



## The role of culture in firm-bank matching<sup>☆</sup>

Antonio Accetturo<sup>a,1</sup>, Giorgia Barboni<sup>b,c,1</sup>, Michele Cascarano<sup>a,1</sup>, Emilia Garcia-Appendini<sup>d,\*,1</sup>

<sup>a</sup> Economic Research Unit, Bank of Italy, Trento, Italy

<sup>b</sup> University of Warwick, Warwick Business School, United Kingdom

<sup>c</sup> CAGE, University of Warwick, United Kingdom

<sup>d</sup> Department of Banking and Finance, University of Zurich, Switzerland

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### ABSTRACT

We assemble a unique dataset containing population-level information on loan applications in a region hosting two cultural groups to study the role of culture in firm borrowing decisions. We find that firms are more likely to apply for loans from culturally close banks. This effect is stronger for opaque firms, but not for less performing firms, indicating that firms do not expect preferential treatment from same-culture banks. Loan applications to culturally distant banks increase sharply with firms' size and age, suggesting a role of information asymmetry in firm-bank matching. In contrast, we find no effect of cultural proximity on loan supply. Overall, our results show that demand-side factors play a key role in the formation of same-culture lending relationships.

### 1. Introduction

Several studies have documented that borrowing from culturally close banks benefits both firms, which receive better loan terms, and banks, which face lower default rates (Giannetti and Yafeh, 2012; Fisman et al., 2017; Beck et al., 2018). Yet, many firms rely heavily on credit from culturally distant lenders (see e.g., Claessens and Van Horen, 2014). These facts raise the following questions: Why do some firms borrow from culturally distant banks? Which firms and banks are more likely to engage with culturally proximate vs. culturally distant counterparties?

In this paper, we address these questions by focusing on the role of culture in the formation of credit relationships. We define culture as the set of “beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation” (Guiso et al., 2006). The empirical identification of the effect of culture on the formation of lending relationships is challenging because firms and banks from different cultural groups are usually located in different countries. Culturally distant lending relationships tend to occur among

firms that participate in international markets (for example, importers or exporters) and are geographically distant from their lenders. In addition, cross-country differences in economic conditions (such as interest rates, inflation, or expectations about the business cycle), and the rules and incentives provided by foreign institutions and regulations, can affect financing choices. As such, comparisons of culturally proximate vs. culturally distant loans may capture differences in loan terms or credit availability across jurisdictions rather than the effect of culture, even if the comparisons are within the same borrower (Fernández, 2011). We overcome these empirical challenges by analyzing population data on loan applications within a contained geographical area that features a single regulatory, institutional, and macroeconomic setting: The autonomous province of South Tyrol in Northern Italy.

South Tyrol is an excellent natural laboratory to assess the role of culture in the formation of lending relationships. One of the richest areas in Italy and in the European Union, it is home to individuals belonging to two different cultural groups: Italian and Germanic. Both Italian and German are official languages and the two cultural groups

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\* Correspondence to: Department of Banking and Finance, University of Zurich, Plattenstrasse 14, 8032, Zurich, Switzerland.

E-mail address: [emilia.garcia@bf.uzh.ch](mailto:emilia.garcia@bf.uzh.ch) (E. Garcia-Appendini).

<sup>1</sup> All authors have contributed to the manuscript equally.

share a common Catholic religious background; they live next to each other within municipalities, although they lead relatively segregated social lives. Important for our study, the region hosts a large number of firms from a representative range of industry sectors, and the banking sector is dominated by small, local banks.

Leveraging this unique setting and detailed credit registry data on loan applications, we quantify the effect of culture on firms' new loan applications (i.e., credit requests made by firms to banks with which they had no previous relationship). We also exploit the heterogeneity in borrowers' financial characteristics to analyze the determinants of the formation of culturally close lending relationships.

Our main result is that demand-side factors play a key role in the formation of culturally close credit relationships. Specifically, we find that firms are up to 52% more likely to apply for a loan with a bank of their same culture (+0.76 percentage points of a mean value of 1.4%, which represents the unconditional probability of applying for a loan with any random bank in their locality). This result cannot be explained by time-varying or time-invariant firm or bank characteristics, as it is robust to controlling for firm-time and bank-time fixed effects and to potential differences in the composition of the sample. We also rule out that a larger presence of culturally proximate banks in the close vicinity drives our result, as we restrict our sample to banks within the local commuting area and control for the presence of nearby bank branches (Degryse and Ongena, 2005; Alessandrini et al., 2009). A placebo simulation shows that our findings are not mechanically driven by the distribution of culture of banks and firms within the local labor market. Overall, these findings indicate that culture is a first-order determinant of the choice of banking relationships when firms apply for loans.

Firms may demand loans to same-culture banks for two different reasons. On the one hand, cultural proximity may reduce information asymmetries and search frictions by facilitating firms' communication and contracting with the lender (Rogers and Bhowmik, 1970). On the other hand, borrowers may be driven by preference-based motives, or by expectations of in-group favoritism (Haselmann et al., 2018; D'Acunto et al., 2020). A heterogeneity analysis reveals that the propensity to apply for loans of the same cultural group is highest for relatively opaque borrowers (startups, small firms, and high growth firms), and that applications to culturally distant banks increase sharply as firms become older and larger. However, we find no evidence that firms with lower profitability or higher risk are more likely to apply for loans with a same- vs. a different-culture lender. These results suggest that information asymmetries and search frictions, and not the expectation of receiving preferential treatment, are the likely driver of same-group loan applications. In line with this interpretation, we also find that banks lending to different-culture firms are larger, non-cooperative banks whose lending technology is better suited for processing hard information (Stein, 2002; Berger et al., 2005).

