WHY SO MANY LOCAL ENTREPRENEURS?

Claudio Michelacci and Olmo Silva*

Abstract—We document that the fraction of entrepreneurs working in the region where they were born is significantly higher than the corresponding fraction for dependent workers. This is more pronounced in more developed regions and positively related to the degree of local financial development. Firms created by locals are bigger, operate with more capital-intensive technologies, and obtain greater financing per unit of capital invested, than firms created by nonlocals. This suggests that there are so many local entrepreneurs because locals can better exploit the financial opportunities available in the region where they were born. This helps to explain how local financial development causes persistent disparities in entrepreneurial activity, technology, and income.

I. Introduction

As emphasized by Schumpeter (1911), entrepreneurship is a key determinant of one economy's technological performance.[1] Entrepreneurship can be either nurtured locally or attracted from abroad and, in principle, both sources of entrepreneurial activity can contribute to technology growth. Yet their relative importance and determinants are largely unexplored. In this paper, we document the relevance of local entrepreneurship for business creation: we show that new businesses are mainly created by local entrepreneurs, and that this tendency is more pronounced in more developed regions. We also analyze the determinants of local entrepreneurship, and how it differs from other entrepreneurial forms. Overall, our analysis suggests that entrepreneurship can hardly be regarded as a mobile factor of production that gets allocated to arbitrage away technology differences, and it identifies local entrepreneurship as a potentially relevant source of the well-documented disparities in entrepreneurial activity, technology, and income, across countries and regions (see, for example Lucas, 1990; and Hall & Jones, 1999).

We document the contribution of local entrepreneurship to business creation, in both the United States and Italy. U.S. data come from the U.S. Census 2000, which provides information on both state of birth and state where the individuals currently work. Italian data come from the Survey of Household Income and Wealth (SHIW), which has recently been used to analyze the effects of social capital on financial development and of local financial development on real economic activity (see Guiso, Sapienza, & Zingales, 2004a, 2004b). We evaluate the relevance of local entrepreneurship in different regions within a country, and relative to other workers. This allows us to control for possible differences in judicial and legal systems (which vary little within a country), as well as for any other institutional and cultural characteristics that affect both entrepreneurial opportunities and individuals' geographical mobility. In both the United States and Italy we find that the fraction of entrepreneurs who start up their business in the region where they were born is significantly higher than the corresponding fraction for dependent workers. We refer to this difference as a local bias in entrepreneurship (LBE). Although Americans are substantially more mobile than Italians, we find that the magnitude of LBE is comparable in the United States and in Italy.

The Italian data contain detailed information on value, size, and financial structure of businesses created by entrepreneurs. As this information is not available in the U.S. data, we analyze the determinants of LBE by focusing the analysis on Italy.[2] We then document the following empirical regularities:

(i) LBE is more pronounced for larger businesses (in terms of market value and number of employees).
(ii) LBE is positively related to the level of economic development of the region, as measured by GDP per capita and the unemployment rate. Yet it is almost unrelated to the degree of specialization of entrepreneurial activities and their density.
(iii) Firms created by locals are bigger (in terms of market value, number of employees, and capital), operate with more capital-intensive technologies, and receive greater financing per unit of capital invested, than firms created by nonlocals.
(iv) LBE is increasing in the degree of local financial development, as measured by Guiso et al. (2004a). This result holds after we instrument financial development with some variables describing regional characteristics of the banking system as of 1936—thus just before a banking law was passed that restricted entry in the banking sector up to the mid-1980s; see Guiso et al. (2004a).
(v) LBE is increasing in some outcome-based measures of trust in the community, such as electoral participation

Received for publication May 17, 2005. Revision accepted for publication July 24, 2006.

* CEMFI; and CEP and EUI, respectively.

We owe much gratitude to Luigi Guiso for help with the data. We thank Francesco Daveri, Andrea Ichino, Esteban Jaimovich, Omar Licandro, Steve Machin, Barbara Petrongolo, Stephen Pischke, Dani Rodrik (the Editor), Guido Schwerdt, and two anonymous referees for very helpful comments and suggestions. We also benefited from the comments of participants to seminars at EUI, LSE, UCL, the EEA Annual Conference in Amsterdam, and the ESSLE meeting in Ammersee.

[1] Michelacci (2003) and Acs et al. (2004) formally analyze the role of entrepreneurship in endogenous growth models. They argue that entrepreneurship is the key factor that allows scientific knowledge to affect technology. See Acs and Audretsch (2003) for a review on the literature documenting the existing positive link between entrepreneurial activity and one country's ability to achieve prosperity.

[2] Italy is a country that has been unified, from both a political and a regulatory point of view, for the past 140 years; yet it still exhibits remarkable regional differences in technology and GDP per capita, which make it particularly suitable for our investigation. Moreover, Italy is the country first studied by sociologists to investigate the effects of trust and social capital on real economic activity; see Banfield (1968) and Putman (1993).

The Review of Economics and Statistics, November 2007, 89(4): 615–633

and blood donation; see Guiso et al. (2004b). LBE appears instead to be unrelated to measures of the importance of personal contacts in local markets.

As documented by, among others, Blanchflower and Oswald (1998), Evans and Jovanovic (1989), and Holtz-Eakin, Joulfaian, and Rosen (1994), funds provision is an important concern when creating a new business. We therefore interpret the previous findings as suggesting that LBE results from the combination of two factors, independently put forth in the literature. First, distance matters in the provision of funds, so that firms have to locate close to their financiers to obtain financing. Berger et al. (2001) and Petersen and Rajan (2002) provide direct evidence about the importance of distance in the provision of funds to firms; a theoretical argument is given by Williamson (1987). Second, locals may have some sort of "region-specific collateral" that facilitates access to credit and that would be lost if they had to move and set up their business in a different location. For example, local financiers, such as banks and venture capitalists, may have privileged information about individuals who have been living in a given location for several years. Or it could be that moral hazard problems associated with borrowing are less severe, because of peer effects or local social pressure, for individuals who reside in the same region as where they were born; see Arnott and Stiglitz (1991) for a theoretical analysis of how peer monitoring mechanisms can mitigate moral hazard problems. This mechanism would explain both why local financial development benefits proportionally more locals than foreigners (fact iv), and why local start-ups are bigger and more leveraged and operate with more capital-intensive technologies (fact iii). Moreover, since trust appears to be one key determinant of financial development (see Guiso et al., 2004b), this channel can also explain why LBE is positively related to measures of trust (fact v).

Of course, there are other possible explanations for LBE.[3] These however seem to contradict some of the previous findings. For example, LBE could arise if individuals choose to become entrepreneurs in their native location because they strongly prefer to reside there, but they lack employment opportunities as dependent workers. Alba-Ramirez (1994), Martinez-Granado (2002), and Chelli and Rosti (1998) document how this may explain some entrepreneurial spells in Spain, the United Kingdom, and Italy, respectively. If this was the main explanation for LBE, however, we would expect a negative correlation between LBE and the local level of development: in particular, LBE should be inversely related to the unemployment rate in the region of residence, which does not appear to be the case (fact ii). This possible explanation also seems at odds with the finding that locals create more valuable businesses than nonlocals (fact iii).

Alternatively, the combination of entrepreneurial learning and regional sectoral specialization may provide an explanation for LBE. Consider a situation where regions tend to have a natural advantage in some sectors of activity, and that entrepreneurs choose to start up their business in the region with the greatest natural advantage in the business sector. Also assume that, because of learning and technological spillovers, local individuals have a greater probability than nonlocals of acquiring entrepreneurial ideas specific to the sector where the region has its natural advantage. This mechanism would also induce LBE. Guiso and Schivardi (2005) provide some evidence supporting the relevance of this channel. Yet our results suggest that entrepreneurial learning can hardly account for the previous findings. In particular, this explanation would tend to predict that LBE is greater in regions where the sectoral natural advantage and the scope for learning from other entrepreneurs are greater. Fact ii documents that LBE is only mildly related to the degree of sectoral specialization of entrepreneurial activities and to the number of entrepreneurs present in the regions of birth. This seems to limit the scope of an explanation based on the combination of entrepreneurial learning and regional sectoral specialization.

Finally, LBE could arise because locals can better exploit their personal network to contact customers and suppliers, to obtain more reliable information about the company's business market, or to more easily recruit workers in labor markets.[4] Thus we would expect LBE to be positively related to measures of social capital and measures of intensity of personal networks in the local community.[5] Fact V documents that LBE is higher in regions with higher level of trust; however, this is unrelated to measures of the importance of social contacts in local markets. Since LBE is also positively related to the degree of local financial development (fact iv), overall we find some evidence that social capital contributes to business formation, at least because it facilitates access to credit for local entrepreneurs.

The paper is organized as follows. Section II describes the Italian data set. Section III documents LBE in Italy and the United States. Section IV uses Italian data to document some properties of LBE. Section V discusses the role of local credit markets, while section VI deals with social capital. Section VII concludes.

[3] See section 2 of the working paper version of this study for a simple model, based on Lucas (1978), describing how the different mechansims discussed in the text can induce LBE.

[4] The idea that personal networks and social capital matter in business formation has been emphasized by Aldrich and Zimmer (1986). Aldrich, Rosen, and Woodward (1987) and Blumberg and Pfann (2001) provide some evidence that entrepreneurs heavily rely on their personal networks to start up their business and make them succeed. The role of social contacts in the labor markets has also been recognized by, among many others, Granovetter (1974), Montgomery (1991), and Bentolila, Michelacci, and Suarez (2004).

[5] See Coleman (1988, 1990) for a definition of social capital, which is described as a resource for action, accruing to individuals embedded in social ties, that facilitates productive activities.

II. Data

Since our analysis mainly focuses on Italy, we start describing the Italian data and then discuss how well it represents the population of Italian firms. We will briefly describe the U.S. Census data later, when using it.

A. Description

Italian data primarily come from the Survey of Household Income and Wealth (SHIW) collected by the Bank of Italy. SHIW provides a representative picture of Italian households, in terms of both income dynamics and occupational choices. We focus on the 1991, 1993, and 1995 waves of the survey because they contain detailed information on individual decisions about occupational choice and geographical mobility. We sample only working individuals aged between 18 and 65, who are heads of household. Heads of household are the most relevant decisional unit within a household and they are most likely to actively engage in the labor market; this reduces sample selection problems related to labor market participation.[6] Further details about the construction of the data set and the definition of the variables used in the analysis are in the appendix.

We start constructing the variable *local* as a dummy variable taking value 1 if the individual works in the province where she was born.[7] Italy is currently divided into twenty regions and 103 provinces. An Italian province roughly corresponds to a U.S. county.

