

Districts on the verge of an organizational breakdown: the Flexibility versus Cooperation trade-off

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Abstract

Recent year witnessed the emergence of serious threats to the industrial districts model in Italy and in other developed countries due to the increasing relevance of international competitors with lower production costs. The reaction to such a threat has been twofold: on the one hand most Italian producers have focused their production on the highest part of the quality ladder (limited quantities for sophisticated consumers), on the other hand several districts have radically transformed their organizational structure moving from a flat, “fully-connected”, local structure to a more hierarchical less dense structure, where local relations are sometimes dropped in favour of international outsourcing of basic production phases.

The role of major firms within the district has increased in such a way that sometimes it is doubtful that we can still speak about an industrial district since, traditionally, the main strengths of this peculiar form of organization of production lies in the capability of many firms to cooperate/coordinate while staying autonomous and not merging in a unique large corporation.

Such a strength is based on the stability of the relationships between the different subjects, which allows to develop localized social capital as generalized expectations of cooperation. This situation is increasingly threatened by the option of acquiring new and (in some respect) more efficient partners outside the district (and indeed also beyond the national borders), which the fittest firms take advantage of in a progressively more integrated world economy. Even the mere possibility of this happening can dissipate a significant amount of localized social capital.

The shift from the traditional industrial district towards a more integrated organizational setting, with larger, fewer subjects. would therefore trade-off flexibility for cooperation.

We explore such a trade-off by modelling the interaction of independent firms within an industrial district as a repeated game of trust, where cooperative outcomes are not due to the cultural attitudes of the players, but the result of non-cooperative behaviour taking place in a stable organizational setting. When the outside option of changing partners is not too attractive, cooperation may arise also without ties between firms; when such attractiveness increases, cooperation may only be guaranteed by stabilizing the relationship through a formal commitment.-----

Such a “defensive strategy” can be shown to be socially efficient as long as the efficiency gain of changing partners is not too large, when leaving the firms free to change becomes socially optimum.

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1. Introduction

Over the past twenty-five years, a large numbers of papers in the fields of economics, sociology and economic geography, has examined “industrial districts” (henceforth, IDs) which are geographical clusters of small interconnected firms specializing in a particular industries. IDs have been highly economically successful and indeed may explain the positive performance of the Italian economy after WWII despite the many inefficiencies which hinder the functioning of the Italian economic system as a whole.

For these reasons IDs provide an important counterexample to traditional views of economics, which highlights either the virtues of the competitive market, in which firms interact on a relatively anonymous basis, or of the internal hierarchy of firms, where authoritative decisions are supposedly made by hierarchical superiors or controllers of residual ownership rights (Coase, 1937; Williamson, 1975).

Ids, in their “canonical” form (as illustrated by Becattini, 1987, 1990) are neither market nor hierarchies. Within IDs, firms interact continuously with each other, but the strict conditions of impersonal competitive markets do not apply. Nor is there any single overarching authority. Yet, such local economies are often capable of outperform, those varieties of organization that are more familiar to economists.

The basis for their success (extensively documented in a plethora of case-study based papers and books) appears to be a mixture of diffuse cooperation and productive decentralisation. Unlike the standard vertically integrated firm, where all stages of the production process are hierarchically organized within a single organization, particular phases of the production process are put out to specialized firms who cooperate with each other in making the final product.

In the ideal-typical industrial district, production is organized by “final firms” (known as *impannatori* in Prato and *converter* in Como) which relates with customers on the final market, take orders, and decide production plans. They then divide the production *filière* to a large number of smaller subcontractors, each of whom may specialize in only one phase of production, and then assemble the finished product and bring it to market.

For decades, such a radical decentralization of production was thought as highly unusual in advanced economies. More recent studies focusing on “Industrial Cluster” showed that these peculiar organizational practices and institution were neither limited to certain parts of Italy - the centre and the northeast of the country (the so-called *terza Italia*) – nor to “traditional”

sectors – such as textiles, clothing, footwear, and jewellery – but also more advanced ones such as mechanical engineering electronic devices and medical equipment. Some scholars (Scott 1993, Storper, 1997; Maggioni, 2002 and 2004) pushed the argument even further by highlighting the strikingly similar organizational features of IDs and most famous high-tech cluster such as Silicon Valley and Route 128.

