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## **Cooperative banks, innovative entrepreneurship, and trust:** Insights from Italian history

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## **Cooperative banks, innovative entrepreneurship, and trust: insights from Italian history**

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### **Abstract**

We investigate the role of the historical presence of cooperative banks on current levels of new business formation in innovative industries. Empirical evidence shows that the regional tradition of entrepreneurship tends to be persistent. In Italy, current provincial rates of entrepreneurship in high technology sectors still depend significantly on the propensity of entrepreneurs to use new technologies in 1927 (Cosci et al.2022). How important was it in the past that these innovative entrepreneurs found banks that were able to finance their investment projects? In 1950, in a country destroyed by WWII, Italian monetary authorities assigned a strategic role to small banks to promote local economic development. Our findings suggest that the diffusion of small banks in the first four decades of the post-war period fostered the development of an innovative entrepreneurial culture in Italian provinces, but only in the area characterised by relatively higher levels of trust.

Keywords: cooperative banks, innovative entrepreneurship, trust.

**JEL classification:** L26, O33, R11

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## 1. Introduction

In economic literature we find a growing body of empirical evidence supporting the hypothesis that historical processes still play an important role in shaping local entrepreneurial culture (for a review of the literature, see Fritsch & Storey, 2014; Fritsch & Wyrwich, 2023). If we look at the roots of local entrepreneurial culture in Italy, we find that current provincial rates of entrepreneurship in High and Medium-High Technology Manufacturing (HTM) sectors depend significantly on the propensity of entrepreneurs to use the motive power in 1927 (Cosci et al. 2022). In 1927, in some Italian provinces, there were entrepreneurs willing to adopt new technologies, and in others not. This different historical endowment of entrepreneurial culture still affects current entrepreneurship rates. How important was it in the past that these innovative entrepreneurs found banks willing to finance them?

Scholars agree that loan officers of small local banks can play an essential role in providing innovative firms with access to financial resources, thanks to their ability to produce and process soft information (Berger & Udell, 1995; Berger et al., 2001; Cosci et al., 2016; Petersen & Rajan, 1994) and to build trusting relationships (Ghio et al. 2019; Howorth & Moro, 2006). All innovative firms invest in high-risk projects that are, by definition, new. Their evaluation requires the production of costly “soft information”, i.e. qualitative and “forward-looking” information. Therefore, some regions may be characterised by a culture conducive to innovation because, in the past, innovative entrepreneurs found local banks with which they were able to build mutual trust relationships. Empirical evidence (Cosci et al. 2023) shows that current rates of entrepreneurship in HTM sectors still depend on the presence of small financial institutions in 1927; they also depend on the presence of Cooperative Banks (CBs) in 1936, but only when we exclude Italy’s southern provinces from the sample. In 1950, in a country destroyed by war, Italian authorities assigned a strategic role to small banks to promote local economic development. The first aim of our analysis is to investigate whether the diffusion of CBs following that choice still affects HTM sectors’ start-up rates, like the diffusion of small banks in 1927 and 1936. In 1950, the Governor of the Bank of Italy, Donato Menichella, wrote that capital had to be provided “above all” by small, peripheral institutions that lived close to each small business owner, shared his life and his preoccupations. He also wrote that he feared the mistakes, the carelessness, and the negligence of the officials of large banks (Cotula et al., 1997, p. 32). During the 1960s, 1970s, and 1980s, the actions of local entrepreneurs interacted with the strong discretionary power of the Bank of Italy (see Gigliobianco, 1997). The network of CBs in Italy was strengthened, and the process continued until the beginning of the 1990s, when the cooperative credit system underwent

profound changes. We therefore focus our analysis on the effect of the presence of CBs at the beginning of the 1990s on current provincial entrepreneurship rates.

The second aim of our analysis is to investigate whether the historical role of CBs in the post-war period has been different in contexts characterised by different endowments of institutional trust. Cosci et al. (2023) found a positive and significant effect of the local presence of CBs in 1936 only when southern Italian provinces, traditionally lacking social capital, were excluded from the sample. Giuseppe Toniolo, an important promoter of people's banks (*Banche Popolari*, BPs) in Italy, highlighted the importance of trust for the proper functioning of CBs. He wrote in 1895 that cooperation had its unexpected degenerations and that cooperative devices, especially credit ones, were built on trust and therefore above all on personal honesty. And this was all the more the case where real guarantees were lacking, as in the credit activities of the people's banks (Molesti, 2012, p.3). CB loan officers have much more discretion than their counterparts in the big banks, but discretion is a double-edged sword: it can be used fairly to finance trustworthy loan applicants, or it can be used to redirect financial resources to firms that have close ties with influential members of the local community. In the latter case, mistrust in the fairness of the screening process may discourage potential innovative entrepreneurs. Several studies document the historically low level of institutional trust in the southern Italian regions (e.g. Banfield, 1958; Putnam et al., 1993; Guiso et al., 2004). According to Putnam et al. (1993), Italy's southern area has always been caught in an "equilibrium of mistrust". The proliferation of CBs in the South in the late nineteenth century and their apparent contradiction with Putnam's hypothesis that the population of the South was incapable of cooperating inspired an interesting empirical study by A'Hearn (2000). His findings suggest that CBs in the South were different from those in the Centre-North. In particular, he documented that the lack of deposits forced southern CBs to rely heavily on rediscounting for funding (unlike their northern counterparts). Southern savers seem to distrust the new CBs, perhaps because they distrusted the local bourgeoisie. Differences between CBs located in the South and the rest of Italy were also found by Ferri and Messori (2000) using more recent data. They found that the presence of CBs in the 1990s improved credit allocation in the Centre-North Italy, but worsened it in the South. We argue that the effectiveness of CBs' screening and monitoring activities may depend critically on the environment in which they operate.

We find a positive and significant effect of the presence of CBs in 1991 for HTM sectors in the subsample of provinces characterised by levels of our institutional trust indicator higher than the average, while we find no significant effect when we also include lower trust provinces in the sample. We never find a significant effect for the Low and Medium-Low Technology Manufacturing sectors (LTM). In addition, in the regressions carried out,

we do not find any significant effect of their presence in 2001 and 2011. These results give support to the hypothesis that the presence of CBs at the beginning of the 90s has influenced subsequent local entrepreneurial culture in those local Italian communities that have more confidence in the formal and informal institutions governing their lives.

This paper contributes to two strands of the empirical literature. It deepens the investigation of the “long-term” impact of the presence of CBs on current entrepreneurship rates, in line with Cosci et al. (2023), by suggesting that it may be important to introduce a historical perspective in the literature on financial constraints on innovative firms (e.g., Berger & Udell, 1995; Berger et al. 2001; Cosci et al., 2016; Magri, 2009; Monehn et al. 2008; Petersen & Rajan, 1994). Moreover, it highlights the importance of considering the trust environment in which CBs operate when empirically investigating their role in local development (for a review of the literature, see Duqi et al., 2019).