We extend our main analysis to examine loan approvals conditional on loan applications, and find that lenders are not more likely to approve loans from same-group borrowers relative to different-group borrowers. We also do not find evidence of heterogeneity in loan approval of same-group firms based on firm opaqueness or observable measures of profitability and risk, nor that same-group firms receive preferential loan terms. These results show that banks do not select firms based on culture, and provide support to our interpretation that firms do not apply for loans from same-culture banks with the expectation of preferential treatment. In line with this interpretation, we do not find that conditional on loan application and approval, same-culture loans perform worse than loans to different-group firms. These results highlight the need for a quasi-random setup to further investigate the effects of culture on loan terms. Although our estimates warrant a causal interpretation only under rather strict assumptions, they reveal the central role of cultural proximity in the formation of lending relationships stemming from the demand-side of credit.

This paper contributes first and foremost to the literature on the formation of firm-bank matches (Schwert, 2018; Farinha et al., 2021). We add to this literature by identifying an additional factor, cultural proximity, as a first-order determinant of the formation of firm-bank matches. Importantly, our results show that the prevalence of culturally proximate lending relationships is mostly driven by the demand side of credit, while supply-side factors play a limited role. These findings help to explain the success of similar-culture banks across borders.

Our paper also adds to the literature on the role of information acquisition in lending to opaque firms (see e.g., Liberti and Petersen, 2019). We find that cultural proximity may reduce information asymmetry and search frictions by facilitating firms' communication and contracting with the lender, and that the effect of cultural proximity survives to controlling for other sources of soft information such as geographic proximity and personal interactions.

Finally, our paper contributes to the literature on the role of cultural origin in economic exchanges and financial contracts (see e.g., Guiso et al., 2009; Alesina and Giuliano, 2015). We add to this literature by focusing on the role of cultural origin on the demand side of credit. Our data and empirical strategy allow us to study the role of culture in the loan application process and to distinguish the effect of culture from other confounding factors inherent in cross-country comparisons.

## 2. Institutional setup

South Tyrol is an autonomous province in Northern Italy that is bordered by Austria and Switzerland. The region was part of the German and Austro-Hungarian Empire until the First World War, when it was annexed to Italy following the defeat of the Dual Alliance. At the time of the annexation, 89% of the population spoke German, 3% spoke Italian, and the remainder of the population spoke either Ladin or other languages of the Austro-Hungarian Empire (Istituto Provinciale di Statistica, 2015). However, this changed quickly, as the fascist government initiated a process of "Italianization" of the region that favored both the immigration of Italian speakers from other regions and the outmigration of German speakers to Germany and Austria (see Accetturo et al., 2019b for more historical details on the Italianization process). Among other changes, this process permanently altered the distribution of the population across both linguistic groups. As of 2011, the last available census, 69% of the population spoke German, while slightly more than one-quarter spoke Italian.

The current institutional framework of South Tyrol dates back to 1972, when a "Statute of Autonomy" was granted to the region. Among other things, the 1972 agreement established the right for citizens to use their own mother tongue in all occasions. The application of this right has enabled the two linguistic groups to preserve their culture, as everyday life activities – such as childcare, eldercare, and schooling – are separated for each language group. In fact, segmentation in everyday life is a feature that characterizes the South Tyrolean society (Forer et al., 2008) despite the fact that almost 80% of South Tyrolean students are proficient in both languages (Vettori and Abel, 2017).

Important for our study, South Tyroleans face the same institutional and economic structures despite the strong segmentation in other aspects of everyday life. For example, the regulations for all banks that operate in the region are defined at the national level. Similarly, all firms headquartered in South Tyrol are subject to autonomous regulations that are set at the province level (and agreed upon by both cultural groups, to avoid the empowerment of one over the other), and the provincial chamber of commerce is in charge of their enforcement. Thus, banks and firms in our study share a common legal and regulatory framework that is independent of the cultural origin of their owners or managers. Overall, the fact that German and Italian speakers face the same formal institutional framework but live in an extremely segmented society makes South Tyrol an ideal setting for studying the role of cultural proximity on economic outcomes without