These form of production organization require a high degree of inter-firm cooperation. Formal contracts are relatively rare, subcontracting depends on word-of-mouth agreements. Final firms need to respond quickly to market and technological shocks: i.e. swing of fashion in the footwear and clothing industries, changes of customized specifications in the capital machinery sector, shift of technological paradigm in the electronic, communication and biotech industries. Yet, this also poses a theoretical puzzle, as the potential for opportunistic behaviour in such relations is significantly higher than in standard contractual relationships.

Not only subcontractors may behave opportunistically toward final firms in this form of organization but final firms may behave opportunistically toward their subcontractors.

The production of customised machinery requires a very high degree of flexibility from subcontractors, both in terms of their willingness to accept changes in specifications and their willingness to work overtime at short notice to complete a commission. In the short term, this may involve substantial costs for a subcontractor, which outweigh the price that a subcontractor receives for a particular order. While these costs may be compensated for by future orders in a long-term relationship, there is no necessary reason why a final firm should not pocket the gains it makes from a subcontractor's flexibility, without making any long-term commitments. After all, it is under no contractual obligation not to do so.

On the other hand, subcontractors could hold final firms to ransom, using the threat of “hold-up” to renegotiate informal agreements in their favour. This is perhaps the main reason why the “new institutional economics” of Williamson (et al.) emphasizes vertical integration as a solution to problems of potential opportunism. In their view, it usually makes sense for a firm that is highly dependent on one or more of its suppliers to buy these suppliers and integrate them rather than run the risk of being blackmailed.

The evidence suggests that these risks of opportunism on both sides have been overcome without resort to contract, in contrast to other economic contexts, where such extensive cooperation on the basis of diffuse relationships is relatively rare. It seems plausible at first

glance that this lack of opportunism in cooperative relations is the result of trust (or more precisely trustworthiness) of some kind between subcontractors and final firms.

Indeed, scholars working on industrial districts (Bagnasco, Becattini, Piore and Sabel, Harrison) have come to a broad consensus that trust between economic actors plays a crucial role in the economic success of industrial districts. With a few important exceptions (Dei Ottati, Lorenz) however, authors have tended to identify this trust as being specifically non rational in its origin (and a similar fate has accompanied the surging literature on open source software communities¹). It is typically attributed to pre-existing history and shared social values or to the creation of new forms of common identity rather than to interests.

Much of this hostility to rational choice accounts of trust and cooperation in industrial districts is founded on the perception that standard neoclassical economics has little to offer to the study of such an issue. However, a rich stream of literature, which builds on the classic results on cooperation in repeated games,² has shown that reputation concerns may foster the development of trust relationships between rational and self-interested agents (Bull, 1987; MacLeod and Malcomson, 1988; Kreps, 1990; Kandori, 1992; Greif, 1993; Ghosh and Ray, 1996; Holmström and Roberts, 1998; Baker et al., 2002). Those papers shed some rational light on the interpretation of entrepreneurs' behaviours in Italian IDs, who cannot be genetically different from the entrepreneurs of the rest of the world.

On an intermediate position between the “irrational” and the “hyper-rational” sides there lies a stream of literature (Lorenz, 1992; Bellandi, 1996; Mistri and Solari, 2002; Farrel and Knight, 2003) focussed on institutions as evidence that cooperation in these industrial districts is strongly linked to institutions (i.e. informal rules that govern the behaviour of actors) which act both directly, by influencing the trustworthiness of individual agents, and indirectly, by conveying information on the trustworthiness of agents. According to this literature, social institutions are sets of rules that structure social interactions by:

- (1) providing information about how people are expected to act in particular situations,
- (2) being recognized by the members of the group as “the rules” to which others conform in these situations
- (3) structuring the strategic choices of actors in such a way as to produce equilibrium outcomes.

¹ On this interesting similarity see Maggioni (2004).

² Friedman (1971), Kreps et al. (1982), Kreps and Wilson (1982), Milgrom and Roberts (1982), Radner (1985), Fudenberg and Maskin (1986).

Further evidence of the existence of community rules in industrial districts may be found in recent original research findings (Bramanti and Maggioni, 2006) about five IDs in the textile/clothing and wood/furniture industries. The empirical results of the analysis (based on about 80 in-depth interviews with institutional actors and leading firms and more than 250 questionnaire-structured CATI interviews to small and medium sized independent firms) showed the existence of a widespread set of informal understandings governing business practice in relationships between firms while highlighting a mounting pressure for larger final firms to “escape” from the traditional organizational pattern of the ID through two alternative business strategies: outsourcing part of the production to firms outside the district or internalising a particular production phase by acquiring the sub-contractor.