Individuals sampled in SHIW are asked to report about their main working activity. First, they have to state whether they work as dependent workers or are self-employed. If dependent workers, they then report whether they work as *blue* or *white collars.* If self-employed, they report whether they are (i) *entrepreneurs,* (ii) *craftsmen,* (iii) *professionals,* (iv) *manager/partners of societies,* or (v) *workers of family firms.* We construct the variable *worker* as a dummy variable identifying individuals who work as dependent workers (either blue or white collars). We then construct the variable *entrepreneur* as a dummy variable identifying self-employed with some salient traits typically associated with entrepreneurship, such as risk bearing, independence in decision-making, innovative behavior, and creative attitude. To decide which self-employed worker is an entrepreneur, we rely on the survey explanatory notes and we classify as *entrepreneur* any self-employed who works as either (i) *entrepreneur,* (ii) *craftsman,* (iii) *professional,* or (iv) *manager/partner of societies.* Indeed, according to SHIW explanatory notes, both *entrepreneurs* and *craftsmen* actively and personally manage the business that they own; the main difference between the two occupations is related to the number of people employed in the activity, with craftsmen mainly working alone. Similarly, *manager/partners of societies* are defined as individuals who own shares of the firm and who actively run and manage the business. We also include *professionals* in the definition of *entrepreneur,* since this category includes any individual who independently practices her art or profession, and who usually remains personally liable for her business activity.[8] Conversely, we exclude self-employed *workers of family firms* from the definition. In fact, workers of family firms are mainly just workers, classified as self-employed, who contribute to the activity of the family venture. In many cases, however, these jobs require little leadership and innovative activity, which justifies their exclusion.[9]

It is widely documented that entrepreneurs are very likely to be children of entrepreneurs (see, for example, Dunn & Holtz-Eakin, 2000, and references therein). This is an important concern if second-generation entrepreneurs simply take up the business activities started by previous generations. As the physical structures of the ventures cannot be very easily relocated, the geographical mobility of entrepreneurs could appear to be low simply because businesses are mechanically passed down from one generation to the next. To mitigate this problem, we construct the variable *start-up* as a dummy variable identifying individuals who start up a new business. We use information about the channel whereby a job was found, and we classify as start-ups all *entrepreneurs* who declare that they have *not* obtained their job "by taking up parents' activities" (*start-up*).[10] Questions about the channel whereby a job was found were not asked in 1995. To increase the degrees of freedom, in some of the specifications below we also add data for 1995. In that case we identify as start-ups those *entrepreneurs* who are *not* working in the same occupation and sector as the one of their parents. This is quite restrictive in distinguishing start-ups from other entrepreneurs, since in principle new ventures could be created in the same sector and occupation as that of the parents. Finally, the dummy variable *non-start-up* identifies *entrepreneurs* who are not start-ups.

[6] We also drop individuals born in the Aosta Province. In fact, no people living in that province were interviewed in any SHIW waves, implying that no information about geographical mobility is available.

[7] We assume that individuals work and live in the same province because no information about working location is available. To check for the validity of this assumption, we also ran the analysis using regions rather than provinces to identify geographic mobility (see table 4). As regions cover large portions of the Italian territory, it is unlikely that individuals live and work in different regions. Results remain broadly unchanged, which makes us confident about the plausibility of the assumption.

[8] Yet this last choice may be more controversial, since business creation is not always clearly associated with becoming a professional. Therefore we checked that excluding professionals from the definition of *entrepreneur* does not affect the results below. To save space, we do not report the results.

[9] As a result, we also exclude *workers of family firms* from the sample, as it would also be misleading to consider them as dependent workers.

[10] We also checked that our results remain unchanged when defining as *start-up* any *entrepreneur* who declares that she has found her job by "having started an activity on her own." The correlation between the two definitions is very high (close to 90%). With this second definition, however, we may miss some new entrepreneurial ventures that take the form of a large incorporated company, since, in this case, it is not clear how the individual would interpret the wording of the question.

TABLE 1.—DESCRIPTIVE STATISTICS

Variable	1991–1993 Sample			1991–1993–1995 Sample		
	N	Mean	St. Dev.	*N*	Mean	St. Dev.
Local	8,404	0.73	0.44	12,232	0.74	0.44
Worker	8,404	0.77	0.42	12,232	0.77	0.42
Blue collar	8,404	0.36	0.48	12,232	0.36	0.48
White collar	8,404	0.41	0.49	12,232	0.41	0.49
Entrepreneur	8,404	0.23	0.42	12,232	0.23	0.42
Start-up	8,385	0.20	0.40	12,213	0.19	0.39
Non-start-up	8,385	0.03	0.16	12,213	0.04	0.18
Male	8,404	0.89	0.31	12,232	0.88	0.32
Age	8,404	43.7	9.51	12,232	43.7	9.46
Married	8,404	0.84	0.37	12,232	0.84	0.37
Number of children	8,404	1.49	1.08	12,232	1.47	1.07
No more than primary school	8,404	0.25	0.43	12,232	0.23	0.42
Junior high school	8,404	0.34	0.47	12,232	0.34	0.47
High school	8,404	0.31	0.46	12,232	0.32	0.47
At least BA/BS	8,404	0.10	0.31	12,232	0.11	0.31
Intergenerational transfers	8,404	0.002	0.050	12,232	0.005	0.069
Household income	8,404	44,457	29,026	12,232	46,522	32,046
Household wealth	8,404	209,302	369,417	12,232	228,626	420,600
Firm age/job tenure	8,244	16.1	10.6	11,973	16.6	10.8
Weekly hours worked	8,359	41.4	9.42	12,153	41.5	9.99
Employment size of the firm	1,878	3.85	18.22	2,762	3.85	16.98
Firm value	1,724	109,460	401,977	2,566	112,864	423,054
Ammortamenti (capital)	1,612	2,572	5,887	2,232	3,055	8,269
Capital-Labor ratio	1,592	1,565	3,260	2,212	1,791	4,624
Bank Debts/capital	1,548	0.56	6.48	2,264	0.57	5.75
Unemployment rate	8,404	0.13	0.07	12,232	0.13	0.07
GDP per capita, 1970	8,404	9.56	2.50	12,232	9.58	2.48
Share of entrepreneurs	8,404	0.12	0.04	12,232	0.12	0.04
Share of firms, 1971	8,404	0.04	0.01	12,232	0.04	0.01
KavP	8,404	0.60	0.12	12,232	0.60	0.12
KavR	8,404	0.29	0.15	12,232	0.29	0.15
Blood donation, province	8,404	0.03	0.02	12,232	0.03	0.02
Voter turnout, province	8,404	0.16	0.07	12,232	0.16	0.07
NavP	8,404	0.31	0.08	12,232	0.31	0.08
Local share, province	8,404	0.20	0.05	12,232	0.20	0.05

Note: Start-up: entrepreneurs who did not find their job by taking up parents' activities. Age and firm age/job tenure in years. Household income and wealth, firm value, and ammortamenti in thousands of liras. GDP in 1970 in millions of 1990 liras. Share of entrepreneurs: number of entrepreneurs over province population. Share of firms: number of firms over province population. KavP/KavR: province/region level index of capital availability. Blood donation: number of 16 oz. blood bags collected per million of inhabitants in the province. NavP: intensity of labor market networks in the province. Local share: fraction of locals (either dependent workers or entrepreneurs) in the province population.

For our analysis, we also use information about individuals' *gender, age, educational achievements, marital status, number of children, household wealth* and *income, job tenure,* and, for start-up entrepreneurs, *firm age*. Descriptive statistics for the variables retained in the analysis are reported in table 1. SHIW also provides information about the monetary value of entrepreneurial ventures, as well as other measures of firm's size. *Entrepreneurs* in SHIW are asked to estimate the market value of their participation in the venture, in case of selling it. This is the basis to calculate the *firm's market value.* We also consider indicators for the *employment size* of the firm, the *capital stock,* and the *capital-labor ratio.* To measure the capital stock of the firm we use information about capital depreciation, which corresponds to the variable *ammortamenti* in the survey. *Ammortamenti* is the amount of capital that has to be imputed by law to the current year of production. This legal requirement is set taking into account sector of activity, age, and legal structure of business ventures and it represents a proxy for the capital stock of the firm. To have a proxy for the capital-labor ratio, we divide the value of ammortamenti by the number of people working at the firm.

All variables characterizing the size of the firm (in terms of value, employment, or capital) are self-reported and thus likely to be subject to measurement error. The *employment size* of the firm is less likely to be subject to under-reporting than the *firm's value,* which tends to be understated for fear that statistical information may be leaked to the tax authority; see OECD (1992, 2000) for evidence about this.

B. Is the Italian Sample Representative?

Since SHIW was not designed to be representative of the population of Italian firms (but just of Italian households), we start assessing how well the characteristics of the ventures sampled in SHIW track features of the population of Italian firms. We compare some sample statistics from SHIW with similar records obtained from the ISTAT 1991 Census of Italian Firms and Services. We study firms' characteristics along the size and geographical location dimensions since they are key for the analysis that follows. We also discuss some evidence about the sectoral distribution of firms sampled in SHIW, which is also relevant for some of the exercises pursued below. It is worth mentioning

TABLE 2.—EVIDENCE ON LBE, 1991 AND 1993 ONLY

Description Depvar.:	1-OLS Local	2-OLS Local	3-OLS Local	4-OLS Local	5-OLS Local
Constant	0.716*** (0.037)	0.733*** (0.070)	0.716*** (0.038)	0.733*** (0.069)	0.705*** (0.078)
Blue collar					0.025 (0.020)
Entrepreneur	0.075*** (0.017)	0.067*** (0.017)			
Start-up			0.066*** (0.016)	0.059*** (0.016)	0.070*** (0.016)
Non-start-up			0.152*** (0.043)	0.136*** (0.040)	0.149*** (0.038)
Controls	No	Yes	No	Yes	Yes
Obs.	8,404	8,404	8,385	8,385	8,385
R-squared	0.735	0.765	0.735	0.765	0.765

Note: The dependent variable is being a local: working in the province of birth. In columns 1 to 4, the reference individual is a worker. In column 5 she is a white-collar worker. The controls are individuals' gender, age, marital status, number of children, educational achievement dummies, 1991 and 1993 year dummies, and macro region dummies. All regressions use OLS. Cluster adjusted (province) standard error in parentheses. p-value < 0.10 = *, p-value < 0.05 = **, p-value < 0.01 = ***.

that the ISTAT census only marginally covers agricultural activities. This may partly alter the comparability of the two samples. For this reason, we report figures both including and excluding agricultural activities from the computations.

Table A1 in the appendix compares the size distribution of firms in the two data sets. ISTAT data show that Italian firms tend to be quite small.[11] SHIW reproduces this feature remarkably well and independently of the exclusion of the agricultural sector from the analysis. The table also reveals that the geographical distribution of firms in SHIW tracks closely that obtained by using census data.[12] The only remarkable exception is Lombardia, which is one of the most heavily industrialized regions in Italy: although Lombardia is the region with the greatest number of firms in both data sets, its absolute relevance is more striking in ISTAT data than in SHIW. This is probably because Lombardia is a region where many foreign and multinational firms are located. Since SHIW only samples Italian individuals, foreign-owned businesses are not in our data set. While this may explain the observed discrepancy, it might also bias our analysis since it may lead us to underestimate the geographical mobility of entrepreneurs by omitting an important component of the entrepreneurial pool. As long as the difference between ISTAT and SHIW firms' geographical distribution captures the incidence of foreign and multinational firms, this measure can be used to assess the robustness of our findings. In the analysis that follows, we check that our results are not driven by omitting foreign and multinational firms from our sample. Finally, when we compare the sectoral distribution of firms in SHIW with that in the ISTAT census, we find that SHIW slightly underrepresents trade and commerce, while it over-represents manufacturing; yet, overall, the two surveys provide a very similar picture of the sectoral composition of Italian firms.

[11] For the sake of comparison, 75% of U.S. firms have between one and nine employees, 12% have between ten and nineteen employees, and 13% have at least twenty employees. See U.S. Census Bureau data, 2001, at https://www.sba.gov/advo/stats/data.html.

[12] We also assessed the geographical distribution of firms by province. The results are in line with those obtained using regions. They are not reported here to save space.

III. Evidence of LBE

We start documenting the existence of LBE both in Italy and in the United States.

