_2 + w_2 \, \mathrm{MX}_2 + w_3 \, \mathrm{CC} + w_4 \, \mathrm{D} + z \\ \mathrm{Pf} &= m_0 + m_1 \mathrm{Size}_1 + m_2 \, \mathrm{MX}_2 + m_3 \, \mathrm{CAP} + m_4 \, \mathrm{D} + z \\ \mathrm{GP} &= n_0 + n_1 \mathrm{Size}_1 + n_2 \, \mathrm{MX}_2 + n_3 \, \mathrm{CAP} + n_4 \, \mathrm{D} + z \end{aligned}$$ where

eff – operating expenses / SIZE_1
SIZE_1 – Outstanding credits
MX_1 – Commissions / SIZE_1
D – Dummy variable (0: banks' affiliated, 1: other enterprises)
eff_1 – operating expenses / SIZE_2
SIZE_2 – Interests and commissions income
MX_2 – Commissions / SIZE_2
Z_1 and Z_2 – Stochastic disturbance
CAP = net worth / net total assets, while all the other variables meet the definition already given
GP is the factoring margin (i.e. interest received - interest paid + commission and charges

Ferretti and Vezzani (1992) found that: 1) cost efficiency increases with the output volume; 2) this advantage is not

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[38] Ferretti and Vezzani (1992) noted that "the evaluation of profitability differs from the previous assessment of efficiency, since regression (2) does not refer to a precise accounting relation. Adopting an accounting model would have required a much higher number of predictor variables.

36

reflected in the level of profitability which shows an inverse relation with size; 3) the benefits of size on efficiency are more relevant for financial services than for administrative services; 4) administrative services have unit costs that are greater than the ones of financial services; this cost differential does not seem to be completely covered through pricing, since the return on equity is lower the higher the ratio between administrative and financial services; 5) keeping all the other variables constant, the ownership structure seems to matter in explaining firm performance. More precisely, bank affiliates are less efficient and less profitable than factors strictly linked to industrial corporations".

Tagliavini (1995) investigated economies of scale in four Italian non-banking financial industries (i.e. leasing, factoring, consumer credit and mutual funds) for the period 1985-92, by adopting a parametric methodology. He applied to the factoring industry three different input and output definitions[39] (see table 2.9) and five business forms for the cost function (i.e. the linear, the quadratic, the exponential, the reduced translog and the translog)[40]. Taglievini's findings (1995) are in-line with the results of Ferretti and Vezzani (1992): "the linear cost function shows a quite low determination[41], but regression coefficients are substantially stable over the period 1985-92. The quadratic function does not show statistical significance, which would enable us to consider the regression coefficients. The exponential function shows substantial economies of scale concerning credit management activities and financing activities. Regression coefficients are substantially stable over the period 1985-92 and show that operating costs increase very slightly when financing activities are increased. Economies of scale on credit management

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[39] Tagliavini (1995) adopted a multi-output production function only in the factoring industry, while it adopted a single-output production function for the other three industries.
[40] For further details, see Tagliavini (1995) p. 400
[41] The term "determination" refers to the r^2 values.

activities are relatively weaker, but these are strengthened over time". In addition, Tagliavini (1995) assessed that there are no economies of scope in the Italian factoring industry, by analysing the regression coefficients of the exponential function.

Faroldi and Tagliavini (1996) investigated efficiency in the Italian credit consumer industry between 1991 and 1994, applying Data Envelopment Analysis (DEA) to a balanced panel data of 21 companies. The intermediation approach was employed to define inputs and outputs: average number of employees, physical assets, costive debts, capital were used as inputs; consumer loans is the only outputs. The resulting average technical efficiency score was 94.46%; 11 companies (with a 40% market share, in terms of consumer loans) were found on the efficient frontier.

Fiordelisi and Molyneux (1999) examined the efficiency and the productivity in the Italian factoring industry using Data Envelopment Analysis. The intermediation approach was employed: the average number of employees, the average value of fixed-tangible assets and the average value of the financing debts were employed as inputs; the average outstanding hire amount of without-recourse factoring, the average outstanding hire amount of with-recourse factoring and the average outstanding hire advanced credits payment were used as outputs. Substantial cost saving opportunities were found in the Italian factoring market: the mean cost inefficiency over the period 1993-97 ranged between 14% and 22%. These inefficiencies are mainly generated by allocation inefficiencies (ranging between 8.5% and 13.5%), rather than technical inefficiencies (ranging between 5 and 10%). Scale and technical inefficiencies seem to have an equivalent magnitude and the assumed prevalence of the latter, usually found in banking literature, is not observed in the Italian factoring industry.

Monferrà (1998b), which seems to be the most pertinent study, proposed an empirical investigation in order to assess differences in corporate behaviour among non-banking credit institutions

38

(leasing, factoring and consumer credit companies) and banks. Monferrà (1998b) employed the following regression models[42]:

$$Rg = a + a_1\, Mi + a_2\, Lev + a_3\ Gs + a_4\ Co + a_5\, Eff + e$$
$$Roe = b + b_1\, Mi + b_2 Lev + b_3 Gs + b_4 Co + b_5 Eff + e$$

where
- Rg = Profit/loss from operating activities on Equity
- RoE = Return on Equity
- Mi = Interest margin on total asset
- Lev = Intermediated funds on Equity
- Gs = Net commission incomes on intermediation margin
- Co = Operating costs on intermediation margin
- Eff = Intermediated funds on number of employees

Monferrà (1998b) found that: 1) in factoring institutions, profits are strongly influenced by the interest margin, but also by the service incomes and the leverage (Gs and Lev are found highly significant) ; 2) in leasing companies, profits are mainly influenced by the interest margin and the leverage (Mi and Lev are found highly significant), while the service components (Gs) is statistically insignificant. Monferrà (1998b) noted that the production process in leasing seems to be simpler than that in factoring; 3) in consumer credits enterprises, operating costs (Co), commission incomes (Gs) and efficiency (Eff) are not significant for statistical purposes: according to these results, the production process in consumer credit appear to be simpler than in factoring and leasing.

