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the Financing of Small Firms:
The Case of MagneTek

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European University Institute
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Industrial organization and the financing of small firms: the case of MagneTek.¹

The industrial district or, using a wider definition, the system of local firms, is now fully recognized as an object of intermediate analysis between micro and macroeconomics. So much so that some researchers maintain that an industrial district and flexible specialization "hopefully looked upon as the third way to economic and social development and as a universally applicable model" have already assumed the characteristics of an "influential and oppressive orthodoxy". (Amin-Robins 1991: 186-187). Speaking more concretely, the emergence of intermediate entities of analysis has generated suggestive interpretations of economic development underlying, for instance, the concept of *Terza Italia* (Bagnasco 1977) or regional development with widespread industrialization.

The industrial district has recently been studied using instruments taken from analyses of transaction costs type and of the theory of

¹ The research, carried out for the project "The relationships of small firms with intermediaries and financial markets" financed by the Consiglio Nazionale delle Ricerche and directed by Prof. Marcello de Cecco at the European University Institute, is based on informal interviews with persons operating in, or studying the Valdarno economy in a stretch of time between late spring and autumn 1993. We wish to thank Giovanni Bazzini, Stefano Cioncolini, Marinella Bonechi Fratini, Quintiliano Ceci of the Statistics Department in the Commune of Montevarchi and Giorgio Seri of the Chamber of Commerce in Arezzo. Special thanks are due to Romano Ceccherini who has paved the way for many contacts useful to the research and who has succeeded in explaining with extreme clarity the "real" running of the financial market in Valdarno and to Ing. Mauro Cini of MagneTek who has given me many hours of his time. We also wish to thank Renato Giannetti and Mauro Lombardi who have read and commented on a previous draft of this paper. The author holds himself responsible for any errors or omissions.

information. The analysis based on notions of the theory of information tries to interpret an industrial district as a system of economic agents organized according to an information hierarchy, based on the distinction between information relating to technical aspects of production and that relating to markets. It is possible, thus, to reconstruct the flow of information internal to the system and through it to establish the global emergent property. When we speak of a "district" we mean a "multistable system" characterized by self-limitation, operative flexibility and adaptive rationality (Lombardi 1994). This type of characterization denies the univocity of future courses of development of industrial districts while pointing out lines of possible divergence of evolution patterns. The most important consequence of this approach concerns the normative aspect: to the extent that each industrial district shows systemic properties and a unique adaptive behaviour, possible measures of economic policy must be suited to that one system and cannot in any way be generalized. In this paper we propose to show that analysis in terms of systems has another important consequence, in this case relating to the positive sphere of the economy: the analysis of local systems of firms must take into account the historical or evolutionary dynamics of the system or of its component sub-systems.

When dealing with intermediate economic entities as those specified above important problems arise also relating to the use of statistical data applied to the analysis of the more common characteristics of industrial districts. This problem can be illustrated in reference to the interpretation in terms of transaction costs of the question of financing small and medium-size firms (SMFs). A transaction costs type of analysis takes as

basic unity of the analysis transactions and their costs, rather than goods, and assesses markets and firms according to their capacity to economize those costs. The basic hypothesis of this type of analysis is that the contemporaneous presence of elements of competition and cooperation within an industrial district makes it possible to reduce considerably transaction costs since in industrial districts the reciprocity between performance and counterperformance is to a large extent guaranteed by mechanisms of a social nature, less costly than normative or bureaucratic ones. Recent studies on the system of financing of firms in industrial districts have applied theoretical models used in transactional analysis, especially the cross transaction model (Dei Ottati 1992). A consequence of this type of analysis is that the statistics used in the discussion on financing of SMFs do not include the actual financial flows that operate in industrial districts. These are not only qualitatively different in that they largely foresee the setting up of informal and trust relationships between operators, but are also quantitatively different in that they do not use or only partly use the usual credit channels to which industrial districts have access. This means that instruments for analysis must be tailored *ad-hoc* and also that in industrial districts, statistics on the financing of firms can only be considered reliable after a careful analysis of financial flows, external to the normal channels. This paper also shows how difficult it is to use normal analysis to assess flows of financing also in the case of local systems of firms. Another result obtained is that the direction of financing flows is totally different to what would be expected according to the theory of cross transactions applied to the relationship between subsupply and credit. Theoretical works are examined in the

following pages as a starting point before the research focuses on a particular case. The investigation is then continued using theory and applied analysis, a method used by most analytical works on industrial districts and local system of firms. Two levels of reading are possible, the first essentially directed to aspects of method, showing how many of the instruments which can be used by an economist in concrete analysis must come out of a historian's drawer, the second showing how the definition of the particular features of a system of firms can be traced back to the history of that system.

The research is structured along the following lines. The first paragraph contains a general description of the scenario of the industrial micro-history, object of the research. The second is a detailed description of the functioning of the network sub-system, here represented by the sub-contracting system of an electronic company: MagneTek s.p.a.. After a brief description of the main characteristics of MagneTek we set out to define its relative importance in the context of output. Thus a detailed description of the sub-contracting system is given, showing the structure and the main real, financial and information flows running through it. We end with considerations on the relevance of this paper to the theory of the firm and its functioning.

1. The Scenario.

The object of our research is set within the local system of firms of the Southern Upper Valdarno (from now on simply referred to as Valdarno) whose definition as a local system is by now accepted

(ISTAT-IRPET 1986; CLES 1992). Within this local system attention is concentrated on the organization of production in the territory, consisting of a relevant sub-system with a large electronic firm and other small and very small firms only working on commission for the main one. A detailed description of these real, financial, information and social relationships reveals the special characteristics of this productive system and shows the capacity of the sub-system to adapt to the traditional (social and anthropological) characteristics of the area. The description, almost pedantic in its detail, is set off by reports on two other sub-systems of organization of production in the same area which have adapted in a very different way from the case which is the object of our research. It is however useful to begin by describing the scenario.

1.1. The scenario and factors of location of firms.

Upper Valdarno is a clearly cut out natural area and can be said to have a well-defined geomorphological and historical identity (Fonnesu-Rombai 1986). The administrative and statistical boundaries of the Valdarno area, however, do not coincide exactly with the geographic and economic ones of the Valdarno territory. The 14 communes of the district belong to two different provinces though geographers have agreed to consider it an entity characterized "by an economic and anthropic unity of its own" (Barbieri, 1972: 366). There isn't a real administrative centre nor a centre where administrative, cultural, commercial and productive activities are concentrated, these being divided amongst the most important towns in the plain, which form an uninterrupted built-up area between Levane and Incisa. This stretch of land (300-400 metres above sea level) was, up to the 50s, almost completely used for agriculture and

share-cropping. Most of it was, in fact, under share-cropping except for some areas outside the towns or in the mountains, cut up into small properties, which still exist officially though not effectively so, and didn't allow inhabitants to make enough to live on. Differently from other parts of the region, the areas above have not been affected by changes due to the end of the share-cropping system, in other parts followed by migration of peasants and consequent deterioration of the countryside. The region specializes mostly in vines and olive groves; the landed property is divided into small holdings except for some extensive farms, and it is customary for the inhabitants of this area to have a double income, deriving on the one hand from their agricultural, on the other from their industrial, activity. When, during the 50s, those living in the mountains left the land, agriculture was completely neglected. In the last few years, however, there has been a timid "return to their origins" on the part of people who had chosen to live in the towns in the plain but the houses are mostly second homes used for summer lets or for brief spells.

The road network in the Valdarno fulfils a most important function: it is in fact the axis of land communications of the entire peninsula, due to the presence of the motor-way and of the railway lines linking Milan to Rome. This is one of the important reasons for the location of the industrial plants even if Valdarno seems to have acquired its present characteristics for other concurrent factors of location. If we turn to areas where industrialisation started in earlier times we find them located in suburbs of the principal towns, in the plain and near railway stations. The present railway line follows the track of the line built between 1862 and 1866, joining Arezzo to Florence. Some industries as brick-works,

hydroelectric and thermoelectric plants, have been set up where raw material was present (lacustrine clays, the La Penna dam built in 1957 and the Levane dam built in 1958; lignitiferous deposit at Castelnuovo dei Sabbioni). In any case, and in relatively more recent times, the availability of land at somewhat lower prices compared to the big cities has more than compensated transport costs, favouring location of many productive plants along the motor-way belt. It must also be noted that areas bordering the motor way have been helped by regulations on depressed areas, designed to encourage growth of productive plants in the 70s. Many of these plants have recently changed hands and been restructured.

Of late, local regulations have played a very important part in location. An example is the area round Terranuova Bracciolini, which, since the second half of the 80s, has benefited from a friendly regulatory stance and the space to expand. Local government, in this case, helped the setting up of new plants not only by making bureaucratic regulations less restrictive but also by developing infrastructures in areas chosen for industrial development.

1.2. Productive structures.

Valdarno's main productive structure is not characterised by one prevailing kind of production. Its striking feature is a consistent productive differentiation with a distinct prevalence, as to local companies and workforce, of manufacturing enterprises belonging to many and diverse sectors (IRES 1994: appendix table 4).

Valdarno is not a Marshallian industrial district where factors of integration among companies determined by external economies, present

in the area, give rise to specialised production. As mentioned above, the growth of companies in the area, historically at least, has its economic justification in the presence of location economies tied to low costs of the land, which have more than compensated transport costs to the towns. On the other hand, this has not in any way set off a mechanism which in time might have favoured the growth of external economies such as might have created a well defined industrial area, as, for example, foreseen by a model of location of companies of the path-dependent type (Krugman 1991). It must also be said that low transport costs have not helped the development of well run, specialised services; Valdarno, in fact, has had to continue to gravitate towards Arezzo, and to a greater degree, towards Florence. The offer of low cost services in these towns explains the high percentage of industrial workers, higher, historically, than the provincial and regional figures, and the low incidence of "services" upon the productive fabric of Valdarno. On the other hand, differentiation of sectors has allowed Valdarno to overcome economic crises with no great difficulty and is considered by the Local Authority an element of "social" advantage compared to monoprodukt areas (AAVV 1992).