The remainder of this paper is organised as follows. Section 2 describes our indicator of institutional trust. Section 3 presents the empirical strategy and the results of the econometric estimations. Finally, Section 4 concludes the paper.

## **2. High-trust and low-trust regions in Italy**

We can define trust according to Mayer et al. (1995) as “the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor and control that other party” (p. 712). Institutional (or embedded) trust can be defined as the presence in a region of a general willingness to trust others based on values and principles that are considered intrinsically desirable (Jones & George, 1998). A high-trust region can be defined as a context in which culture (Hofstede, 1981), social constraints, and institutional constraints (Hardin, 1996) promote the formation of institutional trust.

As stated in the Introduction, Italy is a country characterised by significant territorial disparities in terms of the endowment of social capital. Literature highlights how differences in the endowment of social capital are reflected in the traditional divide in economic development between the Centre-North and the South of the country. Indeed, the South of Italy is generally associated with a lower endowment of bridging social capital - i.e., the propensity to form links between different social groups that foster cooperation within a community, leading to the greater sharing of information and broader access to resources and opportunities that would

otherwise be excluded - than the Centre-North. This form of social capital plays a crucial role in economic development processes, as its characteristics allow for a greater sharing of knowledge and a wider diffusion of trust (Sabatini, 2008). In the South, there is a predominance of bonding forms of social capital, in the form of strong ties within social groups, which can foster forms of exclusion and social division, as well as a certain resistance to change, potentially harmful to economic activity (Crescenzi et al., 2013).

We create a composite index that allows us to examine the regional endowment of trust and highlight the divide between the different areas of the country. Our focus is on institutional trust, which, as we have already pointed out, indicates a community's confidence in the formal and informal institutions that govern its life. In this sense, we believe there is a strong link between institutional trust and bridging social capital. Greater institutional trust implies a more active participation of people in society, which can be translated into greater cooperation. It can therefore be seen as a fundamental prerequisite for developing those weak ties, as Granovetter (1973) puts it, that make up bridging social capital.

There are difficulties in measuring institutional trust at the provincial level because the indicators derived from different surveys and typically used as proxies for the level of institutional trust are not available at the NUTS-3 level. For this reason, we must necessarily resort to objective indicators representing the results of institutional trust. In line with the framework proposed by Terzo (2022), we construct our composite index by incorporating four indicators, utilising a reflective model wherein these indicators are regarded as potential manifestations of the phenomenon under examination. To aggregate the indicators and construct our composite index, we use the Principal Component Analysis described in Appendix 1.

**Table 1.** Institutional trust indicators

| Indicator                                                                        | Label                 | Year | Source                                      |
|----------------------------------------------------------------------------------|-----------------------|------|---------------------------------------------|
| Number of blood bags per million inhabitants                                     | <i>Blood_donation</i> | 1995 | AVIS<br>Guiso et al. (2004)                 |
| Number of artistic, cultural and recreative associations per 100.000 inhabitants | <i>Associations</i>   | 2000 | Istat                                       |
| Voter turnout for the divorce referendum                                         | <i>Voter_turnout</i>  | 1974 | Ministry of interior<br>Guiso et al. (2004) |
| Number of non-sport daily newspapers sold per 1,000 inhabitants                  | <i>Newsp_read</i>     | 2001 | Cartocci (2007)                             |

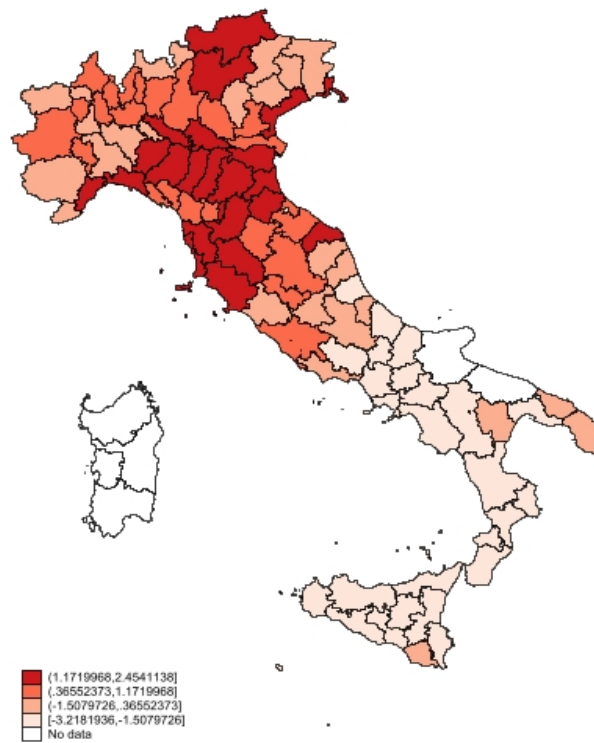
The indicators under consideration in our analysis are reported in Table 1:

- *Per capita blood donations.* Blood donation is widely recognised as an accurate latent proxy for social capital (e.g., Guiso et al., 2004, 2008, 2011; Nannicini et al., 2013). We consider it an appropriate proxy for trust in civic institutions because it captures altruistic, cultural and social relationships (Argentiero et al., 2023).
- *The number of artistic, cultural, and recreational associations per 1,000 inhabitants.* Associationism can certainly be a valid proxy for levels of social and civic participation, which can be stimulated by the presence of institutional trust. A territory characterised by social norms that orient individual behaviour towards the collective interest by increasing the propensity to cooperation can, indeed, be fertile ground for the proliferation of associative activities (Mendoza-Botelho, 2013). In our analysis, we consider artistic, cultural, and recreational associations rather than other types of non-profit organisations because they fall into the category of “Putnamian groups”, which are seen as a source of trust and social ties, as opposed to “Olsonian groups”, which are considered collective, acting to promote particularistic interests to the detriment of the general interest (Knack, 2003);<sup>4</sup>
- *Voter turnout for the 1974 divorce referendum.* Electoral participation can be plausibly linked to institutional trust. In a context characterised by a strong culture of cooperation, fostered by the presence of institutional trust, people are likely to be more inclined to participate in politics because it influences their perception of the importance of their actions and their vote in the social context (Alesina & Wacziarg, 2000; Cox, 2003);
- *Number of non-sport daily newspapers sold per 1,000 inhabitants.* Newspaper reading is a traditional proxy for social capital. This is because better-informed citizens are generally more inclined to participate in civic and political activities (Putnam, 2000).