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[42] As noted by the same author, the model may be affected by multi-collinearity, which arises from the adoption of financial ratios as predictor variables. These variables, in fact, may have collinearity problems because they are taken by the same financial statement scheme (see Korobow and Stuhr, 1992)

4.3 Prospective design for an empirical investigation

This section aims to describe the ideal features of an empirical investigation aimed to determine whether a special suite of prudential rules for each type of credit institution is necessary to level the playing field and guarantee competitive equality. This assumption may be adequately investigated by assessing the following issues: 1) are the management characteristics and profiles of banking and quasi-banking institutions (lessors, factors and consumer credit enterprises) homogenous for regulatory purposes? 2) Does the recent development of controls ensure competitive equality among financial institutions?

The first issue was assessed by Monferrà (1998b), who, to the best of our knowledge, is the only one who attempted to investigate differences among credit institutions. As noted by the same author, the investigation model adopted (i.e. a regression analysis) may be affected by multi-collinearity and focuses on the profit structure of these intermediaries. Therefore, Monferrà's findings need to be further investigated. In detail, it would be interesting to assess differences among different type of credit intermediaries by examining their efficiency, rather than by focusing solely on their profits. This investigation appears to be extremely interesting for the supervisory authorities. The efficiency of credit intermediaries is currently a target for regulators, in order to ensure market soundness and stability[43]. In other terms, the final objective of supervision ("the overall stability of the financial system"), should be achieved by ensuring market competition, which represents the tool to increase efficiency.

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[43] As noted earlier, Article 5 of the Italian Bank Law states "credit authorities shall excise the power of supervision activities, in respect of the sound and prudent management of the supervised institutions, to achieve the overall stability, efficiency and competitiveness of the financial system"

40

In detail, it would be necessary to identify: 1) which factors determine the efficiency of a credit institution (by assessing the dissimilarities among different credit institutions); 2) which may be the consequence of omitting to consider differences among credit institutions. The investigation methods may be different. Concerning the first issue, the approach proposed in Spong et al., (1995) seems to be straightforward: on the basis of the enterprise efficiency estimates,[44] two sub-samples (the "most efficient" and "least efficient" companies) are identified: the balance sheet and cost-income data of both groups are compared in order to capture the factors which make an enterprise efficient. The second issues may be investigated by changing the definition of the inputs and the outputs of credit institutions: inputs and outputs may, in fact, be defined without considering the differences among the four class of credit institutions (i.e. regulatory view). By applying the Spong et al., (1995) approach, based on these new efficiency estimates, if is possible to compare the new conclusions (conceptually wrong) with the previous findings (i.e. fundamentally correct), and assessing any mistakes incurred by regulators.

The second issue was assessed only with regards to banks. The simultaneous equation model with partial adjustment [especially, the extended version applied by Jacques and Nigro (1997) and Aggarwal and Jacques (1998)] is straightforward and its application to non-banking credit intermediaries would be extremely interesting. This model would allow us to test the impact of supervision (focusing on capital adequacy requirements[45]) by analysing the influence of the capital standard requirements on the behaviour of credit institutions: a comparative analysis among different types of credit intermediaries would allow us to effectively assess competitive equality. However, at the moment, a simultaneous equation model

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[44] Spong at al., (1995) focused on US banks

[45] Although there are several, the core of the prudential regulation is given by the capital adequacy requirements

with partial adjustment cannot be applied in non-banking credit intermediaries for the following reasons: 1) current regulations do not (yet) require a minimum capital ratio, although there are some limitations regarding large exposures, derivatives operations and currency exposition. The regulatory pressure variables could not be appropriately defined because a precise capital target is not required, in comparison with the risk-adjusted assets; 2) capital could not be defined as the ratio of capital to risk-weighted assets [as in Ediz et al., (1998), Aggarwal and Jacques (1998), Jacques and Nigro (1997)] because this data is not available[46]. Capital could be measured in terms of the ratio of capital to total assets [as in Shrieves and Dahl (1992)]; 3) risk cannot be defined as the ratio of risk-weighted assets to total assets, because this data is not available. Apart from these "operating" difficulties, it is too early to assess the impact of the capital adequacy rules on the behaviour of credit institutions, because the supervisory framework has not yet been fully implemented and a capital target is not yet required.