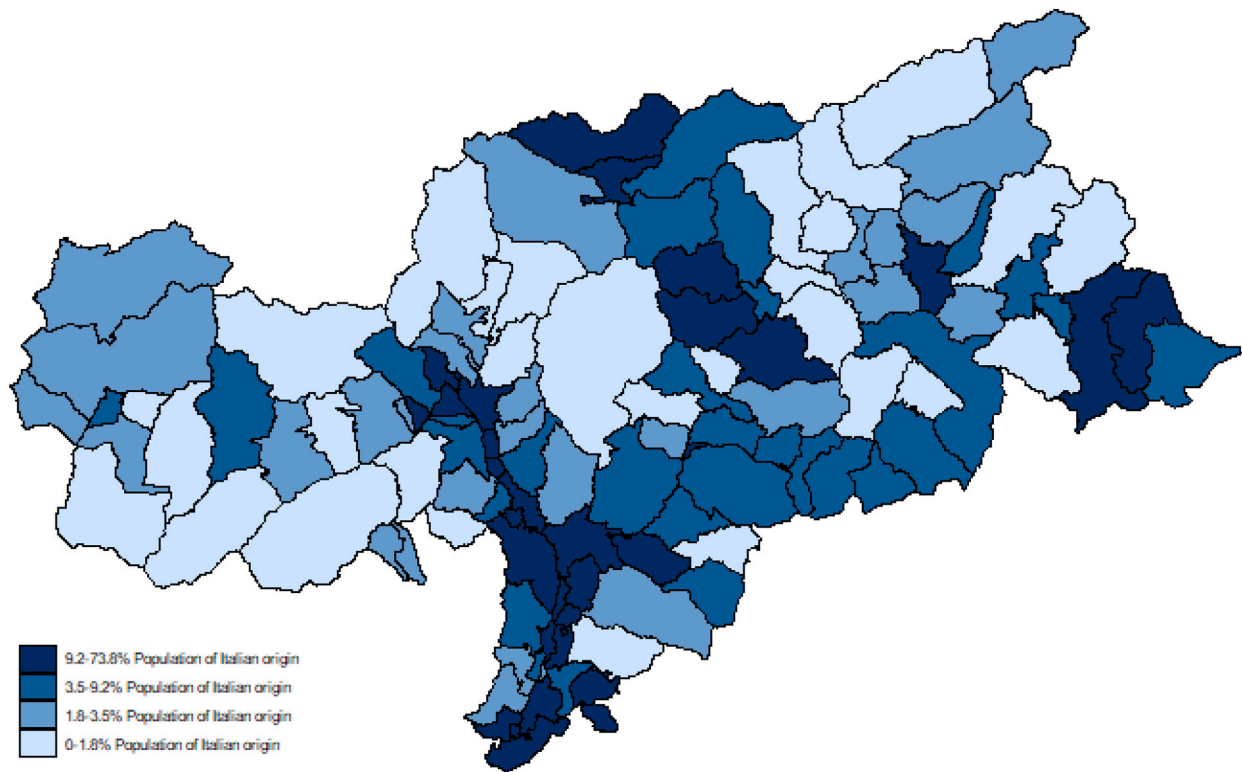


Fig. 1. Geographic distribution of linguistic groups in South Tyrol.

Note: This figure shows the distribution (quartiles) of the Italian-speaking population by municipality in the South Tyrol, as reported by the 2011 Census (Istituto Provinciale di Statistica, 2015).

confounding factors such as institutions, norms, geographical distance, among others. In addition, as shown in Fig. 1, there is substantial geographic variation in the composition of the linguistic groups across the region.

The banking market structure in the South Tyrol is the perfect natural laboratory to analyze the role of culture in the formation of credit relationships, as it is dominated by small, local banks where the functional distance between the loan officers and the bank board is minimal. In addition, the South Tyrol is a small geographic area, which alleviates concerns that our results are driven by a shorter distance to culturally proximate banks. Nevertheless, as we explain below, we restrict loan applications to banks within a small commuting area and control for the location of banks in the nearest vicinity to the firms in our sample to address this concern.

### 3. Data and stylized facts

#### 3.1. Data sources

Our main source of data is the Italian Central Credit Registry, owned and administered by the Bank of Italy. This registry contains information on all performing and non-performing loans extended by all banks and financial companies that operate in Italy. From this database, we obtain information on all the lending relationships held by firms headquartered in South Tyrol over the period 2005–2015 (13,469 unique firms, for a total of 142,594 firm-bank lending relationships over the study period).<sup>2</sup>

<sup>2</sup> For a loan observation to appear in the credit registry, the legal reporting threshold is a total borrower exposure of 30,000 euros towards a given financial intermediary; however, this threshold was 75,000 until December 2008. Following the related literature, to ease comparability throughout all years in our sample period we only consider firm-bank pairs for which the total granted amount is greater than 75,000 euros (Cingano et al., 2016).

We also obtain information on new loan applications. We identify a new loan application whenever an intermediary lodges a preliminary information request (Servizio di Prima Informazione, SPI) about a borrower. An SPI is similar to a credit check: it is an inquiry made by a bank about the current credit position of a potential borrower. This inquiry is made for borrowers with whom the bank has not had a credit relationship before. Since these inquiries can be placed only when the intermediary receives a formal request for credit from an individual or a firm, and at a small cost for the financial intermediary, we assume that SPI checks represent all new loan applications to non-incumbent banks (Albertazzi et al., 2017; Branzoli and Fringuellotti, 2020).

We then collect the number of employees (an indicator of firm size) of all firms in our sample using the Italian Social Security Service (INPS). We also obtain the names, gender, place of birth, and age for all members of the firms' management and executive boards from Infocamere. This database is maintained by the Italian Chamber of Commerce and contains management information for all the firms that are headquartered in Italy. Following the procedure described in Grinblatt and Keloharju (2001) and Bedendo et al. (2020), we use these data to manually classify the cultural origin of all administrators, which is then used to identify the firms' overall cultural origin. We classify a firm as belonging to an Italian or Germanic cultural group if the majority of the members of the board and top executives are, respectively, of Italian or Germanic cultural origin (see Online Appendix A for more details). Finally, for a subset of firms in our sample, we are able to obtain additional accounting variables from the CERVED Group dataset.