Looking at Figure 1, which shows us the spatial distribution of our composite index, we see the predictable divide between the Centre-North and the South of Italy. All southern provinces are characterised by values below the average. The peculiar socio-economic and cultural conditions of the South may foster a negative perception of formal and informal institutions, which may be reflected in the low presence of pro-social behaviour.

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<sup>4</sup> This categorization of organizations into Putnamian and Olsonian stems from the research of Putnam et al. (1993) and Olson (1982). Putnam and his colleagues attributed the economic success of Italian regions to the presence of a robust network of associations, facilitating cooperation and solidarity essential for addressing collective and agency problems. Conversely, Olson emphasized organizations advocating for specific interests, warning of potential conflicts between these interests and those of the community, which could undermine interpersonal trust, institutional integrity, and economic performance (Pena-López & Sánchez Santos, 2007).

**Figure 1.** Choropleth map of the institutional trust index

### 3. Empirical strategy

#### 3.1 Dataset

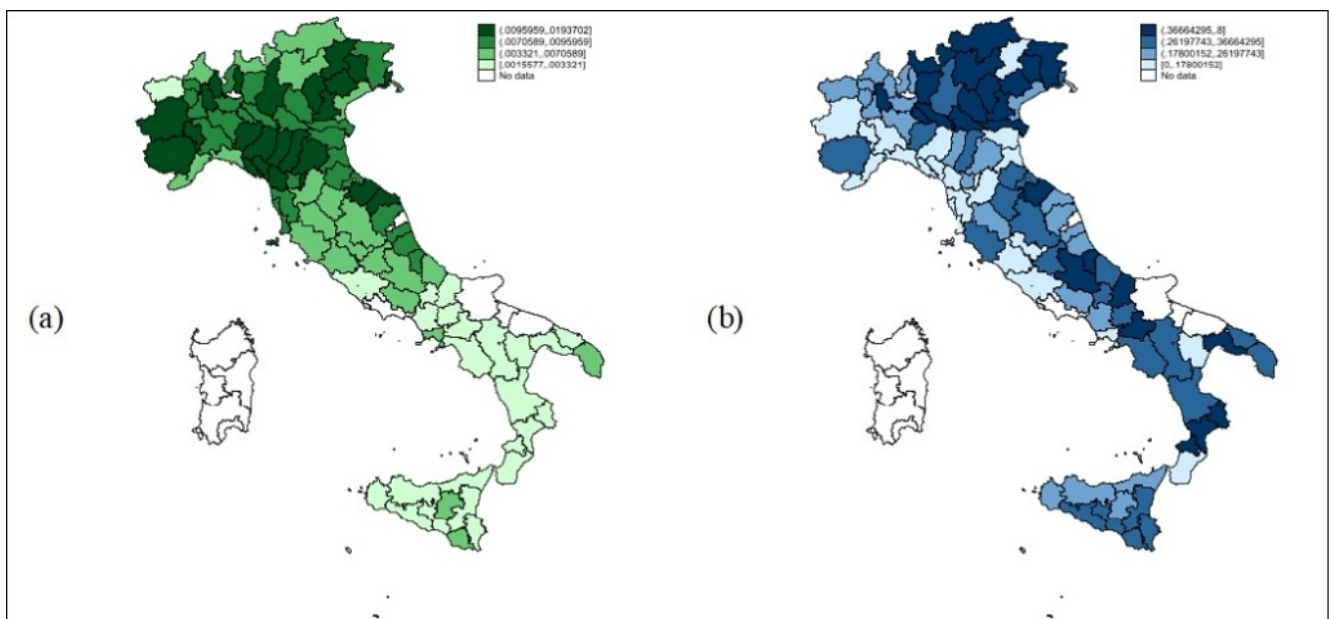
We use a panel dataset constructed by merging different data sources. Italian provinces, classified according to the NUTS-3 classification, serve as our geographical reference units. Given the numerous administrative changes in Italy over the years, our sample includes a total of 95 provinces.<sup>5</sup> The data sources are the Italian National Statistics Institute (ISTAT), the Bank of Italy and the Chamber of Commerce's business register, the latter providing data on the number of firm births during the 2000s. The 1927 industrial census (Censimento Generale dell'Industria e dei Servizi), published in 1932 when the famous statistician Corrado Gini (1884–1965) was head of ISTAT, is an important source of our historical data.

<sup>6</sup>For the newly created provinces through division, the historical data from the province to which they belonged in 1927 were included in the dataset. We excluded from the sample all the provinces for which this operation was not possible.

### 3.2 Dependent variable

As a dependent variable, we consider the start-up rate at the provincial level for the period 2004–2017, examining different groups: (1) HTM sectors (*HTM*); (2) LTM sectors (*LTM*); and (3) the total manufacturing sector (*Manuf*).<sup>6</sup> Figure 2a shows the start-up rate in the HTM sector for 2004–2017. We can see that the northern area of the country (especially the North-West and the Northern Adriatic) and part of the Centre are characterised by high levels, while the remaining central provinces are characterised by medium levels and most southern provinces by low levels. However, the quantile map also shows a significant heterogeneity within the macro-regions.

**Figure 2.** Choropleth maps of HTM (a) and Coopbank 91 (b) variable



### 3.3 Independent variable

Our independent variable is the share of CBs (Popular banks, BPs, and Casse Rurali e Artigiane, CRAs) on total bank branches in Italian provinces in 1991 (Coopbank91). We claim that the geographical distribution of CBs in 1991 reported in Figure 2b is the result of a cumulative causal mechanism that operated in the 1960s, 1970s, and 1980s, in which the actions of local entrepreneurs interacted with the discretionary power of the Bank of Italy. An interesting study by Gigliobianco (1997), based on documents from the Bank of Italy’s archives, shows that

<sup>6</sup> For the analysis of the technology intensity of the manufacturing sectors, we consider the classification adopted by Eurostat (see [https://ec.europa.eu/eurostat/cache/metadata/Annexes/htec\\_esms\\_an3.pdf/](https://ec.europa.eu/eurostat/cache/metadata/Annexes/htec_esms_an3.pdf/)).

in the 1950s and 1960s the number of rejected applications far exceeded the number of approved ones.<sup>7</sup> In any case, between the 1960s and the 1980s the cooperative banking movement in the Italian credit market strengthened. In the 1990s, the cooperative credit system underwent profound changes. The name of the CRAs was changed to “Banche di credito cooperativo” (Cooperative Credit Banks), and the many previous restrictions on their credit specialisation and geographical expansion were relaxed. BPs grew through a wave of mergers and acquisitions both within and outside their banking category, becoming in some cases closer to joint stock companies than to CBs.