Consequently, at present it is difficult to assess the impact of capital requirements on credit intermediaries, and whether the simple extension of the target capital currently required for banks (i.e. 8%) would be appropriate for non-banking credit intermediaries. In first approximation, the initial sign that *quasi-banks* seem to require lower capitals is supplied by the Bank of Italy (2000), according to which quasi-bank institutions are less risky. In detail, the lessor keeps the legal ownership of the leased asset: this enables leasing companies to recover easily the full amount invested in the asset .In factoring, the relationship between the factoring firm and the creditor tends to be exclusive

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[46] The only available information is reported in Bank of Italy (2000): "The companies' total supervisory capital, 97 per cent of which consists of tier-one capital, amounted to 12.7 trillion lire (Euro 6,559 billion), while the risk asset ratio decreased from 9.9 to 9.5 per cent. Their net exposure to interest rate risk came to 1.25 trillion lire (Euro 644 million), or 9.8 per cent of supervisory capital. Exchange rate risk exposure remained modest at 3.8 per cent"

42

(i.e. the creditor transfers to the factor the whole portfolio of its commercial credit). Consequently, factors have the possibility to make an in depth assessment of the credit risk and of the quality of the credit transferred. In consumer credit, the extensive application of credit scoring systems allows the consumer credit institutions to increase the assessment velocity and contain costs.

5. Models

The empirical investigation focuses on factoring companies. Although it would have been interesting to consider leasing and consumer credit companies, there are some difficulties in collecting data which suggest to limit (at the moment) the empirical analysis only to this type of credit institution.

The analysis organised as follows: first, economic efficiency is estimated using the Multistage DEA method (described in section 5.1) proposed in Coelli et al., (1998)[47]. The definition of inputs and outputs (described in section 6.1) is made taking into account the distinctive aspects of the factoring intermediaries. Secondly, in order to assess the determinants of factoring companies efficiency, two sub-samples of firms have been taken following Spong et al., (1995): one consisting of the "most efficient" institutions, defined as the first quartile of the efficiency score distribution, and the other comprising the "least efficient" companies, defined as the fourth quartile. On the basis of the available information, two broad areas of comparison have been identified: the economic conditions and the financial conditions.

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[47] The adoption of a non parametric technique (such as the DEA), rather than a stochastic methodology, was made necessary by the small number of observations available. According to Resti (1997a) "econometric and linear programming technique results do not differ dramatically when based on the same data and conceptual framework".

5.1. Multistage DEA model

DEA is a linear programming methodology which uses data on the input and output quantities of a group of firms to construct a piece-wise linear surface over the data points. DEA seeks to identify the Decision Making Units (DMU) in the data set which determines an envelopment surface by solving a sequence of linear programming problems (one for each DMU in the sample). The DMUs on the frontier surface are called "technically efficient"; for each DMU not on the frontier, labelled as "technically inefficient", the efficiency score is determined by comparing its performance to the envelopment surface[48]. DEA can be either input-oriented or output oriented[49]: we have selected an input-orientation because the prevailing strategy in the highly competitive Italian factoring industry seems to be input minimisation, from a given output level, rather than the output maximisation with input levels held constant. If information on prices is available and a behavioural assumption can be appropriately made, DEA allows us to estimate allocative and cost efficiency: in the input orientation, the former refers to the combination of inputs which produces a given quantity of outputs at minimum cost, while the latter expresses the ability of a firm to choose its input and/or output levels and mix them to optimise its economic goal.

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[48] The most serious DEA drawback is that this methodology does not allow for a random error due to error measurement or to good or bad luck. Therefore, the detection of outliers and influential observations is a particularly important task in DEA. The methodology applied has followed the most relevant approaches in literature and it was organised as follows: a) identification of non conforming observations (outliers) by analysing input and output data and efficiency scores; 2) "outliers" were prioritised on the basis of the underlying production process; 3) influential observations were detected by following Wilson's (1995); 4) in order to consider the masking problems, Wilson (1995) procedure was repeated by dropping all best-practice companies; 5) an individual follow-up was undertaken for the "likely" outliers and influential observations previously detected.

[49] In the first case, the envelopment surface is defined by seeking the maximum possible proportional reduction in input usage with output levels held constant. In the second case, DEA defines the efficient frontier by seeking the maximum proportional increase in the output production, with input levels held constant.

44

The origin of the DEA methodology can be traced back to Charnes, Cooper and Rhodes (1978), which generalised the piece-wise-linear conical hull approach to estimate the efficient frontier and radial inefficiencies scores (proposed by Farrell, 1957) to multiple outputs and reformulated the optimisation process as a mathematical programming problem. This model assumes that all DMUs are operating at the optimal scale level: if this assumption does not fit reality, efficiency scores calculated by solving a Constant Return to Scale (CRS) model confuses Technical Efficiency (TE) with Scale Efficiency (SE). This assumption was removed by Banker, Charnes and Cooper (1984), who added a convexity constraint to the previous model. These models, labelled as oriented models, are often solved in two stages (see Ali and Seiford 1993): the first involves a proportional contraction in inputs, while the second stage proposes a maximisation of the sum of (any remaining) slacks[50]. However, because the second stage implies the maximisation of the sums of slacks (rather than a minimisation) and the projected point obtained is not invariant to the unit of measurement, the specification of the peers and targets (necessary for the calculations of the efficiency scores) obtained in the second stage may be unsatisfactory.

To address this problem, we have applied the multi-stage DEA methodology proposed by Coelli (1998). This method involves a sequence of DEA models to identify the projected efficient points and is therefore more computationally demanding than other methods[51]: however, it avoids the necessity to maximise the sum of slacks and the efficient projected points identified are invariant to units of measurement. Because price information is available and cost minimisation is a reasonable behavioural objective in the Italian factoring market, we run the following cost minimisation DEA model:

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[50] A problem associated with the piece-wise linear form of the frontier estimated by DEA are the "slacks", which are generated by the part of the frontier which is parallel to the axes.