A. Basic Evidence

To measure the magnitude and significance of LBE we run the following regression:

$$Local_i = \omega + \lambda En_i + \delta X_i + \varepsilon_i,$$

where, as previously discussed, $Local_i$ is a dummy variable taking value 1 if individual i works in the province where she was born, while En_i is a dummy variable taking value 1 for individuals who are either *entrepreneurs* or *start-ups,* depending on the specification. Whenever En_i identifies start-up entrepreneurs, we include in the vector of controls a dummy for *non-start-up* entrepreneurs. As a result, the intercept ω identifies the fraction of dependent workers (*workers*) working in the province where they were born; the λ coefficient instead measures LBE for either entrepreneurs or start-ups. Finally, the vector X_i includes a set of individual and aggregate control variables that vary depending on the specification. Our approach is thus descriptive: it allows quantifying the difference between the fraction of local entrepreneurs and local dependent workers, after controlling for some relevant characteristics. Since the main variables of interest vary at the province level, in all regressions, we correct standard errors for possible dependence of residuals within province clusters.

B. LBE in Italy

We start by considering the sample only concerning 1991 and 1993. Table 2 reports the fraction of local dependent workers (i.e., the constant ω) and the local bias

TABLE 3.—EVIDENCE ON LBE, INCLUDING 1995

Description Depvar.:	1-OLS Local	2-OLS Local	3-OLS Local	4-OLS Local	5-OLS Local	6-OLS Local
Constant	0.724*** (0.036)	0.799*** (0.051)	0.724*** (0.036)	0.797*** (0.051)	0.769*** (0.058)	0.802*** (0.055)
Blue collar					0.024 (0.018)	
Entrepreneur	0.072*** (0.014)	0.063*** (0.013)				
Start-up			0.063*** (0.012)	0.056*** (0.012)	0.068*** (0.013)	0.053*** (0.014)
Start-up × geographical difference						0.700** (0.279)
Geographical difference						−0.369 (0.800)
Controls	No	Yes	No	Yes	Yes	Yes
Obs.	12,232	12,232	12,213	12,213	12,213	12,213
R-squared	0.742	0.772	0.742	0.772	0.772	0.772

Note: The dependent variable is being a local: working in the province of birth. In columns 1 to 4, the reference individual is a worker. In column 5, she is a white-collar worker. The controls are individuals' gender, age, marital status, number of children, educational achievement dummies, 1991 and 1993 year-dummies, five macro region dummies, and, in the regressions with start-ups, a dummy variable for non-start-up entrepreneurs. Geographical difference is the difference between the regional distribution of firms in ISTAT and SHIW. All regressions use OLS. Cluster adjusted (province) s.e. in parentheses. p-value < 0.10 = *, p-value < 0.05 = **, p-value < 0.01 = ***.

in entrepreneurship, using different definitions and specifications. Columns 1 and 2 quantify LBE when comparing *workers* with *entrepreneurs,* with and without controlling for the following characteristics: age, gender, four dummies for educational achievements, marital status, and number of children; five macro region dummies (northwest, northeast, center, south, and islands); and a full set of year dummies.[13] This set of regressors is included to assure that some basic individual and aggregate attributes do not drive our findings. Columns 3 and 4 quantify LBE when considering *start-ups* rather than *entrepreneurs.* Finally, in column 5 we break up the share of local dependent workers into white and blue collars and quantify LBE relative to each group.

The size of LBE is around 7 percentage points. This is the result of the difference between a share of local entrepreneurs, which is around 79%, and a share of local dependent workers, which is around 72%. These numbers are quite high, which suggests that LBE cannot be disregarded on the basis of its little economic relevance. LBE does not vary substantially after controlling for individual characteristics and it arises independently of whether we focus on entrepreneurs or start-ups. This implies that the transmission of entrepreneurial activities from one generation to the next is unlikely to explain LBE.[14] When the fraction of dependent workers is split into white and blue collars (column 5), we find that LBE for *start-ups* is about 7 percentage points with respect to white collars, and 4.5 percentage points (but still highly significant) relative to blue collars. When considering *non-start-up* entrepreneurs the effects are approximately twice as big.

In table 3 we show that the previous findings remain broadly unchanged when adding the third SHIW wave. Columns 1 and 3 of table 3 reveal that LBE is in the order of 6.5 to 7.5 percentage points when no controls are used. After adding the controls (columns 2 and 4), we still find that LBE is positive, statistically significant, and of a similar order of magnitude. Given that the inclusion of the 1995 wave leaves the results unchanged, in the remaining analysis we make use of all three SHIW waves, to increase degrees of freedom. Moreover, we present only results pertaining to start-up entrepreneurs. Indeed, start-ups provide the most direct evidence about business creation, which is the focus of the paper.[15]

As previously discussed, the exclusions of foreign-owned businesses from our data set may affect our results. To assess the robustness of our findings to this concern, we measure the incidence of foreign and multinational firms in the region by calculating the difference between ISTAT and SHIW firms' geographical distribution. We then evaluate how the inclusion of this control in our regressions affects LBE and how it interacts with it. Column 6 of table 3 reports on this exercise. Once we include the ISTAT-SHIW discrepancy in the geographical distribution of business ventures and its interaction with the entrepreneurial status variable, we find that LBE is as sizable and significant as before. The interaction term is also positive, yet not strongly significant. Overall this indicates that the omission of multinational and foreign-owned businesses from the sample is unlikely to drive our results.

C. Some Evidence for the United States

In Italy, geographical mobility is quite low. We now show that LBE also exists in a more mobile economy such as the United States. We use the U.S. Census 2000 1% file data. Census data are available at the Integrated Public Use

[13] As a robustness check, we also augmented our regressions with industry dummies. The results were unchanged.

[14] Also notice that the problem of the intergenerational transmission of entrepreneurial activities is reduced by the fact that we excluded workers in family firms from the definition of *entrepreneur.*

[15] In any case, we checked that our findings remain valid when using all entrepreneurs rather than just start-ups.

TABLE 4.—U.S. EVIDENCE ON LBE, U.S. CENSUS 2000

Description Depvar.:	1-OLS Local, Italian Region	2-OLS Local, U.S. States	3-OLS Local, U.S. States	4-OLS Local-Whites, U.S. States	5-OLS Local-Whites, U.S. States
Constant	0.825***	0.712***	0.712***	0.700***	0.700***
	(0.046)	(0.060)	(0.060)	(0.065)	(0.065)
Entrepreneur	0.053***	0.032***		0.032***	
	(0.015)	(0.006)		(0.006)	
Entrepreneur, incorporated			0.030***		0.033***
			(0.008)		(0.007)
Entrepreneur, unincorporated			0.032***		0.032***
			(0.006)		(0.007)
Controls	Yes	Yes	Yes	Yes	Yes
Obs.	12,232	544,869	544,869	486,511	486,511
R-squared	0.826	0.646	0.646	0.648	0.648

Note: The dependent variable is being a local: working in the region (for Italy) or the state (for the U.S.) of birth. The reference individual is a worker. Column 1 uses Italian data from SHIW; controls are the same as in table 5. Columns 2 to 5 use U.S. Census 2000 data (available at http://www.ipums.umn.edu/usa/); local is defined as a person who works in the same state as where she was born. The U.S. sample only includes U.S. citizens who are either "whites" or "African Americans." In columns 4 and 5 we consider only white U.S. citizens. The following controls are included in columns 2 to 5: individuals' gender, age, marital status, number of children, educational achievement dummies, macro region dummies, and race dummies (in columns 2 and 3). Descriptive statistics for the U.S. sample are presented in table A2. All regressions use OLS. Cluster adjusted (region for Italy; state for U.S.) s.e. in parentheses. p-value < 0.10 = *, p-value < 0.05 = **, p-value < 0.01 = ***.

Microdata Series (IPUMS) center at the University of Minnesota. Similarly to SHIW, the sampling unit in Census 2000 is the household. Approximately one out of every six housing units in the United States were included in the long form Census 2000 sample. The 1% sample produced in 2000 is obtained by randomly selecting 1% of the observations in the long form Census 2000 sample. The data contain information on individuals' educational achievement, marital status, age, race, occupational status, state of birth, and state of work.

Like in the SHIW analysis, we retain only heads of households aged between 18 and 65. We consider only U.S. citizens who are of either "white" or "African American" origins. We drop Native Americans, non-U.S. citizens, and U.S. citizens with other ethnic origins (mainly from East Asia), because Native Americans are a very small group, displaying almost no mobility rates, while non-U.S. citizens and individuals with other ethnic origins are likely to be born out of the United States, independently of their occupation.

We construct the variable *local* as a dummy variable taking value 1 if the individual works in the U.S. state where she was born. Since a U.S. state is substantially larger than an Italian province, we compare U.S. results with those obtained by using Italian regions (rather than provinces) as the geographical unit of the analysis. Individuals sampled in the Census are asked to report about their main working activity. We select individuals who are at work, and we construct the variable *worker* as a dummy identifying individuals working as dependent workers, in either the public or the private sector. Next, the variable *entrepreneur* identifies self-employed workers in either incorporated or unincorporated businesses. Notice that an incorporated business may better represent what may arguably be considered a *true* entrepreneurial venture. For example, if there are some fixed costs to incorporate a business, entrepreneurs would find it profitable to pay for them only in the presence of sufficiently rewarding projects; so incorporated businesses tend to be larger than unincorporated ones. In the following analysis, we report results for the two separate categories. In all regressions we use a set of controls similar to those previously considered; see the descriptive note in table 4 and table A2 for details.

Our findings are reported in table 4. The first column quantifies LBE in Italy when using regions to identify geographical mobility. LBE is around 5 percentage points, which implies that entrepreneurs are approximately 6.5% less mobile than dependent workers. U.S. results are reported in columns 2 to 5. Columns 2 and 3 deal with all selected individuals, and columns 4 and 5 present results for whites only. Columns 3 and 5 separately quantify LBE for self-employed in incorporated and unincorporated businesses. American workers appear to be substantially more mobile than Italian workers. Yet LBE also arises in the U.S. economy. Its magnitude is similar when considering incorporated or unincorporated businesses. The estimated LBE for the United States is about 3 percentage points, and it is statistically significant. This implies that, in the United States, entrepreneurs are about 4.5% less mobile than dependent workers. This is comparable with our Italian results.[16]

IV. More on LBE

By contrast with the U.S. data, SHIW contains detailed information on value, size, and financial structure of the businesses created by entrepreneurs. Thus, we henceforth focus the analysis on Italy. We next show how LBE relates to (i) the size of the firm, (ii) the development of the region, and (iii) the sectoral specialization of entrepreneurial activities.

[16] In comparing the results one may also notice that a U.S. state is still bigger than an Italian region. Clearly the size of the geographical unit of analysis affects the mobility rates of workers and entrepreneurs. To control for this effect, we re-ran all the U.S. regressions after adding a control for the population size of each U.S. state. We found that the magnitude of LBE remained unchanged. This is in line with the Italian evidence, where LBE is not strongly affected by considering as a unit of analysis the region rather than the province.

TABLE 5.—LBE BY FIRM SIZE

Description Depvar.:	1-OLS Local	2-OLS Local	3-OLS Local	4-OLS Local
Panel A: Employment Size				
Constant	0.724***	0.799***	0.724***	0.798***
	(0.036)	(0.051)	(0.036)	(0.051)
Start-up	0.044***	0.033***	0.056***	0.047***
	(0.014)	(0.014)	(0.012)	(0.012)
Start-up × employing more than one individual	0.046**	0.058***		
	(0.021)	(0.018)		
Start-up × employing more than five individuals			0.043*	0.059**
			(0.025)	(0.026)
Controls	No	Yes	No	Yes
Obs.	12,177	12,177	12,177	12,177
R-squared	0.742	0.772	0.742	0.771
Panel B: Market Value				
Constant	0.725***	0.798***	0.725***	0.799***
	(0.036)	(0.051)	(0.036)	(0.051)
Start-up	0.045***	0.038**	0.056***	0.049***
	(0.015)	(0.021)	(0.013)	(0.013)
Start-up × firm value greater than the median	0.038*	0.038**		
	(0.023)	(0.021)		
Start-up × firm value greater than top decile			0.046	0.052*
			(0.034)	(0.031)
Controls	No	Yes	No	Yes
Obs.	11,983	11,983	11,983	11,983
R-squared	0.741	0.770	0.741	0.770

Note: The dependent variable is being a local: working in the province of birth. The reference individual is a worker. The controls are individuals' gender, age, marital status, number of children, educational achievement dummies, 1991 and 1993 year dummies, macro region dummies, and a dummy variable for non-start-up entrepreneurs. All regressions use OLS. Cluster adjusted (province) s.e. in parentheses. p-value $<$ 0.10 = *, p-value $<$ 0.05 = **, p-value $<$ 0.01 = ***.