Besides sector differentiation, the main characterising factor in Valdarno is the very high number of small and especially micro-sized companies in every sector of production (CLES 1992; IRES 1994). In the course of the 80s some already fragmented sectors have become even more fragmented, seeing both an increase in the number of workers and a decrease in the average size of the company. We are referring to the footwear, building and electro-mechanical sectors. In all of them, as will be said in the following pages, the incentive to fragmentation has been

the creation of interdependence networks between companies, a fact this, seen to be a successful strategy to overcome the economic crisis of the early 90s.

If the existence of this close interdependence network between companies within one sector and between these and the territory is particularly interesting, then some doubts arise on the use of an empirical research which considers each company as an atomistic non-interacting unity. A recent study (CLES 1992) explores the Valdarno economy in the years 1985-1988, based on a sample of companies whose setting up "did not follow the usual statistical criteria [...] but resulted from a research aimed at discovering the more important and qualitatively more representative plants of the productive structure of the area" (CLES 1992: 51). These companies have been examined from the point of view of their economy and employment, the structure of ownership and management, the products, productive processes and markets. Compared to the above mentioned research our paper will try to throw light on particular mechanisms in the organisation of the system of companies which have somehow remained submerged but which cannot in any way be neglected. This also helps to show how many of what, at the end of the 80s, were considered problems, have since been solved using economic and social resources present in the territory.

1.3. The financial scenario.

An outline must follow of the financial scenario which forms the background of our research. It is fairly similar to the one drawn up by Flaccadoro and Pittaluga (1991) describing the financing of SMFs during the 80s, showing that: (i) SMFs are prevalently financed through forms of

indebtedness while bigger companies have drawn from internal funds and risk capital; (ii) the structure of liabilities of SMFs is seen to be extremely rigid; (iii) indebtedness towards banks on the part of SMFs has been the main form of financing. The financing of small companies in the province of Arezzo has been looked into by the Socio-economic Information Centre for the Arezzo province (Censis 1991). The resulting picture shows a growing demand for financial counselling services and for information on financial matters on the part of companies. However, neither local banks nor financial services networks, inadequately developed in the province, in contrast to elsewhere in the region, have been able to answer this demand. The Censis research project has shown a growing use of short term credit both for current management as for financing of investments and an increase of the weight of financial burdens on total cost, which penalizes the very small companies. Even when entrepreneurs find it difficult to get credit they don't seem to refrain from making new investments, turning to self-financing, to their estate and to family finances, or, if possible, to credit by long term public banks. Basically, however, the financial management of the company still seems to be mainly based on acquaintances, on common sense and on the wariness of the entrepreneur rather than on market supply analysis, even though it seems to reveal a certain capacity to analyse and to reassemble the supply of financial services on the basis of its needs. The local credit system appears to be on the defensive both on the subject of further guarantees required for the assignment of credit as on costs of financial services.

2. *The creation of a network subsystem: the electronic sector.*

Briefly, then, the scenario is characterised by (i) a long established location structure; (ii) a multisectorial productive structure, incapable of starting important external economies for the benefit of the companies, mostly small, operating in the territory; (iii) a substantially backward financial structure; (iv) a rather backward social structure, at least if compared to the standard represented by *Terza Italia*.

The network company, spread out in the territory, which we are analysing consists of the organisation of a large electronic company which seems to have succeeded in giving positive answers to the crisis of the early 90s, ably exploiting those very characteristics of the somewhat cultural, social, industrial backwardness of the region. Our working hypothesis has been that the company was successful in exploiting lowly qualified labour for technically avant-gard production; it has created a network of small companies, efficient at least for the purpose required, as we shall see later, while in other parts of the area the data on handicraft seem to show a distinct loss of competitiveness for small companies (Intercomunale 1985).

It is important to understand that this exploitation does not seem to be the result of "rational" plans on the part of the firm, but rather the result of the interacting behaviour, arising from different socio-economic traditions, of the components of the local system. The result, still in a process of definition, rather than answer economic or strategic rational criteria, seems to be the consequence of an adaptive behaviour of the

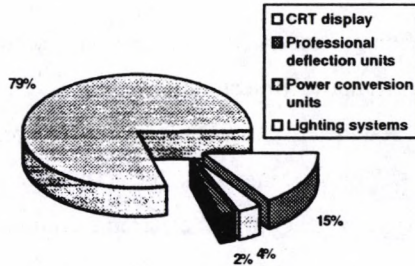
agents in the network. These, in fact, act according to cues they receive from other agents outside the system and, above all, according to the social and cultural traditions implanted in the territory. The key element in the interaction between the components of the network is the organization of production around a leading concern surrounded by a multitude of micro-companies, acting as sub-contractors, working exclusively in association with the main company. This fragmentation of firms and its accentuation can be explained by this type of work organization, which is, however, differently structured in the various sectors.

In Valdarno there are three different types of *façoniste* work organizations -different also if compared to the system of textile sub-supply analyzed in Modena (Lazerson 1991)- which have taken shape contemporaneously but in different ways and for different aims, adapting to the structural socio-economic conditions of the area. The three systems are found in three different sectors (electronic, footwear and building) in answer to different economic and technological incentives; this shows the flexibility and adaptation of the social structure of the area in the face of special productive needs. As already mentioned, our research describes the sub-contracting system present in the electronic industry and defines this system in comparison with that adopted in footwear manufacture and in building. This description is useful in that it shows how the strategy of a network of companies, with or without a leading concern, requires the adaptation of every single sub-system to traditional and social conditions "external" to production but within the area or the sector to which the network belongs.

2.1. MagneTek.

The leading concern in the electronic sector is MagneTek s.p.a. situated at Terranuova Bracciolini. MagneTek s.p.a. (from now on called MagneTek), founded as ARCO s.p.a. in Florence, in 1957, is at present part of the US group MagneTek Inc.. The group, amongst the leading world producers of electric and electronic equipment, with a turnover of 1,512 billion dollars, manages 52 plants in the US and 7 in Europe, for a total 18.000 workers. In Italy there are two plants, in Milan and Terranuova Bracciolini. The Milan plant has a workforce of about 135 while the Valdarno plant at Terranuova Bracciolini employs 540 and acts as the Italian headquarters of the group. The Terranuova plant, besides production, is the main seat of R&D and management. R&D absorbs 100 workers; another 100 are equally divided between production management, including contacts with external sub-contractors and administrative and accounting procedures.

MagneTek produces electric and electronic apparatus for civil and industrial use. This apparatus is generally characterized by high energetic efficiency and thus allows a considerable saving of electricity. As regards production in Italy, the Milan plant produces ferromagnetic reactors for lighting with fluorescent lamps and electronic transformers for high pressure (H.I.D.) gas lamps. The Terranuova plant produces commutation feeders, high definition monitors, electronic reactors and other electronic components for lighting technique, professional electronic apparatus and controls for asynchronous motors. The following graph shows the composition of sales per product segment, by MagneTek in the year 1991/1992:



Markets of destination of MagneTek products are those of information technology, civil and military telecommunications, biomedicine, lighting technique and protection against air pollution (electrostatic precipitators for neutralizing the particulate of industrial fumes). Amongst its customers are some of the major world electronic groups, such as IBM, APPLE, SIEMENS, NCR, OLIVETTI, Hewlett-Packard, and also FFSS, ENEL, Pignone, Alenia, Officine Galileo, SMA (Maritime Air Signalling), ITALTEL. The market of MagneTek products is thus the market of advanced electronics, characterized by continuous changes in products -the average period before renewal of MagneTek products is about 18 months- and by a limited number of competitors. The market is strictly monitored and production is mostly on commission. This, together with flexibility and the control of territorial organization of work, as will be explained in detail later, in the course of the past three years has allowed a progressive reduction of stores, with a system which looks like an interesting variation on the substitution model proposed by P. Milgrom and J. Roberts (1988).

The competitive strategic advantages of the company are, as expressed by the company itself, the high quality standard of its products, massive investments in R&D and price competitiveness, flexibility of productive processes, besides the direct manufacture of magnetic components of the product. Some of these competitive advantages, assumed as data, are also due to an efficient use of the family and social structure characteristics of Valdarno, obtained through the organization of work in the area. The following table shows some significant data taken from MagneTek balance sheets:

A synthesis of MagneTek's balance sheets (data in million lire)

	1989/90	1990/91	1991/92	1992/93
Total sales	82.426	78.853	128.500	145.000
Operational profit	5.673	4.634	9.071	11.500
Cash-Flow	8.811	9.381	15.969	17.500
R&D	2.166	2.275	4.405	4.400
Fixed investments	5.209	5.257	6.135	8.600

Source: MagneTek's balance sheets.

2.2. The impact of the MagneTek system on the productive structure of Valdarno.

The impact of MagneTek on the productive structure of Valdarno with special reference to Terranuova is considerable. In 1991 the plant employed 540 people, about 4% of industrial workers in Valdarno and 25% of the total number of employed in industry in Terranuova Bracciolini, that is 14% of the total workforce in the town. If we add on those estimated by the company to be the roughly 220 (out of a total of about 350) "official" sub-contractors in Valdarno we reach the figure of 5% employed in industry in Valdarno and around 30% in the town. As we shall see later, these data underestimate the MagneTek's effective

presence in the territory. We have mentioned the concentration of administrative functions, of production management, including contacts with sub-contractors, and of R&D, in the plant. From the point of view of the productive processes, the most complex phases of production are carried out inside the plant, as for instance:

1. assembly on board of components supplied by sub-contractors - only few sub-contractors hand over the finished product-;
2. board tests on the entire series produced;
3. tests on finished pieces;
4. heat tests to avoid "infant mortality" on 100% of the pieces;
5. quality control on items in clearance;
6. packing and despatch.