[51] Such as, for example, the two-stages DEA suggested in Ali and Seiford (1993)

$$\min_{\lambda x_i^*} w_i' x_i^*,$$

$$\text{st:} \quad -y_i + Y\lambda \geq 0,$$
$$x_i^* - X\lambda \geq 0$$
$$N1'\lambda = 1$$
$$\lambda \geq 0$$

where

w_i is a vector of input prices for the i-th firm
x_i^* (which is calculated by LP) is the cost minimising vector of input for the i-th DMU, given w_i and y_i

The total Cost Efficiency of the i-th firm is calculated as CE= $w_i' x_i^* / w_i' x_i$, which represents the ratio of minimum cost to be observed. Allocative efficiency estimates are calculated as: AE= CE/TE.

6. Data

Data were obtained from the "Osservatorio sugli Intermediari Finanziari Non Bancari" (OSSFIN)[52] and the "Associazione Italiana per il Factoring" (ASSIFACT) . At the end of 1999, *financial intermediaries* entered in entered in the *special register* (i.e. the register referred to in Article 107 of the Banking Law) were 203: 176 *financial intermediaries* offer leasing services, 80 institutions offer factoring services and 45 intermediaries offer consumer credit services. Leasing, factoring and consumer credit together account for more than 85% of lending by supervised financial companies. In Italy, non-banking credit services are mostly offered by "Specialised Intermediaries", which are companies operating only in one market (such as factoring or leasing or consumer credit): these companies are either bank-affiliated (labelled as "traditional companies") or industrial group affiliated (labelled as "captive companies"). Although leasing, factoring and consumer credit may also be offered by banks and diversified intermediaries (i.e. companies operating in more than one market segment, such as leasing companies offering also factoring services), these two usually play a marginal role[53]. For

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[52] OSSFIN is a database managed by the Scuola di Direzione Aziendale (SDA) of the Università di Milano, L. Bocconi.

[53] E.g. banks and diversified intermediaries hold a very small market share (i.e. according to OSSFIN (1997), 0.7% and 3.5%, respectively) in the Italian factoring sector.

this reason, this study considers only the "specialised intermediaries" .

The sample adopted in this study considered globally 23 factoring companies[54] over the period 1995-1997[55], representing at least 80% (in terms of turnover) of the whole Italian factoring market[56]. Collecting data for the Italian factoring industry is problematic, because there is no public source of information and, as far as we are aware, the sample used is the largest sample available[57].

6.1 Input-Outputs definitions

In efficient frontier analyses, the definition of the inputs and outputs influences the accuracy of the estimates. As originally noted by Stigler (1976) "measured inefficiency may be a reflection of a failure to incorporate the right variables and the right constraints and to specify the right economic objective of a production unit". Even in banking, where the literature dealing with efficiency measurement is extensive (see Berger and Humphrey 1997), there is no consensus on what a bank produces. Among the approaches proposed in the banking literature, it is not clear which is the most appropriate for representing the production characteristics of leasing, factoring and consumer credit firms[58]. From a certain point of view, the production approach may be

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[54] The sample considered originally 25 factoring firms: two companies were detected as outliers and omitted

[55] In details, the sample represents over 90% (in terms of turnover) of the whole Italian market in 1995 and 1996 and about 80% in 1997.These values were calculated based on the market size data reported in the Banca d'Italia, annual reports.

[56] These values were calculated based on the market size data reported in the Banca d'Italia, annual reports.

[57] All previous studies of the Italian Factoring industry have used smaller sample sizes than in our study. For example, the sample adopted by Ferretti and Vezzani (1992) comprised 14 factoring companies representing 48% of the whole Italian factoring industry.

[58]The inputs and outputs definition is particularly challenging in this paper because: 1) to the best of our knowledge, no previous study has applied frontier analysis to measure

considered suitable: non banking credit institutions do not collect deposits and uses labour and physical capital to produce their outputs (which are fundamentally different from banking loans): the production approach may appear to be more suitable than the intermediation approach. However, from another point of view, non banking institutions provide intermediation services between financial surplus and deficit units. As noted in the previous section, these companies can be distinguished as "traditional" (i.e. banking-group affiliated) or "captive" (i.e. industrial-group affiliated): in the first case, these institutions receive funds from their bank-parent companies and provide credit facilities to bank customers; in the second case, factoring companies receive funds from their parent companies and provide financial facilities to customers of the companies belonging to the group. In our opinion[59], the intermediation approach captures the reality of the Italian quasi-banks better than the production approach. The inputs and outputs selected are the following: the guarantee services (measured as the outstanding hire amount of without-recourse factoring), the credit management services (measured as the outstanding hire amount of with-recourse factoring) and credit facility services (measured as the outstanding hire advanced credits payment) are used as output. Labour (measured as the number of full-time employees), physical capital (measured as the book value of fixed-tangible assets)

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firm efficiency and productivity in the factoring industry; 2) the OSSFIN database is extensive and the number of variables, which may be considered as potential inputs and outputs of a factoring companies, is high; 3) although the number of factoring firms is large in comparison to the Italian factoring market, this number is small for the application of frontier methodologies. As noted by Brown (1995) and (1996), "the number of efficient units increases rapidly with the dimensions of the input and output vectors so most of the banks in a small data set might have the maximum efficiency score". Therefore, the largest number of inputs and outputs which enable efficient and inefficient firms to be discriminated should be chosen.