A. *LBE and Firm Size*

Table 5 characterizes how LBE is related to the size of the firm. Panel A deals with employment size. The first two columns quantify LBE for firms employing one or more than one worker; in the last two columns, we repeat the exercise for firms employing five or more than five workers, which corresponds to the top decile of the distribution of employment size of firms in SHIW. We find that the share of local entrepreneurs is always significantly higher than the share of local dependent workers. Moreover, LBE is increasing in the number of people employed at the firm: LBE is between 10 and 11 percentage points when considering larger businesses.[17]

Panel B in table 5 deals with the market value of the business. In the first two columns, we split the sample by using the median of the value distribution of firms (which is equal to 30 million 1991 Italian liras). In the last two columns, instead, we use the top decile (which is equal to 300 million 1991 Italian liras). In any group we find that the share of local entrepreneurs is higher than the corresponding share of dependent workers. Interestingly, LBE is also increasing in the value of the firm: for start-ups in the top decile of the distribution of firm's values, LBE is as high as 10 percentage points.

The findings presented in table 5 highlight a positive relation between measures of a firm's size and LBE. To corroborate the claim, we also compare the average size of local and nonlocal firms. To do so, we consider (i) the employment size of the firm, (ii) the capital stock, as proxied by yearly "ammortamenti" (capital depreciation), and (iii) the capital-labor ratio. For completeness, we also compare the average wage of local and nonlocal dependent workers.

Table 6 reports the results obtained by regressing proxies for firm size and capital intensity on a dummy identifying local entrepreneurs; Columns 2, 4, and 6 include the following controls: individuals' gender, age, family status, number of children, job tenure, and average hours worked per week; indicators for the size of the city or town where the individual lives; dummy variables for educational achievement, less than full-year activities, sector of occupation, and calendar years; and five macro region dummies. We find that firms managed by local entrepreneurs are larger and more capital intensive. Given the average size of firms, the employment advantage of local start-ups is around 37%. Similarly, local firms have, on average, 40% more capital, and capital-labor ratios that are 38% higher than those of nonlocal firms.[18] This may suggest that locals have an advantage at creating a business in their native location. Of course, this may also simply reflect selection issues, say

[17] We also studied whether the fraction of local dependent workers varies in firms of different sizes. We did not find any significant pattern.

[18] We also repeated the same exercise using the pecuniary value of the firm. As already mentioned, this measure is subject to substantial underreporting, especially at the top of the distribution. Also in this case, we find that local start-ups have higher pecuniary value than nonlocal ones, although the difference is somewhat less significant than that obtained with employment size and capital.

TABLE 6.—SIZE OF LOCAL AND NONLOCAL START-UPS

Description Depvar:	1-OLS Employment Size of Firm	2-OLS Employment Size of Firm	3-OLS Capital	4-OLS Capital	5-OLS K/L Ratio	6-OLS K/L Ratio
Local	1.19	1.41*	1,391***	1,540***	624***	715**
	(0.83)	(0.75)	(307)	(353)	(202)	(291)
Controls	No	Yes	No	Yes	No	Yes
Obs.	2,333	2,256	1,919	1,848	1,899	1,830
R-squared	0.001	0.029	0.004	0.056	0.003	0.048

Note: Regressions are run on the sample of start-up entrepreneurs only. The controls are individuals' gender, age, marital status, number of children, firm age, weekly hours worked, dummies for the size of the city or town where the individual lives, dummies for educational achievements, less than full-year jobs, sectors of occupation, calendar years, and five macro region dummies. All regressions use OLS. Cluster adjusted (province) s.e. in parentheses. p-value < 0.10 = *, p-value < 0.05 = **, p-value < 0.01 = ***.

TABLE 7.—LABOR INCOME OF LOCAL AND NONLOCAL DEPENDENT WORKERS

Description Depvar.:	1-OLS Total Wage Bill	2-OLS Total Wage Bill	3-OLS Total Wage Bill	4-OLS Net Wages	5-OLS Net Wages	6-OLS Net Wages
Local	−2,594***	−908**		−2,544***	−946**	
	(626)	(418)		(610)	(401)	
Local × white collar			−1,757***			−1,793***
			(489)			(465)
Local × blue collar			249			208
			(350)			(341)
White Collar			5,702***			5,583***
			(443)			(431)
Controls	No	Yes	Yes	No	Yes	Yes
Obs.	9,434	9,213	9,213	9,434	9,213	9,213
R-squared	0.009	0.402	0.417	0.009	0.403	0.418

Note: Regressions are run on the sample of dependent workers. The controls are individuals' gender, age, marital status and number of children, job tenure, weekly hours worked, dummies for the size of the city or town where the individual lives, dummies for educational achievements, less than full-year jobs, sectors of occupation, calendar years, five macro region dummies, and the regional unemployment rate. All regressions use OLS. Cluster adjusted (province) s.e. in parentheses. p-value < 0.10 = *, p-value < 0.05 = **, p-value < 0.01 = ***.

because only the best businesses created by locals survive and thrive.

We repeat a similar exercise for dependent workers, considering both their total wage bills and their net wage income. We control for all variables included in the previous regressions, and local unemployment rates. Results are reported in table 7. A remarkably different picture emerges: local dependent workers earn significantly lower total wage bills and net wages than migrants do. This is in line with findings in the migration literature; see, for example, Borjas (1987) and Borjas, Bronars, and Trejo (1992). The wage premium of immigrants is to be imputed to white-collar immigrants, earning significantly more than local white workers. Given the average total wage bill, local white collars earn 5% less than movers; a similar figure emerges when using net wages. Overall there exist remarkable differences between dependent workers and entrepreneurs, in that dependent workers who migrate earn higher average wages than locals, while the businesses created by nonlocal entrepreneurs are on average smaller and less valuable than those created by locals.

B. LBE and Local Economic Development

So far, we have analyzed how the relative mobility of entrepreneurs is related to individual and business characteristics. We next discuss how LBE is related to some measures of local economic development such as unemployment rate and GDP per capita. Since these indicators only vary across provinces (or regions), one caveat applies when evaluating the statistical significance of the coefficients. Correcting standard errors for possible dependence of residuals within province (or region) clusters is asymptotically efficient; yet, as shown by Bertrand, Duflo, and Mullainathan (2004), there may be problems in finite samples. To investigate this issue, we follow Guiso et al. (2004a) and we also report the p-values that arise when we collapse the data at the provincial (or regional) level, after partialling out individual effects. The results appear in square brackets at the bottom of table 8. We proceed analogously in the rest of paper, when considering indicators that exhibit no variation within a province (or a region).

Unemployment rates by regions of residence were obtained from ISTAT Labor Force Surveys for 1991, 1993, and 1995, and averaged over the three years.[19] Since we are interested in analyzing how labor market conditions affect LBE, we would like to use the unemployment rate at the date when the business was created or the worker become employed. These are, however, difficult to be imputed. Nevertheless, unemployment differentials across Italian regions have not (drastically) changed over the past decade. Moreover, current average unemployment rates may provide a better approximation to the lifetime employment opportunities that affect individuals' working choices. In table 8 we first analyze the relation between local unemployment rates and LBE by interacting the entrepreneurial

[19] Unemployment rates defined over provinces could not be computed because provincial codes in ISTAT Labor Force Surveys are protected for confidentiality reasons.

TABLE 8.—LBE AND LOCAL ECONOMIC DEVELOPMENT

Description Depvar.:	1-OLS Local	2-OLS Local	3-OLS Local	4-OLS Local	5-OLS Local	6-OLS Local
Constant	0.502*** (0.070)	0.770*** (0.066)	0.847*** (0.060)	0.916*** (0.026)	1.325*** (0.058)	1.314*** (0.118)
Start-up	0.110*** (0.026)	0.103*** (0.022)	0.046*** (0.012)	0.044*** (0.012)	−0.025 (0.032)	−0.024 (0.031)
Start-up × unemployment rate	−0.397*** (0.150)	−0.360*** (0.125)				
Unemployment rate	1.744*** (0.234)	0.309 (0.401)				
Start-up × north			0.030* (0.018)	0.035** (0.017)		
North			−0.202*** (0.009)	−0.203*** (0.009)		
Start-up × province GDP in 1970					0.008** (0.004)	0.008** (0.003)
Province GDP in 1970					−0.062*** (0.007)	−0.051*** (0.011)
Controls	No	Yes	No	Yes	No	Yes
Obs.	12,213	12,213	12,213	12,213	12,213	12,213
R-squared	0.759	0.772	0.754	0.755	0.770	0.776
p-value of start-up × relevant variable after collapsing the data	[0.073]	[0.057]	—	—	[0.050]	[0.040]

Note: The dependent variable is being a local: working in the province of birth. The reference individual is a worker. The controls are individuals' gender, age, marital status, number of children, and dummies for educational achievements; 1991 and 1993 year dummies, five macro region dummies, and a dummy variable for non-start-up entrepreneurs. Regional unemployment rates are averages over the years 1991, 1993, and 1995. North includes all regions north of Rome and Sardinia; south includes all other Italian regions. All regressions use OLS. Cluster adjusted (region, columns 1 and 2; province, columns 5 and 6) s.e. in parentheses. *p*-value < 0.10 = *, *p*-value < 0.05 = **, *p*-value < 0.01 = ***. The last row reports the *p*-value of the interaction between start-up and the relevant variable (unemployment rate in columns 1 and 2, province GDP in column 5 and 6) after collapsing the data at either the province or regional level, depending on the specification. The number of observations in the collapsed data are 92 in province-level regressions and 19 in region-level regressions.

status variable with local unemployment. Column 1 presents the results with raw figures; column 2 includes the usual set of individual and aggregate controls.

We find a negative relation between LBE and local unemployment rates. Indeed, the interaction term between the entrepreneurial status variable and the unemployment rate displays a sizable, significant, negative coefficient, implying that in regions where unemployment is lower, LBE is higher. An increase in the unemployment rate of 5 percentage points is associated with a decrease in LBE of about 1.5% for *start-ups.*

As discussed in the introduction, when employment opportunities as dependent workers are scarce and people are attached to the native location, individuals may decide to create their own business, which could in principle explain LBE. Yet the evidence in the first two columns of table 8 imply that LBE is higher in regions with more favorable labor market conditions; this suggests that the combination of poor labor market conditions and individuals' attachment to the native location can hardly explain LBE. Furthermore, local businesses tend to be larger and more valuable than nonlocal ones, which further suggests that this explanation cannot fully account for LBE.

Columns 3 to 6 of table 8 further characterize the relation between LBE and local level of economic activity by studying how LBE varies across Italian regions (north versus south) and in relation to the province level per capita GDP. Columns 3 and 4 provide evidence that LBE is higher in the north than in the south. The regional breakdown roughly reproduces Italian disparities in terms of economic activity, since northern regions are among the richest areas in the European Union, while southern regions are among the poorest. Overall, the evidence suggests that LBE tends to be positively related to the level of economic activity.