### 3.4 Control variables

To avoid omitted variable bias, we include a set of control variables that refer to the current and previous periods. Regarding the current period, we first include value added per capita (*Va*) and population aged 15-64 (*Pop*) to control for the level of local economic development and the spread of potential entrepreneurs. We also control (following Cosci et al. 2022) for agglomeration effects, human capital endowment, and regional knowledge by including population density (*Popdens*), the share of employees with a tertiary degree (*Tertiary*), and research and development expenditures as a percentage of GDP (*R&D*).

We are interested in investigating if and how the diffusion of CBs in Italy in the early 1990s affected the development of the local entrepreneurial culture. Since a culture takes generations to emerge, we have included in our model historical control variables related to the pre-war period. As stated in the Introduction, when we look at the roots of local entrepreneurial culture in Italy, we find that current provincial rates of entrepreneurship in HTM sectors depend significantly on the propensity of entrepreneurs to use the motive power in 1927 (Cosci et al. 2022). We therefore included among our control variables the provincial entrepreneurship rate in 1927 (*Histentr*) and the share of entrepreneurs using motive power in 1927 (*Histmpower*). We also included the value added per capita in 1931 (*Histva*), the population in 1931 (*Histpop*), the population density in 1921 (*Histpopdens*), the share of illiterate people out of the total people aged six years and over in 1931 (*Histilliteracy*), and a dummy for provinces with a long tradition of academic institutions (i.e., having a university in 1895, *Histuniv*), which may

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<sup>7</sup> An exemplary case may illustrate Bank of Italy’s discretionary power. The request to open a CRA in a small town in 1961, supported by the local bishop, was motivated by the “appalling usury” practised by a few unscrupulous wealthy people to the detriment of the poor, unable to defend themselves or to apply for bank loans. Additionally, in the entire municipality, there was only one representative of a big bank, which had only one employee and was open for no more than three hours a day. The director of the local branch of the Bank of Italy expressed a favourable opinion on the request in his report. Despite the documentation and the director’s favourable report, the request was rejected because, as Guido Carli, the governor of the Bank of Italy, wrote, authorisations were granted to set up new banks only in places without existing bank branches. Given the almost non-existent activity of the big bank’s branch in the area, Gigliobianco argues that it is likely that it was not so much the fear of overbanking but the power of the big bank to avoid competition that led to the negative decision (see Gigliobianco 1997, pp. 212-213).

have fostered the accumulation of large stocks of knowledge over time. We control for historical differences in the provincial industrial structure and in the financial system's development by including in the estimates two variables measuring the presence of large firms (*Histlarge*) and the share of firms in the financial sector (*Histcred*) in 1927.

Finally, to control for differences in the geographical location, we include macro-regional dummies, namely North-West (*Nw*), North-East (*Ne*), and South (*So*), with Centre (*Ce*) as the reference category, and over time by introducing year dummies (useful to control for external shocks). We also introduce a dummy for the province of Sondrio (*DuSo*), an outlier for the high share of CBs, and a dummy for Rome and Milan (*DuMiRo*), which are the two most developed financial centres in Italy. A detailed description of all the variables and the summary statistics is reported in Table 2 for the whole sample and in Table 3 for the two subsamples of High-trust and Low-trust provinces (characterised by values of our institutional trust indicator above and below the average, respectively). We report the correlation matrix of explanatory variables in the Appendix (Table A2).

**Table 2.** Summary statistics of the whole sample (Italy)

| Variables                   | Definition and sources                                                                                                                                          | Obs. | Mean        | S.D.        | Min         | Max           |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------------|-------------|-------------|---------------|
| <b>Dependent variables</b>  |                                                                                                                                                                 |      |             |             |             |               |
| <i>HTM</i>                  | Number of start-ups in High and medium-high Technology Manufacturing sectors divided by active population (per 1,000) (2004-2017) (ISTAT and Business Register) | 1344 | 0.007       | 0.008       | 0.000       | 0.043         |
| <i>LTM</i>                  | Number of start-ups in Low and medium-low Technology Manufacturing sectors divided by active population (per 1,000) (2004-2017) (ISTAT and Business Register)   | 1344 | 0.057       | 0.059       | 0.010       | 0.711         |
| <i>Manuf</i>                | Number of start-ups in Manufacturing divided by active population (per 1,000) (ISTAT and Business Register) (2004-2017)                                         | 1344 | 0.064       | 0.061       | 0.012       | 0.717         |
| <b>Independent variable</b> |                                                                                                                                                                 |      |             |             |             |               |
| <i>Coopbank91</i>           | Share of cooperative banks (BPs and CRAs) branches on total bank branches in 1991 (Bank of Italy)                                                               | 1344 | 0.282       | 0.154       | 0.000       | 0.800         |
| <b>Control variables</b>    |                                                                                                                                                                 |      |             |             |             |               |
| <i>Va</i>                   | Value added per capita (in millions of euro) (ISTAT) (2004-2017)                                                                                                | 1344 | 22,873.647  | 5,868.652   | 12,174.000  | 44,219.000    |
| <i>Pop</i>                  | Population 15-64 years old (2004-2017) (in 000)                                                                                                                 | 1344 | 372.117     | 427.355     | 55.365      | 2,844.500     |
| <i>Popdens</i>              | Number of inhabitants per square kilometre (ISTAT) (2004-2017)                                                                                                  | 1344 | 256.797     | 340.965     | 37.280      | 2,652.730     |
| <i>R&amp;D</i>              | R&D expenditure as a percentage of the GDP (regional) (ISTAT) (2004-2017)                                                                                       | 1344 | 1.146       | 0.396       | 0.280       | 2.190         |
| <i>Tertiary</i>             | Share of persons employed with tertiary degree (ISTAT) (2004-2017)                                                                                              | 1248 | 0.170       | 0.039       | 0.070       | 0.320         |
| <i>Histentr</i>             | Number of entrepreneurs in industry in 1927 over population in 1931 (ISTAT)                                                                                     | 1330 | 0.020       | 0.005       | 0.009       | 0.033         |
| <i>Histmpower</i>           | Number of entrepreneurs using motive power over total entrepreneurs in industry in 1927 (ISTAT)                                                                 | 1330 | 0.200       | 0.098       | 0.020       | 0.417         |
| <i>Histva</i>               | Value added per capita in 1931 (lire) (Italian Union of Chambers of Commerce)                                                                                   | 1330 | 3,059.611   | 720.834     | 1,874.000   | 4,993.000     |
| <i>Histpop</i>              | Population in 1931 (ISTAT)                                                                                                                                      | 1330 | 482,016.420 | 357,963.410 | 133,739.980 | 2,068,246.100 |
| <i>Histpopdens</i>          | Number of inhabitants per square kilometre in 1921 (ISTAT)                                                                                                      | 1330 | 153.206     | 106.378     | 32.100      | 632.200       |
| <i>Histuniu</i>             | Dummy 1 = if in the province there was a university in 1895 (provincial) (ISTAT)                                                                                | 1330 | 0.196       | 0.397       | 0.000       | 1.000         |
| <i>Histilliteracy</i>       | Share of illiterate people on total people six years-old and over in 1931 (ISTAT)                                                                               | 1330 | 0.213       | 0.154       | 0.020       | 0.500         |
| <i>Histcred</i>             | Number of firms of the credit sector over total firms in 1927 (ISTAT)                                                                                           | 1330 | 0.010       | 0.005       | 0.002       | 0.026         |
| <i>Histlarge</i>            | Number of large firms (over 250 employees) over total firms of the credit sector over total firms in 1927 (ISTAT)                                               | 1330 | 0.001       | 0.001       | 0.000       | 0.008         |
| <i>Nw</i>                   | Dummy: 1= North-West                                                                                                                                            | 1344 | 0.240       | 0.427       | 0.000       | 1.000         |
| <i>Ne</i>                   | Dummy: 1= North-East                                                                                                                                            | 1344 | 0.240       | 0.427       | 0.000       | 1.000         |
| <i>So</i>                   | Dummy: 1= Southern                                                                                                                                              | 1344 | 0.312       | 0.464       | 0.000       | 1.000         |
| <i>Duso</i>                 | Dummy: 1= Sondrio                                                                                                                                               | 1344 | 0.010       | 0.101       | 0.000       | 1.000         |
| <i>Dumiro</i>               | Dummy: 1= (Rome and/or Milan)                                                                                                                                   | 1344 | 0.031       | 0.173       | 0.000       | 1.000         |