Externally, sub-contracting companies are entrusted with all the stages of the production process which require highly intensive processing or for which economies of scale do not allow automation inside the plant. As will become clearer later in the paper, MagneTek generally expects from the sub-contractor finished and tested pieces; in some instances, for components whose tests require particularly costly machinery, tests are carried out inside the plant. MagneTek, not wishing to receive faulty pieces, pays sub-contractors for them in advance, on the basis of statistics previously drawn up. MagneTek also decides the maximum price it will pay its sub-contractors: for this reason competition to reduce prices may arise, even if margins are minimal, between sub-contractors of the same hierarchic belt.

2.3. Structure of the system and real flows between companies.

The relationship between the leader company and its sub-contractors is represented by a tree structure. The term "first level relationships" applies to productive, financial and social relationships of any kind set up between the leader company and other companies, known as first level companies, working on commission for MagneTek. The term "second level relationships" applies to relationships set up between first level companies and subordinate companies, termed second level companies. By spread over the territory we mean all those relationships set up by sub-contracting companies of any level and the entire group of family/neighbours/acquaintances (FNA) with whom companies maintain non-formal and non-registered work relationships. The term contracting system indicates the entire system of MagneTek sub-contractors; the term sub-contracting system indicates the sub-system formed by a first level company and all the companies and FNA related to it.

Real flows between different hierarchic levels, shown in figure 1, consist in goods and machinery.

As to goods, flows towards inferior hierarchic levels consist in raw materials and semimanufacture (i.e. toroids, copper and tin or more generally, components); first level flows -those between MagneTek and first level sub-contractors- are naturally greater compared to lower ones; storage of raw materials is either inexistent or very brief; sub-contractors do not need to pay any guarantee money in order to obtain raw materials. These travel with advice notes, scrupulously registering goods in production. The registration only takes place between definite hierarchic levels and not between these and FNA. The system of management of

MagneTek storage is such that these flows are kept under control in real time and to allow recurring inspections in sub-contractors' workshops of the goods consigned to them. In effect, the characteristics of the goods are such as to render them almost unsaleable, at least on markets accessible to sub-contractors, so that the control organization does not have to deal with the problem of stealing of goods, as instead happens in the textile (Lazerson 1991) or footwear industries. Copper is an exception, but probably the expense of controlling and collecting rejects would be far higher than the losses due to possible stealing and to the rejects themselves.

Flows of returned goods towards higher hierarchic levels consist in finished products. Actually, different hierarchic levels generally correspond to different stages of manufacture, so that, for example, second level companies hand over products which may or may not have been tested; first level companies hand over products which have surely been tested. The FNA hand over to the company with which they are in contact, material which has not been tested. This is how the leader company gets its finished and tested products which it can assembly directly on board. Faulty pieces, as said above, do not reach MagneTek. In practice, the first level company acts as preliminary control filter on the quality of the product and guarantees the correct execution. It must also be pointed out that this control on the product is not only technical since, owing to the integration which characterizes the territory, the first level company exercises a social control on the execution of the work carried out by lower hierarchic level sub-contractors. This mechanism of control holds also for FNA and between companies of lower hierarchic

level and FNA. The delivery of a faulty lot is paid for in terms of the confidence that the first level company has in its sub-contractors. If this happens the latter see the risk, particularly worrying in times of crisis, of work being sent elsewhere. But delivery of faulty lots or failure to keep to delivery dates also shatters the reputation of the company: in case of crisis or reduction of work, the reputation of being a "bad worker" lowers the probability of finding work elsewhere in the area. Consequently MagneTek can boast a guarantee of the quality of their sub-contractors' products, the result of a mechanism of social control on production which is also hierarchic and technical. This mechanism is based on trustful relationships between companies and between companies and FNA, and moreover on the wish of companies and workers to keep up their reputation of trustworthy companies and skilled workers.

Let us now consider machinery. A first level company can receive on loan or buy from MagneTek machinery which is obsolete or slow or damaged. Once readjusted usually at very low cost, it can be put to direct use or lent informally to lower level companies. It is of course in the interest of companies of the first level to help the development of lower level firms - as this means an increase of production flow towards MagneTek, reinforcing its ties to its own sub-contracting system. A strong link between MagneTek and its own sub-contracting system means, for a first level company, an insurance against possible crises: a decrease in flow of orders will not undermine the stability of the company as the loss is distributed over the entire sub-contracting system.

The possible expansion of a sub-contracting company lies thus in the acquisition of the total sub-contracting of a certain product. It would

thus be possible to obtain margins of profit also by trading raw materials which could be bought by the sub-contractor himself on the market. This could, on the other hand, let him exercise a tighter control on conditions of payment -and so probably he could impose conditions of total advantage to himself- within his own sub-contracting system. This strategy is on principle MagneTek's favourite, and it tries to extend it to its system of contractors, who however offer a strong resistance. Among companies of MagneTek's contracting system the relationships of mutual trust and respect are unstable: the transformation of this system into one of efficient companies, the possibility of fixing prices on the part of higher, rather than lower hierarchic levels, is accepted because, realistically "we are all in the same boat". In effect, companies of different hierarchic levels are tied by bonds of solidarity which originate from a perception that their survival closely depends on the stability of the leading concern. With the emergence at the first hierarchic level of relatively autonomous companies capable of acting as leader in the management of a sub-contracting system can bring on a fragmentation of the network of relationships of solidarity and trust which keep the system on its feet, endangering its life. One of the causes can be traced back to sub-contractors' aversion to risk: the second level company would come to depend very closely on a generally small first level company, with an increase of risk in its activity, and this might persuade it to leave activity in the subsystem in favour of alternative and less risky work, usually salaried work.

2.4. Organization of work.

The chance for any sub-contracting company to create a sub-contracting system made up by other companies and FNA depends largely on a favourable setting, but also on technical characteristics of work required by MagneTek from its sub-contractors. As mentioned already, MagneTek tends to resort to external production of components needing high intensity processing or of those for which automation of production inside the plant would not be economically convenient. These products, however, are not generally of low technical level, but require many different stages of workmanship, often by hand. Let us consider, for example, the production of some electromagnetic windings. As we have seen, one of the strategic resources of MagneTek is to produce electromagnetic components in its own plant. Production of some windings is delegated to sub-contracting companies. In this case the productive process is divided up into various stages, of different work intensity: the copper thread must be cut, it must be wound round the toroid, the ends of the copper threads must be placed in a metal model of the circuit in which they will be inserted, the threads must be cut to measure, soldered, inserted inside a plastified container. The main plant, as we said, receives finished and tested products. The first level company receives finished products ready for delivery -sometimes for testing- lower level companies receive partly finished goods, and are responsible for some particular stages of the manufacture or of test procedures. Products of FNA are low level partly finished goods, that is to say, windings. The characteristics of this kind of work make it suitable to be spread out widely in the area. Though requiring some manual skill, it can

be carried out with continuous interruptions- the winding only takes a few minutes. The work can thus take place in spare time or during after supper gatherings. The raw material is not bulky, doesn't make any dirt and has a further characteristic which helps to avoid fiscal controls, it can be transported in the anonymous plastic bags distributed in shops.

The organization of the workshop is very simple, owing to the minimum encumbrance of the items and the possibility of working in a very restricted space. This, anyway, depends on the type of work carried out by the sub-contracting company and above all by the presence or not of employees in the company. While first level sub-contractors generally work in a small workshop, sometimes with bulky machinery, second level sub-contractors only need a garage; it is often the one attached to their house, equipped with an aspirator to dissipate the tin fumes in the open air. For FNA all that is needed is a large table and a few pairs of pliers.

It must be stressed that this type of work organization is well suited to certain characteristics of Valdarno houses. Apart from the historic centres of old towns, one of the distinctive features of Valdarno houses is the presence, on the ground floor or in the basement, of spacious rooms, sometimes even larger than those in the house above. During the 80s more and more houses were built with these characteristics as well as semi-detached houses. Here, the ground floor or basement rooms are not only used as garages but also as extra living space, and have at least a large kitchen and bathroom. Families spend most of their day in these rooms, so that in fact, there is no physical separation between the workshop and the actual house, which is to say, between work and home.

This very close integration between home and workplace makes the dividing line between work and spare time almost non-existent: the smaller companies do not have definite hours of work nor a clear cut separation between those employed by the company and members of the family, as all members of the family, when they come back from school or work, become workers for the company. One can generalize this picture for the whole productive structure of the area, at least regarding *façonistes* or family micro-companies, in the textile, footwear or electromechanic sectors.

Results of the 1991 census show that the average family in Valdarno has 2.9 members. But the family we refer to above is an extended one: usually members of the same family, more often parents and children or brothers and sisters buy apartments in the close neighbourhood, sometimes in the same estate of semi-detached houses. Less common but still recurrent is the decision taken by two of these families to convert only one of the two big ground floor spaces available to use during the day together, while the other is turned into a garage, again to be shared. In practice these families, statistically divided, spend the greater part of the day in a common house. The extended family often thus lives in the working place of some of its members. The place of work merges with the house of one or more families and becomes a meeting place for neighbours or acquaintances of the families. It is easy now to understand how, from this nucleus, work informally is spread out amongst FNA.

The following case is exemplary. It does not concern a MagneTek sub-contracting system but that of another small electromechanic plant operating in the area and so illustrates how typical in the area of our

research is the model of diffusion of work. In our case nearly all the *façonistes* in the company are located in a group of newly built houses. These houses are in a PEEP (plan for inexpensive housing) area whose building cooperatives, both "red" and "white", have built about 100 flats beginning from the end of the 70s. Some members of one of these cooperatives started, in the middle of the 80s, a cooperative of production and work which began first as *façonistes* for goldsmiths' companies in the Arezzo area. At the end of the 80s they started working for an electromechanical company, assembling switches, cables with plugs and other electrical products of large-scale consumption. Differently from gold, this production required a huge quantity of work whose difficulty was scarce or very scarce. It could also be carried out at home so that members of the cooperative had begun to ask other members of their family to join in the work. This included neighbours, over the whole PEEP area. As will be specified in the course of the paper, this diffusion was a kind of guarantee of survival for the cooperative and in fact it did survive, notwithstanding the sharp fall in flow of work commissioned by the electromechanical company. However it survived by completely cutting the work given out to families and also leaving many payments outstanding. On the other hand, its survival ended up by destroying not only the reputation of members of the cooperative but also the agreement-based largely on mutual trust and on face to face relationships- of the micro-society of dwellers in the PEEP houses. The survival of the cooperative of work -which now takes on work of another kind from another company producing plastic- was not considered an entrepreneurial success in times of recession. To have transferred to the

PEEP micro-society the cooperative's economic problems has turned an unfulfilled economic failure into a lacerating reason of conflict among members of the micro-society. They were suddenly faced with the destruction, probably irreversible, of the social cohesion built up through years of good neighbourhood.

