Towards Indicators of Social Capital for Regional Development Issues: The Case of French Rural Areas

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for Regional Development Issues:
The Case of French Rural Areas

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Abstract

This paper aims at giving empirical content to the notion of social capital for regional development issues. It first provides a typology of both positive and negative influences of sociological factors on economic performance, and a set of available social capital indicators. Second, using the results of four case studies, the relevance of these indicators is assessed. Third, it presents an econometric study on the role of social capital on economic development. The results show that both local cohesion ("bonding") and external social links ("bridging") are important in order to define social capital and explain performance.

Regional Development, Social Capital, Case Studies, Indicators, Rural Areas.

Le but de cet article est de construire une méthode de mesure empirique de la notion de capital pour les questions de développement régional. Nous commençons par proposer une typologie des mécanismes positifs et négatifs par lesquels les facteurs sociologiques influent sur la performance économique, ainsi qu'une liste d'indicateurs reliés à ces mécanismes. Puis, à l'aide des résultats de quatre études de cas, nous évaluons la pertinence de ces indicateurs. Enfin, nous présentons une application économétrique. Les résultats montrent que la cohésion locale (« bonding ») et les liens sociaux extérieurs (« bridging ») sont tous deux importants pour définir le capital social et expliquer la performance économique.

Développement Régional, Capital Social, Etudes de Cas, Indicateurs, Zones Rurales.

JEL Classifications: A13, R11, Z13

INTRODUCTION

Recently, there has been a revival of interest about the role of sociological factors in explaining development in lagging areas. The attractive notion of "social capital" has been popularised (after PUTNAM's (1993) seminal works) by the World Bank's *Social Capital Initiative* launched in 1996. It gave rise to an unprecedented excitement among researchers concerned with development issues, associating not only economists, but also sociologists and political scientists. Whereas early studies on social capital concerned developing countries, more recent work transferred the concept to developed countries, especially to rural or peripheral regions (RUPASINGHA *et al.*, 2002, IYER *et al*, 2005, BEUGELSDIJK and VAN SHAIK, 2005).

However, the notion of social capital also gave rise to much controversy. One important difficulty in assessing the actual role of social capital in economic performance is the lack of relevant indicators. Usual indicators include the density of associations, trust indicators, and crude measures such as the size of households or ethnolinguistic fragmentation. The problem with these measures is that there is only a presumption that they proxy for attributes such as the propensity for collective action. Besides, the positive correlations found in empirical studies do not demonstrate a positive impact of social capital on economic performance, as the causal relations at stake may be much more complex.

Consequently, even if a statistical approach is irreplaceable in order to perform statistical tests about the relationships between economic and sociological phenomena, fieldwork is also irreplaceable to determine relevant indicators and have a clearer view of the actual mechanisms that statistical analysis captures. The aim of this article is to provide new results in both directions. First, we present the results of four case studies on contrasted French rural regions. Comparing these four regions gives a better view of the relevance of classical usual social capital indicators. Moreover, it gives useful insights into the links between sociological behaviour and development dynamics. Second, we present a simple

econometric study on French rural areas in order to assess the generality of our findings. The results suggest that some indicators widely used in social capital studies should be considered with caution. They also show the importance of considering both indicators of local social cohesion and of external social links.

Choosing rural areas as case studies is interesting because sociological characteristics are thought to be more homogenous and stable in time. Moreover, it is fashionable in political discourses to consider that rural development can be enhanced by local factors of cohesion and identity. Besides, there are high variations in the level of local cohesion between rural communities (especially in France), which makes the countryside interesting for testing the relation between sociological characteristics and development.

The rest of the paper is organised as follows. The next section briefly presents the mechanisms by which sociological characteristics can influence economic performance, and enumerates the indicators that can be used to measure the relevant sociological characteristics. Then, we give the results of four case studies in which sociological characteristics have been measured by interviews with inhabitants and local institutions. It assesses the relevance of some statistical indicators in the light of the results of these interviews. Last, we present the econometric study. The final section concludes and gives suggestions for future research.

FROM ECONOMIC MECHANISMS TO CLASSES OF INDICATORS

Sociological features have not been much taken into account in mainstream economics until recently. However, there are many ways by which sociological factors could impact on economic success. We first present them in a synthetic way. Then, we discuss which indicators can be used to measure the relevant sociological characteristics in empirical studies.

An overview of the impact of sociological factors on economic performance

Many definitions of social capital have been used in academic literature. We shall use LIN's (2001) definition of social capital, which has the advantage of being both operational and comprehensive: "*resources embedded in a social structure, which are accessed/mobilized in purposive actions*". According to this definition, social capital does not consist in social networks *per se*, but in the resources that these networks may give access to. Similarly, norms of collective action are useless unless there are projects to co-operate on. While Lin's definition is quite operational at the individual level, it is less clear whether this notion makes sense at a collective level, in particular if the system under study is quite large, such as a region or a country. Nevertheless, the idea that a region whose inhabitants have a lot of social capital will on the whole perform better is convincing, for at least three reasons.

First, social capital implies many social links, some of which may *transmit valuable information*. Relevant information is often costly, and the ones who have easier access to it may have a decisive advantage. Because knowledge is more and more specialised and fragmented, having information about new technologies, potential demand, or matching partners can be essential for regional development.

According to R. BURT (2000), from an individual's point of view dense social networks are likely to convey rather commonplace information. Conversely, weak ties, connecting different social groups, will usually bring more original information. However,

such information also tends to be less reliable. Consequently, there is a tradeoff between weak (original and diverse information) and strong (reliable information) ties. At the regional level, PUTNAM (2000) introduced a similar distinction between what he termed *bonding* and *bridging social capital*. *Bonding* social capital involves strong and redundant ties, whereas *bridging* social capital involves loose but non-redundant ties, i.e. ties than span different social worlds. In the following, we shall see the relevance of that distinction for other phenomena as well[1].

The second class of mechanisms by which social relationships may play a positive role concerns *opportunism problems*. This can be because there are frequent interactions, which discourage cheating. This can also stem from a purely psychological effect (individuals internalize the community's interests). Whatever its source, the prevalence of trust and loyalty allows a substantial decrease in transaction costs. Economic agents save on resources in contracting, management and monitoring, as many relationships are informal.