**Note:** All data are at provincial level if not specified otherwise.

**Table 3.** Summary statistics of the sub-samples of High-Trust and Low-Trust provinces

| Variables                   | High-Trust |            |            |              | Low-Trust  |            |            |               |
|-----------------------------|------------|------------|------------|--------------|------------|------------|------------|---------------|
|                             | Mean       | Std. Dev.  | Min        | Max          | Mean       | Std. Dev.  | Min        | Max           |
| <b>Dependent variables</b>  |            |            |            |              |            |            |            |               |
| <i>HTM</i>                  | 0.009      | 0.007      | 0.000      | 0.0043       | 0.004      | 0.004      | 0.000      | 0.032         |
| <i>LTM</i>                  | 0.068      | 0.070      | 0.014      | 0.711        | 0.037      | 0.027      | 0.010      | 0.161         |
| <i>Manuf</i>                | 0.077      | 0.072      | 0.015      | 0.717        | 0.042      | 0.024      | 0.017      | 0.174         |
| <b>Independent variable</b> |            |            |            |              |            |            |            |               |
| <i>Coopbank91</i>           | 0.261      | 0.161      | 0.000      | 0.714        | 0.320      | 0.136      | 0.000      | 0.800         |
| <b>Control variables</b>    |            |            |            |              |            |            |            |               |
| <i>Va</i>                   | 26,076.795 | 4,313.236  | 17,980.000 | 44,219.000   | 17,291.020 | 3,604.065  | 12,174.000 | 30,298.000    |
| <i>Pop</i>                  | 383.133    | 464.039    | 80.257     | 2,844.500    | 352.916    | 354.096    | 55.365     | 2,105.275     |
| <i>Popdens</i>              | 272.749    | 288.192    | 37.280     | 2,652.730    | 131.000    | 97.437     | 36.800     | 632.200       |
| <i>R&amp;D</i>              | 1.291      | 0.373      | 0.280      | 2.190        | 0.894      | 0.294      | 0.380      | 1.650         |
| <i>Tertiary</i>             | 0.172      | 0.042      | 0.070      | 0.320        | 0.168      | 0.034      | 0.070      | 0.280         |
| <i>Histentr</i>             | 0.023      | 0.005      | 0.014      | 0.033        | 0.017      | 0.003      | 0.009      | 0.026         |
| <i>Histmpower</i>           | 0.245      | 0.076      | 0.090      | 0.417        | 0.118      | 0.076      | 0.020      | 0.384         |
| <i>Histva</i>               | 3,457.344  | 558.389    | 2,598.00   | 4,993.000    | 2,346.03   | 314.935    | 1,874.00   | 3,239.00      |
| <i>Histpop</i>              | 486,902.82 | 364,066.05 | 133,739.98 | 1,998,224.50 | 444,311.40 | 329,276.58 | 133,739.98 | 2,068,246.100 |
| <i>Histpopdens</i>          | 165.584    | 109.159    | 32.100     | 628.100      | 131.000    | 97.437     | 36.780     | 632.200       |
| <i>Histuniv</i>             | 0.230      | 0.421      | 0          | 1            | 0.143      | 0.350      | 0          | 1             |
| <i>Histilliteracy</i>       | 0.123      | 0.083      | 0.020      | 0.340        | 0.374      | 0.117      | 0.040      | 0.500         |
| <i>Histcred</i>             | 0.011      | 0.004      | 0.002      | 0.026        | 0.001      | 0.005      | 0.002      | 0.021         |
| <i>Histlarge</i>            | 0.001      | 0.001      | 0.000      | 0.008        | 0.0003     | 0.0004     | 0.000      | 0.0020        |

### 3.5 Econometric specification

Considering the variables described above, we estimate the following econometric model.

$$starturate_{it} = \alpha + \beta_0 Coopbank91_i + \beta_1 Controls_{it} + \beta_2 Hist-Controls_{it} + u_i + e_{it} \quad (1)$$

The dependent variable and some of the explanatory variables vary both across provinces and over time (2004-2017). Since the main variable of interest and some control variables are measured in a single year, equation (1) cannot be estimated using the fixed-effects model. We therefore use the random-effects (RE) model, which exploits the variability of the time-varying dependent and independent variables. Given that estimating a random-effects panel model does not allow us to address the issue of unobserved heterogeneity, we use a correlated random effects (CRE) model, in which the group means of the variables that vary within groups are added to the regressors, capturing the correlation between unobserved heterogeneity and the covariates (Mundlak, 1978). By including the means of time-varying variables, the Mundlak correction helps to control for time-invariant characteristics of the entities, thereby providing more reliable estimates of the coefficients of interest. This correction is widely used in panel data analysis to improve the accuracy of regression estimates and ensure robust inference.

### 3.6 Results

Table 4 reports the results of the estimation of equation (1) using RE and CRE models for total manufacturing (columns 1 and 2), HTM sectors (columns 3 and 4) and LTM sectors (columns 5 and 6), considering the whole sample of Italian provinces. The variable *Coopbank91* is not significant in the most reliable CRE model, while it is significant in the RE model for HTM sectors. If we estimate Equation (1) for High-Trust provinces, we find, interestingly, that the variable *Coopbank91* has a positive and significant effect on current HTM start-up rates (Table 5, Columns 3 and 4), both in the RE and CRE models. We still do not find a significant effect of the variable *Coopbank91* in the LTM sector.