Additionally, for all banks in our sample (361 unique banks over the study period), we obtain balance sheet information from Bank of Italy's supervisory reports, and information about the management board from the Segnalazione sugli Organi Societari (Or.So.) database. Or.So. is maintained by the Bank of Italy and records information on the name, gender, place and date of birth of all the members of the governing bodies and the top executives of each bank. Using these data,

**Table 1**  
Sample distribution.

	No. of unique firms	No. of unique banks	Share of Italian firms	Share of Italian banks	Market Share of Italian banks
2005	8213	174	0.250	0.672	0.197
2006	8503	189	0.248	0.693	0.249
2007	8693	197	0.249	0.695	0.265
2008	8728	208	0.244	0.712	0.259
2009	8413	217	0.243	0.737	0.308
2010	8409	225	0.241	0.751	0.300
2011	8258	223	0.236	0.749	0.292
2012	8019	226	0.231	0.757	0.298
2013	8046	222	0.232	0.739	0.281
2014	8134	219	0.233	0.744	0.290
2015	8150	224	0.233	0.754	0.304

*Notes:* This table contains a description of the number of unique firms and unique banks in our sample across the years, and their distribution across cultural groups. The total count report the number of unique banks and firms and the respective shares for Italian agents overall the sample period. The last column report the market share for Italian banks measured as the share in granted loans to all firms in the region. Authors' calculation on CR-Or.Soc.-Infocamere-INPS dataset.

and adopting the same procedure as for firms, we classify a financial intermediary either as Italian or German origin.

Mostly due to data availability, we focus on the management board to classify the cultural origin of banks and firms (Infante and Piazza, 2014). To the best of our knowledge, there are no available datasets with the names and gender of other employees, such as the loan officers. However, this is not likely to represent a large limitation for our study, as (i) the credit market in the South Tyrol region is dominated by local banks, where the distance between the firm and the bank board is quite limited and (ii) the vast majority of firms in the region are small, privately held establishments where owners and managers are likely to be the same person, or linked by family (and hence, cultural) ties (Bedendo et al., 2020). Most importantly, our focus is on the matching process between banks and firms. Ex-ante, the firm manager does not know the identity of the loan officer that will handle the loan application; however, the cultural origin of the bank is public information, and the cultural origin of the bank management board is a good proxy for this.

### 3.2. The anatomy of credit relationships

Table 1 provides a description of the base credit registry sample, which contains loan equilibrium outcomes. In a given year in our sample period (2005–2015), this dataset contains loan-level information on more than 8,000 unique firms and roughly 200 unique banks, and covers a large fraction of the universe of the South Tyrolean firms. The table also shows that the percentage of Italian firms is relatively low (23%–25%) and reflects population shares, suggesting that entrepreneurship rates are quite similar in the Germanic and Italian cultural groups. The larger percentage of Italian banks reflects the fact that all Italian banks may operate in the South Tyrolean credit market. However, as the last column of Table 1 shows, the market share of Italian banks in South Tyrol is almost always less than 30% across the study period. This indicates that the credit market in South Tyrol is not dominated by Italian banks, and is consistent with the share of Italian firms in the region. It should also be noticed that our measure of culture is predominantly time invariant. The cultural origin of the management only changes in 1.9% of the cases for bank-year observations and 1% for firm-year observations in our study population.

Panel A of Table 2 summarizes firms, banks, and loans in the credit registry. Firms in the credit registry are 16 years old on average and have 17 employees on average. Each firm has outstanding links with an average of 1.6 banks, and the majority of these (1.1) are with the same cultural group. Around half of the banks in the credit registry are credit cooperative banks (48%). The average bank has 1.2 billion euros in total assets, an average capital to assets ratio of 18%, and an 11% ratio of non-performing loans over total loans.

Panel B contains information on loan applications drawn from the SPI dataset. Firms in this sample are statistically similar to firms in the credit registry. The median firm in the SPI dataset is in fact similar to the median firm in the credit registry in terms of size, age, profitability and risk. Banks are similar, as well: 43% of the banks in the SPI dataset are credit cooperative banks; the capital to assets ratio is 18%; and the non-performing loan NPL ratio is 11%. Panel B also shows that on average, each firm in the sample applies for credit with 1.7 non-incumbent banks, 59.4% of which correspond to same-culture banks.

### 3.3. Stylized facts on culture and firm-bank matching

The summary statistics presented before indicate that the choice of culture of lenders and borrowers is not a random choice. For example, in 2015 we observe that 77% of the firms and 25% of the banks are of Germanic origin (see Table 1). If the choice of culture of lenders and borrowers were randomly assigned, then roughly 36% ( $= 0.77 \times 0.25 + 0.23 \times 0.75$ ) of all lending relationships would belong to firm-bank pairs sharing the same cultural origin. However, the fraction of same-group relationships, which we observe in Table 2, is twice as large (72.7%).<sup>3</sup> This finding represents our first stylized fact regarding the role of cultural proximity in the lending process:

**Stylized fact 1.** *The observed fraction of firms borrowing from a bank of its same cultural group is larger than the one implied by random matching between firms and banks.*

In Appendix Table B1, we compare the characteristics of firms that borrow exclusively from banks of their same cultural group with those of firms that borrow from at least one bank of a different culture. Results show that the latter firms are younger, smaller, grow less, and have fewer lending relationships than firms that form relationships with banks of a different cultural origin. These characteristics are typical of startups and opaque firms. On the other hand, firms that borrow exclusively from banks of the same culture are not associated with worse quality: they are more profitable and less risky than firms with relationships with banks of a different cultural origin. These findings constitute our second stylized fact:

**Stylized fact 2.** *Firms borrowing exclusively from same-culture banks are younger, smaller, and have larger sales growth than firms borrowing from different-culture banks.*

<sup>3</sup> If we focus on banks' market shares, the fraction of randomly assigned same-culture pairs would be 61%, still 12 percentage points lower than the observed fraction.