2.5. The behaviour of deciding subsystems

It is probably useful, at this point, to describe the behavioural strategies of firms belonging to MagneTek sub-contracting system. In this description we consider only variables internal to the MagneTek sub-contracting system: that is, we only consider existing interactions between MagneTek and its sub-contractors. Hence the more important "visible" strategies in relationships between companies are basically two: the first is an index of the economic good health of the company: profit, ROI (return on investment) or whatever else for MagneTek, turnover for sub-contractors; the second is a trust variable: product delivery time. As regards profit, one must point out that it is assessed only from inside the sub-contracting system: an increase in MagneTek's profits is not interpreted in terms of greater efficiency and wider market penetration, but only as proof of the soundness of the whole contracting system. In effect we are dealing with a system of firms whose economic health totally depends on the health of a component sub-system which mediates relationships between sub-contracting systems and what is external to the system. That is, we are not dealing with an atomistic system of companies, perhaps of different sizes, but having the same power of regulation of the system. We are, instead, dealing with a system which has a main deciding sub-system, MagneTek, and sub-contracting systems

whose autonomous strategies of decision largely depend on MagneTek's decisions. The possible interaction between MagneTek's sphere of action and that of sub-contracting systems concerns few and definite variables: for the others, the main being the economic presence on the market, MagneTek is the deciding subsystem.

On the matter of delivery time, considered as an index of sub-contracting system efficiency, one must stress that this is enforced on the system by MagneTek. One of MagneTek's structural aims is in fact to shorten the time materials stay in store and at the same time to shorten the length of time goods employ to go through production. This means the time necessary to produce a product, from the initial buying of raw material to packing and dispatch. These two aims are a variant of the "just in time" and can be achieved only in the hypothesis of the good functioning of the sub-contracting system, so that, as mentioned above, MagneTek imposes very short times of delivery and insists on their being respected. Thus the variable "delivery time" on the part of sub-contractors interacts and adds its results to those seen for the increase of output: keeping delivery time over a period acts as a strategic variable in the relationship between the company and the sub-contracting system. With this structure of production MagneTek, in about two years, has been able to reduce the average time to produce an item, from raw material to dispatch, from about two months to about two weeks.

Work relationships established between MagneTek and the sub-contracting system, at least for the first level, are of principal-agent kind. We must point out that only for the first group of bigger (on average) first level companies, the agent receives incentives to carry out managerial

functions, which is not the case in the standard model. Thus, as will be shown further on, MagneTek not only intends to increase the efficiency of first level firms also to make sure there will be greater flexibility in production, but wants to share with them part of the company risk, especially concerning the purchase of machinery.

From a strictly formal point of view, relationships between MagneTek and first level sub-contractors are regulated by a procedure of qualification of the sub-contracting company. The process naturally starts with an application sent to MagneTek in which the applicant asks to become a sub-contractor for one or more products. MagneTek verifies the existence of certain conditions, also mainly formal, for the application to be accepted. The minimum conditions are those prescribed by law, i.e., that the company be legally constituted and that it have its own machinery/tools. MagneTek then checks the qualification of the company in terms of processing through its own inspectors and a questionnaire. Having concluded these formal and legal steps the company is accepted in MagneTek's sub-contracting system.

These formalities conceal a system of recruitment of first level sub-contracting companies in which a preponderant role is played by informal relationships of trust, as is proved by the fact, altogether not surprising, that many first level firms are run by ex-employees or relatives of employees, more or less directly. Naturally, and this is said once and for all, adequate technical bases must exist for it to be possible to establish the following procedures: the sub-contracting company must be technically equipped to carry out its work. The information MagneTek deems relevant for admission into its own sub-contracting system is thus

hierarchically structured: a first requisite is technical capacity; secondly, non-formal information, pertaining to the sphere of relationships of trust. These spheres of information are not separate: it would be unthinkable that in presence of positive information concerning, for instance, trustworthiness, a sub-contracting relationship is set up with a firm not technically equipped to undertake the task; on the other hand, a technically advanced firm able to undertake the task might be rejected in favour of another, with inferior technical capacity, but more trustworthy.

The real process of selection of new first level companies, underlying the formal one carried out by MagneTek, is left completely to the existing system of firms of the same level. We have seen that first level sub-contractors build up a sub-contracting system, based on relationships of trust or at least, on the reputation of aspiring second level sub-contractors, who thus end up by being assessed not only as to skill and disposition towards work but also as to moral conduct. In this way MagneTek delegates to lower levels the responsibility and the risk of choosing companies of lower hierarchic level and widens the sphere of possible relationships of trust. This system gives rise to a certain hierarchic mobility among companies and starts off the mechanisms schematized in the table below.

The table describes modifications in the relative positions in terms of "confidence in future work" (C), modification of the hierarchic position (H), dependence of higher level companies on the sub-contracting system of a subordinate (D), in the hypothesis of an increase in profit/turnover (or of respect of delivery times) of one of the companies of the system indicated in the first column. With +C we

indicate the increased probability that a sub-contracting company will maintain or increase its share of output. With +H we indicate increased probability that the company will effect changes for the better in its position in the hierarchic scale, in consideration that not all companies at level X are considered in the same way by the company at level X-1 on which they depend. With +D we indicate the dependence of the company at level X on the sub-contractor at level X+1 in terms of quality and quantity of the product.

Modifications in the relative position of firms in Magnetek contracting system.

	MagneTek	1st level firms	2nd level firms
MagneTek		+C	+C
1st level firms	+D	+C +H	+C
2nd level firms		+H	+D +C +H

The table shows that the increase in MagneTek's turnover means greater confidence for the entire sub-contracting system; that the increase in turnover of a first level company can modify its hierarchic position, increasing the confidence in work and dependence of MagneTek on the sub-contracting system of that company; lastly, that the increase in the turnover of the second level company increases the possibility for the company to climb to a higher level and come in direct contact with MagneTek; besides, it increases its confidence in its relative position among second level companies and its dependence on the company hierarchically above in its sub-contracting system. Naturally, the system's reaction times to output changes are not immediate, or rather, it may be possible for modifications in the position of single firms in the system to

be affected by obligations and viscosity in the course of time. For instance, it is unthinkable that a second level micro-firm can rise to a higher level in much less than 18 months; whereas an increase in its output modifies instantly and cumulatively its confidence status.

In the case of a decrease in output/non respect of times of delivery - or more generally, of economic difficulties in any of the firms in the system- the ratios illustrated in the table are immediately inverted. However, in this case, reactions to the system are immediate: failure to deliver, a weakening of the second level sub-contracting system -meaning an output decrease- are immediately transformed into a loss of confidence, degree of dependence and thus hierarchic position of the company in the sub-system.

2.5.1. The economic calculus of the sub-contracting firm.

As we have seen, the strategic objectives of firms belonging to the MagneTek's contracting system are: output increase and delivery time observance. These two conditions completely describe the behaviour of first level sub-contractors of a fair size and also the incentive system which allows agents to carry out entrepreneurial-like functions. In order to describe the behaviour of micro-firms of the same level and, above all, of inferior levels other elements must be added which will in the end describe in detail the economic calculation of a sub-contracting firm.

The calculation follows completely different methods from those established by standard economic theory. A micro-firm, in its calculations, only considers monetary cost proceeds, and acts maximizing net money revenue. **We are justified by results obtained thus far in research, in assuming that if we wished to calculate the budget of any

microfirm in the MagneTek system employing methods of calculation used for capitalist companies, that is, assessing the prices of market inputs which enter in the production but have not been bought on the market, the result would almost always show that the micro-firm works at a loss. On the other hand, if we do not take into account those elements for which no money investment has been required, the result would almost always show a considerable profit.** In the first case we would obtain a great exaggeration of costs, as we would have to value the quantity of work put into the firm at market prices. **The procedure to use would be to broadly assess the value of the work absorbed by production but not paid for in money, at its market price, assuming the hypothesis that if that work was obtained through the market, it would not modify current prices. But this hypothesis assumes that the owner of those inputs (labour) instead of using them in production, might have sold them on the market at current prices. This, however, is an absurd hypothesis for MagneTek's contracting system**: that work would not have been mobilized other than by that particular system of cottage work and is thus work not saleable on the market.

In the second case, if we do not include in the calculation elements not bought with money on the market, costs are reduced to a minimum (in the extreme case of an unregistered worker, costs are near zero). Money purchases of the firm as regards production are usually electricity, transport, some tools and machinery, book-keeping, taxes and insurance and pension contributions of the principals.

Lower level micro-firms or FNA hire labour not at market price, but at prices set within the MagneTek contracting system. Whoever hires

labour in that system decides its price. He does so knowing the price at which MagneTek hires its labour and well knowing that the labour he hires is otherwise not saleable by those who own it -specially in times of crisis-. **The estimate of costs is a reconstruction of the sum of losses determined by the productive process. Inclusion in this calculation of the money value of labour employed in production, but not bought**, or bought on the special market internal to MagneTek's subsystem, **can be considered a loss only if such labour could have been sold at the same price. But could it have been sold?**:

"to include amongst the costs the value of labour supplied by serfs would make sense only if, renouncing production, that labour could have been sold at that given price" (Kula, 1970: 37).²

This system of production which, as clearly suggested, resembles the work structure of the feudal system, results in benefiting MagneTek, with an increase in the flow of goods in entry at predefined costs while, at the same time, the loss and error risk falls wholly on firms lower in the hierarchy. Not only MagneTek, but no other company would be able to employ, even indirectly, the labour of FNA in the area were it not through the system of its sub-contractors. On the other hand, the sub-contracting company is interested in activating a flow of goods to be manufactured, much larger than the company itself would manage to manufacture directly: in the short run there will be an increase of money revenue and in the long run, an increase in the probability of survival of the company: in case of crisis and of flow of goods in entry the company

² The text between 2 asterisks (** ...**) is reproduced unabridged, with few adaptations from Kula's *Theory of feudal system* 1970: 35 and following pages.

will reduce the expenditure of the manufacturing account of its own sub-contracting system, thus making it possible to preserve minimum turnover, to allow it to survive.