Thus, in conclusion, there is evidence to suggest that trust and cooperation in Italian industrial districts relies on the presence of historical tradition, common habits, informal community institutions as well as on rational decisions and behaviours. The following sections are a first attempt to model the interaction of firms within an ID on a pure rational and “methodologically egoistic” perspective.

2. The model

We model the interaction between two firms (an upstream and a downstream) in an industrial district as characterised by both moral hazard and a selection problem. The two sides of the interaction, for simplicity, are assumed to be separable with respect to their effects and presented in the next two sub-sections.

2.1 The trust game

We represent moral hazard in the simplest way as a two times (potentially) repeated trust game,³ where an upstream firm (A) decides whether to trust a downstream firm (B) and provide a high level of effort in the production of components to be used by B in manufacturing a final good. The quality of the components produced increases in the level of effort chosen by the upstream firm.

A’s level of effort as well as correlated measures of performance are observable by B but not verifiable, so that fully contingent or any kind of explicit incentive contracts are unavailable. However, B can try to provide incentives to A by promising to reward a high level of effort,

³ The analysis of the trust game that follows draws heavily from Colombo and Merzoni (2006).

for instance by paying a bonus. That promise is not credible if the interaction is one-shot, but it can be made credible within a stable relationship, i.e. within a relational contract between the parties.

If A trust (*t*) B and chooses a high level of effort, B can honour trust (*h*) and reward A or abuse it (*a*). If A does not trust (*nt*) B, no reward is paid and no abuse can take place. If the game is played only once A prefers to trust if trust is honoured and not to trust if trust is abused; B prefers to abuse trust if given the chance of doing so, but it prefers honouring trust to not being trusted. Without loss of generality we can represent the extensive form of the trust game as follows:

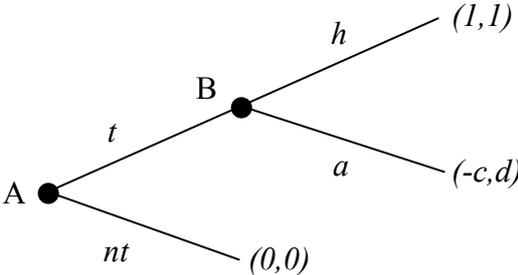


Figure 1 – The trust game

where $c > 0, d > 1$.

The unique sub-game perfect equilibrium of the one-shot version of this game is (nt, a) , which is Pareto-inefficient since in (t, h) both players are better off.

In order to capture the idea that stability is valuable, we consider a twice repeated version of this game played under incomplete information on A’s type. This allows us to obtain a reputation equilibrium *à la* Kreps and Wilson (1982), where trust emerges as a possible equilibrium strategy. We assume that with probability p B is trustworthy and always honours trust, whereas with probability $(1-p)$ its payoffs are those reported in Fig. 1.

The probability p can be thought of as a pure modelling device, useful to obtain “reasonable” results. Alternatively, it can be taken to represent the share of the population which spontaneously adopt reciprocal (cooperative) behaviour. The choice between the two interpretations has important implications on the way we look at the nature of industrial districts: is social capital a source or a consequence of the development of districts?⁴ Our

⁴ Who comes first between the egg and the hen?

interpretation will be that social capital, and so the presence of reciprocal types, is an important pre-requisite for the development of industrial districts, but the degree of stability of the environment, affected by organizational design, does also condition its prospects. Hence, we do not consider p as a mere modelling device, but as a real feature of the environment, while always implicitly assuming it to be small enough not to be sufficient for trust to arise in the one-shot version of the game.

It is straightforward to show that if $p > \frac{c}{c+1}$ A's equilibrium strategy would be to trust B also when the game is played only once. This would amount to have such a high concentration of reciprocal types in the population, that trust always prevails, also in one-shot interactions; henceforth, we rule out this case and concentrate on $p \leq \frac{c}{c+1}$, so that trust will require reputation building.

When the game is repeated, A's beliefs on the actual type of B evolves following Bayes' rule. Hence, at the beginning of the second period the probability that A attaches to the event of facing a trustworthy B is the following

$$p_2 = \begin{cases} p & \text{if in period 1 A did not trust B} \\ \frac{p}{p + (1-p)y_1} & \text{if in period 1 A gave trust and trust was honoured} \\ 0 & \text{if in period 1 A gave trust, but trust was abused} \end{cases}$$

where y_t is the probability that the untrustworthy B honours trust in period t .