**Table 2**  
Descriptive statistics.

	No. Obs.	Mean	St. dev.	p25	p50	p75
<b>Firm characteristics</b>						
Age (years)	91,190	15.584	13.386	6.000	13.000	23.000
No. of employees	64,851	17.456	143.986	2.333	5.500	12.167
Risk score	24,870	1.859	0.826	1.000	2.000	3.000
Profitability	26,624	0.039	0.224	0.001	0.044	0.099
Leverage	24,905	0.333	0.307	0.000	0.292	0.563
Multi-borrowing	91,182	0.317	0.465	0.000	0.000	1.000
Bank links	91,182	1.573	1.353	1.000	1.000	2.000
Bank links in same group	91,182	1.143	1.096	1.000	1.000	1.000
<b>Bank characteristics</b>						
BCC	2,336	0.480	0.500	0.000	0.000	1.000
$\log(\text{Total assets})$	1,913	20.939	2.027	19.354	20.708	22.450
Capital to assets ratio	1,913	0.176	0.277	0.101	0.140	0.198
NPL ratio	1,902	0.112	0.074	0.058	0.094	0.147
<b>Loan characteristics</b>						
Same group	143,422	0.727	0.446	0.000	1.000	1.000
Nearby branch	143,594	0.732	0.443	0.000	1.000	1.000
$\log(1+\text{Length of relationship})$	143,594	1.861	0.837	1.386	2.079	2.485
Term loans	143,594	0.199	0.399	0.000	0.000	0.000
Collateral	28,537	0.518	0.500	0.000	1.000	1.000
Minor anomalies	132,017	0.088	0.284	0.000	0.000	0.000
Bad loans	133,807	0.013	0.115	0.000	0.000	0.000
<b>Firm characteristics</b>						
Age (years)	24,058	13.845	13.842	4.000	10.000	21.000
No. of employees	14,524	33.797	241.897	2.750	7.000	18.333
Risk score	8,575	1.894	0.824	1.000	2.000	3.000
Profitability	8,593	0.034	0.193	0.000	0.041	0.092
Leverage	8,593	0.335	0.290	0.028	0.307	0.550
No. of applications	24,058	1.684	1.335	1.000	1.000	2.000
<b>Bank characteristics</b>						
BCC	1,380	0.433	0.496	0.000	0.000	1.000
$\log(\text{Total assets})$	1,191	21.184	2.191	19.261	20.953	22.972
Capital to assets ratio	1,189	0.177	0.205	0.100	0.141	0.208
NPL ratio	1,180	0.106	0.069	0.057	0.091	0.140
<b>SPI inquiry characteristics</b>						
Same group	31,190	0.594	0.491	0.000	1.000	1.000

*Notes:* This table contains summary statistics for the main variables used in our analysis. Panel A contains information taken from the credit registry (CR). The CR sample consists of all firm-bank-year observations for firms in the South Tyrol Region appearing in the credit registry between years 2005 and 2015 (i.e. having a loan). Panel B describes the SPI sample, consisting of all firm-bank-year observations for firms in the South Tyrol Region such that the bank has lodged an SPI inquiry for the firm in the credit registry between years 2005 and 2015. To calculate firm characteristics, we use a single observation per firm and year. *Profitability* is Earnings before interest and taxes (EBIT) divided by total assets. Risk score measures the risk of the firm in a scale of 1 (low risk) to 3 (high risk). *Leverage* is the ratio of total debt to total assets. *Multi-borrowing* is a dummy variable equal to one if the firm has multiple banking relationships. *Bank links* is the total number of bank relationships established by the firm during the year. *Bank links in the same group* is the total number of relationships with banks of the same cultural group established by the firm during the year. To calculate bank characteristics, we use a single observation per bank and year. *BCC* is a dummy variable taking a one if the bank is a credit cooperative, *Banca di Credito Cooperativo* (BCC).  $\log(\text{Total assets})$  is the natural logarithm of total bank assets. *Capital to assets ratio* is the ratio between total capital and total bank assets. *NPL ratio* is the ratio of non performing loans (NPLs) to total loans. *Same group* is a dummy variable taking a one if the bank and the firm belong to the same cultural group, and zero otherwise. *Nearby branch* is an indicator variable for the existence of a bank branch in the same municipality as the firm.  $\log(1 + \text{length of relationship})$  corresponds to the natural logarithm of one plus the length of the bank-firm relationship, measured in years since 1997. *Term loans* is a dummy that equals one if all the loans granted to the firm are term loans; *Collateral* is a dummy taking the value of one if all the loans are term loans and they are collateralized by means of real or personal guarantees provided by the firm, zero otherwise. *Minor anomalies* is a dummy equal to one if at least one loan of firm  $i$  at time  $t$ , anytime between years  $t$  and  $t+3$ , is recorded by bank  $j$  as unlikely-to-be-paid, overdrawn or past-due over 90 days exposure. *Bad loans* is a dummy taking a value one if the borrowing firm is classified as insolvent by the bank, zero otherwise, anytime between years  $t$  and  $t+3$ . Authors' calculation on CR-Or.So.-Infocamere-INPS dataset.