Third, social relationships facilitate *collective action*, and in particular informal insurance mechanisms. One of the best-known examples in development studies is rotating credit associations or tontines. Mutual aid can be a crucial element in societies that lack efficient risk management institutions. Uncertainty management can also consist in smoothing various fluctuations of the economic activity. For instance, the workforce may be managed by a pool of firms according to their needs. Collective action may also involve the production of public goods (such as common waste management, a marketing study or advertising campaign), which remedies another type of market imperfection, namely the presence of high fixed costs.

A significant weakness in social capital literature is that the negative impacts of social capital are seldom taken into account (PORTES and LANDOLT, 1995). By our definition, social capital is always valuable for a rational individual. But it may have collectively negative effects. First, social relationships may *discourage economic agents to seek new (and better)*

economic opportunities. When agents are embedded in a social structure, they do not tend to devise an optimal search of the best partners available. Social capital between members of a group may thus result in long-term mismatching and more generally inefficient allocation of resources.

Another negative effect is the fact that individuals tend to have *low individual incentives*, for at least two reasons. First, a strong embeddedness in social networks may tend to promote a conservative or timid behaviour, because a conspicuous behaviour will be badly considered by peers[2]. Consequently, innovative and risky behaviour will be rare. Second, safety nets provided by the community will not push individuals to do their best.

The third kind of mechanism we consider includes all *exclusion* effects, and in particular the classical rent-seeking behaviour through collusion. This includes for instance refusing to hire job seekers that are not of the "right social group". From a sociological point of view, exclusion can have very negative effects for the excluded people, who are unable to access the social capital of the group. But it can also lead to losses for the group that practices it, as an outsider may well be able to bring valuable skills to the group.

This presentation of both positive and negative mechanisms shows that the definition of social capital must at least be bidimensional. *Bonding* social capital (i.e. strong links) and *bridging* social capital (i.e. weaker links giving access to new resources) have conflicting effects. *Bonding* social capital can solve agency and collective action problems, but also fosters redundancy of information, low incentives, collusion and discrimination. Conversely, *bridging* social capital is essential for bringing new ideas and opportunities, but the potential resources it carries are much less reliable. Consequently, no single indicator can encompass all the phenomena that are grouped together under the label "social capital". Two empirical predictions also stem from this discussion. First, *bonding* and *bridging* have no reason to be positively linked and both should impact economic performance. Second, the effect of bonding social capital should be non-linear because of the mix between positive and negative

effect. This feature, also raised by BOSCHMA (2005) about the relationship between proximity

and innovation, is coherent with empirical works that find a "bell-shaped" relationship

between embeddedness and performance (e.g. UZZI, 1996). When embeddedness is low, it has

a positive impact on performance, but after some threshold, embeddedness is detrimental to

performance.

Most statistical studies on social capital rely either on specific questionnaires

conducted in a few regions (IYER et al, 2005) or on survey information based on national

samples (KNACK and KEEFER, 1997; BEUGELSDIJK and VAN SCHAIK, 2005). In the first case,

the replication of the results is often questionable, whereas in the latter it is not possible to get

information at a local level. Here, we try to get both local information and generality, by

associating case studies and statistical data. In what follows, we present a list of indicators

that may capture the relevant aspects of social capital involved in the foregoing mechanisms.

Indicators for bonding social capital

To examine how to measure bonding social capital, we first consider each mechanism

again:

- Concerning information transmission, the *bonding* aspect of social capital mainly involves

   the density of social links.

- Incentives problems may be solved either by norms of loyalty or by a strong social

   control. The former may be revealed by a high degree of trust or of sociological

   homogeneity. The latter may be measured by the density of strong links.

- Collective action could be eased by the sociological homogeneity of the concerned group,

   provided that a relevant norm of co-operation exists.

- Restriction of opportunities will appear when the openness of social networks is too

   restricted. This problem echoes the first point.

- Insufficient incentives will appear when the society is too conservative, and not enough open to outer competition.

- The effects of collusion and discrimination should become apparent at a regional level when the society is fragmented into clear-cut subgroups.

At first sight, the enumeration above does not leave much hope of finding simple measures of social capital. At least the following aspect should be accounted for:

- Homogeneity of social status in the local society. It is difficult to find a reliable indicator for that feature. Here, the Gini index on household incomes was used[3].

- Norms of trust/loyalty/reciprocity. The criminality rate could be a proxy for distrust, because of its declarative nature. It has the drawback of incorporating other phenomena, which have nothing to do with trust. Another potential indicator is religious practice. This indicator does not seem relevant for a study in France, because of the importance of secularism, and the fact that the mix of catholic and protestant regions, makes it impossible to build a single meaningful measure. Two other measures have been chosen in this study. First, the ratio of household having their name on the telephone directory appeared to be a promising proxy for trust[4]. Second, gifts to charities were used as an indicator of the propensity to co-operate.

- Norms of co-operation. They are difficult to capture by statistical indicators. For co-operation in the agricultural sector, we used the average farm size. The smaller the farms, the more collective action is likely to have been important to preserve farm employment[5]. Concerning political co-operation, a simple indicator is the "fiscal integration coefficient". It measures the average percentage of fiscal resources that are shared between municipalities. Of course, this rests on the assumption that co-operation between politicians is correlated to co-operation in general, which needs to be tested.

- Norms of conservatism. There is no obvious indicator for that, although we looked at the vote to conservative parties.

- Density of local (strong) social networks. It is typically measured by the density of associations. Other possible indicators include data on household structure, socialisation places, and commuting (high commuting distances could imply less social life). Although none of these measures directly captures the intensity of interaction between individuals, they are generally considered as reasonable proxies for sociability.

Statistical studies generally focus on one aspect of social capital, e.g. norms of trust or association density (DURLAUF AND FAFCHAMPS, 2004). Here, we choose to measure these different aspects together, whenever possible, and examine the relationships between each other.

Indicators for bridging social capital

Bridging social capital mostly involves the transmission of new information to the agents that need it. Operationally, it will be defined here as links with individuals outside the region, which may give access to new information and opportunities[6].

Bridging can take many forms for development issues, but we will restrict here to three main types. First, emigration and immigration are a source of *bridging*, because migrants generally keep in touch with people from their former place of residence. Second, relationships inside the economic world can generate new opportunities and direct the localisation of future investment decisions. The third form will be labelled "political relationships" (taken on a broad sense, including politicians, businessmen and so on). It is based on the fact that local leaders can have acquaintances at higher levels, which can give them access to valuable resources. Unfortunately, former empirical studies on social capital have not much taken into account the *bridging* component, so the assessment of the validity of *bridging* indicators will be more difficult than for the other indicators.