If we call z_t the probability that A trust B in period t , as shown in Colombo and Merzoni (2006)⁵ the unique sequential equilibrium of a twice repeated trust game with incomplete information is the following

$$\begin{aligned} \text{if } \left(\frac{c}{c+1}\right)^2 \leq p \leq \frac{c}{c+1} & \text{ then } z_1 = 1, y_1 = \frac{p}{(1-p)c}, z_2 = \frac{d-1}{d} \text{ and } y_2 = 0 \\ \text{if } p < \left(\frac{c}{c+1}\right)^2 & \text{ then } z_1 = 0, y_1 = \frac{p}{(1-p)c}, z_2 = 0 \text{ and } y_2 = 0 \end{aligned}$$

The equilibrium expected payoffs for A and B for the one-shot ($\pi_A(1)$ and $\pi_B(1)$) and the twice repeated trust game ($\pi_A(2)$ and $\pi_B(2)$) are:

⁵ See Result 2.2 and its proof in Appendix A.

$$\pi_A(1)=0 \text{ and } \pi_B(1)=0; \pi_A(2)=p\left(\frac{(c+1)^2}{c}\right)-c \text{ and } \pi_B(2)=d \text{ if } \left(\frac{c}{c+1}\right)^2 \leq p \leq \frac{c}{c+1}$$

$$\pi_A(1)=0 \text{ and } \pi_B(1)=0; \pi_A(2)=0 \text{ and } \pi_B(2)=0 \text{ if } p < \left(\frac{c}{c+1}\right)^2$$

Therefore, if the game is played twice, i.e. the moral hazard problem is set within a durable relationship between the two firms, even an untrustworthy firm B would honour trust with positive probability $\left(y_1 = \frac{p}{(1-p)c}\right)$ in order to build a reputation for trustworthiness, provided that the share of trustworthy (reciprocal) firms in the population, p , is large enough. Untrustworthy firm B would honour trust more frequently as that share increases. In such equilibrium both firms are better off with respect to the one-shot version of the game, where, in an equilibrium without trust, they both get nothing.⁶

2.2 The selection problem

Besides moral hazard and the connected trust-building issue, we assume that the relationship between the two firms is characterised by a selection problem. The quality of components to be used by firm B depends not only on the effort provided by the supplier, but also on some intrinsic feature of the inputs used, I , divided by the cost of the input, c :

$$i = \frac{I}{c}.$$

For simplicity we assume that the two dimensions of quality enter separately in firm B's payoff function, so that the overall payoff for B is just the sum of the payoff obtained from the trust game above and of the measure of quality of the inputs per unit of expense i :

$$\Pi_B = \pi_B + i$$

We assume that with respect to the quality of inputs all upstream firms within the district are homogeneous and we let I_d be such quality level, c_d the corresponding cost and i_d the quality per unit of expense, all known to everybody.

⁶ Indeed it is straightforward to see that if $p \geq \left(\frac{c}{c+1}\right)^2$ then $\pi_A(2) = p\left(\frac{(c+1)^2}{c}\right) - c \geq 2\pi_A(1) = 0$, while $\pi_B(2) = d > 2\pi_B(1) = 0$ always.

At the beginning of the second period firm B may decide to switch to another foreign supplier. The quality of the input produced by the foreign supplier is assumed to be uncertain and non-verifiable, and its expected value \hat{I} will in general be lower than the quality of the input produced within the district, i.e. $\hat{I} < I_d$. However, the cost of the foreign input is assumed to be much lower, so that the expected quality per unit of expense \hat{i} , is larger than that obtained within the district

$$\hat{i} = qi_h + (1 - q)i_l > i_d.$$

Hence, in this respect firm B always find it profitable to switch to a foreign supplier and not to be stuck in a long-term relationship with A.

2.3 Flexibility or commitment?

The analysis of the previous two sub-sections has shown that there are two distinctive features of the interactions between upstream and downstream firms within a district having opposite implications on the desirability of long-term relationships between them. Stability fosters trust and cooperation, but it also implies a renounce to use flexibility and replace the current partner with a better (less costly) one.

In this sub-section we address this trade-off and endogenize the stability of the relationship between firms, by letting the downstream firm B choose the length of its association with firm A. The choice of a (two periods) long-term relationship is modelled as having a commitment value: once that decision has been taken A cannot be replaced and so it will be the supplier of B for both periods. Hence the choice of a long-term relationship amounts to a move towards a more direct integration of the firms, which, for simplicity, we assume to correspond to a vertical integration of the two firms, with B acquiring A.