In Table B3, we compare the characteristics of banks lending to high vs. low fractions of firms of the same cultural group. Results show evidence of specialization into same-group lending: banks with high (low) fractions of same-group lending lend to 2.4% (63.3%) of different-culture firms. Banks that lend to a large fraction of firms from the same cultural group are significantly smaller, and are more often local credit cooperative banks (BCC), than those lending to a smaller fraction of same culture firms. This finding constitutes our third stylized fact:

**Stylized fact 3.** *Banks lending to large fractions of same-culture firms are smaller, and much more likely to be cooperative banks, than those lending to different-culture firms.*

Overall, **Stylized facts 2** and **3** indicate that firms that rely more heavily on same-culture loans are more opaque, while banks that lend

more to same-culture firms rely more heavily on soft information. These results suggest that information asymmetries are of first-order importance to determine the prevalence of same-culture relationships.

#### 4. Cultural proximity and loan applications

We start our main analysis by looking at firms' selection of a lender. For this analysis, we emulate the loan application process by creating a database with all the possible pairs of firms and banks that operate in the same local labor market (commuting area) in each period. There are 14 local labor markets in South Tyrol. This database represents all the potential banks where a firm could submit an application for a loan. The underlying assumption of relating banks and firms in the same local labor market is that, when deciding to apply for a loan, a firm can potentially apply to any branch of banks operating locally. This assumption builds on prior findings that suggest most lending is

**Table 3**  
Cultural proximity and new loan applications.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Same group	0.00562*** (27.56)	0.00515*** (27.70)	0.00620*** (28.22)	0.00588*** (26.97)	0.00747*** (27.27)		0.00369*** (7.386)	
Italian bank and firm						0.00272*** (11.93)		0.00083 (1.247)
German bank and firm						0.0121*** (22.84)		0.00797*** (7.477)
Nearby branch				0.0323*** (39.43)	0.336*** (40.20)	0.0326*** (39.67)	0.0197*** (11.30)	0.0198*** (11.37)
Adj. R <sup>2</sup>	0.001	0.095	0.094	0.092	0.098	0.096	0.084	0.084
No. Obs.	2,710,594	2,710,594	2,710,594	2,710,594	2,710,594	2,710,594	565,170	565,170
Dep. Var. Mean	0.0145	0.0145	0.0145	0.0145	0.0145	0.0159	0.0159	0.0164
<b>PSR</b>							✓	✓
<b>Fixed effects:</b>								
Year	✓							
Bank-Year		✓		✓	✓	✓	✓	✓
Ind-Size-Age-Loc-Yr			✓	✓		✓	✓	✓
Firm-Year					✓			

Notes: The sample consists of all firm-bank-pairs where the firm is located in the South Tyrol and the bank has a branch operating in the same local labor market as the firm between years 2005 and 2015. The dependent variable is *Loan application*, a dummy variable taking the value one if the bank lodged a request of information from the firm (as recorded in the SPI database), and zero otherwise. *Same group* is a dummy that equals one if the firm and the bank share the same cultural origin. *Nearby branch* is an indicator variable for the existence of a bank branch in the same municipality as the firm. For the fixed effects: *Ind* are 201 firm sector groups; *Size (Age)* are 4 equally-sized size (age) bins; *Loc* are indicators for 14 local labor markets. T-stats are in parentheses. \*, \*\*, \*\*\* denotes significance at the 10%; 5%; 1% level, respectively. Standard errors clustered at bank-firm level.

done at a local level (Petersen and Rajan, 2002; Degryse and Ongena, 2005), hence when deciding to apply for a loan firms typically consider the pool of banks that operate locally. It also holds in our setting, where we observe that 91 percent of all lending occurs within a local labor market. By focusing on banks in the same commuting area, we also level the field of potential lender banks in terms of their access to soft information, as all of them have a relatively short distance to the borrower.

Based on this expanded database, we use the SPI database on loan applications to create a binary variable, *Loan application<sub>ijt</sub>*, which equals one if firm *i* requested a loan from bank *j* during year *t*, and zero otherwise. Only banks without prior information about the borrower will submit a request for information to the SPI; thus, this variable is a good proxy for new credit applications.<sup>4</sup>

To analyze the role cultural proximity plays in the loan application process, we regress *Loan application<sub>ijt</sub>* on *Same group<sub>ij</sub>*, an indicator of whether the bank and the firm belong to the same cultural group or not, and a set of firm-, bank, and relationship-specific controls (respectively *X<sub>it</sub>*, *X<sub>jt</sub>*, and *X<sub>ijt</sub>*), which are likely to affect the formation of new banking relationships and be correlated with *Same group<sub>ij</sub>*. More formally, we estimate a regression of the following type:

$$Loan\ application_{ijt} = \beta_0 + \beta_1 Same\ group_{ij} + \beta_2 X_{it} + \beta_3 X_{jt} + \beta_4 X_{ijt} + \epsilon_{ijt}. \quad (1)$$

Table 3 contains the results from estimating different specifications of Eq. (1). In column 1, we present a benchmark specification in which we only control for the macroeconomic conditions in the region by adding year fixed effects. We find a very strong and positive effect of *Same group* on the creation of a new lending relationship: The coefficient is 0.00562, and it is statistically significant at the 1% level. Economically, the coefficient is very relevant, as it corresponds to 38.7% of the average value of the dependent variable (0.014).