Columns 5 and 6 provide further support to the claim by relating LBE to the province-level per capita GDP in 1970.[20] This specific year is chosen because more than 70% of the sampled entrepreneurs started their activity after 1970. This approach allows us to better isolate the effect of exogenous variation in economic development on LBE, since it reduces the risk that the correlation is driven by the effects of entrepreneurial activity on local GDP.[21] Results show that the interaction term between entrepreneurial status and per capita GDP is positive and significant, which confirms that LBE is higher in more developed regions. Overall, the positive relationship between LBE and economic activity (as measured by employment rates and GDP per capita) may indicate that local entrepreneurship plays a role in creating persistent disparities in economic development.

C. *LBE and Local Entrepreneurial Density*

In table 9, we relate LBE to the entrepreneurial density in the province of residence. The idea is to investigate whether learning from other entrepreneurs could explain LBE. For each province considered in SHIW, we compute the fraction of entrepreneurs over the population of residence in 1991,

[20] We use raw GDP per capita, rather than its logarithm, to make results comparable with Guiso et al. (2004a). Results remain unchanged when considering the logarithm of per capita GDP rather than its level.

[21] We also tried considering earlier years and averages over the 1965–1975 period. The results are roughly unchanged; yet earlier data include missing values and their reliability is somewhat reduced.

TABLE 9.—LBE AND LOCAL ENTREPRENEURIAL DENSITY

Description Depvar.:	1-OLS Local	2-OLS Local	3-OLS Local	4-OLS Local
Constant	0.772***	0.751***	0.754***	0.745***
	(0.095)	(0.076)	(0.141)	(0.052)
Start-up	0.014	0.016	−0.020	0.033
	(0.031)	(0.032)	(0.042)	(0.038)
Start-up × share of entrepreneurs	0.407*	0.284		0.287
	(0.248)	(0.243)		(0.284)
Share of entrepreneurs	−0.396	0.335		0.338
	(0.568)	(0.385)		(0.284)
Start-up × share of firms in 1971			1.89*	
			(1.08)	
Share of firms in 1971			0.95	
			(2.89)	
Start-up × sector share of entrepreneurs				−0.084
				(0.077)
Sector share of entrepreneurs				0.024
				(0.065)
Controls	No	Yes	Yes	Yes
Obs.	12,213	12,213	12,213	12,213
R-squared	0.743	0.772	0.772	0.772
p-value of start-up × relevant variable after collapsing the data	[0.483]	[0.426]	[0.521]	[0.553]

Note: The dependent variable is being a local: working in the province of birth. The reference individual is a worker. The controls are individuals' gender, age, marital status, number of children, and dummies for educational achievements; 1991 and 1993 year dummies, macro region dummy variables, and a dummy variable for non-start-up entrepreneurs. Entrepreneurial share is the fraction of entrepreneurs in the population, averaged over 1991, 1993, and 1995. The share of firms in the population in 1971 was calculated using ISTAT data available online at www.istat.it. Sector share of entrepreneurs is defined as the fraction of entrepreneurs in a given province that works in a specific sector; this is averaged over 1991, 1993, and 1995. Cluster adjusted (province) s.e. in parentheses. *p*-value < 0.10 = *, *p*-value < 0.05 = **, *p*-value < 0.01 = ***. The last row reports the *p*-value of the interaction between start-up and the relevant variable (share of entrepreneurs in columns 1 and 2, share of firms in column 3, sector share of entrepreneurs in column 4) after collapsing the data at the province level. The number of observations in the collapsed data are 92.

1993, and 1995, and we proxy for the degree of entrepreneurial density by taking the average figure over the three years. Results are reported in columns 1 and 2. Using information derived from various ISTAT data collections, we also relate LBE to the ratio of firms in a province to the population of the province, in 1971. This year is sufficiently far away in time that most entrepreneurs in our sample had not yet started up their activity by that date, which reduces reverse causality problems. Results are reported in column 3. Our findings show that there exists a positive relation between LBE and the density of entrepreneurial activities. Yet its effect is modest in size and not robust. For example, after controlling for individual characteristics in column 2, the interaction term between the entrepreneurial status variable and our measure of entrepreneurial density is not significantly different from 0. This may indicate that technological spillovers and learning from other entrepreneurs play little role in determining LBE.

To further investigate the role of technological spillovers in determining LBE, we next relate LBE to the sectoral composition of local entrepreneurial activities. The idea is to test whether technological spillovers are stronger in provinces where entrepreneurial activity is more specialized. If technological spillovers are the main explanation for LBE, we would expect LBE to be increasing in the degree of specialization of entrepreneurial activities. We measure the level of entrepreneurial specialization in a specific sector and in a given province by computing the total number of entrepreneurs within a sector-province cell over the total number of entrepreneurs in the province, which is similar to the proxy used in Guiso and Schivardi (2005). We then take the average figure obtained over 1991, 1993, and 1995.[22] In fact, we are unable to calculate the corresponding quantity at the date when each business venture was actually started. Yet the geographical and sectoral distribution of the Italian districts have not drastically changed in the past decades, which makes us confident about this measure of sectoral specialization of entrepreneurial activities.

When we augment the regressions in column 2 of table 9 by including the indicator for the sectoral composition of entrepreneurial activities and its interaction with the entrepreneurial status variable, we find that the degree of entrepreneurial specialization does not play any significant role in accounting for LBE (see column 4). We even find that LBE is lower in provinces with more specialized entrepreneurial activities, although the effect is not statistically significant.

Guiso and Schivardi (2005) show that in areas with dense and specialized entrepreneurial environments, average total factor productivity tends to be higher. They argue that when more entrepreneurs work within a given sector and geographical area, people have higher chances of acquiring specific entrepreneurial skills.[23] Although they do not directly address the question of why LBE may emerge, their evidence could suggest that technological spillovers and

[22] Guiso and Schivardi (2005) use the number of entrepreneurs in a sector-province cell over the total population to measure entrepreneurial density. Our results do not vary when considering this alternative proxy.

[23] A closely related strand of literature focuses on knowledge and R&D spillovers and location decisions, suggesting that business ventures tend to be concentrated in locations specialized in given production activities; see for example Ellison and Glaeser (1997).

TABLE 10.—LEVERAGE OF LOCAL AND NONLOCAL FIRMS

Description Depvar.:	1 Bank Debt	2 Bank Debt
Local	0.44**	0.24*
	(0.20)	(0.14)
Controls	No	Yes
Obs.	1,937	1,849
R-squared	0.001	0.031

Note: Regressions are run on the sample of start-up entrepreneurs only. The dependent variable is the amount of firm bank debts over firm capital as proxied by "ammortamenti." The controls are individuals' gender, age, marital status, number of children, firm age, weekly hours worked; household wealth (linear and squared) and total income; dummies for the size of the city or town where the individual lives; dummies for educational achievements, less than full-year jobs, and sectors of occupation; 1991 and 1993 year dummies and five macro region dummy variables. Cluster adjusted (province) s.e. in parentheses. p-value < 0.10 = *, p-value < 0.05 = **, p-value < 0.01 = ***.

entrepreneurial learning may explain LBE. Our findings, however, provide little support to this explanation.

V. The Role of Financial Markets

It is well documented that funds' provision is an important concern in the decision to become an entrepreneur. As discussed in the introduction, there are several reasons why locals could have better access than nonlocals to local credit markets. If firms also have to locate close to their financiers to obtain credit, this mechanism could explain why LBE emerges. We therefore now investigate the role of financial markets in determining LBE. We start documenting that local firms are able to obtain greater financing per unit of capital invested. Then, we construct an index of local financial development and relate it to LBE, the probability of being an entrepreneur, and to firm's size.

A. Preliminary Evidence

Table 10 documents that firms created by locals receive greater financing per unit of capital invested than firms created by nonlocals. We consider the sample of start-up entrepreneurs and regress the ratio of bank debts to firms' capital on the dummy for being a local. In column 2 we report the results after including the usual set of variables. Bank debts are measured in SHIW as short-term (within eighteen months) loans from banks and other financial institutions for business activities.

We find that the dummy identifying local individuals displays a positive and significant coefficient. Given average values for the bank debt-capital ratio, this implies that local entrepreneurs obtain 45% more financing per unit of capital invested than nonlocal entrepreneurs.

B. An Index of Local Financial Development

To further investigate the role of financial markets, we follow Guiso et al. (2004a) in constructing a measure of local financial development. We exploit information collected in SHIW about households' access to credit. SHIW asks whether the household has been turned down for a loan or discouraged from applying; we use this information to create an indicator measuring how easy it is to obtain credit in a given location.

To apply the methodology, we have to take a stand on what is the relevant local financial market. Ideally, we would like to construct province-level indicators because this would be consistent with the evidence discussed so far. Moreover, up to the 1990s, banks could only open branches conditional on authorization granted province-by-province by the Bank of Italy. Thus, also from an economic point of view, the province seems to be the natural unit of analysis. Yet, as documented by Guiso et al. (2004a), statistical considerations related to missing data suggest that regional indicators are more reliable. We therefore compute and report results obtained using both province- and region-level indicators.

To identify geographical differences in the supply of credit, we estimate the probability that a household, potentially interested in borrowing, is either turned down for a loan or discouraged from applying. To approximate the set of potential borrowers, we pool together all households with some debt and those that we know have been denied credit or discouraged from applying for a loan. We then estimate a linear probability model for the likelihood that a household is shut off from the credit market that is, it has been either denied a loan or discouraged from applying. As controls we include household income and wealth (linear and squared); number of people belonging to the household, number of children; household head's age, gender, marital status, educational achievement, and job qualification; indicators for the size of the city or town where the household lives and calendar year dummies. Finally, we include dummy variables for either provinces or regions of residence. Region and province dummies represent the conditional probability of being shut off from the credit market in the corresponding location. We then use these conditional probabilities to measure local financial development by computing the following indicator:

$$Kav = 1 - \frac{\text{Conditional Probability of Rejection}}{\max\{\text{Conditional Probability of Rejection}\}}$$

where *Kav* stands for capital availability. We denote province- and region-level credit availability by *KavP* and *KavR,* respectively.