Let us deal with emigration first. Three elements must be taken into account: the density of links between emigrants and their former regions, the existence of resources in the

former region, and the possibility for emigrants to access them. An "emigration bridging indicator" is computed as follows. Suppose we study a set of R regional units on which we want to measure bridging social capital. We also consider a set of U urban poles, where most important resources are supposed to be located. This assumption is motivated by both empirical and theoretical research on agglomeration processes, and the well-known role of agglomeration on innovation. For each regional unit, we sum an "access to outer resources from emigrants" index over all urban poles. This index is the product of three factors:

- Migration rate, computed as the share of inhabitants of the urban pole in the latest census (year t) who resided in the regional unit during the former census (year $t-1$)[7].

- Level of resources in the urban pole, which is proxied by the logarithm of employment.

- Access to these resources by emigrants, which is measured by an index of similarity between social categories.

Formally, the emigration bridging indicator is computed by the following equation:

$$emigrationbridging_i = \sum_{j=1}^{U} \left[\ln E_i \cdot \left(\frac{M_{i \to j}}{NM_i + M_{i \to j}} \right) \left(1 - \frac{1}{2} \sum_{k=1}^{6} \left| \frac{M_{k,i \to j}}{M_{i \to j}} - \frac{N_{k,j}}{N_j} \right| \right) \right] \qquad (1)$$

where j sums over all urban poles, E denotes employment in period t, M the number of migrants from regional unit i to urban pole j during the period $[t-1,t]$, and NM non migrants of regional unit i during the same period. Index k splits the population of migrants (M) and of the urban poles (N) in period t into 6 social categories: farm owners, independent workers, executives, intermediary occupations, clerks, and factory workers.

A similar index is constructed for immigration. Here we consider migration from urban poles to regional units. Our similarity index now compares the distribution of migrants across social categories to the distributions of residents of the regional unit (and not of the urban poles as for emigration bridging). Formally:

$$immigrationbridging_i = \sum_{j=1}^{U}\left[\ln E_i \cdot \left(\frac{M_{j \to i}}{NM_i + M_{j \to i}} \right)\left(1 - \frac{1}{2}\sum_{k=1}^{6}\left| \frac{M_{k, j \to i}}{M_{j \to i}} - \frac{N_{k,i}}{N_i} \right| \right) \right] \qquad (2)$$

Turning to the second form of *bridging* social capital, business networks, we used data about multiplant firms. This does not reflect the diversity of business relationships, and in particular neglects the role of mutual shareholding between firms. As many plants in underdevelopped areas belong to larger firms, we assume that data about multiplant firms capture a significant part of business relationships between locations.

We can compute two types of indicators:

- First, a "head office indicator", which takes into account the fluxes from head offices to subordinate plants. It is the sum, over all other regions, of the number of workers "depending" of the region of interest, weighted by the resource level indicator (logarithm of employment again).

- Second, a "subordinate plant indicator", which takes into account the fluxes from subordinate plants to head offices. It is computed by doing the reverse operation.

Formally, denote i the region of interest, and let W_{ij} be the number of workers in another region j, who work for a firm whose head office is in region i. The two indicators are computed as follows:

$$headoffice_i = \frac{1}{E_i}\sum_{j=1}^{U}W_{ij}\ln E_j \quad (3) \qquad \text{and} \qquad backoffice_i = \frac{1}{E_i}\sum_{j=1}^{U}W_{ji}\ln E_j \qquad (4)$$

where j sums over all urban poles again.

A high density of outer links to a region full of resources alone cannot ensure that these links will indeed convey some of these resources. For many successful projects (e.g. the settlement of a new firm), the critical factor of success may be the existence of a particular relationship (for instance the fact that a local politician has acquaintances in business circles). However, it seems reasonable to consider that the probability of having access to outer resources increases with the number of outer links.

This leads us to consider political relationships as a source of *bridging* social capital. Little can be said about the accurate mechanisms that bring new opportunities to a region by that channel. Some indicators could be proposed to capture them however. The turnout on local and on professional elections could proxy for the elected member's performance. However, many factors can influence electoral turnout, which have nothing to do with the politicians' efficiency to form outer links, in particular other sociological features. Moreover, there is clearly a reverse causation from economic performance to electoral turnout. The number of subsidies obtained by communities seems to be a better indicator, provided that uniform rules are applied on the study area. Public subsidies cover various topics, many of which have little direct relationship to economic performance (e.g. grants for cultural events). This decreases the risk of endogeneity associated with this indicator.

Table 1 sums up the indicators that were used in this research. We now present the fieldwork that was conducted to assess the relevance of these indicators, before proceeding to econometric analysis.

Insert table 1 about here

TESTING STATISTICAL INDICATORS: FOUR CASE STUDIES

The case study areas

In order to test our indicators, we selected four case study areas that display a high variability according to two criteria: economic dynamism and sociological characteristics. These areas were small regions are known as "*pays*". "*Pays*" is a French word that can mean "country", but also (according to XIXth century geographer Vidal de la Blache) "a small region with roughly homogenous characteristics". Here however, it refers to a public policy that has been implemented since 1999 in order to encourage local leaders in rural areas to group together

and build common development strategies based on a contract with the national government. This contract opens the possibility for various subsidies. The "*pays*" is the geographical area resulting from this contract[8].

Insert figure 1 about here

Table 2 gives some figures about the four zones (see figure 1 for their geographical location). Economic dynamism was assessed by simple indicators (employment growth, average income). The level of co-operation was assessed by looking at former empirical works, notably of co-operation in the agricultural sector. Here is a short description of the four *pays*:

- The *pays de Saint-Flour* is a mountainous region, and its economy is based on cattle breeding. It has undergone a sharp decline of both population and employment. Although it is well connected by highway (and to a lesser extent by railway) to the metropolitan areas of Clermont-Ferrand and Montpellier, very few initiatives have emerged in order to take advantage of the many possible opportunities based on its gorgeous landscape and typical food products.

- The *pays de Dinan* is well known for having a rich cultural and social life. There is a strong co-operative movement in the agricultural sector, which leads to postulate a high level of social capital. However, it has undergone a rather declining economic evolution, compared to the nearby labour market areas of Rennes, Saint-Malo, and Saint-Brieuc.

- The *pays Loire-Beauce* is situated in the rich alluvial plain of the *Bassin Parisien*. It is a rich area thanks to agriculture, but has also undergone high employment growth due to many recent industrial settlements. Population and local institutions are known to display a high individualism. This feature is made clear by the small size of the *pays* as well as by the absence of fiscal integration between municipalities.