**Table 4.** Estimation results I: Dependent variable provincial start-up rate

| VARIABLES                    | Whole sample: Italy  |                       |                     |                     |                     |                      |
|------------------------------|----------------------|-----------------------|---------------------|---------------------|---------------------|----------------------|
|                              | (1)<br>Manuf<br>(RE) | (2)<br>Manuf<br>(CRE) | (3)<br>HTM<br>(RE)  | (4)<br>HTM<br>(CRE) | (5)<br>LTM<br>(RE)  | (6)<br>LTM<br>(CRE)  |
| <i>Coopbank91</i>            | 0.450<br>(0.372)     | -0.393<br>(0.392)     | 0.949**<br>(0.455)  | 0.574<br>(0.492)    | 0.399<br>(0.373)    | -0.457<br>(0.397)    |
| <i>Va</i>                    | 0.287**<br>(0.136)   | 0.138<br>(0.122)      | 1.148***<br>(0.341) | 0.752**<br>(0.346)  | 0.328**<br>(0.129)  | 0.187<br>(0.125)     |
| <i>Pop</i>                   | -0.212<br>(0.159)    | -0.268***<br>(0.088)  | -0.176**<br>(0.086) | -0.206*<br>(0.112)  | -0.234<br>(0.163)   | -0.283***<br>(0.089) |
| <i>Popdens</i>               | 0.366*<br>(0.220)    | 0.417***<br>(0.121)   | 0.141<br>(0.122)    | 0.159<br>(0.156)    | 0.386*<br>(0.226)   | 0.441***<br>(0.122)  |
| <i>R&amp;D</i>               | 0.110**<br>(0.045)   | 0.119**<br>(0.048)    | 0.304***<br>(0.086) | 0.288**<br>(0.139)  | 0.109**<br>(0.048)  | 0.121**<br>(0.049)   |
| <i>Tertiary</i>              | 0.083*<br>(0.045)    | 0.107**<br>(0.042)    | 0.135<br>(0.113)    | 0.186<br>(0.119)    | 0.072<br>(0.048)    | 0.098**<br>(0.042)   |
| <i>Histentr</i>              | 0.601***<br>(0.201)  | 0.568***<br>(0.162)   | 0.110<br>(0.163)    | 0.085<br>(0.204)    | 0.652***<br>(0.208) | 0.620***<br>(0.164)  |
| <i>Histmpower</i>            | 0.531**<br>(0.220)   | 0.252*<br>(0.137)     | 0.622**<br>(0.243)  | 0.475***<br>(0.173) | 0.483**<br>(0.217)  | 0.216<br>(0.138)     |
| <i>Histua</i>                | 0.345<br>(0.416)     | -0.345<br>(0.476)     | -0.195<br>(0.543)   | -0.569<br>(0.598)   | 0.274<br>(0.423)    | -0.366<br>(0.482)    |
| <i>Histpop</i>               | 0.041<br>(0.174)     | 0.181*<br>(0.109)     | -0.207<br>(0.138)   | -0.139<br>(0.137)   | 0.086<br>(0.177)    | 0.222**<br>(0.110)   |
| <i>Histpopdens</i>           | -0.207<br>(0.223)    | -0.178<br>(0.140)     | 0.223<br>(0.144)    | 0.245<br>(0.179)    | -0.239<br>(0.227)   | -0.217<br>(0.141)    |
| <i>Histuniv</i>              | -0.100<br>(0.103)    | 0.031<br>(0.105)      | 0.099<br>(0.131)    | 0.156<br>(0.132)    | -0.112<br>(0.103)   | 0.027<br>(0.106)     |
| <i>Histilliteracy</i>        | 0.292***<br>(0.100)  | 0.345***<br>(0.099)   | 0.134<br>(0.119)    | 0.158<br>(0.124)    | 0.301***<br>(0.104) | 0.358***<br>(0.100)  |
| <i>Histcred</i>              | 0.185<br>(0.214)     | 0.346*<br>(0.201)     | -0.177<br>(0.222)   | -0.113<br>(0.252)   | 0.237<br>(0.217)    | 0.407**<br>(0.203)   |
| <i>Histlarge</i>             | -1.057*<br>(0.566)   | -0.237<br>(0.531)     | -0.152<br>(0.688)   | 0.246<br>(0.668)    | -1.091**<br>(0.546) | -0.280<br>(0.537)    |
| <i>Macroregional dummies</i> | Yes                  | yes                   | yes                 | yes                 | Yes                 | yes                  |
| <i>Provincial dummies</i>    | Yes                  | yes                   | yes                 | yes                 | Yes                 | yes                  |
| <i>Time dummies</i>          | Yes                  | yes                   | yes                 | yes                 | Yes                 | yes                  |
| <i>Observations</i>          | 1,235                | 1,235                 | 1,209               | 1,209               | 1,235               | 1,235                |
| <i>Number of provinces</i>   | 95                   | 95                    | 95                  | 95                  | 95                  | 95                   |

**Note:** Clustered standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 5.** Estimation results II: Dependent variable provincial start-up rate