To support the validity of the indicators, we report on three exercises. First, an *F*-test strongly rejects the null hypothesis that either the province or the regional dummies are all equal. Second, a test on whether dummies for provinces within the same region are equal leads to a rejection of the null hypothesis in only two regions (corresponding to Lombardia and Toscana) out of nineteen. Finally, we checked that there exists a significant positive correlation between our region-level indicator (*KavR*) and the index derived in Guiso et al. (2004a). For example, the simple correlation between the two indicators is 0.90 and is significant at the 1% level, while the Spearman-rank corre-

TABLE 11.—LBE AND LOCAL FINANCIAL DEVELOPMENT

Description Depvar.:	1-OLS Local	2-OLS Local	3-OLS Local	4-IV Local	5-IV Local
Constant	1.062***	0.877***	0.762***	0.777***	0.687***
	(0.099)	(0.076)	(0.064)	(0.080)	(0.117)
Start-up	−0.081	−0.056	0.015	−0.006	0.001
	(0.056)	(0.053)	(0.018)	(0.019)	(0.023)
Start-up × KavP	0.233**	0.186**			
	(0.099)	(0.093)			
KavP	−0.558***	−0.135			
	(0.175)	(0.097)			
Start-up × KavR			0.135**	0.209**	0.189*
			(0.064)	(0.077)	(0.098)
KavR			0.119	0.069	0.141
			(0.168)	(0.228)	(0.278)
Controls	No	Yes	Yes	Yes	Yes
Obs.	12,213	12,213	12,213	12,213	8,385
R-squared	0.748	0.772	0.772	0.772	0.765
p-value of start-up × KavP (or KavR) after collapsing the data	[0.089]	[0.083]	[0.049]	[0.079]	[0.167]

Note: The dependent variable is being a local: working in the province of birth. The reference individual is a worker. KavP and KavR are indices of local financial development (capital availability) at the province and region level, respectively. KavP and KavR always refer to the region of residence, except in column 5 where it refers to region of birth. In this last case the sample concerns only the 1991 and 1993 waves of SHIW. See body text and Guiso et al. (2004a) for details about the construction of these indices. The controls are individuals' gender, age, marital status, number of children, dummies for educational achievements, 1991 and 1993 year dummies, macro region dummy variables, and a dummy variable for non-start-up entrepreneurs. Columns 1–3 are OLS estimates. Columns 4–5 instrument KavR and its interaction by the structure of the banking system in the region in 1936, see text. Cluster adjusted (province, columns 1 and 2; region, columns 3 to 5) s.e. in parentheses. *p*-value < 0.10 = *, *p*-value < 0.05 = **, *p*-value < 0.01 = ***. The last row reports the *p*-value of the interaction between start-up and the relevant variable (KavP in columns 1 and 2, KavR in columns 3 to 5) after collapsing the data at either the province or regional level, depending on the specification. The number of observations in the collapsed data are 92 in province-level regressions and 19 in region-level regressions.

lation is 0.79 and the null hypothesis that the two series are independent is strongly rejected with a *p*-value of 0.0001. We start using provinces and regions of residence, rather than those of birth, because this information is missing for 1995. Yet, we document below that our findings are also confirmed when using financial market indicators for regions of birth, with the data coming from only the 1991 and 1993 waves of the survey.

One important concern regards the possibility that the index of local financial development simply captures clustering of individuals with similar characteristics that make them potentially *good* borrowers. Alternatively, it could be that entrepreneurs tend to start up their businesses in locations where production and good delivery is more efficient. In turn, this would tend to generate high demand for loans, which makes the financial markets tighter and endogenously reduces the value of the credit availability index. To avoid these problems, we need to identify some exogenous variation in the supply of credit that affects local financial development.

Following Guiso et al. (2004a), we exploit Italian banking regulation changes that occurred in 1936. After the banking crisis of 1930–1931, the Italian government approved in 1936 a law that imposed rigid limits on the ability of different types of credit institutions to open new branches and expand their credit activity. As detailed in Guiso et al. (2004a), the number of branches in each province in the 1990s can be partly explained by the number and types of banks in 1936. We therefore instrument the region-level indicator of financial development (*KavR*) with a set of variables describing the regional characteristics of the banking system as of 1936. These variables are number of branches per million of inhabitants in the region, share of branches of local banks, number of savings banks per million of inhabitants, and number of cooperative banks per million of inhabitants (province-level indicators cannot be instrumented since we lack an analogous set of province-level variables for the banking system in 1936). The proposed instruments explain more than 50% of the regional variation in credit availability as measured by *KavR,* and an *F*-test strongly rejects the null of joint nonsignificance of the instruments. Guiso et al. (2004a) also show that these instruments are quite unrelated to the level of economic development of regions in 1936.

C. *LBE and Local Financial Development*

If local individuals can more easily obtain credit in the region of birth, we expect that the development of local financial markets should benefit local entrepreneurs relatively more than nonlocal ones. We therefore envisage LBE to be increasing in the level of local financial development. Table 11 provides evidence supporting this prediction. We first exploit the province-level variation in credit availability (*KavP*) and its interaction with the dummy variable identifying entrepreneurial status. Column 1 does not include any controls; column 2 includes the previously detailed variables. We find that, once we control for the conditions of the local credit market, the raw difference between the fraction of local entrepreneurs and the share of local dependent workers is no longer significant. Yet the interaction between entrepreneurial status and the indicator for local financial development exhibits a positive and statistically significant coefficient, which implies that LBE is higher in regions with more developed local financial markets. The result survives also in the regressions with the data collapsed at the province level.

Given the results in column 2, LBE is equal to 0 in a province with the least developed financial market in the sample ($KavP = 0$), it is equal to 11 percentage points in a province with an average value of financial development ($KavP = 0.6$), and it reaches a value of 14 percentage points in the province with the most developed financial market ($KavP = 0.79$). These calculations suggest that credit availability in local financial markets can (almost fully) account for the emergence of LBE.

We repeat the same exercise exploiting region-level variation in local financial development. This is done in column 3. Again we find that the interaction between the dummy variable identifying entrepreneurial status and the index of local financial development exhibits a positive and statistically significant coefficient, while the entrepreneurial status variable is no longer significant. Quantitatively, we find that moving from the least to the most developed local financial markets, as measured by *KavR,* would raise LBE from 0 to 7 percentage points.

As previously discussed, the indicator of financial development may be correlated with unobserved determinants of LBE; or it could be that causation runs from clustering of entrepreneurs to local financial development, rather than the opposite. We address this issue by instrumenting *KavR* and its interaction with the *start-up* dummy with the previously described set of variables describing the structure of regional banking markets in 1936. The IV estimates reported in columns 4 and 5 confirm the results we obtained using OLS. The impact of local credit availability on LBE is now even larger, and more statistically significant. Moving from the least to the most developed financial market would raise LBE from 0 to 11 percentage points. When we repeat the same analysis using the level of local financial development in the region of birth, results remain broadly unchanged. Although the exclusion of 1995 causes a fall in sample size, the estimated impact of local financial development on LBE is as sizable as that obtained with the region of residence and strongly statistically significant.

One caveat applies to our accounting exercise. Since our financial market indicators are measured with error, we may be overestimating their power in explaining the emergence of LBE. Following Hall and Jones (1999), we address the problem in this way: define by F and $\hat{F}$ the *true* (unobserved) and estimated financial development indicators, respectively. Notice that by construction both have a minimum value of 0. Next, let $corr(F,\hat{F})$, σ_F, and $\sigma_{\hat{F}}$ denote the correlation between the two indices and the two associated coefficients of variation, respectively. Now, notice that the square root of the ratio of the estimated OLS coefficient to the IV coefficient (in table 11) is $corr(F,\hat{F})$, that is, $\sqrt{\frac{\sigma_F}{\sigma_F}} = corr(F,\hat{F})$.

Given that we observe both $corr(F,\hat{F})$ and $\sigma_{\hat{F}}$, we can derive the coefficient of variation for the *true* financial market indicator (σ_F) and repeat our accounting exercise using this as a conservative measure for its maximum value.

TABLE 12.—PROBABILITY OF BEING AN ENTREPRENEUR AND LOCAL FINANCIAL DEVELOPMENT

Description Depvar.:	1-OLS Entr. Status	2-IV Entr. Status	3-IV Entr. Status
Local × KavR	0.137***	0.150***	0.147**
	(0.047)	(0.044)	(0.056)
KavR	−0.013	−0.068	−0.074
	(0.070)	(0.087)	(0.092)
Controls	Yes	Yes	Yes
Obs	12,231	12,231	8,466
R-squared	0.019	0.018	0.017
p-value of local × KavR after collapsing the data	[0.265]	[0.195]	[0.123]

Note: The dependent variable is being a start-up entrepreneur. The controls are individuals' gender, age, marital status, number of children, dummies for educational achievements, a dummy for having received a monetary transfer from parents or relatives; 1991 and 1993 year dummies and macro region dummies. KavR is the index of local financial development (capital availability) at the region level. See body text and Guiso et al. (2004a) for more details. KavR refers to the region of residence, except in column 3 where it refers to region of birth. In this last case the sample concerns only the 1991 and 1993 waves of SHIW. Column 1 presents OLS estimates. Columns 2 and 3 instrument KavR and its interaction by the structure of the banking system in the region in 1936, see text. Cluster adjusted (region) s.e. in parentheses. p-value < 0.10 = *, p-value < 0.05 = **, p-value < 0.01 = ***. The last row reports the p-value of the interaction between start-up and KavR after collapsing the data at the regional level. The number of observations in the collapsed data is 19.

Once this is done, we still find that, in the region with the most developed financial market, LBE is as high as 6.5 percentage points, which supports the previous conclusions.

D. *Further Evidence on the Effects of Local Financial Development*

So far, evidence provides support to the claim that LBE arises because local entrepreneurs can exploit their personal networks and reputational capital to gain access to local credit markets. We next show that the development of local financial markets stimulates entrepreneurship and that this effect runs *via* local entrepreneurs. This further documents how the interaction between credit availability and locals' social capital can determine LBE.

In table 12 we estimate the effects of local financial development, in interaction with being a local, on the probability of being an entrepreneur. In column 1, we report OLS results when we include *KavR* and its interaction with the dummy variable identifying local individuals; in columns 2 and 3 we instrument the indicators of local financial development for regions of residence and regions of birth, respectively.[24] The usual controls are included in all regressions.[25]

Table 12 provides some new evidence about the channel whereby financial development affects the probability of being a start-up entrepreneur. In fact, we find that, while the coefficient attached to the indicator of local financial development is not statistically significant (and negative), the interaction term between credit availability and the dummy

[24] Note that when we include only credit availability indicators, we find that the level of local financial development exerts a positive and significant impact on the probability of being a start-up entrepreneur; the estimated coefficient on *KavR* is 0.111, with a standard error of 0.053. This confirms the findings in Guiso et al. (2004a).

[25] See table 12 for details. Following Guiso et al. (2004a), we do not control for wealth. Yet our findings were confirmed when we added this control.

TABLE 13.—FIRM SIZE AND LOCAL FINANCIAL DEVELOPMENT

Description Depvar.:	1-IV Empl. Size	2-IV Empl. Size	3-IV Capital	4-IV Capital	5-IV K/L Ratio	6-IV K/L Ratio
Local × KavR	18.0**	16.4**	6,369*	6,655**	5,281*	5,120*
	(7.14)	(7.49)	(3,309)	(3,094)	(2,663)	(2,782)
Local	−4.45*	−4.24*	−578	−1,096	−1,007	−1,194*
	(2.09)	(2.42)	(1,200)	(1,084)	(963)	(1,010)
KavR	−10.1**	−7.80	−824	−2,400	−1,917	−2,533
	(4.29)	(6.33)	(2,597)	(3,313)	(2,173)	(2,413)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	2,256	1,595	1,848	1,383	1,830	1,365
R-squared	0.055	0.035	0.055	0.049	0.047	0.043
p-value of local × KavR after collapsing the data	[0.138]	[0.139]	[0.137]	[0.249]	[0.152]	[0.297]

Note: Regressions are run on the sample of start-up entrepreneurs. The controls are individuals' gender, age, familial status, and number of children; firm age, weekly hours worked; dummies for the size of the city or town where the individual lives; dummies for educational achievements, less than full-year jobs, sectors of occupation, and calendar years; and five macro region dummies. KavR is the index of local financial development (capital availability) at the region level. See body text and Guiso et al. (2004a) for more details. All estimates instrument KavR and its interaction by the structure of the banking system in the region in 1936, see text. Columns 1, 3, and 5 consider KavR in the region of residence, while the remaining ones deal with KavR in the region of birth. Cluster adjusted (region) s.e. in parentheses. *p*-value < 0.10 =*, *p*-value < 0.05 = **, *p*-value < 0.01 = ***. The last row reports the *p*-value of the interaction between start-up and KavR after collapsing the data at the regional level. The number of observations in the collapsed data is 19.

identifying local individuals has a large, positive, and statistically significant coefficient. For the average individual in column 2, the probability of starting up a business increases by 35% when moving from the least to the most developed financial market. The IV results, for both regions of residence and birth, reinforce the evidence that the development of local financial markets mainly stimulates entrepreneurship by promoting local entrepreneurship.[26]

In table 13, we finally consider the effects of local financial development on the employment size of the firm, its capital stock, and its capital-labor ratio. Independently of whether we use region of residence or region of birth, we always find that the interaction between the index of financial development and the dummy identifying local individuals is positive and statistically significant. This suggests that local financial development mainly affects the average size of firms and their capital intensity by favoring local individuals. This provides further evidence for the claim that local financial development drives LBE.