- Lastly, the *pays du Forez* is situated at the periphery of the sharply declining industrial basin of Saint-Etienne. It displays a very positive economic dynamism however (notably in the industrial sector), and is in particular the place of many collective initiatives.

Insert table 2 about here

These study areas were chosen in order to represent four contrasted cases: poor economic dynamism and poor local co-operation (*pays de Saint-Flour*), poor economic dynamism and high local co-operation (*pays de Dinan*), high economic dynamism and poor local co-operation (*pays Loire-Beauce*), and high economic dynamism and high social co-operation (*pays du Forez*).

Methodology

Information was collected from two sources, during spring and early summer 2004. First, detailed interviews were performed with local institutions (municipalities, development agencies, chambers of commerce, business associations and so on). They allowed us to characterise the local governance, and investigate in detail the actual phenomena at work between sociological, institutional and economic features. This material includes many striking examples of success or failure of collective actions. Second, interviews of the population were performed. In each study area, 50 inhabitants answered a questionnaire dealing with the various aspects of social capital. Although the sample in each area is very small, we tried to make it as representative as possible, by stratifying it *ex ante* by age and type of zone (urban or rural). The age of interviewed people was obtained using electoral crolls. When computing averages, the sample was stratified *ex post* by socio-economic category and employment status.

The questions were split into three categories: social norms (norms of trust/loyalty/reciprocity, co-operation and conservatism), local social networks and "*bridging* social capital*"* (outer links and more generally openness). The results of the survey were then compared to the indicators listed in table 1. All indicators are presented in table 3. Note that several indicators have no equivalent in the survey: social homogeneity, collective action, conservatism, and business networks. These features were grasped through the qualitative interviews with local leaders.

Insert table 3 about here

Note that due to data availability constraints, different years are used for different indicators. For each indicator, we tried to use the latest data available. Concerning average farm size, we choose 1970 in order to take into account the productivity gains which occurred since the 1940s, but to avoid most distortions due to the CAP regulations, in particular the regulations for preventing overproduction[9].

Naturally, we should keep in mind that answers to questionnaires can be biased by subjectivity and framing effects, especially for questions about social norms. That is why detailed interviews were a precious tool to corroborate the results of the survey.

Qualitative results

Before comparing the results of the surveys and the statistical indicators, we give for each *pays* a brief synthesis of the qualitative interviews with local leaders.

- In the *pays de Saint-Flour*, most interviewees declare to be proud of belonging to that *pays*. However, collective action turns out to be difficult in every field. Co-operation is always difficult between municipalities, even for mundane operations such as organising a common school or co-ordinating tourism offices. It is the same between firms, even when

synergies are clearly possible, as in the food or tourism sectors. Both the population and local leaders are generally very pessimistic about the future, and do not like newcomers, which leads to a vicious cycle of isolation.

- In the *pays de Dinan*, by contrast, working together is like a second nature. There are countless examples of co-operation between municipalities. The situation is similar in the economic world. There are several entrepreneur associations, which allow various collective actions such as recruiting the workforce, advertising and so on. They are also used to negotiate together with local authorities. There is no hostility towards newcomers, as this area has long been the place of many migrations.

- In the *pays Loire-Beauce*, most interviewees consider the inhabitants of the *pays* as individualistic and distrustful. The absence of fiscal integration between municipalities does not mean that common actions between municipalities are absent however. In fact, there are many common actions, but they are limited to precise topics such as waste management, water supply, school transportation and so on. Conversely, in the economic world, common actions are virtually non-existent. This is due to the fact that most establishments belong to larger firms, and very few complementarities are to be found between them within the *pays*. The fact that employment growth is high is mostly due to the strategic position of the pays near highways and national roads, not to the existence of specific resources.

- In the *pays du Forez*, co-operations are still rare between municipalities, but are widespread in the economic sector. Interestingly, there are even co-operations between establishments of larger firms, for instance for waste management, which contrasts with the *pays Loire-Beauce*. For smaller firms, the quality of relationships between entrepreneurs and workforce has many times been noted. According to many interviewees, there is no historical identity, but a new identity is slowly building thanks to the *pays* policy. The *pays* is very open to migrations, due to its geographical situation.

Many executives from the nearby area of Saint-Etienne are attracted by the positive image

of the pays.

Quantitative results

We now present the quantitative results. Probit analysis was used to see on which

variables *pays* had statistically different values. Average values for each pays are given in

table 4[10].

Insert table 4 about here

Beginning with social norms and social homogeneity indicators, the Gini index turns

out to be a poor predictor of social cohesion. It takes its highest value in *Saint-Flour*, probably

the most stable and conservative study areas. It does not help to predict the level of collective

action either, as the low value in *Loire-Beauce* shows.

Measures of trust yield consistent result, with the noticeable exception of the *pays de

Dinan*. Survey results suggest a low level of trust, while the phonebook indicator gives a high

value, which is consistent with the interviews with local leaders. In fact, informal

conversation with some inhabitants at the end of the questionnaire showed that even those

who stated that they do not trust others are fond of engaging in collective activities. A

plausible interpretation is that in *Dinan*, there is a high trust between known people, but not

with outsiders. Consequently, the trust indicator used in the questionnaire (which measures

how much people trust others in general) should be used with caution in development issues.

The phonebook indicator seems to be more relevant, precisely because it mostly concerns

relationships between known people.

A similar interpretation should explain the surprisingly low value of the *lend question

indicator* (which measures the propensity to lend money to others, see table 3) for the *pays de

Dinan, which seems contradictory with the high value for charity gifts. Measures of charity gifts are consistent between survey and indicators, which is not surprising given the objective nature of the question. They may measure the tendency to share with other people. The value is especially low for the *pays Loire-Beauce* (20%), consistently with the qualitative interviews.

The results of the two collective action indicators fit remarkably well with the results of the qualitative interview. For average farm size, the mechanism is particularly clear in *Dinan*, where the strong collective will to preserve agricultural employment led to a widespread development of intensive pig and poultry breeding. Conversely, in the *pays de Saint-Flour*, where agricultural development could be based on high quality products, we observe on the contrary a concentration of property and vast farms producing generic goods. However, the reason why co-operation in agriculture should spill over to other sectors is unclear though, so that indicator should not be used alone.