On the other hand, if B chooses a (one period) short-term relationship the firms are kept separate and maintain full autonomy and independence: A can be replaced by B with an alternative supplier, when profitable. Of course, also in that case nothing prevents firm B from extending its relationship with firm A; however, this only takes place when it is profitable since there is no commitment to a long-term relationship

In some circumstances (for some values of the parameters) trust emerges without the need of commitment, because the parties recognise from the beginning that A will not be replaced; however, in other circumstances commitment is needed for trust, because without it the firms

do not cooperate (B abuses trust if trust is given and A does not trust B) in anticipation that their relationship will last just one period. The condition for the occurrence of the two regimes is stated in the following lemma.

Lemma 1. *Commitment is not needed for trust if and only if $\hat{i} - i_d \leq 1$.*

Proof. Given Bayesian updating a untrustworthy firm B is only able to build a reputation for trustworthiness if the equilibrium in period 1 requires B to play a mixed strategy and honour trust with positive probability but not with certainty, i.e. if and only if $0 < y_1 < 1$. That only occurs if, when given the move in the first period, B is indifferent between honouring or abusing trust. When the parties are not committed to a two periods relationship, B is indifferent if its continuation payoff from honouring trust and not replacing A is equal to its continuation payoff from abusing trust and replacing A, i.e. if $dz_2 + 1 = d + \hat{i} - i_d$, which can be re-written as $z_2 = \frac{d-1+\hat{i}-i_d}{d}$. Given that z_2 is the equilibrium probability that A trust B in the second period, it cannot be greater than 1. Hence, $\frac{d-1+\hat{i}-i_d}{d} \leq 1$ and so $\hat{i} - i_d \leq 1$. On the other hand, if $\hat{i} - i_d > 1$ there is no reputation-building equilibrium where firm A could be replaced but it is not, since that would require $z_2 > 1$. (Q.E.D.)

When commitment is not needed for trust, firm B will always choose not to acquire A, since reputation concerns allow to solve moral hazard problems while keeping the firms independent. When instead commitment is needed for trust, B has to choose between acquiring A and renounce to the ability to replace it with a foreign supplier or maintaining the firms independent to exercise the option of replacing the inefficient local partner, but giving up the benefits of cooperation. The following proposition summarises all the possible equilibria.

Proposition 1. *When $\hat{i} - i_d \leq 1$ commitment is not needed for trust, firms A and B stay independent and the equilibrium strategies in the repeated trust game are*

$z_1 = 1, y_1 = \frac{p}{(1-p)c}, z_2 = \frac{d-1+\hat{i}-i_d}{d}, y_2 = 0$; when $1 \leq \hat{i} - i_d \leq d$ commitment is needed for

trust and used, firm B acquire firm A and the equilibrium strategies in the trust game are

$z_1 = 1, y_1 = \frac{p}{(1-p)c}, z_2 = \frac{d-1}{d}$ and $y_2 = 0$; when $d < \hat{i} - i_d$ commitment is needed for trust but it

is not used, firms A and B stay independent and the equilibrium strategies in the trust game are $z_1 = 0, y_1 = 0, z_2 = 0, y_2 = 0$.

When fostering trust does not require to commit to a long-term relationship the two firms stay independent; when commitment is needed for trust the downstream firm decides to vertically integrate with the upstream firm when the gains from changing supplier are relatively small, while it stays independent aiming at replacing the domestic supplier with a foreign, more efficient one otherwise.

Fig. 2 shows how the optimal choice by the downstream firm changes as the expected gains from switching to a foreign supplier $\hat{i} - i_d$ increases.