This paper has so far described MagneTek's system from the point of view of the sub-contracting firm. The prospect from the apex of the system is probably different and perhaps the real situation is very different to the sub-contracting system that MagneTek proposes to manage. As said above, MagneTek has very tight times of delivery as, in fact, required by a "just in time" system. In reality, the fact of being distributed over the area brings on the typical intrinsic limits and viscosities of cottage industry. As MagneTek makes use of marginal work it does not have the availability of a reserve of work to be increased at will: the quantity of work turned out by each worker can oscillate towards a decrease, rarely towards an increase, as that worker has another main activity of work. Anyway, other activities are preferred to work at that price, or even at prices much higher than the firm can be willing to pay. This is the limiting factor which causes the wide distribution of work over the area. And it is this limit which has made MagneTek turn to other regions, such as Marche, Abruzzo and Veneto for its sub-contracting firms. Greater distances, however, mean higher transport and control costs, which is why MagneTek, applying the system described above, is trying to create a contracting system in the area, characterized by an entrepreneurship more marked than its present one. Our impression is, however, that the kind of distributed entrepreneurship which the management seems to envisage finds great obstacles especially in the

cultural and social characteristics of Valdarno and also in the thickening of the contracting system just outlined. The small entrepreneur who chooses to work for MagneTek is a classic example of risk-averse behaviour: working on commission for MagneTek is considered relatively reliable or at least as reliable as being hired by any private firm; besides, it requires a minimum starting capital making risks and credit exposures non-existent. A worker is motivated to work for MagneTek because he/she knows he/she can bring in the work of other members of his/her family, certainly not because he/she is being led by a brutish lust for profit. CLES (1992:121) found one of the factors of weakness of the development of Valdarno to be just this lack of planning and scarce propensity to risk on the part of entrepreneurs, and hoped that "a new generation of entrepreneurs" would take over. But the small entrepreneur knows that if he takes even a small risk (above all in terms of monetization of that risk) he can earn much more than he would if he were salaried. In order to do this, he can only depend on his working capacity and on that of those he trusts: in any case, people work more, as we have seen, only if they work for themselves and their family. This mechanism is at the same time the effect and the cause of the consolidation of a cultural hegemony, which Valdarno doubtlessly has, still anchored to a marked dominance of a social class, directly engaged in material production, so that the style of life the members of that class enjoy and pursue is tied to the material production of goods (Falorni 1992). One ventures to say that this local system of firms, well-disguised, is none other than the classic share-cropping model, having a low capital outlay on the part of the owner (MagneTek) and a very high intensity of

work on the part of members of the peasant families (the sub-contractors) for the accomplishment of an assuredly substantial production.

2.6. Financial flows between firms.

So far we have described the real functioning of MagneTek's system in terms of labour commodity flows and we have analyzed the economic calculations of the companies in the system. We can now pass on to an analysis of the financial flows between companies of MagneTek's sub-system. The general lines of the financing system of companies in MagneTek's subsystem do not differ greatly from those traced in the description of the financial scenario. Using the latter for comparison, we must point out two fairly important phenomena: (i) on the demand side, a clearly stressed risk aversion on the part of micro-firms at all levels; (ii) the emergence of substantial credit flows of short and very short period (generally 90-110 days) from micro-firms at all levels towards MagneTek through a system of delayed payments. The following description is limited to the reconstruction (1) of financial inflows relative to the sole sub-contracting system and (2) of the financial flows internal to MagneTek's sub-contracting system. Not included, of course, is the problem of MagneTek's financing on the credit market, which requires completely different instruments of research from those employed here.

2.6.1. Financial inflows in the sub-contracting system.

It is impossible to assess the total amount of financial inflows in the sub-contracting system but from what has been said so far we can order companies according to the volume of credit to which they resort and the type of financial instrument to which they have access. If the volume of credit is considered, the order reflects the hierarchy of the sub-contracting

system, in which first level firms generally resort to credit for higher amounts than those at lower hierarchic levels and make use of a greater variety of financial instruments, while FNA never fall back on credit, since their production costs, in effect, are limited, as shown, to the bare cost of labour.

The following table lists the financial instruments described more in detail further on, employed by the various firms (first level, second level, ..., FNA) in MagneTek's sub-system in order to have access to credit.

Financial instruments usable/used by a standard firm in MagneTek's sub-contracting system.

	Mortgage debt	Medium term credit guarantee consortia	Short period/commercial bill transactions	Commercial advances	Current account overdraft	Leasing
1st level firm	yes	yes	yes	yes	yes	yes
2nd level firm	no	no	yes	yes	yes	yes
FNA	no	no	no	no	no	no

The table contains all the financial instruments used over the years by firms related to MagneTek; this, however, does not imply that every firm working at a given time has run up debts employing each one of the various instruments nor does it mean that every firm in the system has at least once in the course of its activity resorted to each of those instruments. The table only shows the real possibility, verified over the years, of having access to credit by means of various financial instruments.

Clearly FNA, as illustrated above, has no necessity nor propensity to run into debt in order to carry out its activity. The same disinclination is found at all levels of sub-contracting. The initial capital necessary to join

MagneTek's sub-contracting system -and entry, as said, generally takes place at low hierarchic levels- is of no great size; so entry does not necessarily require access to credit. This also applies to the normal administration of small family firms. On the other hand, however, second level firms are compelled to take out short run debts from banks, both to be sure they will have elasticity of cash through current account overdraft as to be able to have advance payments of supplies, according to the mechanism described later on. Less often a second level firm resorts to leasing to buy machinery. Recourse to credit is in fact shown to be necessary only in certain periods of a firm's activity, that is, when investments in machinery are needed in order to rise from a lower hierarchic level to a higher one or when the company is keen on keeping or gaining important and lasting commissions. In exactly the same manner first level firms, besides forms of short run indebtedness indispensable for current management, can resort to leasing or medium period debts through credit guarantee consortia for the purchase of machinery, generally with a view to increasing MagneTek's dependence on its own sub-contracting system. Precisely this kind of motivation was behind the biggest investment known to us (about 250 million lire, in 1993) when a first level firm bought a special welding set.

It is clear from this description that the channels of access to credit are essentially the local banking system and, for the purchase of machinery, leasing companies. We must also mention, and will later illustrate, the role played by credit guarantee consortia and by facilities granted by Artigiancassa (Artisan fund). This is a similar situation to that

registered by Censis (1991) in the Arezzo province and summed up in the following table.

Industrial and artisan firms in the province of Arezzo according to sources of credit to which they resorted in the Years 1988-1991(%).

	Artisan firms	Industrial firms	Total
Ordinary short-term	50.0	90.7	71.3
Ordinary medium long	9.0	20.9	15.2
Special/subsidized	25.7	19.8	19.5
Leasing	21.8	15.1	18.3
Artisan fund	35.9	1.2	17.7
Other	2.6	5.8	4.3

Source: Censis 1991: 79 tab. 39.

We must underline that the role played by local banks and by leasing companies is greater in MagneTek's system than in the province as a whole: local banks and leasing companies, in this order of importance, are in fact the sole lenders for sub-system companies. We wish to point out that in the course of our research we have found no evidence in favour of a hypothesis of company financing through other companies or through the definition of sub-contracting and credit relationships, of the kind analyzed in the context of industrial districts (Dei Ottati 1992). The only two known cases of financing obtained by small firms through channels other than banking and leasing are external to MagneTek's sub-system. They are (i) financing through money-lenders, a profession which has died out with the physical death of the once locally well known characters who carried it out, lending money at extremely high interest and to whom especially tradesmen and artisans turned in cases of extreme difficulty, especially up to the middle of the 1980s; (ii) a system of financing between firms limited to catering, in particular to

cafés. It is customary in this sector for the company producing or distributing coffee, to lend part of the starting capital (a figure between 40-70 million) necessary to buy a café or to set it up at generally higher than market charges interest and furthermore, for exclusive supply over a stretch of time, usually lasting beyond the settlement of the debt. This financing system can be explained if one considers the special nature of factors concerned, such as the need for considerable sums of money to buy or open a café, the fact that the whole sum needed is usually collected from various lenders and that, owing to the low social and economic level of the prospective owners of cafés, access to bank credit is strongly limited.

2.6.1.1. Leasing.

We have seen that leasing is the financial instrument generally used to buy machinery. Differently from Modena's textile sub-contracting system (Lazerson 1991), leasing is almost never leaseback. Leasing contracts are stipulated through banks or preferably through private companies. It is usually the company which produces the machine tool, tied to the leasing company by contract conventions, that introduces the customer to the leasing company. The leasing company buys and at the same time stipulates the leasing contract with the user. The above mentioned Censis research shows that 24.7% of the Arezzo companies had stipulated leasing contracts, during the two years before 1991, for the realization of investments (Censis 1991: 76 tab. 36); this percentage rose to nearly 30% for artisan firms and went down to 20% for industrial firms. As the two following tables show, there is a fairly differentiated

behaviour between industrial and artisan firms as regards the number of leasing operations and the total they amount to.

Artisan and industrial firms according to the number of leasing operations (%).

Number of operations	Artisan firms	Industrial firms	Total
1	54.8	42.6	47.4
2	19.4	12.8	15.4
3	16.1	12.8	14.1
4-5	6.5	19	14.1
over 5	3.2	12.8	9
Total	100	100	100

Source: Censis 1991: 78, tab. 37.