Lastly, the conservative vote rate correctly predicts the high parochialism of the *pays de Saint-Flour*, but appears to be of little value in predicting co-operation in general (see for instance the result of the *pays Loire-Beauce*). Conservative parties not only promote conservative values, but also free market options, so the interpretation of this indicator is difficult.

The results on local social networks point out that the level of sociability is high in *Saint-Flour* and low in *Loire-Beauce*. For the two other *pays*, the picture is more mixed. Survey results and their statistical counterparts display some important differences, which is not surprising, given the very indirect nature of indicators such as the number of sport facilities per capita, and the poor quality of the association membership indicator. Average household size seems totally unrelated to sociability in general, and its low variability makes it a poor indicator anyway. Bar density seems to be a good proxy for sociability, notwithstanding the awkward result for *Forez*, in which the qualitative interviews suggest that

informal sociability is high. A possible explanation is that there have been many recent changes in the *pays* (numerous newcomers and the implementation of collective actions thanks to the *pays* policy), so the rise in sociability has not been yet translated into places of sociability. A noteworthy feature is that sociability is not directly related to collective action, nor is trust, as the case of *Saint-Flour* illustrates.

Indicators about personal outer links display a striking inconsistency between the declarations of interviewees and other sources of information. The results of the questionnaires suggest that the *pays de Saint-Flour* is very open and rich in outer links, whereas both interviews with local leaders and statistical data show the opposite. According to the interviews, the most open pays is *Loire-Beauce*, whereas *Dinan* and *Forez* occupy intermediary situations. This is consistent with the results of the statistical indicators. Consequently, random surveys as the one used here appear to be a poor tool for assessing the level of *bridging* social capital. This is because there is more to *bridging* than just links outside the region. Moreover, the number of outer links matters less than the potential resources they carry. Thus, unless detailed enquiries are possible to analyse in depth the structure of relationships outside a region, fieldwork will generally be insufficient to assess *bridging* social capital.

Turning to the business network indicators, the results confirm the information gathered in the interviews, namely that *Saint-Flour* is very isolated economically. The qualitative interviews did not make it possible to rank the three other *pays* according to theirexternal economic networks. According to the indicators, *Dinan* appears to be the most open of all, followed by *Forez* and *Loire-Beauce*. The results of both migration and business networks indicators thus prove to rank the study areas in approximately the same order.

Last, measures about local politics yield some interesting results. First, the *local elections turnout* survey measure is totally unrelated to its statistical counterpart. The highest discrepancy between statement and reality is to be found in the *pays Loire-Beauce* and the

pays du Forez, where the actual turnout is also the lowest. The highest turnout is in the *pays de Saint-Flour*. Surprisingly, there is an inverse relationship between *knowledge of the pays* and *interest in local governance*. The latter is very low in the *pays Loire-Beauce* and the *pays du Forez* (consistently with actual turnout, but not with declared turnout). It is quite high in the *pays de Saint-Flour*. The main lesson from the results on political indicators is that electoral turnout is not related to any measure of social capital nor political performance. Similarly, the subsidies indicator is poorly related to the political power that showed through the interviews. It is high in *Forez* (where no influential political leader is reported) and low in the *pays de Dinan*, whose president is a member of the national Parliament.

In summary, here are the most relevant indicators for measuring the various components of social capital found in the case studies:

- The phonebook indicator seems to be a reasonable proxy for trust. As we saw in Saint-Flour, *trust alone does not imply collective action*. However, it should be a necessary condition for co-operation, and bring other advantages such as a low opportunism.

- Charity gift mostly seems to work best as a "negative indicator" indicating areas with low reciprocity, as the case of *Loire-Beauce* shows. Again, a high value of this indicator does not imply collective action.

- Average farm size fares well as an indicator of collective action. However, nothing guarantees that it would work so well in other areas (think for instance of wine producing areas, where farms are usually small).

- Fiscal integration seems a good indicator as well, provided that the behaviour of mayors reflects the general behaviour of the population, which our case studies tend to corroborate.

- Bar density gives fairly good results at predicting sociability, despite some distortions in low-density areas.

- Population bridging indicators and business link indicators fare quite well in predicting the area's openness and access to outer resources via non-market relationships.

AN ECONOMETRIC APPLICATION

Case studies are not sufficient for making valuable inferences about the causal role of social capital on development. Our study areas differ in too many ways, and their main virtue is to display very contrasted situations that allowed to test the robustness of the potential social capital indicators. In this section, we go a step further and present a simple empirical test on French rural areas. Our dependent variable will be employment growth on the period 1990-1999[11]. Our level of study is the "*bassin de vie*". *Bassins de vie* are statistical units that are designed to be economically integrated for basic services and commuting (INSEE, 2003). They are defined by statistical criteria satisfying two requirements. First, for a list of services considered as "basic", most inhabitants do not get out of the *bassin de vie*. Second, they must be integrated with regard to commuting: most inhabitants of a *bassin de vie* work inside it.

There are 1745 *bassins de vie* in France classified as rural, whose average population of rural *bassins de vie* is of about 12 000 inhabitants, with a standard deviation of 9 500 inhabitants. While it is somewhat heterogeneous, this scale of study proved to be relevant for studying both economic and sociological relationships. We restricted the sample by excluding Corsica and *bassins de vie* with less than 2000 inhabitants. We were then left with 1704 units.

Building social capital indices

To build social capital indices, we use the indicators of the last section, except that social capital variables are now taken at the beginning of the period (i.e. 1990) whenever possible. This makes reverse causation less likely. Moreover, all indicators were normalised and centered.

As social norms indicators and structural indicators happen to be strongly positively correlated, we group them together, and first perform a principal component analysis (PCA) on all bonding social capital indicators[12]. Consistently with the findings of the case studies, several variables appear to be irrelevant to measure social capital[13]:

- Both the Gini index and the share of commuters have the counterintuitive property of being positively linked to other bonding variables. It seems that more inequality of income is associated with more trust and reciprocity norms, and that more commuting is associated with more sociability.

- Household size is negatively correlated to other bonding indicators.

- Fiscal integration appears to be unrelated to other social capital variables (in the PCA, it becomes important only in the fourth component).

- Last, conservative vote is positively related to other measures of bonding social capital, but the case studies suggest it is associated with "bad" bonding (i.e. leading to closure and exclusion).

Consequently, all these variables were dropped from the analysis. We also excluded the "sport facilities" variable, given its poor performance in case studies. We thus keep only five measures of bonding social capital, viz. charity gifts, phonebook indicators, inverse farm size, density of bars/cafés and density of associations. The weights of each variable in the three first components of the corresponding PCA are given in table 5.