VI. More on the Effects of Social Capital

In the previous section, we have provided evidence suggesting that locals have better access to credit markets than nonlocals; this may (at least partly) be because locals can use their personal connections and reputational capital to obtain financing. Yet, as discussed in the introduction, there are several other reasons why personal networks can help an entrepreneur start up a business and make it succeed. In fact, the use of personal networks can help entreprenuers contact customers and suppliers, obtain more reliable market information, and more easily recruit suitable workers for new ventures. If this was the case, we would expect LBE to be positively related to measures of social capital and intensity of personal networks in the local community.

To analyze this issue we start considering two output-based measures of trust in local communities. The first indicator is the number of 16 oz. blood bags collected per inhabitant in the province (*blood donation*); the second indicator is the average province-level *voter turnout* for all referenda held in Italy between 1946 and 1987.[27] Both measures are proxies for the level of trust and economic cooperation, which are distinctive features of social capital, and have been used in Guiso et al. (2004b); see their paper for further details.

Additionally, we construct two proxies for the general relevance of personal networks in the community. The first index focuses on labor markets, and it is based on the probability of finding a job through personal contacts in the province. To obtain this indicator, we follow the methodology previously used to measure the degree of local financial development. First, we identify individuals who found their job through personal contacts as those who explicitly declare that they found their job by using "direct referrals from relatives, friends, and acquaintances to their potential employer." Next, to measure geographical differences in the intensity of networks across labor markets, we estimate a linear model for the probability that a dependent worker finds her job through contacts. In the estimation we control for the number of people in the household; number of children; individual's age, gender, marital status, and educational achievement; indicators for the size of the city or town where the household lives, calendar year dummies,

[26] We did not add the dummy identifying locals to our regressions. Simultaneously including the indicator of financial development, the dummy for natives and their interaction tend to create collinearity problems. Yet, when we include all variables, our findings are qualitatively confirmed, although the estimates of the specific coefficients are less precise. For example, for the instrumented measures of financial development for regions of residence, we find that *KavR* has an estimated impact of −0.044 with a *t*-statistic of −0.34; the interaction term has a 0.114 coefficient with a 1.05 *t*-statistic; the *local* dummy has a 0.012 impact with a 0.40 *t*-statistic. An *F*-test rejects the null that the interaction term and the *local* dummy are jointly nonsignificant with a *p*-value of 0.0069.

[27] In Italy, voting in referenda is not mandatory. The referenda considered cover a very broad set of issues, including the choice between republic and monarchy, divorce, abortion, hunting regulation, and the use of nuclear power. See Guiso et al. (2004b) for further details.

TABLE 14.—LBE, TRUST, AND LABOR MARKET CONNECTIONS

Description Depvar.:	1-OLS Local	2-OLS Local	3-OLS Local	4-OLS Local
Constant	0.796*** (0.062)	0.726*** (0.114)	0.808*** (0.071)	0.318*** (0.050)
Start-up	0.031* (0.017)	0.007 (0.020)	0.015 (0.038)	0.095** (0.040)
Start-up × blood donation	0.971** (0.451)			
Blood donation	0.111 (1.03)			
Start-up × voter turnout		0.295** (0.122)		
Voter turnout		0.326 (0.458)		
Start-up × NavP			0.132 (0.122)	
NavP			−0.037 (0.170)	
Start-up × local share				−0.238 (0.183)
Local share				2.34*** (0.186)
Controls	Yes	Yes	Yes	Yes
Obs.	12,213	12,213	12,213	12,213
R-squared	0.772	0.772	0.772	0.783
p-value after collapsing the data of start-up × relevant variable	[0.245]	[0.028]	[0.657]	[0.946]

Note: The dependent variable is being a local: working in the province of birth. The reference individual is a worker. The controls are individuals' gender, age, family status, number of children, and dummies for educational achievements; 1991 and 1993 year dummies, five macro region dummy variables, and a dummy variable for non-start-up entrepreneurs. Blood donation is the number of blood bags collected per million inhabitant in the province; voter turnout is the average turnout to referenda between 1947 and 1989 at the province level. NavP measures the availability of labor market networks using the probability of finding a job through personal contacts (defined at the province level). Local workers share is the fraction of locals (either dependent workers or entrepreneurs) in the population of the province. All regressions use OLS. Cluster adjusted (province) s.e. in parentheses. *p*-value $< 0.10 =$ *, *p*-value $< 0.05 =$ **, *p*-value $< 0.01 =$ ***. The last row reports the *p*-value of the interaction between start-up and the relevant variable (blood donation in column 1, voter turnout in column 2, NavP in column 3, local share in column 4) after collapsing the data at the province level. The number of observations in the collapsed data is 92.

and the regional unemployment rate. Finally, we include dummy variables for the province of residence, which identify the conditional probability of finding a job through personal contacts in a province. We then use these conditional probabilities to construct an indicator, varying between 0 and 1, for the local importance of personal networks in the labor market. The index is constructed as follows:

$$NavP = \frac{\text{conditional probability of finding job through contacts}}{\max\{\text{conditional probability of finding job through contacts}\}}$$

where *Nav* stands for network availability; higher values of *NavP* indicate that personal contacts are more important in the local labor market. Also, we obtain a second indicator for the relevance of personal networks by computing the fraction of local workers (either local dependent workers or local entrepreneurs) in the population of the province (*local share*). Notice that while *NavP* measures the actual importance of connections in the local labor market, *local share* gauges their potential relevance in any market of interest to the company.

We next relate these indicators to LBE by including them in our baseline regression both directly and in interaction with the dummy identifying entrepreneurial start-ups; the four columns in table 14 contain the results for the four different indices. Columns 1 and 2 deal with the measures of social capital (*blood donation* and *voter turnout*); columns 3 and 4 deal with the measures of the intensity of personal networks.

When using *blood donation* as a measure of social capital, we find that the entrepreneurial status dummy is marginally significant, and its size is around 3 percentage points. The interaction between *blood donation* and *start-up* is instead positive and strongly significant. Similar results arise when considering *voter turnout,* although now *start-up* completely loses significance. Since trust appears to be one key determinant of financial development (see Guiso et al., 2004b), these results are not necessarily in contrast with our interpretation that local financial development is an important determinant of LBE. Of course, we cannot exclude that high levels of trust have a positive direct impact on local entrepreneurship (and LBE), beyond their effect through credit availability.

Finally, in columns 3 and 4, we analyze how the two proxies for the general importance of personal networks in local markets are related to LBE. When considering the effects of *NavP,* we find that both entrepreneurial status and its interaction with *NavP* are not statistically significant; see column 3. When considering the effects of *local share,* we find that its interaction with the entrepreneurial status dummy is negative (rather than positive), and not statistically different from 0. Overall, we do not find strong evidence for a role of personal networks in accounting for LBE, possibly leaving aside their effect on access to credit.

VII. Conclusions

In this paper, we have documented that, both in Italy and in the United States, the fraction of entrepreneurs who set up their business in the location where they were born is significantly higher than the corresponding fraction for dependent workers. We have referred to this difference as a local bias in entrepreneurship (LBE). The magnitude of LBE remains unchanged when we confine our attention to new businesses (start-ups), which implies that LBE is not the plain result of the intergenerational transmission of entrepreneurial activities.

We have then documented that, in Italy, LBE is larger when considering relatively big and valuable companies. LBE is also higher in areas with low unemployment rates and high GDP per capita, which suggests that LBE may help perpetuate differences in technology and economic development. LBE appears instead to be unrelated to how intense and specialized entrepreneurial activities are in the given location, which suggests that technological spillovers and learning from other local entrepreneurs plays little role in explaining LBE.

We have also found that firms created by locals are, on average, more valuable and bigger (in terms of capital and employment), operate with more capital-intensive technologies, and are able to obtain greater financing per unit of capital invested than firms created by nonlocals. We interpreted these findings by arguing that locals can better exploit the financial opportunities available in the region where they were born. In particular it could be that local banks have access to privileged information about local individuals; or it could be that, due to peer monitoring or local social pressure, the moral hazard problem associated with borrowing is less severe for local individuals that borrow from local banks. Either way, local individuals have privileged access to financing in the region where they were born. If banks also require the financed entrepreneurial venture to be geographically close, say because this reduces monitoring costs, this mechanism can generate LBE. By using the measure of local financial development originally proposed by Guiso et al. (2004a), we found that LBE is increasing in the degree of local financial development, which further supports our interpretation. Guiso et al. (2004a), Jayaratne and Strahan (1996), and Dehejia and Lleras-Muney (2003) have shown that local financial development spurs real economic activity. Our mechanism can then help in explaining *how* local financial development causes persistent disparities in entrepreneurial activity, technology, and income across regions and countries. Under this view, technological catching up requires both the nurturing of local entrepreneurship and well-developed local financial markets.

REFERENCES

Acs, Zoltan J., and David B. Audretsch, *Handbook of Entrepreneurship Research* (London: Kluwer Academic Publishers, 2003).

Acs, Zoltan J., David B. Audretsch, Pontus Braunerhjelm, and Bo Carlsson, "The Missing Link: The Knowledge Filter and Entrepreneurship in Endogenous Growth," CEPR discussion paper 4783 (2004).

Alba-Ramirez, Alfonso, "Self-Employment in the Midst of Unemployment: The Case of Spain and the United States," *Applied Economics* 26:3 (1994), 189–204.

Aldrich, Howard, Ben Rosen, and William Woodward, "The Impact of Social Networks on Business Foundings and Profit: A Longitudinal Survey" (pp. 154–168), in Neil C. Churchill, John A. Hornaday, O.J. Kasner, and Karl H. Vepser (Eds.), *Frontiers in Entrepreneurship* (Wellesley, MA: Babson College, 1987).

Aldrich, Howard, and Catherine Zimmer, "Entrepreneurship through Social Networks" (pp. 13–28), in Howard Aldrich (Ed.), *Population Perspective on Organizations* (Uppsala: Acta Universitatis Uppsaliensis, 1986).

Arnott, Richard J., and Joseph E. Stiglitz, "Moral Hazard and Nonmarket Institutions: Dysfunctional Crowding Out of Peer Monitoring?" *American Economic Review* 81:1 (1991), 179–190.

Banfield, Edward, *The Moral Basis of a Backward Society* (New York: Free Press, 1968).

Bentolila, Samuel, Claudio Michelacci, and Javier Suarez, "Social Contacts and Occupational Choice," CEMFI mimeograph (2004).

Berger, Allen N., Nathan H. Miller, Mitchell A. Petersen, and Raghuram G. Rajan, "Does Function Follow Organizational Form? Evidence from the Lending Practices of Large and Small Banks," manuscript (2001).

Bertrand, Marianne, Esther Duflo, and Sendhil Mullainathan, "How Much Should We Trust Difference in Difference Estimates?" *Quarterly Journal of Economics* 119:1 (2004), 249–275.

Blanchflower, David, and Andrew Oswald, "What Makes an Entrepreneur?" *Journal of Labor Economics* 16:1 (1998), 26–60.

Blumberg, Boris F., and Gerard A. Pfann, "Social Capital and the Uncertainty Reduction of Self-Employment," IZA discussion paper 303 (2001).