[59] Faroldi and Tagliavini (1996) express the same opinion: "the intermediation approach is the most suitable for non-banking credit industries, […] because the productive process can be described as a transformation of financial resources, combined with labour and capital, offered to units with a deficit of financial resources".

and financial capital[60] (expressed as the average value of the financing debts) are used as inputs. In order to estimate the economic efficiency, the cost minimisation is considered a reasonable behavioural objective and the input prices are defined as follows: the the average labour costs (i.e. Total labour costs on number of employees) is used for the first input; the ratio "other non-interest expenses on total assets" is employed for the second input; the index "interest costs on borrowed funds on the average amount of borrowed funds" is used for the third input.

7. Empirical results

Firstly, the economic efficiency of factoring companies is determined. Our findings suggests that cost efficiency may be substantially improved. The mean economic efficiency score was 0,653[61] and about one third of institutions are relatively efficient. Distinguishing between technical and allocation efficiency, cost saving opportunities seems to be higher for technical efficiency: about 60% of factoring companies are inefficient and the mean score is 0.751. Allocation-efficient institutions account for one third and the average score is 0.846.

Secondly, according to the economic efficiency estimates, factoring companies are grouped according to Spong et al., (1995), in

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[60] As noted previous study (e.g. see Favero and Papi (1995) and Berger and Mester (1997), the treatment of the financial capital is an important aspect of the efficiency measurement. Similarly to a bank, a factoring firm solvency depends on the availability of the financial capital, which is sufficient to absorb portfolio credit losses. If financial capital is omitted, the efficiency estimates may be inaccurate

[61] Remembering that the analysed technical efficiency measure expresses a relative judgement, the mean efficiency level may be compared with those found for Italian banks. According to Giannola e Scarfiglieri (1998), who applied the DEA on a panel data (291 banks over the period 1993-96), the mean cost efficiency is 70%. For a comparison in terms of technical efficiency, (among the most recent DEA application in the Italian banking industry), see Favero and Papi (1995), Resti (1997) and Casu and Girardone (1998).

order to assess the determinants of the factoring companies' efficiency[62]. Two sub-samples have been taken: one consisting of the "most efficient" factoring institutions, defined as the first quartile of the economic efficiency score distribution, and the other comprising the "least efficient" companies, defined as the fourth quartile. The characteristics of these two groups are the following: 1) efficient factoring intermediaries have almost double the asset size than the least efficient enterprises (764 million euros vs. 447 billion euros); 2) examining the distribution by asset size, the most efficient factoring companies seem to be very small (50%) or very large (33%); 3) most of the companies in both groups are banking affiliated (*traditional factors)*: 83% in the most efficient set and 67% in the least efficient.

A first comparison is made by examining the mean value of the balance sheet and the cost-income statement of the two groups (table 1).

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[62] This paper does not seek to analyse the causal relationship between efficiency and business and economic equilibrium conditions for factoring intermediaries. However, it aims to assess if there are substantial differences among economic, financial and capital conditions of most and least efficient intermediaries.

Table 1

Most vs. Least efficient factoring firms: financial statement

Cost-Income statement	Most efficient	Least efficient	Gap	Balance sheet	Most efficient	Least efficient	Gap
				Assets			
Interest incomes and similar revenues	6,67	6,44	0,23	Due for discounted credit for factoring operations	97,95	85,69	12,26
Interest expenses and similar charges	4,73	5,24	-0,51	Other performing assets	0,54	6,45	-5,91
Interest margin	1,94	1,2	0,74	Non performing assets	1,51	7,86	-6,35
Net commission incomes	1,77	0,48	1,29	**Liability and Capital**			
Intermediation margin	3,71	1,68	2,03	Costive debts	88,25	92,67	-4,42
Payroll	0,87	0,83	0,04	Non costive debts	6,93	1,67	5,26
Other costs from operating activities	0,7	0,66	0,04	Total debts	95,18	94,34	0,84
Profit/loss from operating activities	2,14	0,19	1,95	Total Capital	4,82	4,77	0,05

Other information	Most efficient	Least efficient	Gap
Turnover	460,65	193,66	266,99
Outstanding	165,79	106,06	59,73
Total due from customers for discounted credit for factoring operations	97,95	85,69	12,26
Net loan losses	1,77	11,46	-9,69

* Group average as a percent of assets

The reclassified cost income statement allows us to investigate differences in the profit structure. Profits from operating activities are largely higher for the most efficient companies: 2.14% of total assetss vs. 0.19%. This large difference between most efficient and least efficient factoring companies shows that technical efficiency has a substantial influence on the profit structure of a factoring firm. It is now interesting to investigate the reasons of this results. Firstly (and mainly), most efficient companies have a higher level of commission/fee incomes. As a result, most efficient factoring companies benefit from a higher intermediation margin: 3.68% vs. 1.68% of total assets: this proves that service activities (credit management and warranty function) in factoring are highly important in terms of efficiency and profitability. Secondly, most efficient institutions have lower interest costs (-0,5%) than least efficient companies. There are non-substantial differences in operating costs (payroll and other operating costs).

Concerning the balance sheet, least efficient enterprises have a higher level of non-performing assets: 7.86% vs.1,51% of total assets. This difference seems to be generated by the amount "due for discounted credit factoring operations", although the least efficient factoring companies have a higher level of "other performing assets" (such as bonds and other securities hold). Looking at the liability structure, most efficient enterprises have a substantial lower level of costive debts by financing their activity with non costive debts: this difference may explain the lower level of interest costs. In addition, major efficiency is clearly confirmed in the lower level of net loan losses: 1.77% of total assets for the most efficient group and 11.46% for the least efficient group.