Insert table 5 about here

Satisfactorily, all variables contribute positively to the first component. This component appears to measure the idea of "sociability". Indeed, among the variables that contribute the most to it are the number of associations and the density of bars/cafés. The phonebook indicator (trust indicator) is also an indicator of the propensity to interact with people. The

second component is more difficult to interpret. As the two variables most associated with it are charity gifts and inverse farm size (proxy of co-operation in agriculture), it is tempting to consider it as being a measure of "reciprocity" or of "openness to others".

Things are clearer concerning bridging indicators (table 6). Migrations and business networks are positively correlated, again consistently with case studies. Political phenomena (mainly forming the third component) appear to be independent of the former.

Insert table 6 about here

Estimation results

In order to see whether our social capital indicators are related to economic mechanisms, we perform simple econometric estimations. Our dependent variable is employment growth on the period 1990-1999. We use five control variables[14]:

- The sum of 1990 population (in thousands) of the neighbouring units weighed by distance, as a measure of market potential.

- The share of industrial employment (excluding food processing).

- The share of residential employment, defined as all activities which are linked to the population (INSEE, 2003), such as real estate, retail sector, education, and administrations.

- The ratio of qualified workers to non-qualified workers as a first human capital indicator.

- The share of the population between 15 and 60 who own at least the *baccalaureat* degree in 1990, as a second human capital indicator in 1990.

   As social capital variables, we use the following indices:

- The first two components of the PCA on the five selected bonding variables. These are labelled Bonding1 and Bonding2 respectively. Bonding1 is a measure of sociability, whereas Bonding2 proxies reciprocity.

- The first three components of the PCA on bridging social capital indicators. These are labelled Bridging1, Bridging2 and Bridging3, and they respectively correspond to general networks (mixing migration and business), migration and political bridging social capital.

Insert table 7 about here

Column 1 in table 7 gives the result of the regression with control variables only. All variables have the expected positive sign.

In column 2, we add social capital variables. All social capital variables have a positive and significant impact (at the 5% level for "political networks"). This confirms the intuition that all aspects of bridging social capital are important. In column 3, we added cross products between bonding and bridging indices, in order to examine the possibility of complementarities between them. It turns out that there are few interactions between bonding and bridging social capital. Consequently, whereas both bonding and bridging are important, there is little amplification effect between them.

Last, we tested for the possibility of a non-linear effect of social capital variables (column 4). As expected, the quadratic terms of the first component of bonding social capital have a negative sign. That is, there exists a threshold over which negative effects of bonding predominate.

CONCLUSION

This article provides a first step towards a better understanding of the interaction between sociological and economic phenomena in peripheral areas. It shows the usefulness of

combining case studies with econometric analysis to better grasp the meaning of the social capital indicators. It demonstrates that social capital is at least bi-dimensional, including a bonding (local cohesion) and a bridging (outer links) component. Econometric estimations give promising results. They show that all these components of social capital are important, and suggest the existence of saturation effects (i.e. when bonding is too strong, it decreases performance). However, while our results corroborate the relevance of bonding social capital for economic performance, much work remains to be done to address causality issues. Two very tricky issues are the possibility of reverse causation and the fact that social capital indicators may in fact proxy for institutional performance (DURLAUF and FAFCHAMPS, 2004). Concerning the latter issue, our case studies suggest that the functioning of local institutions and the efficiency of local leaders is for a large part conditioned by the sociological background. Concerning the possibility of a reverse causation between sociological features and economic performance, more thorough investigations (both theoretical and empirical) must be done. However, using beginning of period variables for social capital parameters tempers the risk of reverse causation. Despite these limitations, this work provides encouraging results about the role of social capital in regional development. Indirect as our indicators might be, the relationships between them suggest that they capture relevant aspects of what is meant by "social capital". Moreover, case studies and econometric analysis gave on the whole coherent results. Both suggest the existence of robust relationships between the sociological and economic spheres. As sociological factors are more and more taken into account in the design of local development policies, deepening the understanding of the mechanisms by which social capital fosters development is essential. One of the main messages to be taken from this work is that although cohesion and co-operation often play a significant role, more attention should be given to external links as a factor of development.

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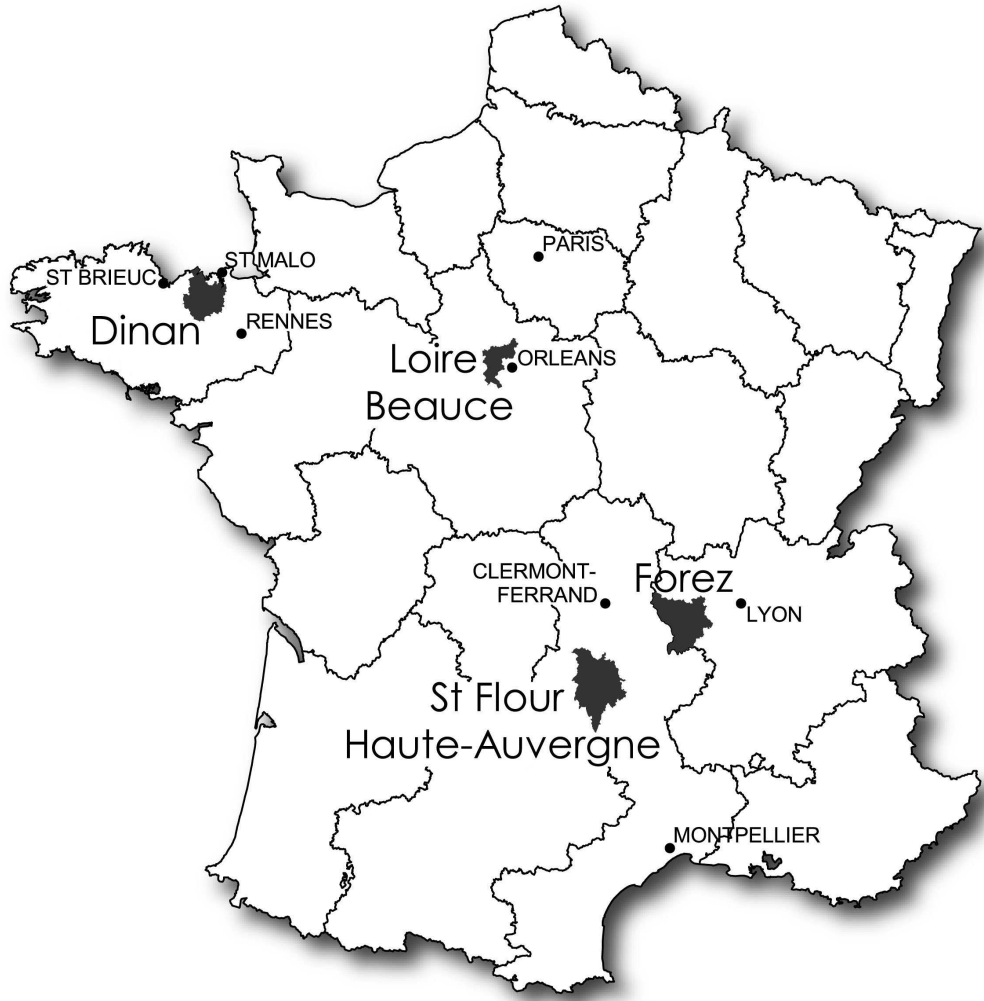
Figure 1. The four case study areas