In columns 2 to 8, we include bank × year fixed effects in vector *X<sub>jt</sub>*. This allows us to control for all time-invariant and time-varying bank characteristics that may affect the supply of credit — including the

<sup>4</sup> Lodging an inquiry to the SPI is neither compulsory nor costless for the bank, albeit the cost is low, amounting to a few cents on the euro. Similarly, a bank might lodge a request of information for a borrower that did not necessarily apply for a loan at the bank. Thus, analyses using this data could result in a non-classical measurement error, potentially biasing the coefficient towards zero.

banks' lending technology and financial conditions, which were shown in the previous section to be correlated with cultural proximity. With these controls, the coefficient of *Same group* is only slightly changed relative to the one in column 1. In column 3 we control for credit demand using industry × location × firm size × firm age × year fixed effects.<sup>5</sup> Results remain virtually unchanged.

Firms might be more likely to demand credit from banks that are located in the closest vicinity (Petersen and Rajan, 2002; Degryse and Ongena, 2005; Alessandrini et al., 2009). To the extent that the banks closest to the firm belong to its same cultural group, the coefficient of *Same group* could be capturing this effect. To address this issue, we add the dummy variable *Nearby branch<sub>ij</sub>* that equals 1 if there is a branch of bank *j* operating in the close vicinity (i.e, the same municipality) as firm *i*, and 0 otherwise. There are 116 municipalities in the South Tyrol region; hence, this geographical subdivision achieves a much more granular subdivision of the region than the local labor market. A cross-tabulation of variables *Same group* and *Nearby branch* reveals that only 55% of bank branches situated in the same municipality of a firm belong to its same culture, which indicates that there is sufficient cultural variation within the closest vicinity of firms in our sample. Column 4 (our preferred specification) contains the estimates including this variable. In line with previous findings, we find that the effect of distance on new loan applications is both statistically and economically significant — in fact, the magnitude of the coefficient of *Nearby branch* reveals that distance is economically more important than cultural proximity. Importantly however, the inclusion of this dummy has virtually no effect on the coefficient of variable *Same group*.

In column 5, we control for all time-invariant and time-varying firm characteristics that may affect the demand for credit by adding firm × year fixed effects (Khwaja and Mian, 2008), including existing bank relationships (credit, checking accounts, savings accounts, other services) that could have a significant positive influence on new loan applications (Farinha and Santos, 2002). The coefficient of variable *Same group* increases relative to the ones in columns 1 to 4 with the inclusion of these demand-side controls.

<sup>5</sup> Industry fixed effects are dummy variables corresponding to each of the 201 3-digit NACE industrial groups; location fixed effects are the 14 different local labor markets in the South Tyrol region; and we consider 4 equally-sized bins to control respectively for firm size and firm age.

In column 6 of Table 3 we split the *Same group<sub>ij</sub>* dummy into the two separate indicators for same-culture matches: *Italian bank and firm<sub>ij</sub>* and *German bank and firm<sub>ij</sub>*, using the same specification as in column 4.<sup>6</sup> The coefficients of both dummies are positive and significant. This exercise also uncovers significant heterogeneity in the coefficients across the cultural groups: the one for German pairs is more than four times larger than the coefficient for Italian relationships. This result mirrors the findings of Fisman et al. (2017) on cultural heterogeneity in loan outcomes — in our case for loan applications. For the case of South Tyrol, this result is compatible with the historical and sociological evidence that the German-speaking group has a stronger cultural identity (see, for example, Grote and Obermair, 2017, Sutter Fichtner, 2009, Steininger, 2010). This trait – derived as a consequence of the Italianization process of the area in the 1920s and 1930s and the political struggles to gain autonomy in the post-World War II decades – has historically generated a strong demand for the preservation of the use of the German language in every-day life and a preference for intra- rather than inter-group interactions.

One concern about the previous estimates is that results could be driven by differences in the composition of the sample of Italian and German firms. To analyze this issue, in Table D1 in the Online Appendix we compare the characteristics of firms that borrow exclusively from banks of their same cultural group with those of firms that borrow from at least one bank of a different culture as in Table B1, but separately for Italian and German culture. With the exception of size and leverage, we find that the direction of the differences in characteristics across firms borrowing from single- vs. multiple-culture banks is the same for the two groups.

To further address the concern of sample composition issues, we use a Propensity Score Reweighting (PSR) procedure that makes the sample of Italian and German firms more comparable. Upon the PSR, the German firms' group is reweighted so that the distribution of the observable characteristics is similar to the Italian group (DiNardo, 2002; Kline, 2011; Accetturo et al., 2019a). We consider the following firm characteristics in this reweighting procedure: age, size (number of employees), growth rate, risk score, the number of banking relationships, and firm leverage. We include the latter two characteristics to control for documented differences in the use of debt between the two cultural groups (Bedendo et al., 2020, 2022). Section C in the Online Appendix provides balance checks (Table C1) and more information about the reweighting procedure.