| VARIABLES                    | Sub-sample: High-trust provinces |                      |                      |                     |                     |                      |
|------------------------------|----------------------------------|----------------------|----------------------|---------------------|---------------------|----------------------|
|                              | (1)                              | (2)                  | (3)                  | (4)                 | (5)                 | (6)                  |
|                              | Manuf<br>(RE)                    | Manuf<br>(CRE)       | HTM<br>(RE)          | HTM<br>(CRE)        | LTM<br>(RE)         | LTM<br>(CRE)         |
| <i>Coopbank91</i>            | 0.364<br>(0.375)                 | -0.344<br>(0.355)    | 1.100**<br>(0.432)   | 1.096**<br>(0.482)  | 0.283<br>(0.381)    | -0.471<br>(0.371)    |
| <i>Va</i>                    | 0.149<br>(0.209)                 | 0.108<br>(0.150)     | 0.421<br>(0.414)     | 0.720*<br>(0.425)   | 0.191<br>(0.190)    | 0.149<br>(0.150)     |
| <i>Pop</i>                   | -0.284*<br>(0.157)               | -0.274***<br>(0.080) | -0.152*<br>(0.089)   | -0.119<br>(0.110)   | -0.288*<br>(0.165)  | -0.278***<br>(0.084) |
| <i>Popdens</i>               | 0.449**<br>(0.219)               | 0.534***<br>(0.101)  | 0.296**<br>(0.125)   | 0.351**<br>(0.139)  | 0.428*<br>(0.227)   | 0.512***<br>(0.105)  |
| <i>R&amp;D</i>               | 0.032<br>(0.065)                 | 0.170***<br>(0.064)  | 0.233**<br>(0.104)   | 0.447**<br>(0.182)  | -0.007<br>(0.068)   | 0.118*<br>(0.064)    |
| <i>Tertiary</i>              | 0.034<br>(0.057)                 | 0.080*<br>(0.047)    | 0.075<br>(0.117)     | 0.141<br>(0.136)    | -0.003<br>(0.054)   | 0.042<br>(0.047)     |
| <i>Histentr</i>              | 0.663***<br>(0.171)              | 0.622***<br>(0.150)  | -0.004<br>(0.177)    | 0.015<br>(0.204)    | 0.742***<br>(0.180) | 0.690***<br>(0.157)  |
| <i>Histmpower</i>            | 0.705***<br>(0.187)              | 0.682***<br>(0.171)  | 0.871***<br>(0.207)  | 1.010***<br>(0.233) | 0.649***<br>(0.191) | 0.604***<br>(0.178)  |
| <i>Histva</i>                | -0.668*<br>(0.381)               | -0.552<br>(0.431)    | -1.521***<br>(0.588) | -1.303**<br>(0.586) | -0.588<br>(0.384)   | -0.482<br>(0.450)    |
| <i>Histpop</i>               | 0.440**<br>(0.207)               | 0.522***<br>(0.106)  | 0.072<br>(0.137)     | 0.137<br>(0.145)    | 0.477**<br>(0.220)  | 0.552***<br>(0.111)  |
| <i>Histpopdens</i>           | -0.268<br>(0.249)                | -0.337***<br>(0.128) | 0.168<br>(0.185)     | 0.054<br>(0.175)    | -0.280<br>(0.257)   | -0.338**<br>(0.133)  |
| <i>Histuniv</i>              | -0.071<br>(0.087)                | 0.070<br>(0.094)     | 0.215*<br>(0.125)    | 0.229*<br>(0.128)   | -0.093<br>(0.089)   | 0.057<br>(0.099)     |
| <i>Histilliteracy</i>        | 0.400***<br>(0.097)              | 0.437***<br>(0.084)  | 0.177**<br>(0.089)   | 0.192*<br>(0.115)   | 0.416***<br>(0.103) | 0.456***<br>(0.088)  |
| <i>Histcred</i>              | 0.030<br>(0.270)                 | 0.067<br>(0.224)     | -0.374<br>(0.311)    | -0.480<br>(0.304)   | 0.084<br>(0.273)    | 0.143<br>(0.234)     |
| <i>Histlarge</i>             | -0.750<br>(0.491)                | -0.598<br>(0.448)    | -0.012<br>(0.698)    | -0.265<br>(0.609)   | -0.754<br>(0.500)   | -0.558<br>(0.469)    |
| <i>Macroregional dummies</i> | yes                              | yes                  | yes                  | yes                 | yes                 | yes                  |
| <i>Provincial dummies</i>    | yes                              | yes                  | yes                  | yes                 | yes                 | yes                  |
| <i>Time dummies</i>          | yes                              | yes                  | yes                  | yes                 | yes                 | yes                  |
| <i>Observations</i>          | 793                              | 793                  | 785                  | 785                 | 793                 | 793                  |
| <i>Number of provinces</i>   | 61                               | 61                   | 61                   | 61                  | 61                  | 61                   |

**Note:** Clustered standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

In the regressions carried out, we do not find any significant effect of their presence in 2001 and 2011 as documented in Table A3 reporting the coefficients of the variable *Coopbank*, 1991, 2001 and 2011 (*Coopbank91*, *Coopbank01* and *Coopbank11*, respectively) for the subsample of high-trust provinces.

When we look at control variables in the whole sample (Table 4) and in the subsample of high-trust provinces (Table 5), we find results consistent with those of Cosci et al. (2022). New firm formation is significantly dependent on the historical rate of entrepreneurship (*Histentr*) in the LTM but not in the HTM sectors. In addition, new firm formation in the HTM sectors depends significantly on the share of entrepreneurs who used motive power (*Histmpower*). Regarding the other control variables (see Table 5, Column 4), current industrial entrepreneurship rates in HTM sectors are positively influenced by population density and R&D expenditure. The historical presence of universities positively affects the current HTM entrepreneurship rate. Universities are considered a good proxy for the historical knowledge base because they accumulate a large stock of knowledge over time (Fritsch, 2011; Fritsch & Wyrwich, 2018; Del Monte & Pennacchio, 2020). They foster the development of important networks of formal and informal relationships, which are able to increase the probability of knowledge spillovers. We also find, like in Cosci et al. (2022), that those Italian provinces that were poorer in the past (lower *Histva*) now register higher current innovative entrepreneurship rates and that, therefore, in the manufacturing sector, the most innovating provinces are probably those that historically were more dynamic and more able to converge. The variable *Histilliteracy* has a significant positive effect on both LTM and HTM current start-up rates. A possible explanation for this result may be that the growth was driven in many Italian provinces, during the post-war period, by new entrepreneurs skilled in exploiting the benefits of backwardness, that is, of a large availability of manpower at a low cost.

#### 4. Concluding remarks

Innovative activity is one of the main drivers of economic growth, but financing innovative entrepreneurs has always been a challenge. Several studies have shown that the rate of local entrepreneurship in the past can be seen as a seed planted in the ground, the fruits of which can still be seen today. Our results support the hypothesis that the historical presence of CBs has fostered the development of an innovative entrepreneurial culture in contexts of high institutional trust. In the subsample of high-trust Italian provinces, there are now relatively higher rates of entrepreneurship in HTM sectors, where the knowledge accumulation process activated by small entrepreneurs before the Second World War found later CBs able to finance their investments in new technologies. This is not true when we include in our analysis also low-trust provinces. The spatial distribution of our composite index of institutional trust shows a huge divide between the Centre-North and the South of Italy. All the provinces located in the South are characterised by values lower than the average. The Governor of the Bank of Italy, Donato Menichella, wrote in 1950 that he had “confidence” in local bankers who used savings in direct and continuous contact with the people from whom they collected them. Our results show that he was right, but also that local bankers may not have earned this trust everywhere in Italy. They support the hypothesis that the trust environment matters and raise concerns about the use of relationship lending technologies in socio-economic contexts that lack institutional trust.