TABLES

Table 1. Social capital indicators tested in this study

Class of phenomenon	Indicators
Social homogeneity	Gini index on income
Trust, loyalty, reciprocity	Rate of phone users not on the directory, charity gifts
Co-operation	Average farm size, fiscal integration coefficient
Conservatism	Vote for conservative parties
Density of local links	Participation in associations, average household size, density of bars and sport facilities, share of commuters
Bridging social capital	Emigration/immigration indicators, business links, electoral turnout, number of subsidies granted

Table 2. Some features of the four case studies

	Saint-Flour	Dinan	Loire-Beauce	Forez
Size (km²)	2 511	1 393	767	1 959
# of municipalities	105	79	40	136
Population 1999 (thousands)	40.0	100.4	46.4	160.3
Population growth 1990-99	-9%	-1%	+4%	+6%
Employment 1999 (thousands)	15.3	32.2	14.8	54.7
Employment growth 1990-99	-7%	-1%	+10%	+9%
Agriculture share 1999	28%	13%	7%	6%
Industry share 1999	9%	16%	30%	31%
Baccalaureat holders 1999	20%	23%	25%	26%
Mean income per household 1999 (€)	20 024	23 739	29 981	26 176
Mean distance to highway (km)	20	8	8	10
Mean time to metropolitan area	72'	20'	27'	23'

Source: INSEE.

Table 3. Survey questions and statistical indicators

Class	Survey questions	Indicators
Social norms and social homogeneity		
Social homogeneity		Gini index on household income (2001)
Trust and reciprocity	Refusal rate Trust indicator: percentage of people agreeing that: "most people can be trusted" Charity gifts indicator: percentage of people who gave money for charity in past twelve months. Lend question indicator: average number of people to whom the interviewees would lend "an important sum of money".	Phonebook indicator: # phone numbers in the phonebook (2004) / # of households Charity gifts: same indicator as in the survey, obtained from data on tax deductions in 2001.
Collective action		Average farm size 1970 (ha) Fiscal integration coeff. (2002)
Conservatism		Conservative vote: results of conservative parties at local elections (2001).
Local social networks		
Formal sociability	Association membership: Average number of associations each person is a member of.	Number of associations for 1000 inhab.
Informal sociability	Individual network size: average number of people the interviewees have a weekly conversation with.	Average household size (1999) Density of bars: number of bars for 1000 inhabitants (1998).

	Frequenting bars: percentage of people going to bars at least monthly. Sport or cultural events: percentage of people going to matches or cultural events at least monthly. Average distance to workplace (km)	Density of sport equipments: number of sport facilities for 1000 inhabitants (1998) Share of commuters: share of people working in another municipality (1999)
Outer links and openness		
Personal links	Share of natives of the pays Individual outer links: average number of people outside the pays interviewees have a weekly conversation with. Seasonal migration: average number of days in the year spent outside the *pays*. Moves: percentage of people who moved from elsewhere in the last 10 years.	Natives (1999) Share of immigrants (1982-90) Recent immigrants (1990-99)
Business networks		Head office indicator (1999) Backoffice indicator (1999)
Political networks	(stated) Turnout at latest local elections	Turnout at local elections (2001) Subsidies received / DGF (2002)[15]

Table 4. Interview results and statistical indicators (standard errors in brackets)

	Saint-Flour	Dinan	Loire-Beauce	Forez	Average all *pays*
Social norms and social homogeneity					
Gini index on household income	0.40	0.37	0.33	0.36	*0.36 (0.02)*
Refusal rate	31%	46%	43%	39%	
Trust indicator	60%	38%	42%	50%	
Phonebook indicator	81%	79%	68%	78%	*72% (9%)*
Lend question indicator	5.05	3.93	5.4	5.85	
Charity gifts declared	40%	45%	20%	36%	
Charity gifts	24%	23%	19%	24%	*21% (3%)*
Average farm size 1970 (ha)	30	14	34	14	*23 (14)*
Fiscal integration coefficient	18%	32%	0%	21%	*23% (13%)*
Conservative vote	77%	38%	45%	47%	*45% (12%)*
Local social networks					
Association membership	0.86	0.83	0.32	0.88	
Associations for 1000 inhab.	10.7	5.7	5.6	5.4	*6.0 (1.8)*
Individual network size	8.98	8.09	7.31	7.75	
Average household size	2.4	2.4	2.7	2.6	*2.5 (0.1)*
Frequenting bars	46%	49%	36%	48%	
Density of bars	*1.23*	*1.31*	*0.92*	*0.92*	*0.99 (0.45)*
Sport or cultural events	76%	85%	54%	90%	
Density of sport facilities	*1.95*	*1.08*	*1.06*	*0.87*	*1.14 (0.45)*
Average distance to workplace	10.6	12.9	10.9	10.8	
Share of commuters	*16%*	*46%*	*59%*	*51%*	*41% (11%)*