Artisan and industrial firms in relation to the total amount of leasing operations between 1988 and 1991 (%)

	Artisan firms	Industrial firms	Total
up to 30 million	41.9	17.8	26.7
31-50 million	19.4	11.1	14.4
51-100 million	22.6	26.7	25.0
101-200 million	12.9	22.2	18.4
201-500 million	3.2	11.1	7.9
over 500	-	11.1	6.6
total	100	100	100

Source: Censis 1991: 78, tab. 38.

Artisan firms in the province seem thus to resort to leasing operations more cautiously and for lower amounts in comparison to industrial firms. This scenario represents a kind of maximum limit for leasing operations in MagneTek's sub-system. The sub-system is in fact made up almost entirely by artisan firms, and furthermore, by artisan firms not needing or with very much less need, for reasons shown above, compared to other productive sectors in the province -as goldsmiths, textile and footwear- of financing for investments.

In any case, when there is need of investing in machinery a clear preference is shown for the purchase of goods through leasing contracts rather than with capital owned. There are various reasons for this preference:

(i) leasing expenses can be registered as costs in the enterprise accounting, thus making it possible to save even large sums on taxes;

(ii) as small firms are family run, the preference for leasing operations in the case of investments, even when the firm itself would be able to finance them, can be explained by a preference for liquidity on precautionary grounds;

(iii) to have ready money means being able to avoid resorting or resorting less often, in case of possible need of cash, to overdrafts, whose rates are generally equal to leasing rates or even higher;

(iv) other reasons are inspired by speculation. A common behaviour of owners of small firms is to buy government securities which are deposited in a bank under their own name, not the company'. Interest on these securities added to tax saving mentioned above are, in some cases, enough to cover interest allowed due to leasing;

(v) buying government securities, other securities or simply making a bank deposit in a current account can considerably affect the volume of credit the firm manages to operate. According to normal procedure, securities held personally are offered as guarantee to take out other loans from the bank on behalf of the firm. It is thus feasible to obtain credit on real security not otherwise obtainable by the company.

2.6.1.2. *Bank credit.*

A clear preference is generally noted for the purchase of financial products from banks. Recourse to the private sector is rare not only since costs are higher, but also because the private sector is not trusted: this solution is sought only if it is impossible to turn to a bank, i.e. when a firm is undergoing severe financial difficulties. Banks, in fact, are considered solid and secure institutions, unlike private companies whose activity cannot be controlled and whose image is indistinct (Censis 1991: 86-105).

The instruments through which the firms in MagneTek's sub-contracting system obtain bank credits are (1) long-term credits (over 10 years) similar to mortgages; (2) medium-term credits (from 36 months to 5 years) also actuated through credit guarantee consortia; (3) short-term credits (under 12 months) actuated through exchange transactions on real security; (4) very short-term credits (under 6 months) through bankers' commercial credit transactions; (5) current account overdraft.

Long-term mortgage-like credits are generally taken out to buy or build property, mortgaging the property itself. The purchase or construction concern both property strictly for industrial use and houses which include a laboratory. As to artisan firms, part of the loan is often covered by grants from Artigiancassa (Artisan fund). Very rarely does the bank grant long-term loans without resorting to a mortgage on real property and limiting itself to exercise a privilege on the machinery.

Medium-term credits are thus taken out with operations which pass through purchase consortia or credit guarantee consortia. These consortia

operate through the establishment of compensation funds made up of contributions from associated firms and promoting institutions which back them financially. The consortia assure a partial covering of losses sustained by banks in the convention, due to insolvency occurred to associated customers in their trust. They are generally established as limited liability cooperative societies and they depend on productive sectors (industrial, commercial and other credit guarantee consortia) as well as analogously, on cooperatives and political associations (in Valdarno there are "white" and "red" credit guarantee consortia). The procedure followed to obtain loans through credit guarantee consortia is the following. An entrepreneur joins a credit guarantee consortium meeting some initial registration expenses; he then applies for a grant indicating the sum and the supporting bank; a special commission from the consortium approves, reduces or rejects the request of a grant. If the request is accepted -and it generally is-, it is sent on directly by the consortium to the bank indicated by the entrepreneur. The consortium generally offers guarantees for half the amount of the loan; the other half is covered by the entrepreneur himself. If the loan is not repaid the bank recovers its loss as follows: 50% of the sum from the entrepreneur, the rest from the credit guarantee consortium. Each member of the consortium is generally responsible for a maximum of 10% on the maximum lending fixed by the statute. The wide diffusion of this type of instrument results clearly in the Censis research (1991: 100 tab. 68): a good 30% of the firms interviewed has resorted to credit lines established through credit guarantee consortia. Please note that this figure is made up of 50.6% of artisan firms and only 10% of industrial firms.

As regards short-term credits, they are actuated by banks through IOUs or real security. It is impossible to have access to short-term bank credit if not through these two mechanisms. It is standard, consolidated practice for loans to firms to be guaranteed by deposits in banks of securities in cash belonging to entrepreneurs, following the mechanism described above in the section on recourse to leasing.

Very short-term credits -banker's credit as defined by lenders- are granted by the bank as advances on sums that the applicant for a loan proves he will cash in the near future. In this case the bank requires many kinds of documents, from invoices to order vouchers. MagneTek mostly makes use of this type of financing for firms; it is similar to mechanisms of deferred payment described further on. Rates of interest paid for this type of loan oscillate around a level 5-6 points higher than the official discount rate.

Lastly, overdrafts, which represent, together with advances just mentioned, the most common form of temporary indebtedness among small firms in MagneTek's system but also the most costly. Current account overdrafts allow firms to have a minimum flexibility of cash necessary to operate. The fact that credits used most frequently are also the most expensive favours the establishment of those mechanisms of preference for cash described above.

2.6.2. Internal financial flows.

A second series of important financial flows totally internal to MagneTek's sub-system, shown in figure 2, concerns instead a tacit system of raising short-term credit which allows MagneTek to receive a considerable flow of "real" loans from all those participating in its

contracting system. Since the contractor is paid at 90 days a financial flow is started from micro-firms as well as from FNA towards MagneTek, a flow which is renewed monthly and is paid at zero rate. Besides, as we have seen previously, most firms in the sub-contracting system resort to banks to obtain advances on those payments, at interest rates which can be very high. With this procedure MagneTek succeeds in collecting through its sub-contractors important financial flows, not only at zero cost, but which can only be actuated through the group of sub-contracting firms. The financing should not be less than 600 million a month, according to calculations largely based on supposition.

In practice, as will be set out more clearly later, this financial flow depends wholly on MagneTek's hegemony on its contracting system, and has increased since the early 90s when micro-firms found it more and more difficult to find possibilities of work alternative to MagneTek's sub-contracting. On the other hand, this short-term financial flow is typical of sub-contracting systems in which sub-contractors have no chance of working for more than one contractor company. In Valdarno this system has reached perfection, for example, in the footwear sector. Crisis in the sector in the mid 80s due to the loss of competitiveness on USA markets to which almost the whole Valdarno production was sent, brought a very large number of small and very small firms in the sector on the brink of bankruptcy towards the end of the 80s and the beginning of the 90s. Since then, new companies have emerged in the footwear and leatherwear sector, whose market share is now consolidated, producers of high quality goods. In this case, small and very small firms which in past years had enjoyed direct access to the final product market have had to

accept the role of *façoniste* for the medium-large companies. The strong position of the latter on the market has continuously reinforced their capacity to fix prices, conditions and time of payment of supply from *façonistes*, favouring a widespread system of payment at 90 days from dispatch, which, considering times of manufacture in the fashion sector, means 180 days from production. Besides, in this kind of work, *façonistes* advance not only the work, but also the raw material and accessories necessary to production, making the financing flow even more consistent. Some family run footwear firms last year accepted to go on working even to the limit of operating loss so as not to preclude a future possibility of work for the contracting company.

When leading concerns do not hold this enormous contracting power there is no trace of such financial flows. This applies to the building trade in Valdarno. *Façonistes* are resorted to, in this case, only for strictly economic reasons, since it is impossible for a medium-small building firm to possess all the necessary equipment, for example for the transport of earth, or employ skilled workers in certain stages of production (plasterers, stucco-workers, plumbers etc.). In this case the relationship runs between a plurality of medium-small firms none of which has important competitive advantages. Here the payment of *façonistes* takes place when the work is completed: in cash or by cheque, maybe post-dated by a few days. The interesting thing is that up to the second half of the 80s this was the most common system of payment for *façonistes*. When between the end of the 80s and the beginning of the 90s leading concerns began to emerge in a position of hegemony, in sectors such as electronics and footwear, the result was the setting up of

important financial flows from small companies to leading concerns which normal statistical indicators are not able to detect.

2.6.3. MagneTek's role in the financing of firms in its sub-contracting system.

We have seen that MagneTek wants to promote a greater entrepreneurship and productive capacity in its contractors, spurring them on to automatize production processes and encouraging them to buy machinery. Thanks to this mechanism MagneTek has succeeded in sharing investment risk in automation with a plurality of first level firms and guarantees the system a greater financing flow than it could itself provide. The situation is thus completely reversed compared to what cross transaction theory foresees in industrial districts (Dei Ottati 1992).