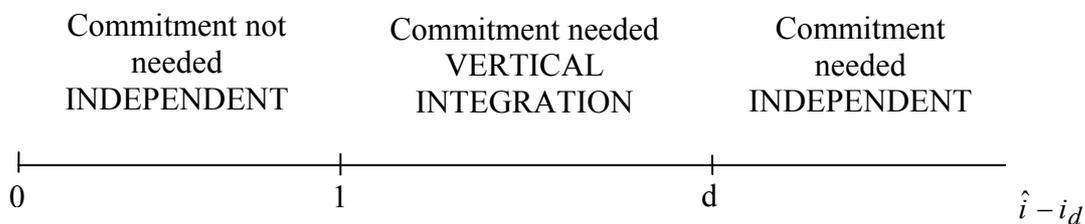


Figure 2 – Comparative statics on the gains from changing

When the gains are small the downstream firm is able to build its reputation for trustworthiness, while keeping suppliers independent: it is the golden age of the industrial district, which maintains its cohesion and its traditional organizational equilibrium. As the gains from changing increase, the temptation of a change of supplier increasingly hinders the ability of the downstream firm to build a reputation for trustworthiness while staying independent and the downstream firm has to trade-off flexibility for cooperation by vertically integrating with the local supplier: the defensive reaction of the main firms of the district is able to succeed in maintaining their competitiveness by consolidating their strategic advantage in term of quality produced through cooperation; yet the industrial district partially change its organizational setting and the average size of the firms belonging to it increases. Finally, when the gains from changing supplier are very large, because cost competition from foreign suppliers overcomes the local ones, a complete organizational breakdown of the district may occur.

In the face of the process of increasing integration of markets at international level, the three scenarios just described might be thought of as stages of an irreversible sequential process, where the organizational setting of industrial districts is increasingly suffering from

competition of low cost suppliers and, after a period of resistance characterised by a defensive concentration process, is bound to succumb. However, the second and third scenario might also be considered as alternative possible outcomes: the breakdown of the system is a possibility, but vertical integration and the rise of the average size may foster a rise in efficiency and quality that neutralizes harsh cost competition from abroad.

3. The empirical evidence

Aim of this section is neither to prove the logical correctness of the theoretical result presented above nor to test the empirical relevance of the model (to do so we will need to add several feature to the model and to control for a number of important variables in a future econometric analysis). What we present here is a summary of the result of a recent applied research (Bramanti and Maggioni, 2006) devoted to the understanding of the structure and evolution of 5 important IDs belonging to two traditional industries: textile and clothing, wood and furniture.

In order to do so we present few tables about the present situation and recent evolution of the IDs of Biella, Como, and Prato for the textile and clothing industries and Brianza, Pesaro for the wood and furniture industry.

Table 1 - Structural characteristics of the IDs

	Como	Biella	Prato	Brianza	Pesaro
Employment	22,487	25,416	49,454	21,206	13,147
Local units	1,541	1,440	9,336	4,476	1,358
National Share of (empl.)	3.8	3.4	8.1	4.6	4.0
ID on industry (local units)	2.1	1.9	11.9	3.5	1.9

Table 1 shows the size (in terms of employment, number of local units and share on the industry total at the national level) of the 5 IDs targeted by the abovementioned applied

research. As can be seen in the table Prato is the largest ID both in absolute and relative terms, followed by Brianza, while Como, Biella and Pesaro are significantly smaller.

Figure 3 - Recent evolution of IDs (percentage of firms in the sample which experienced growth or stability of sales and employment)

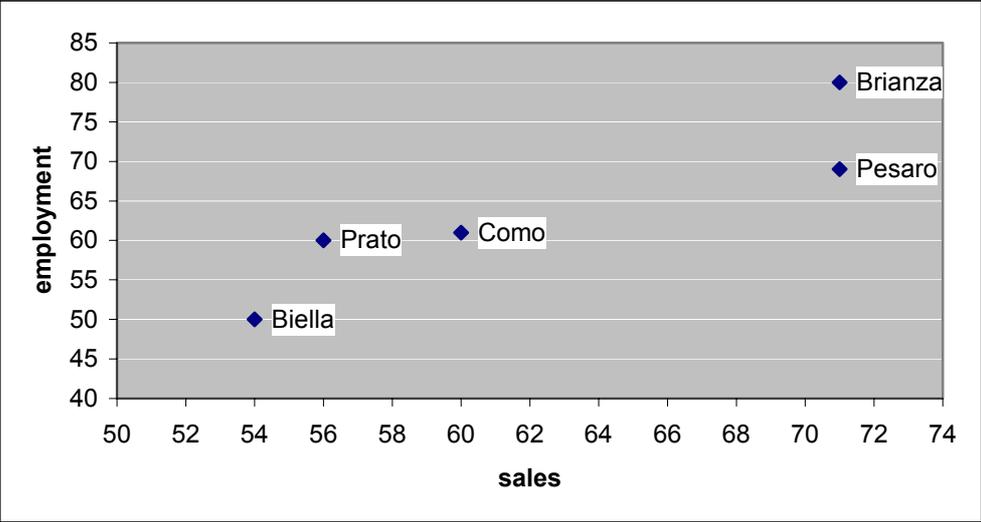


Figure 3 shows the evolution of the IDs as witnessed by the firms interviewed in the empirical analysis. The chart shows that IDs performance are heavily determined by the different situation of textiles as opposed to furniture industry. However, within each industry it is somehow possible to rank the IDs according to their relative performance.