Outer links and openness					
Share of natives	66%	68%	78%	90%	
Individual outer links	5.85	4.3	3.8	3.85	
Seasonal migration	17.3	18.5	16.1	12.9	
Moves in last 10 years	28%	19%	32%	22%	
Share of migrants 1990-99	*11%*	*17%*	*17%*	*15%*	*15% (4%)*
Emigration bridging (1999)	*0.704*	*1.272*	*1.589*	*1.149*	*1.1 (0.2)*
Immigration bridging (1999)	*0.652*	*1.440*	*2.006*	*1.671*	*1.4 (0.4)*
Head office indicator (1999)/1000	*0.401*	*3.612*	*1.800*	*2.192*	*1.6 (3.8)*
Backoffice indicator (1999)/1000	*3.347*	*19.560*	*14.286*	*10.766*	*7.4 (12.5)*
Turnout at latest local elections	86%	77%	86%	84%	
Knowledge of the *pays*	7%	11%	22%	26%	
Interest in local governance	38%	17%	12%	12%	
Turnout in local elections (2001)	*72%*	*66%*	*61%*	*61%*	*65% (5%)*
Subsidies (2002)	*0.39*	*0.26*	*0.34*	*0.46*	*0.43 (0.19)*

Table 5. Components of the PCA on the five best bonding variables (inertia in brackets)

	First component (38%)	Second component (21%)	Third component (17%)
Phonebook	0,540	-0,208	-0,268
Charity gifts	0,318	0,617	0,623
Inverse farm size	0,352	0,618	-0,520
Associations	0,467	-0,350	0,484
Density of bars	0,515	-0,269	-0,188

Table 6. Components of the PCA on the five best bridging variables (inertia in brackets)

	First component (36%)	Second component (34%)	Third component (20%)
Emigration	0,681	0,626	0,068
Immigration	0,548	0,737	0,135
Head office	0,731	-0,565	0,113
Back office	0,665	-0,646	0,045
Subsidies	-0,239	-0,051	0,969

Table 7. Growth regressions: dependent variable = employment growth 1990-99

	(1)	(2)	(3)	(4)
Intcpt	-0.353***	-1.164***	-0.159**	-0.169***
Market potential	0.011***	0.007***	0.007**	0.007***
Residential	0.001***	0.001**	0.001**	0.001***
Industry	0.001**	0.000	0.000	0.000
Q/NQ	0.043***	0.019**	0.019**	0.019**
Baccalaureat	0.798***	0.417***	0.430***	0.389***
Bonding1		0.008***	0.007***	0.016***
Bonding2		0.014***	0.010**	0.009**
Bridging1		0.017***	0.018***	0.018***
Bridging2		0.020***	0.021***	0.021***
Bridging3		0.007**	0.006*	0.008*
Bonding1 * Bridging1			0.001	0.000
Bonding1 * Bridging2			0.004*	0.004**
Bonding1 * Bridging3			-0.001	-0.002
Bonding2 * Bridging1			-0.002	-0.003
Bonding2 * Bridging2			0.000	0.001
Bonding2 * Bridging3			0.006**	0.007**
Bonding1 ^2				-0.002***
Bonding2 ^2				0.000
Bridging1 ^2				-0.003**
Bridging2 ^2				0.003**
Bridging3 ^2				-0.001
R²	0.172	0.203	0.208	0.214

*** significant at the 1% level, ** at the 5% level, * at the 10% level

NOTES

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[1] Other works on social capital emphasize the importance of a third, intermediary, category, which is termed "linking" social capital (Woolcok, 1998). "Linking" involves social links that connect individuals with complementary resources or hierarchical relationships. Although this category is conceptually relevant, we did not introduce it in this work for both theoretical and practical reasons. On the theoretical side, the bonding/bridging distinction is already rich enough to understand most mechanisms involved in regional development issues. On the practical side, linking is very difficult to distinguish empirically both from bonding and from non-social (i.e. "anonymous") relationships.

[2] A well known example in development studies is the case when cultural norms forces you to give some part of your income to your family. Clearly, nobody will be incited to work efficiently, knowing that he can himself rely on others.

[3] Other measures of social heterogeneity are possible, such as measures of the evenness of social categories. As they give similar results to the Gini indicator, they were not discussed here.

[4] For constructing the phonebook indicator, we assumed that every household had a phone at home. The market for fixed phones was liberalized only very recently in France, so our measure of the rate of phone users on the phonebook should not be too much distorted.

[5] The validity of this indicator is probably contextually specific. It would be interesting to see how indicators of farm structure perform in other countries. Il is likely that for other European countries, we should find a link between co-operation and farm structure indicators.

[6] This is of course restrictive, as bridging links may be internal to regions. However, restricting *bridging* to external links is a reasonable approximation for rural areas, which are usually considered as being very homogenous. Note that the *bonding/bridging* distinction varies a lot among authors. For example, Beugelsdijk and van Schaik (2005) define *bridging* in a way that would probably be interpreted as *bonding* by many authors (including us). In our case, the advantage of using a very clear-cut representation of bonding and bridging is to highlight the fundamental trade-off between cohesion and diversity.

[7] The number of phone calls/mail exchange between regionswould measure the actual communications that take place between a region an the rest of the world. Unfortunately, such an indicator is not available at local levels.

[8] In May 2005, there were 316 *pays*, covering about 70% of the French territory.

[9] However, using figures of the 2000 census does not modify the qualitative results on these study areas.

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[10] Because the *pays* do not cover the whole French territory, and their definition lacks statistical objectivity*bridging* indicators were computed at the *bassin de vie* level (see next section) and then averaged over the pays, weighting each unit by its 1999 population. Probit analysis allows to test the significance of various determinants in a binary variable. Here, we tested whether there were significant differences between the four regions for binary variables such as "Trust indicator" or "Lend question". The results of probit analysis is available upon request at the authors.

[11] Employment growth may seem a crude indicator of economic performance. However, employment is almost the only reliable (and robust) economic measure we can get at such a local level. Unemployment is also available, but does not seem to be a very relevant indicator for rural areas. Some authors use professional tax base as a proxy for local GDP. Unfortunately, the rules for calculating tax bases change frequently and display high biases and spatial variations. Note that using as dependent variables unemployment rate and tax base per inhabitant gives results coherent with employment growth concerning social capital variables.

[12] In our case, principal component analysis allows to extract a "common tendency" from a set of quantitative variables. All our variables, though very indirect, share something in common (intensity of sociability in the case of bonding, openness to external opportunities in the case of bonding). PCA helps to remove the unwanted features of the indicators. A very satisfactory property of the bonding index constructed with the PCA is that it is very robust to changes in the list of variables: it changes very little if we add or suppress a few variables.

[13] All results are available upon request at the author.

[14] Other potential control variables such as initial employment density, initial per capita income or age structure were tested, but were not significant in any regression.

[15] DGF ("dotation globale de fonctionnement") is a transfer from the central government, based on objective data linked to the municipalities' size and needs.