A second comparison is based on the mean value of some financial indexes of the two groups (table 2.)

Table 2

Most vs. Least efficient factoring firms: financial ratios

	Most efficient	Least efficient		Most efficient	Least efficient
Activity and Price indices			**Profitability indices**		
AP1 - Total due for discounted credit for factoring operations on Outstanding	67,08%	74,02%	**P1** -Net income for the year on Total Capital	7,17%	-9,80%
AP2 - Interest incomes on factoring operations on Total due for discounted credit for factoring operations	7,02%	9,10%	**P2** -Net income from operating activities on Total Capital	16,65%	-6,36%
AP3 – Spread	1,68%	1,65%	**P3** -Net income for the year on Total Assets	0,86%	-0,26%
AP4 – Commission incomes for factoring operations on Turnover	0,31%	0,26%	**P4** -Net income for the year on Net income from operating activities	54,71%	70,28%
Solvency indices			**P5** -Intermediation Margin on Total Assets	3,36%	2,61%
S1 -Total Assets on Total Capital	18,97	18,78	**P6** -Interest Margin on Total Assets	1,99%	1,95%
S2 -Net write downs/backs of discounted credits to customers on Due for discounted credits for factoring operations	0,58%	0,96%			
S3 -Non performing credits on due for discounted credits for factoring operations	1,77%	11,46%			
* Group average					

53

Financial ratios are divided into three categories: profitability, solvency and price/activity indexes. Examining the profit structure, the most efficient companies achieved a positive economic results in 1997, while the results for the least efficient group were largely negative (see indexes P1, P2 and P3). These results show that technical efficiency is closely related to enterprise profitability. The other profitability indexes (P4, P5, P6 and P7) clearly show that income from commissions are crucial for factoring companies. This is further confirmed by analysing the activity and price indexes: the most efficient group has, on average, a 20% higher unitary commission income (index AP4) and a 2% lower interest rate (index AP2) than the least efficient group. This data, which supports the importance of service activities in factoring, are also confirmed by index AP1: at the end of 1997, the most efficient factors supply, on average, credit facilities to 67% of the total amount of credit traded, while the data for the least efficient group is 74%.

Why should regulatory authorities be interested in these results? First of all, economic efficiency results are desirable being highly related to sound and satisfactory profit structure[63]. The main reason is that most efficient companies have higher commission/fee incomes by showing the importance of service activities in factoring. An explanation of this difference is supplied by examining the price indexes, which shows that most efficient factoring companies apply (on average) higher unitary commission and fees and lower interest rate. The former data may give evidence that the most economic-efficient enterprises supply services with a higher quality and customers are willing to pay a higher price for them; the latter data apparently derives from a poorer quality of the credit portfolio of the least efficient factoring companies. These findings, which are consistent with the previous literature[64], shows that: 1) the production process of factoring companies is a complex process; 2) lending is only a part of the factoring process; 3)

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[63] This conclusion is extensively analysed in Fiordelisi and Molyneux (1999), where it is shown that economic efficiency is due to technical rather than allocation efficiency.
[64] See Monferrà (1998b)

enterprise efficiency (i.e. a current supervisory target) is strictly related to the service activities (i.e. credit management and credit risk guarantee), rather than to the credit intermediation process. A supervisory framework tailored to banks, which does not take account of this management characteristics and profile (i.e. factoring companies cannot be simply considered as suppliers of credit facilities), may not guarantee competitive equality between factoring companies and banks.

8. Conclusion

Despite the importance of quasi-banking institutions, the literature on regulation has never paid much attention to their behaviour from the point of view of their distinctive characteristics and management peculiarities This study has analysed the importance of the management characteristics and profiles of quasi-banking institutions, for regulatory purposes, and to examine the relationship between the regulatory process and differing business behaviours. This aspect, which may appear secondary in the wide-ranging and animated discussions on regulation of financial systems, has recently received a growing interest in respect of both the tendency towards levelling the playing field and of the extension of forms of control to sectors and/or activities which had previously been excluded.

In recent years, regulatory authorities have emphasized the importance of levelling the playing field among different *financial institutions*. The concept of competitive equality, which in this paper generally refers to a characteristic of the regulatory process aimed to ensure the equality of competitive conditions in the fields concerned by the regulation, is often mentioned, but the definition of which is no easy matter.

At first approximation, the problem of competitive equality could be solved by shifting from *institutional* to *business regulation*: the *business regulation* appears to be more suitable than institutional

regulation to tackle the problems related to competitive equality, by virtue of its greater flexibility and adaptability to the significant differences between the institutions. The effective implementation of *business regulation*, however, features logical and practical obstacles. First of all, there are difficulties inherent in the co-existence of business rules within the same institution performing a number of activities. Secondly, the adoption of a strictly business outlook should also somehow restore to the supervisory process those financial activities carried on by non-financial undertakings. This would also require legislation clearly aimed to frame the activities (or even the single financial products); this appears to be hardly achievable Lastly, the equity coefficients, which is the typical instruments of prudential regulation, find their ideal field of application at the overall institutional level, while their use, differentiated according to the various functions, is technically more complex and requires the breaking down of the corporate aggregates, which may turn out to be risky and contrary to the principle of management unity. Additionally, the tendency to control the functions, rather than the intermediaries, although it may be more suited to the constraints of competitive equality, does not eliminate the need of an in-depth knowledge of the behaviour of the *financial institutions*; on the contrary, it increases this necessity.