Table 2 - Hierarchic vs. cooperative behaviours between final firms and sub contractors (as percentage of total number of firms)

	Como	Biella	Prato	Brianza	Pesaro
Hyerarchic behaviours	35	30	60	50	48
Cooperative behaviours	44	29	47	37	46
Neither H nor C	20	25	18	15	14

Table 2 shows the coexistence of hierarchic and cooperative behaviours in the relationships between final firms and sub contractors. Firms were asked to choose between a closed list of behaviours which, in this table, have been grouped into two more general categories. It is worth noting that with the exception of Como, hierarchic behaviour prevails (sometime largely). Furthermore in certain IDs, notably in Biella and Como, there is a relevant share of final firms (around 25%) which does not have any “interactive” (nor hierarchic nor

cooperative) behaviours, thus suggesting a “pure spot market” kind of interactions prevailing in the district.

Table 3 - Stability of the relationships between final firms and sub contractors

	% of total firms				
	Como	Biella	Prato	Brianza	Pesaro
Stable relations, of which:	94,4	93,2	98,0	90,0	96,1
<i>With less or equal to 25%</i>	<i>23</i>	<i>25</i>	<i>18</i>	<i>15</i>	<i>18</i>
# firms	40	59	50	60	51

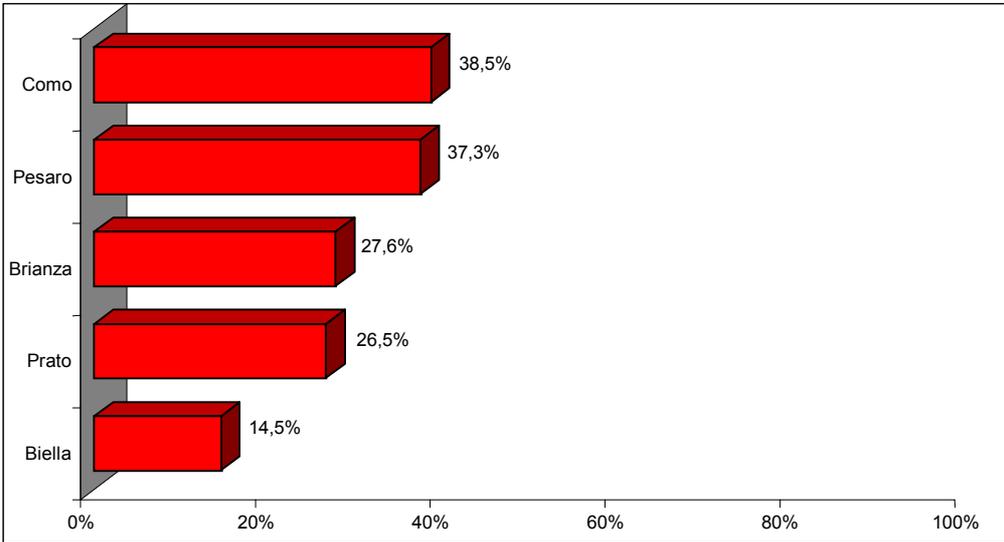
Table 3 illustrates that beyond the mythology of IDs, the stability of relationship between final firms and sub contractors is limited to a subset of firms. The share of final firms which have stable relation with less than a quarter of their sub-contractor is on average across all IDS around 20% (with Biella recording the highest percentage and Brianza the lowest). Poor performance seems to be associated with less stability, good performance with more stability (even if the causality direction cannot be detected in these data).

Table 4 - Changes in the number of sub-contractors

	% of total firms				
	Como	Biella	Prato	Brianza	Pesaro
Growing	38,0	17,0	33,0	31,0	27,0
Constant	47,0	62,0	59,0	64,0	67,0
Declining	15,0	21,0	8,0	5,0	6,0
# firms	40	59	49	59	51

Table 4 shows the recent evolution in the number of sub-contractors within different IDs. As expected, despite the existence of significant conservative behaviours, growing IDs tends to increase the number of sub-contractors while less performant IDs tend to reduce the number of up-stream firms.