In industrial districts, relationships of personal acquaintance and cooperation which in time become crystallized into a Marshallian capital of trust, give rise to privileged relationships between operators: two or more operators who trust each other will tend to finalize as many contracts as possible. As the building up of trust relationships needs expensive steps, on the part of operators, to make their qualities known and hence an investment in trust capital, privileged relationships between operators provide an effective way to reduce transaction costs. Privileged relationships concern not only an extension in time or the renewal of transactions but also the setting up of cross transactions. One of the most characteristic forms of cross transactions existent in industrial districts is that between sub-contracting and credit. The network between sub-contracting and credit creates an informally organized structure in which the entrepreneur-creditor takes part personally and directly at the

risk of the investment not paying itself back, giving rise to what is in effect an implicit company. The cross credit granted on trust seems to be an expedient in the organization, suited to reduce the risks, for both parties, connected with the hazards of conditions on the local sub-contracting market (the terminal firm has a kind of right of pre-emption on the sub-contractors' products in times of heavy demand; for the sub-contractor trust is at stake; the same is true for the terminal entrepreneur who cannot leave the sub-contractor to his fate in times of crisis without risking his reputation in industrial district). The network between sub-contracting and credit favours the specialization of terminal entrepreneurs, generally already established, who operate in the fields of trade, raw materials procurement and credit raising. This specialization entails asymmetric information on production conditions for terminal entrepreneurs and sub-contractors. Their respective competence is necessary to estimate investments and to choose projects according to the expected return. This way, direct financing (without intermediaries) becomes an important method of external financing of firms, even if this does not mean that bank credit and intermediation are negligible. Bank credit as well is affected by the atmosphere of industrial districts: for here also, having personal economic relationships and the stability of operators in the area are important elements. In fact among the best known bank customers are terminal entrepreneurs who succeed in obtaining bank credit with relative ease, both directly and as intermediaries of contracting entrepreneurs for whom they sign guarantees. In industrial districts, therefore, a double financial intermediation is formed: the bank's and that of other entrepreneurs accredited to the bank.

The latter feed a secondary loan market. The consequences on supply and on credit allocation of this double intermediation, at first sight inefficient, are positive. This way problems of adverse selection and moral hazard which are often the first cause of the various instances of credit rationing can be overcome, thanks to information asymmetries between lenders and creditors. From the point of view of allocation, information asymmetry between banks and firms are eliminated through the terminal entrepreneur. In the context of industrial districts double intermediation is a mechanism of organization which in normal circumstances helps liquidity flow to the companies of the system.

The situation in MagneTek's sub-contracting system is completely different. Besides not starting relationships of credit with the firms of its sub-system -even if sometimes it loans out machinery- it does not act, or it does only to a very slight degree, as intermediary between firms and banks. As we saw above, the situation is reversed: companies of the sub-contracting system guarantee short-term financial flows, sometimes consistent ones, from the companies themselves and the credit system to MagneTek. MagneTek's role, given its position of predominance on the labour and financial Valdarno market, is limited to facilitating access to credit to its mostly first level sub-contractors. This means that MagneTek only writes a letter of *patronage*, guaranteeing that the company applying for the credit belongs to its sub-contracting system and that MagneTek undertakes to buy a set quantity of semi-finished goods for a set period of time from that firm. This letter is very important for companies wanting access to leasing or association to credit guarantee consortia. The letter has much less importance or none at all as regards the banking system:

banks in fact, require real or personal guarantees on a loan which MagneTek does not formally provide. Admittedly, to be MagneTek's sub-contractors at any level, is the same as having an informal guarantee of solvency of the debt, also as regards banking companies; this guarantee, however, is not more important than questions of trust concerning a loan applicant, such as personal acquaintance, reputation amongst entrepreneurs or, more generally, a reputation of being a good worker.

2.7. Information flows between firms.

A precise information hierarchy exists also in Magnetek's system though it does not coincide with the one commonly found in industrial districts. In industrial districts "the pure entrepreneur behaves thus: on the one hand he carefully observes the trends on the world market of products in his area and on the other, he is continuously trying to get more information on the productive capacity of his area and its socio-cultural entity. His specific function lies in translating in terms of products saleable on that market all the potentialities contained in the historic fabric of the area" (Becattini 1991: 57). Lombardi (1994), by translating into theory of information terms the concept of "pure entrepreneurship", claims there is an information hierarchy based on the distinction between technical-productive information and information related to markets acquired in a different manner (formally in the field, informally in the area) and diffusion (greater pervasive fluidity towards the area). Information flows are mediated within the district by ongoing interactions between companies; the pure entrepreneur instead, acts as a

filter towards the external scene, not directly visible by the companies in the area.

In MagneTek's system the information hierarchy is a consequence of positions assumed by the leading concern and does not stop at the distinction between market information and information relative to productive processes. MagneTek's system also includes information flows concerning the trustworthiness of the firms in the system and control of the trustworthiness itself, as shown in figure 3.

We must point out that differently from what happens in the area, the hierarchy of productive levels, in this case, gives rise to a complex filtering of information in which the same scheme of flows in entry and exit is repeated at all hierarchical levels. As one proceeds toward lower hierarchical levels the quantity of information exchanged is smaller and its quality undoubtedly worse.

Information flows from outside to inside the system and back are filtered and elaborated by MagneTek. MagneTek, in fact, acts as the central unit answering in terms of product and market strategies to incentives from outside and in terms of production organization and control within the system. In order to optimize the latter function MagneTek must possess data relating to the productive capacity and the trustworthiness of its sub-contracting system. This information is given in reduced form and selected by first level firms, who translate in terms of productive capacity and trustworthiness the information coming from the lower levels of the system. Therefore, the kind of information filtered by first level firms is, downwards, parametric technical-productive information and upwards, technical-productive information limited to the

productive capacities and relative to the trustworthiness of sub-contracting systems. Lower level companies, in their turn, see the repetition of this scheme of signals in entry and exit so that the whole area is covered with an information network which directs downwards essentially technical-productive information and upwards, inbound technical productive information, relative to the trustworthiness of sub-contracting systems. Each company at every productive level thus acts as a filter for information to and from its sub-contracting system.

As already said, technical-productive information flows are less in number and less complex as one proceeds towards the base of the structure. MagneTek sends its own technicians to the workshops, teaches how to use the machines for production and tests and provides an ongoing assistance only to the first hierarchic level. First level firms, in their turn, follow the work of second level firms and the latter control the FNA system. The number and complexity of information flows is thus directly correlated to the quantity of productive stages carried out by firms and to the complexity of the work they accomplish.

Information flows from inside towards MagneTek, instead, become richer and more synthetic as they are filtered by higher hierarchic levels. As regards the trustworthiness of a sub-contracting system information reaching MagneTek essentially concerns the kind of product supplied by that sub-system, the minimum and maximum quantity it can supply in a definite time and the trustworthiness of that system. This information comes to MagneTek directly from the first level filter. But this filter receives much more complex information concerning the times of the whole sub-contracting system: the quality of this information is not

homogenous since it is not only strictly connected to production but also to the state of health or reputation of FNA. In other words, first level firms formalize for MagneTek information flows inside the system, which in lower levels have a high degree of fluidity and informality.

3. Final remarks.

The analysis of MagneTek's sub-system can help to formulate interesting considerations from the point of view of the theory of the firm and from a strictly methodological angle.

From the point of view of the theory of the firm the example of MagneTek can probably be considered an important innovation in organization, in the range of groups organized according to a multidivisional structure. Chandler (1977) characterizes a multidivisional company by the presence of operational divisions, set up according to product line or geographic location, in which the various functions are at once present; the divisions are run by managers controlled as to profit by the general management, in charge of deciding long-term investments and allocation of resources. According to Chandler the aim of a multidivisional company is not so much maximum profit, as the growth of the size of the company, connected directly to a reduction of costs of production and distribution. The emergence of a local network sub-system favoured by MagneTek's action is an unforeseen variant in the strategy of a multidivisional company. Beyond the group's organization it is interesting to note how the firm manages to interact locally in the field of production, finance and information by operating on

local variables. And also how the local context orientates the organizational and productive strategies of the company setting not only production and financing restrictions but also objectives.

In point of fact, this research has lead us to discover, within the intermediate level between micro and macro economic analysis, represented by the notion of a local or territorial system of companies, a concrete case of a further sub-system, largely self-regulated, showing precise channels of communication with the local system of which it is part. We have tried to show how this sub-system can be at least partly described with the help of some of the instruments set up by industrial district theorists. We have stressed that the system is characterized by a plurality of maximising behaviours by firms, different not only between MagneTek and its sub-contractors, but also between sub-contractors belonging to different hierarchical levels, and even between sub-contractors in the same level but different in size. We have shown that MagneTek has set up principal-agent relationships with first level firms and how this element provides and furthers the possibility for the agent to carry out entrepreneurial functions. Lastly we have pointed out that also the economic theory of the feudal system can come in useful to describe work relationships existing within that system; and also how other sub-systems structured in the past follow orbits very similar to those described in detail in our analysis of MagneTek. What is striking is these systems' capacity to adapt "historical" structures in the area, such as reminiscences of the share-cropping system and cottage industry, to the needs of production, with a considerable variety of forms and variables. Fundamentally one gets the impression that these are old structures,

which have survived by adapting to changing economic conditions and productive technologies, with an enormous capacity for responding to exogenous shocks in a brilliant manner and in a short space of time. And in effect, in each part which is a section of MagneTek's sub-system we have found an unusual mixture of old elements (cottage work organization, family partaking in work etc.) and modern elements (the use of electronic machinery, the "just in time" system etc.), between technology and modern information (in connection with work and tests on the quality of products) and information and old-type control (the reputation and moral assessment of workers which outline a system of social control similar to that in a feudal society). Naturally none of this would be important if the impact of this mixture of old and modern elements did not make itself felt on the economy. But, as we have seen, it is precisely this overlaying of different spheres on top of the truly economic one that produces the special, effective system of organization of production in the area.