The competitive equality may be the adoption of the *cooperative supervisory* framework. This may depend on the compatibility between the goals of the supervisory authorities and the supervised institutions. The presence of different priority scales and trade-offs makes it difficult to imagine the "natural" convergence of the goals expressed by the two parties concerned. A self-regulatory process might take place only in the (theoretical) case in which the target function of the credit system, basically encompassing the intermediate variables of the supervisors, were to coincide with the target function of the authorities including the end variables. In this case, the authorities' task would be to maintain this balance, by governing

the mechanisms of transmission of the regulatory impulses between the intermediate and end variables. In any case, the attention paid to the behaviour of the *financial institutions* may allow an easier "involvement" of the latter in "calibrating" the intermediate variables of regulation and, by launching virtuous circles in the mechanisms of transmission of the supervisory impulses, the suitable achievement of the end objectives. An examination of the development of the supervisory policies may easily lead one to conclude that the growing attention of the supervisory authorities towards the greater articulation of the regulation objectives has not been oriented, until recently, by the impact of their actions on corporate behaviours, but by the effect that may be produced on the system as a whole, according to the adopted theoretical models. The reviewing of the models and the move from actions directly aimed to the achievement of the end objectives, and indirect actions, which, logically, "pass" through the behaviour of the *financial institutions*, allows one to consider the relations between supervisory bodies and supervised businesses within the framework of a *cooperative supervisory model*, in which the key actors are the authorities, the *financial institutions* and the market. In this ambit, knowledge of the different characteristics and behaviours of the *financial institutions* is obviously an essential element for the success of the supervisory policies.

The issue of the effects of regulation on the behaviour of *financial institutions* has been traditionally addressed with reference to the explanatory variables of the structural characteristics of the firm markets. However, credit institutions feature a differential sensitivity in the face of regulation, depending on the relative characteristics and management behaviour. The corporate variables interact with the institutional and market variables to define the actual behaviour of the businesses: the appraisal of the influence of these variables, in configuring the sensitivity to regulation of the various credit institutions, entails a punctual and systematic analysis. This analysis highlights how the hypothesis

57

of a differential sensitivity is conceptually acceptable and realistic, in consideration of the specificity of the institutions in question, and may be useful especially in an ambit of indirect regulation. Additionally, the assumption of a different sensitivity leads one to imagine that the reaction of the institutions to regulation may differ, precisely in relation to the characteristics entailed by these sensitivities.

The introduction of prudential regulation seems to produce changes in the behaviour of credit institutions, in respect of the propensity to the relative growth of their own means, achieved through the increase thereof and/or the adaptation of their overall growth. In any cases, there is proof of different reactions by the institutions, in relation to their geographical location, development, competitive status, profitability. Additionally, other contributions have analysed the introduction of relative capitalization restraints on the risk level of the credit institution. All this appears to be consistent with the management balance conditions of a *financial institution*: the application of prudential rules cannot disregard the relations between profitability, solvency and liquidity, compared to the manifestation of risks in their various configurations. On the basis of these considerations, the knowledge of the behaviour of the credit institutions has to constitute a key element of the regulatory process. This affirmation, which may be taken for granted, entails the acknowledgement that these behaviours may differ considerably, in relation to specific corporate characteristics. To sanction the uniformity of supervisory procedures (especially of the prudential controls), often postulated *a priori*, does not mean to ensure their neutrality in respect of the *financial institutions.* The neutrality of the supervisory actions is functional to the achievement of the principle of competitive equality, which apparently will become an important reference point for the regulatory process. This neutrality may be assured solely by articulating the supervisory process capable of recognising and respecting the particularities of the institutions subject to regulation. This imposes the

58

knowledge of said particularities by the supervisory authorities and the adoption of supervision techniques capable of ensuring neutrality, for example, by assuring the discriminating capacity of the selected coefficient (in terms of the variables used and of the guiding values), compared to the conditions of management balance of the various types of institutions.

In this profile, supervision differs from monetary policy in that it may ground its actions on "prevailing behaviours" since the existence of a number of non-aligned subjects can cancel the entire regulatory effort. In terms that are, perhaps, slightly too extreme, a significant variance compared to the above-mentioned desired regulatory behaviour may depend on the difficulty of knowing the peculiar characteristics of the supervised businesses, or may be intentional. In the latter case, prudential supervision tend to lose their aspect of neutrality, by becoming an instrument to guide the evolution of the system's structure towards the arrangement desired by the supervisory authorities and, ultimately, into an instrument of structural control. To confirm the assumption of the structural use of prudential controls, suffice it to mention: 1) the introduction of rules entailing considerable fixed adaptation costs for the institutions, thus constituting an overwhelming barrier to the carrying on of certain activities; 2) the imposition of uniform equity coefficients in different sectors (characterized by differing absolute mean business dimensions) in relation to plant costs and economies of dimension, if any, and by differing income-risk combinations and interest margin policies too.