Figure 4 - Substitution of internal sub-contractors with external suppliers



In this chart the behaviour of textiles and furniture IDs is significantly different. In the textile/clothing industry the ranking based on the degree of substitution of internal with external suppliers is consistent with that based on relative performance (shown in Fig. 3); while in the wood/furniture industry is exactly the opposite.

Table 5 - Location of new external suppliers

	% of total firms				
	Como	Biella	Prato	Brianza	Pesaro
Rest of Italy	30,0	25,0	79,0	94,0	86,0
UE15	20,0	63,0	50,0	17,0	5,0
China	13,0	38,0	36,0	-	-
Rest of Asia	10,0	38,0	21,0	-	5,0
East Europe and ex USSR	5,0	25,0	7,0	-	5,0
America	3,0	13,0	-	-	-
Others	3,0	-	-	6,0	-
# firms	40	59	50	60	51

Biella shows a significant increase in the geographical reach of suppliers; around 40% of the sample has at least a new supplier located in China or other Asian countries (but one must take into account that this may be due to the specificity of the inputs: cashmere and ore high quality wool comes for these areas). Pesaro, on the other hand, utilises almost only Italian suppliers.

Table 6 - Motivation for changing sub-contractors (in the last 5 years)

	% of firms				
	Como	Biella	Prato	Brianza	Pesaro
High costs	53,0	75,0	71,0	72,0	58,0
Low quality	27,0	25,0	43,0	50,0	68,0
End of life of supplier	20,0	38,0	14,0	-	11,0
Low innovativeness	20,0	-	21,0	11,0	11,0
Low reliability	-	-	-	22,0	-
# firms	40	59	50	60	51

The last row of Table 6 shows that, in general, final firms in IDs are happy with their sub-contractors: with the exclusion of Brianza, the lack of reliability is never a reason to change a sub-contractor, thus meaning that only reliable firms are considered right from the beginning as potential suppliers.

Table 7 - Variation in the degree of vertical integration (last 5 years)

Actions	% of firms				
	Como	Biella	Prato	Brianza	Pesaro
Integration	20	13	24	12	22
Outsourcing	30	19	14	30	31
No change	50	68	66	58	51
# firms	40	59	49	59	51

Increase in outsourcing seem to be associated with good performance, while increase in vertical integration (which shows a smaller variance) is highly sensitive on past behaviours of the firms. Biella, for example, show a low index because large firms decided for vertical integration strategies in the early 90s.

Table 8 - Motivations for increase in vertical integration (last 5 years)

Motivations	% of firms				
	Como	Biella	Prato	Brianza	Pesaro
Higher quality	75	63	75	13	73
Timing reliability	50	63	17	75	36
Lower costs	38	63	50	63	45
Reduce knowledge spillovers	25	-	-	13	-
Increase know-how	13	-	8	13	9
# firms	8	8	12	7	11

Table 9 - Causes of increase in outsourcing

Motivations	% of firms				
	Como	Biella	Prato	Brianza	Pesaro
faster production process	75	73	43	56	63
Lower costs	67	73	86	67	94
Acquiring know-how	8	-	29	29	13
# firms	12	11	7	23	16

By reading together Tables 8 and 9 it is possible to observe that the trade-off vertical integrations vs. external outsourcing imply a second trade-off between timing reliability and faster production process. In other words mean and variance of the timing of the production process do behave in very different ways.

4. Conclusion

Cooperative behaviour in the interactions between firms seems to be a basic ingredient for the success of industrial districts, allowing them to preserve the high quality standard of their productions. A rational choice account of the emergence of such cooperative attitudes highlights the importance of stability and long-term relationships to foster them.

However, in an increasingly internationally integrated input market long-term relationships between final firms and suppliers of intermediate goods are difficult to sustain without some form of commitment, binding the parties to each other. Hence, final firms are forced to trade-off the flexibility of being able to change partners at will for the ability to foster cooperation. That amounts to a shift from informal understandings to binding agreements or even fully-fledged vertical integration and it is a first step towards a change in the nature of the organisational setting that prevail within the district.

When the competition of suppliers external to the district, usually based on costs, becomes too strong and the firms belonging to the district are not able to respond by increasing products quality, furtherly taking advantage of cooperative attitude, the organisational setting of the district may reach a complete breakdown.

Our paper try to substantiate the above account through a simple theoretical model. A first inspection on some Italian industrial districts of the textiles and furniture sectors seems to

solidly support our proposed view; yet, a thorough assessment of its relevance would require further empirical work.

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