Borjas, George, "Self-Selection and the Earnings of Immigrants," *American Economic Review* 77:4 (1987), 531–553.

Borjas, George, Stephen G. Bronars, and Stephen J. Trejo, "The Assimilation and Earnings of Young Internal Migrants," this REVIEW 74:1 (1992), 170–175.

Bruderl, Josef, and Peter Preisendorfer, "Network Support and the Success of Newly Founded Businesses," *Small Business Economics* 10:3 (1998), 213–225.

Chelli, Francesco, and Luisa Rosti, "Una analisi sui Flussi del Mercato del Lavoro: I'Occupazione Indipendente," *Politica Economica* 3 (1998), 447–476.

Cooke, Philip, and David Wills, "Small Firms, Social Capital and the Enhancement of Business Performance through Innovation Programs," *Small Business Economics* 13 (1999), 219–234.

Coleman, James S., "Social Capital in the Creation of Human Capital," *American Journal of Sociology* 94 (1988), 95–120.

——— *Foundations of Social Theory.* (Cambridge, MA: Harvard University Press, 1990).

Dehejia, Rajeev, and Adriana Lleras-Muney, "Why Does Financial Development Matter? The United States from 1900 to 1940," NBER working paper 9551 (2003).

Dunn, Thomas, and Douglas Holtz-Eakin, "Financial Capital, Human Capital and the Transition to Self-Employment," *Journal of Labor Economics* 18:2 (2000), 282–305.

Ellison, Glenn, and Edward L. Glaeser, "Geographic Concentration in U.S. Manufacturing Industries: A Dartboard Approach," *Journal of Political Economy* 105:5 (1997), 889–927.

Evans, David S., and Boyan Jovanovic, "An Estimated Model of Entrepreneurial Choice Under Liquidity Constraints," *Journal of Political Economy* 87:4 (1989), 808–827.

Granovetter, Mark S., *Getting a Job* (Cambridge, MA: Harvard University Press, 1974).

Guiso, Luigi, Paola Sapienza, and Luigi Zingales, "Does Local Financial Development Matter?" *Quarterly Journal of Economics* 119:3 (2004a), 929–969.

——— "The Role of Social Capital in Financial Development," *American Economic Review* 94:3 (2004b), 526–556.

Guiso, Luigi, and Fabiano Schivardi, "Learning to Be an Entrepreneur," CEPR discussion paper 5290 (2005).

Hall, Robert E., and Charles I. Jones, "Why Do Some Countries Produce So Much More Output than Others?" *Quarterly Journal of Economics* 114:1 (1999), 83–116.
Holtz-Eakin, Douglas, David Joulfaian, and Harvey S. Rosen, "Entrepreneurial Decisions and Liquidity Constraints," *RAND Journal of Economics* 25:2 (1994), 334–347.
Jayaratne, Jith, and Philip E. Strahan, "The Finance-Growth Nexus: Evidence from Bank Branch Deregulation," *Quarterly Journal of Economics* 111:3 (1996), 639–671.
Lucas, Robert E., "On the Size Distribution of Business Firms," *Bell Journal of Economics* 9:2 (1978), 508–523.
——— "Why Doesn't Capital Flow from Rich to Poor Countries?" *American Economic Review, Papers and Proceedings* 80:2 (1990), 97–96.
Martinez-Granado, Maite, "Self-Employment and Labour Market Transitions: A Multiple State Model," CEPR discussion paper 3661 (2002).
Michelacci, Claudio, "Low Returns to R&D Due to the Lack of Entrepreneurial Skills," *Economic Journal* 113:127 (2003), 207–225.
Montgomery, James D., "Social Networks and Labor-Market Outcomes: Toward an Economic Analysis," *American Economic Review* 81:5 (1991), 1408–1418.
OECD, *OECD Employment Outlook 1992* (1992).
——— *OECD Employment Outlook 2000* (2000).
Petersen, Mitchell A., and Raghuram G. Rajan, "Does Distance Still Matter? The Information Revolution in Small Business Lending," *Journal of Finance* 57:6 (2002), 2533–2570.
Putman, Robert, *Making Democracy Work: Civic Traditions in Modern Italy* (Princeton: Princeton University Press, 1993).
Schumpeter, Joseph A., *The Theory of Economic Development* (Cambridge, MA: Harvard University Press, 1911).
Williamson, Stephen D., "Costly Monitoring, Loan Contracts and Equilibrium Credit Rationing," *Quarterly Journal of Economics* 102:1 (1987), 136–145.

APPENDIX

Italian Data

Our Italian data are drawn from the Survey of Household Income and Wealth (SHIW). The survey is conducted by the Bank of Italy and was started in the 1960s, for cross-sectional analysis. The latest releases contain information about 8,000 households (24,000 individuals) in 300 Italian municipalities. We use 1991, 1993, and 1995 waves and retain in our sample only working heads of households aged between 18 and 65. The following variables were used in our analysis:

Male: Derived from gender of head of household (male, female).

Age: Difference between the year of the survey and the year of birth.

Marital status: SHIW reports whether the individual is (i) married/cohabitant, (ii) single, (iii) separated/divorced, or (iv) widow/widower. From this information we constructed a dummy variable identifying a married individual as one replying yes to (i).

Number of children: Number of children living in the household.

Educational achievements: Four different categories are constructed: no more than primary school; junior high school; high school; at least BA/BS.

Intergenerational transfers: A binary variable identifying whether the head of household received any monetary transfers from parents or relatives (cohabitant and noncohabitant).

Household income: Total household net disposable income. It is the sum of income from employment, pensions and transfers, self-employment, and capital.

Household wealth: Defined as total real assets minus total financial liabilities of the household.

Job tenure/firm age: Number of years the individual has been working with the same employer (for dependent workers) or running the business (for entrepreneurs); for start-up entrepreneurs, this measures the age of the business.

Weekly hours worked: Average number of hours worked per week over the year prior to the survey. It includes overtime.

Employment size of the firm: Total employment at the firm, defined as the total number of employees plus nondependent head/owner of the business.

TABLE A1.—SIZE AND REGIONAL DISTRIBUTION OF FIRMS IN THE ITALIAN SAMPLE

	SHIW Sample (Frequency)		Population, 1991 Census (Frequency)	
	All Firms	Without Agricultural Firms	All Firms	Without Agricultural Firms
Panel A: Firm Size				
1–2	68.3		70	
3–5	20.6	94.3	18.7	93.2
6–9	5.6		5.6	
10–19	3.3	3.3	3.7	3.3
≥20	2.1	2.4	2.2	2.2
Panel B: Region				
Abruzzo	3.68	3.76	2.28	2.3
Basilicata	1.46	1.31	0.93	0.9
Calabria	3.35	3.26	2.68	2.7
Campania	8.55	8.60	7.20	7.3
Emilia-Romagna	8.91	8.85	9.31	9.3
Friuli-Venezia Giulia	2.91	3.00	2.38	2.4
Lazio	6.00	6.13	7.23	7.3
Liguria	4.83	4.95	3.22	3.2
Lombardia	9.68	10.09	17.43	17.2
Marche	4.45	4.49	3.22	3.2
Molise	0.82	0.78	0.54	0.5
Piemonte	8.41	8.68	9.19	8.2
Puglia	7.60	7.05	5.67	5.7
Sardegna	3.23	3.18	2.57	2.6
Sicilia	7.67	7.09	6.40	6.5
Trentino-Alto Adige	2.41	2.38	1.95	1.9
Toscana	7.08	7.33	8.08	8.1
Umbria	3.57	3.61	1.55	1.6
Veneto	5.36	5.44	9.16	9.1

Note: Sources of information are SHIW 1991, 1993, and 1995, and ISTAT 1991 census of Italian firms and services. When agriculture is excluded, a finer breakdown for firm size categories is not available.

Firm's market value: Estimated market value of the entrepreneur's share, in case of selling it (available for entrepreneurs only).

Ammortamenti (capital stock): Firm capital as proxied by capital depreciation ("ammortamenti" in the survey). This information is not available for manager/partners of societies.

Capital-labor ratio: Capital stock, as proxied by Ammortamenti, divided by the firm's employment size.

Business bank debts over capital: Short-term (within eighteen months) loans from banks and other financial institutions for activities related to the running of the business (available for entrepreneurs only), divided by Ammortamenti.

Working less than full year: A dummy variable identifying individuals working less than twelve months in their main occupation, in the year of the survey.

Sector of occupation: It corresponds to agriculture, mining, building, trade, financial intermediation, private services, and public administration.

Macro region dummies: Dummy variables identifying household macro regions of residence: northwest, northeast, center, south, and main islands.

North/south of Italy: A dummy variable identifying regions in the north/south of Italy. North includes all regions north of Rome, and Sardinia; south includes all other regions.

Size of city/town: Number of inhabitants in the municipality where the household resides; in SHIW these are clustered into the following groups: $<$ 20,000; 20,000–40,000; 40,000–500,000; $>$ 500,000. From this, we construct four dummy variables.

Unemployment rate: Regional unemployment rate; average figure over 1991, 1993, and 1995. Information derived from ISTAT Labor Force Surveys.

TABLE A2.—DESCRIPTIVE STATISTICS, U.S. CENSUS 2000

Variable	U.S. Citizens; White and Black			U.S. Citizens; White Only		
	N	Mean	St. Dev.	*N*	Mean	St. Dev.
Local	544,869	0.61	0.49	486,511	0.60	0.49
Worker	544,869	0.88	0.33	486,511	0.87	0.34
Entrepreneur	544,869	0.12	0.33	486,511	0.13	0.34
Entrepreneur, incorporated	544,869	0.04	0.20	486,511	0.05	0.21
Entrepreneur, unincorporated	544,869	0.08	0.27	486,511	0.08	0.28
Male	544,869	0.72	0.45	486,511	0.74	0.44
Age	544,869	42.2	10.9	486,511	42.4	10.9
Married	544,869	0.60	0.49	486,511	0.62	0.48
Number of children	544,869	0.95	1.14	486,511	0.93	1.13
Schooling, below 9th grade	544,869	0.01	0.12	486,511	0.01	0.11
Schooling, 9th to 11th grade	544,869	0.05	0.22	486,511	0.05	0.21
Schooling, 12th grade	544,869	0.31	0.46	486,511	0.30	0.45
Schooling, up to 3 years of college	544,869	0.33	0.47	486,511	0.32	0.47
Schooling, 4 or more years of college	544,869	0.30	0.46	486,511	0.32	0.46
White	544,869	0.89	0.31	486,511	1	1
African Americans	544,869	0.11	0.31	486,511	—	—

Source: U.S. Census 2000; information available for download at http://www.ipums.umn.edu/usa/.

GDP per capita in 1970: Province-level GDP over population in the province; both data for 1970. Original series constructed by the Bank of Italy.

Share of entrepreneurs: Number of entrepreneurs working in a province over the total population of the province; derived from SHIW. Average figure for 1991, 1993, and 1995.

Share of firms, 1971: Total number of firms operating in a province over the total population of the province; both data for 1971. Information collected by ISTAT.

Capital availability, province or region (KavP or KavR): Index of local financial development at the province or region level; see body text and Guiso et al. (2004a) for details.

Blood donation, province: Number of 16 oz. blood bags collected per million of inhabitants in the province; original data collected by AVIS.

Voter turnout, province: Average number of participants to all the referenda that occurred in Italy between 1946 and 1987 over province population. Original data collected by the Ministry of Interior.

Labor market networks availability, province (NavP): Index of intensity of personal networks in the local labor market. It is based on the probability of finding a job through personal contacts, at the province level. See body text for further details.

Local share, province: The fraction of local workers (either dependent workers or entrepreneurs) in the population of the province; average over 1991–1995.