Because the different credit activities may differ substantially, the distorsions produced by uniform, albeit non-neutral, regulations, also due to competitive inequality, which alters the equality of competitive conditions, may determined institutional and business arbitrations and/or the progressive levelling of the peculiarities of the various institutions, such as to alter the morphology of the financial system. Consequently, prudential rules may also

perform the function of effective input control, achieved through the necessary capital requirements and/or the influence on the costs to be incurred, the price policies and, therefore, the achievable profitability. The supervisory authorities may use competitive inequality to guide the structure of the financial system towards the desired configuration, where the stress on prudential supervision does not rule out the need for structural reorganization. In the former case, i.e. where the insufficient attention paid to management behaviour descends from the scarce knowledge of the institutions' peculiarities, it is the selfsame nature of the prudential instrument employed that urges improvements in this direction. A significant contribution to the problem of the adaptation of the prudential rules to the peculiarities of the institutions could come from the major articulation of the instruments employed, (i) to govern corporate risk components other than credit risks, (ii) to treat the latter in a more suitable manner, in the light of the criteria of diversification and fractioning, and (iii) to operate a distinction between the various types and intensity of credit risks. The dissimilar combinations of risks, in fact, is one of the key elements on which the peculiarity of the *financial institutions* is based; if it is physiological, it must not be altered, on the contrary, it must be respected and, if necessary, promoted.

The success of regulation policies may undoubtedly be assessed only in the framework of a "full supervisory cycle"; moreover, it seems to require the "fine tuning" of the actions in accordance with the speedy development of the financial system and businesses: there seem to be no valid reasons why the environment-strategy-structure paradigm cannot be applied to the supervisory authorities. From the point of view of the supervisory bodies, all this entails the expediency of adopting a style of regulation and operating behaviour consistent with the need of a deeper knowledge of the management profiles and organizations of the *financial institutions*, deemed a critical lever for the implementation of the corporate strategies and as prerequisites for

60

efficiency, flexibility and development, instead of solely as structures and mechanisms aimed to ensure the reliability of the behaviour of the *financial institutions* subject to supervision.

By shifting the focus on empirical grounds, an "ideal" investigation might produce solutions for the following issues: 1) are the management characteristics and profiles of banking and quasi-banking institutions (lessors, factors and consumer credit enterprises) uniform for regulatory purposes? 2) Does the recent development of controls ensure competitive equality among financial institutions?

Only a few paper have assessed the first issue, essentially by examining the profit structure of quasi-banks. In reality, rather than focusing only on their profits, it would be interesting to assess differences among different types of credit intermediaries by examining their efficiency. This investigation appears to be extremely interesting for supervisory authorities, because the efficiency of credit intermediaries is a target for regulators. The investigation methods may be different. The approach proposed by Spong et al., (1995) seems to be straightforward and useful: on the basis of the enterprise's economic efficiency estimates,[65] two sub-samples (the "most efficient" and "least efficient" companies) are identified. The balance sheet and cost-income data of both groups are compared in order to capture the factors which make an enterprise efficient. The second issues may be investigated by changing the definition of the inputs and the outputs of credit institutions: inputs and outputs may, in fact, be defined without considering the difference among the four class of credit institutions (i.e. regulatory view). By comparing the new conclusions (conceptually wrong) with the previous findings (i.e. fundamentally correct) and assessing any mistakes incurred by regulators.

The second issue was only assessed with regards to banks. The simultaneous equation model with partial adjustment is

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[65] Spong at al., (1995) focused on US banks

straightforward and its application to quasi-banks would be extremely interesting. This model would allow us to test the impact of supervision (focusing on capital adequacy requirements) by analysing the influence of the capital standard requirement on the behaviour of credit institutions: a comparative analysis among different types of credit intermediaries would allow us to concretely assess competitive equality. However, at present, a simultaneous equation model with partial adjustment cannot be applied in non-banking credit intermediaries, for both practical and theoretical reasons. Consequently, it is difficult to assess the impact of capital requirements on credit intermediaries and whether the simple extension of the target capital currently required for banks would be appropriate for non-banking credit intermediaries. In first approximation, the initial sign that *quasi-banks* seem to require lower capitals is supplied by the Bank of Italy (2000), according to which quasi-bank institutions are less risky.

The empirical investigation undertaken in this paper has focused on the factoring sector. Firstly, economic efficiency was assessed using the Multistage DEA method: the mean economic efficiency score was 0.653, and about one third of institutions are relatively efficient. Secondly, factoring companies were grouped according to Spong et al., (1995) in order to assess the determinants of the efficiency of factoring companies. By comparing their average cost-income statement, balance sheet and financial indexes of the most and least economic efficient factoring institutions, we obtained several indications of the importance of the management characteristics and profiles of the factoring intermediary for regulatory purposes. First of all, in order for economic efficiency results to be desirable they must be closely related to a sound and satisfactory profit structure. The main reason is that most efficient companies have higher commission/fee incomes, by showing the importance of service activities in factoring. Looking at the price indexes, it seems that the most efficient enterprises supply services with a higher quality (and customers are willing to pay a higher price for

62

them) and the credit portfolio of the least efficient factoring companies feature a poorer quality. These findings, which are consistent with the previous literature, show that: 1) the production process of factoring companies is a complex process; 2) lending is only a part of the factoring process; 3) enterprise efficiency (i.e. a current supervisory target) is strictly related to the service activities (i.e. credit management and credit risk guarantee), rather than to the credit intermediation process. A supervisory framework tailored to banks, which does not take account of these management characteristics and profile (i.e. factoring companies cannot be considered simply as suppliers of credit facilities), may not ensure competitive equality between factoring companies and banks.

These results clearly represent the first step of a more in depth investigation. The future researches should extend to extend to the other quasi-banking institutions (consumer credit and leasing), which were found in the previous literature to be more similar to banks rather than factoring companies. As soon as the capital adequacy requirement will be applied to quasi-banks too, the application of the simultaneous equations model with partial adjustment should make it possible to assess whether the recent development of controls has ensured competitive equality among financial institutions.

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