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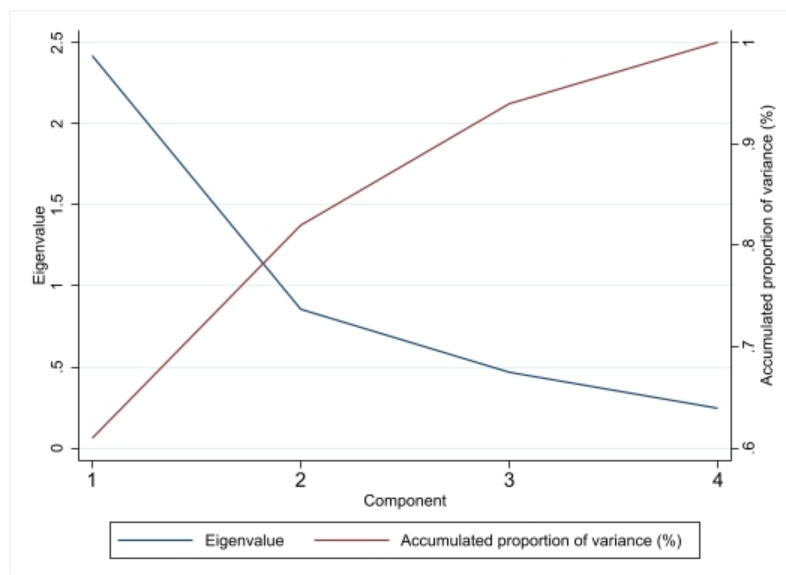
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## APPENDIX 1

### *The composite index of institutional trust*

To aggregate the indicators and construct a composite index of institutional trust, we use the Principal Component Analysis (PCA). PCA is a statistical technique that reduces the complexity of the original data by identifying the main patterns of variation within a set of correlated variables. Figure A1 shows the screeplot of the eigenvalues. Firstly, we can see that the first component accounts for approximately 61% of the total variability, which means that it is responsible for much of the variation between the values of the observed variables in the dataset. Following Kaiser's rule, which advises retaining components with eigenvalues equal to or greater than 1, we opt to extract only the first component. This decision is supported by the screeplot, which exhibits a clear break after the first component, indicating its significance for interpretation. To validate our analysis, we consider two additional tests. The Kaiser-Mayer-Olkin (KMO) test gives a value of 0.66, which indicates that the sample is adequate. In addition, Bartlett's test of sphericity rejects the null hypothesis ( $p$ -value  $< 1\%$ ) of non-correlation between the variables analysed, confirming the suitability of our dataset for the PCA.

**Figure A1.** Screeplot of the eigenvalue



The eigenvector provided in Table A1 demonstrates that the coefficients are relatively similar, with absolute values ranging from 0.41 to 0.59. This suggests that the variables contribute to the component with similar weights, indicating a balanced influence across the included variables. We can see that all indicators are positively correlated with the first component. These are phenomena that usually reflect a high level of civic engagement and active participation in society. Therefore, it is reasonable to expect a positive correlation

between these variables and a component representing a dimension of institutional trust. Thus, the composite indicator obtained from the PCA is such that higher (positive) values indicate better contexts for institutional trust and vice versa.

**Table A1.** Principal components (Eigenvectors)

| Indicator      | PC1  |
|----------------|------|
| Blood_donation | 0.41 |
| Voter_turnout  | 0.59 |
| Associations   | 0.46 |
| Newsp_read     | 0.52 |

## Appendix 2

| Variables           | (1)       | (2)       | (3)       | (4)       | (5)       | (6)       | (7)      | (8)       | (9)       | (10)      | (11)      | (12)      | (13)      | (14)  |
|---------------------|-----------|-----------|-----------|-----------|-----------|-----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-------|
| (1) Histentr        | 1.000     |           |           |           |           |           |          |           |           |           |           |           |           |       |
| (2) Histmpower      | 0.397***  | 1.000     |           |           |           |           |          |           |           |           |           |           |           |       |
| (3) Coopbank91      | -0.174*** | -0.0120   | 1.000     |           |           |           |          |           |           |           |           |           |           |       |
| (4) Pop             | 0.045*    | 0.094***  | -0.114*** | 1.000     |           |           |          |           |           |           |           |           |           |       |
| (5) Histpop         | 0.155***  | 0.203***  | -0.034    | 0.771***  | 1.000     |           |          |           |           |           |           |           |           |       |
| (6) R&D             | 0.341***  | 0.515***  | -0.162*** | 0.107***  | 0.146***  | 1.000     |          |           |           |           |           |           |           |       |
| (7) Tertiary        | 0.0310    | -0.091*** | -0.232*** | 0.336***  | 0.220***  | 0.125***  | 1.000    |           |           |           |           |           |           |       |
| (8) Popdens         | 0.075***  | 0.116***  | -0.180*** | 0.723***  | 0.688***  | 0.092***  | 0.241*** | 1.000     |           |           |           |           |           |       |
| (9) Histpopdens     | 0.237***  | 0.250***  | -0.112*** | 0.545***  | 0.773***  | 0.094***  | 0.164*** | 0.780***  | 1.000     |           |           |           |           |       |
| (10) Histcred       | 0.114***  | 0.215***  | 0.316***  | -0.142*** | -0.164*** | 0.051*    | -0.027   | -0.192*** | -0.236*** | 1.000     |           |           |           |       |
| (11) Histlarge      | 0.193***  | 0.530***  | -0.079*** | 0.126***  | 0.195***  | 0.332***  | 0.017    | 0.264***  | 0.312***  | -0.095*** | 1.000     |           |           |       |
| (12) Histva         | 0.471***  | 0.741***  | -0.141*** | 0.309***  | 0.388***  | 0.481***  | 0.130*** | 0.377***  | 0.467***  | 0.058**   | 0.628***  | 1.000     |           |       |
| (13) Va             | 0.382***  | 0.695***  | 0.038     | 0.305***  | 0.239***  | 0.360***  | 0.166*** | 0.215***  | 0.222***  | 0.228***  | 0.330***  | 0.740***  | 1.000     |       |
| (14) Histilliteracy | -0.458*** | -0.860*** | -0.006    | -0.119*** | -0.165*** | -0.566*** | 0.039    | -0.147*** | -0.232*** | -0.181*** | -0.546*** | -0.847*** | -0.778*** | 1.000 |

**Table A2.** Correlation matrix of explanatory variables

**Table A3** Estimation results: Dependent variable provincial HTM start-up rate (CRE model)

| <b>Sub-sample: High-trust provinces</b> |                                 |                                 |                                 |
|-----------------------------------------|---------------------------------|---------------------------------|---------------------------------|
| <b>VARIABLES</b>                        | <b>(1)</b><br><b>Coopbank91</b> | <b>(2)</b><br><b>Coopbank01</b> | <b>(3)</b><br><b>Coopbank11</b> |
| <i>coefficients</i>                     | 1.096**<br>(0.482)              | 0.056<br>(0.089)                | 0.073<br>(0.117)                |

**Note:** Clustered standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1