In this sense we can bring to its conclusion the method we mentioned at the beginning. Where systems of firms are concerned the basic unity of analysis is the firm, which operates within the particular industrial atmosphere of the system, with all the consequences in terms of coordination of specialized activities, overlaying and intersection of markets. If the community and firms tend to interpenetrate and the markets to intersect and overlay, then atomistic statistics are not able to capture the modes of functioning of the private micro-institutions which come into existence. It is difficult, for example, to measure the capital of trustworthiness of a firm: investment statistics are not able to quantify it

even if it represents an investment in intangible activities, similar to trade-marks or R&D expenses; the same can be said for expenses which go into its building up and which do not appear in the firms' budgets. Such difficulties stem from the nature of the process we have analyzed and are very similar to those found in the history of technology and innovation. The introduction of the notion of path-dependence has brought about a revival in narrative techniques amongst economic historians: notwithstanding the mathematical sophistication of theoretical models, the only way to capture the real unfolding of events has proved to be a historical description -witness the famous case of the QWERTY keyboard (David 1988)-. Now, the introduction of notions of, for example, trust, reputation or, as described above, degree of trustworthiness of companies in MagneTek's sub-system and of their dynamic building up in time, can in fact be dealt with as a path-dependent process: the building up of trust follows a dynamic process in which the impact of past events determines the present and future outcome of the process. For a company, to have built up a certain degree of trust does not mean it has won it for ever: incorrect behaviour or erroneous forecasts can make the company lose it, though it can naturally regain it if in people's memory past behaviour is forgotten. A theoretical representation of these processes is possible, both in terms of a stochastic process or repeated games under conditions of uncertainty. However, the fact remains that the only concrete, empirical instruments available to describe real processes of this kind are description or narration or, alternatively, history.

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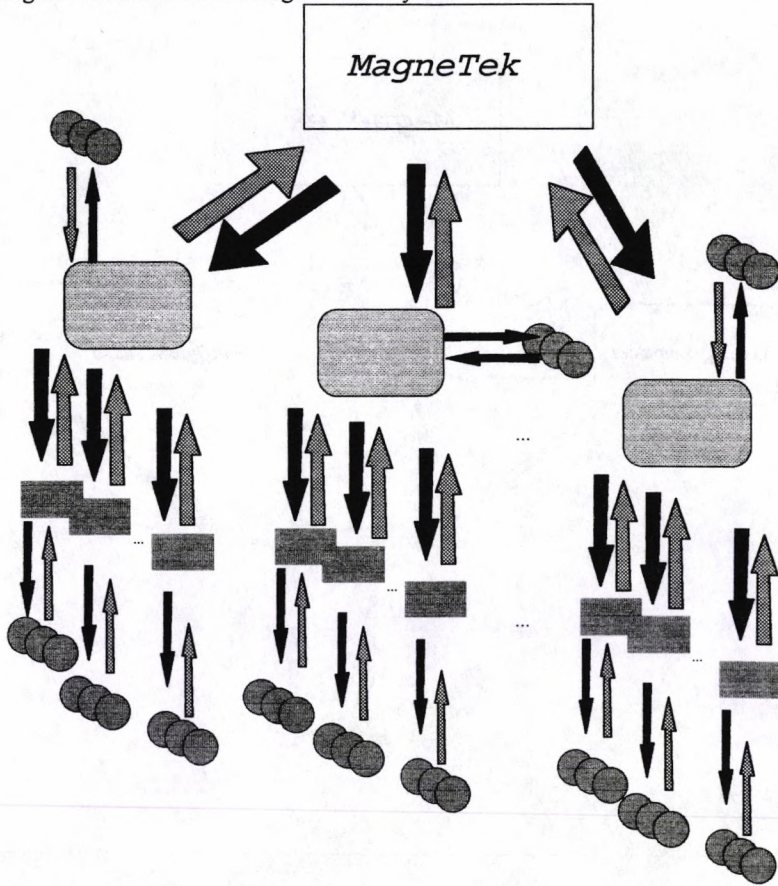
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Figure 1. Real flows of the MagneTek sub-system.



Real flows: components, machinery.

Real flows: semi-finished and finished products.



First level firms.



First level FNA.
Second level FNA.

Thickness is proportional to the size of real flows.

Figure 2. Internal financial flows of the MagneTek sub-system.

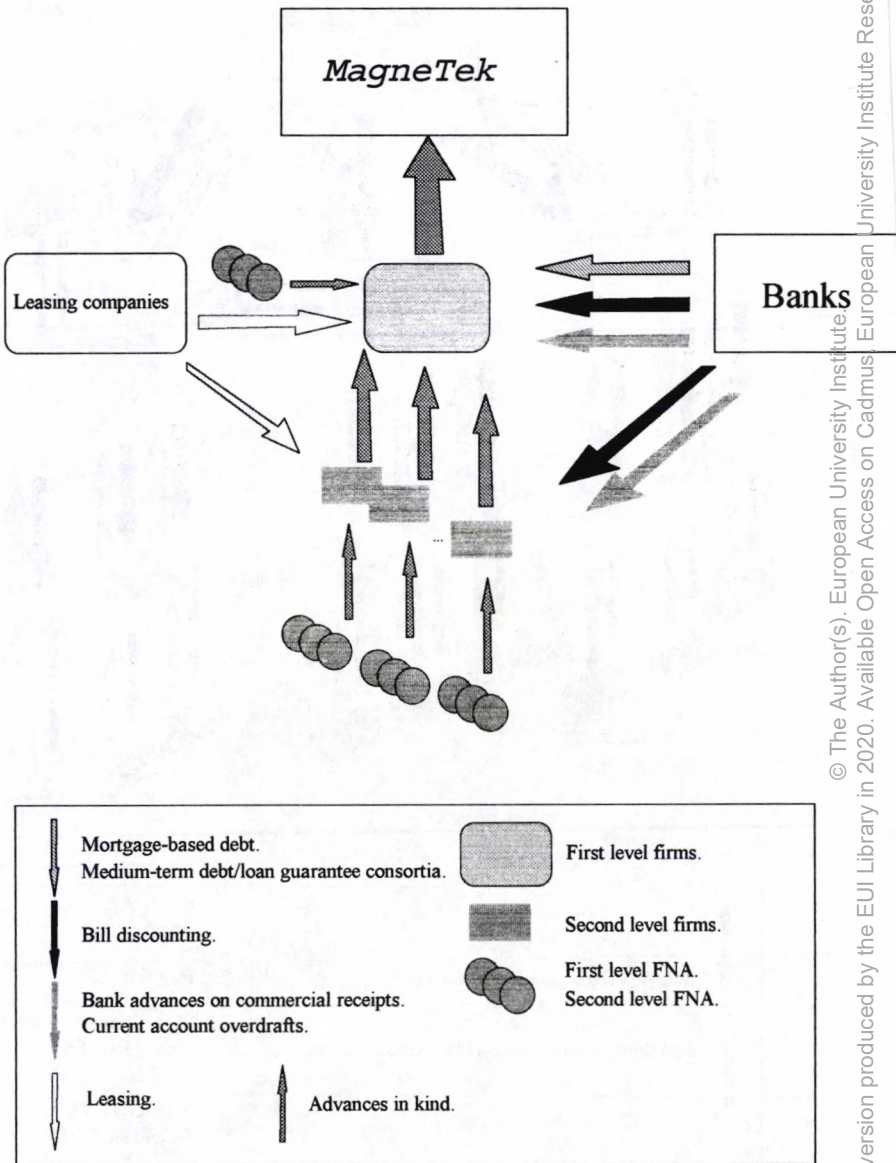
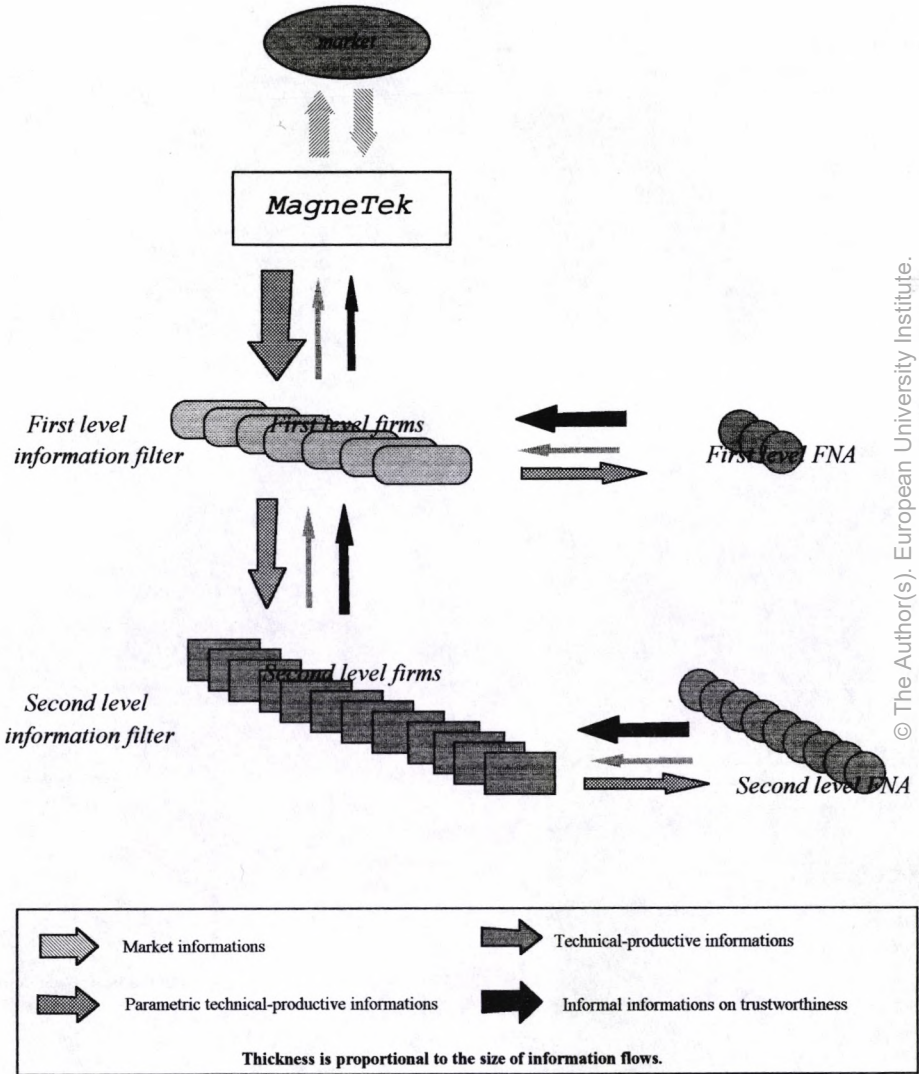


Figure 3. Information flows of the MagneTek sub-system.





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