In columns 7 and 8 of Table 3 we repeat the estimations of columns 5 and 6 using PSR. Results remain qualitatively unchanged, with positive and significant coefficients for *Same group*, *German bank and firm*, and *Italian bank and firm*. Despite the significant drop in the sample size, the former two coefficients remain significantly different from zero. We also note that the magnitude of the coefficients is reduced in the balanced sample; however, cultural proximity remains economically relevant, explaining about 23% of the average value of the dependent value.

Overall, results from Table 3 show that firms are disproportionately more likely to apply for credit from same-culture banks and indicate that cultural proximity is an important determinant in lender selection. The high statistical and economic significance of the *Same group* variable coefficient survives to controlling for all possible time-invariant and time-varying factors that affect the supply and the demand for credit, for the geographical distance between lenders and borrowers, and for potential compositional differences in the sample of Italian and German firms. In Section 7 we perform additional robustness checks for these main results.

<sup>6</sup> Note that for this particular regression we cannot estimate the coefficients with firm  $\times$  time fixed effects because this fixed effect perfectly determines the culture of the firm, and hence, whether the firm and bank pair is Italian or German.

#### 4.1. Heterogeneity analysis of credit applications

We study whether results from Table 3 underlie significant heterogeneity across firms' characteristics. If speaking the same language and sharing a common set of behavioral rules and social conventions facilitate communication and thus reduce information asymmetries and search frictions, we should expect informationally opaque firms (younger, smaller, and growing firms, as discussed by Berger and Udell, 1998, 2002) to rely more on same-culture loans. On the other hand, if firms expect favorable treatment from same-culture lenders due to taste-based preferences or in-group favoritism (Akerlof and Kranton, 2000), then less profitable, or riskier, firms should be more likely to apply for loans from an in-group bank.

We regress *Loan application* on interactions of *Same group* with standard measures of the firm's opaqueness (size, age, and sales growth) and creditworthiness (profitability and risk). Results are presented in Table 4. In all specifications, we include all variables involved in the interaction term separately, and the same controls as in column 4 of Table 3.

In columns 1 and 2 of Table 4 we consider the effect of firm age and firm size on loan applications, respectively. The negative and statistically significant coefficient of the interaction term between *Age* and *Same group* in column 1 shows that the difference between the demand for loans from banks of same vs. different cultural groups is reduced as the firms mature. A similar picture emerges when we analyze, in column 2, the effect of size on requests for loans from new banks. In column 3, we consider size and age simultaneously and continue to find negative interaction terms of both variables with *Same group*. These results hold when we control for firm growth and its interaction with *Same group* in column 4, which is also positive and statistically significant.

The coefficients of the interaction terms with age, size, and firm growth all indicate that asymmetric information plays an important role in the selection of an in-group lender, and are in line with Stylized facts 2 and 3. These results are consistent with an information asymmetries story whereby informationally opaque firms (young, small firms, or those with large sales growth) benefit the most from applying for loans to same-group lenders, as the cost of communication and search frictions are likely highest for these firms.

In columns 5 and 6 of Table 4 we expand the heterogeneity analysis to test for possible favoritism by adding interactions of *Same group* with firm profitability and risk. The sharp drop in the number of observations in column 5 and 6 is because information on firm profitability and quality is only available for approximately half of the firms in our sample. While the results discussed above for size and age continue to hold, we do not find that firm risk or lower profitability correlates significantly with selection to same-group banks. If anything, in column 5 we find that the interaction of firm profitability with *Same group* is positive and significant, indicating that better-quality firms are more likely to apply for loans to banks of the same culture.<sup>7</sup> To further account for firm unobserved heterogeneity, in Table D2 in the Online Appendix we present estimations with firm  $\times$  year fixed effects. The results are similar qualitatively and quantitatively to the ones in Table 4.

Figures D1 and D2 in the Online Appendix visually summarize the results from Table 4 by showing the marginal effects of firm age and firm size on the likelihood of applying for a loan from a bank of the same or of a different cultural group (estimated in columns 1 and 2

<sup>7</sup> Another way to see this is to use the sample of firms in the SPI database and compare the unconditional distribution of the profitability and the riskiness of those applying to same- versus different-culture banks. Figure D4 shows that the distribution of profitability is virtually identical, while the unconditional distribution of risk – a variable that correlates with size and age – is remarkably similar across the two groups.

**Table 4**  
Cultural proximity and new loan applications: Heterogeneity.

	(1)	(2)	(3)	(4)	(5)	(6)
Same group (SG)	0.0105*** (17.39)	0.0112*** (25.02)	0.0141*** (14.66)	0.0131*** (11.56)	0.0148*** (10.80)	0.0152*** (9.627)
SG × Age	−0.00217*** (−8.811)		−0.00124*** (−3.286)	−0.000479 (−1.142)	−0.00177*** (−3.279)	−0.00186*** (−3.396)
SG × Size		−0.00308*** (−15.71)	−0.00296*** (−14.65)	−0.00336*** (−15.17)	−0.00290*** (−9.625)	−0.00287*** (−9.430)
SG × Growth				0.000599*** (2.676)		
SG × Profitability					0.00640*** (2.677)	
SG × Medium Risk						−0.000434 (−0.487)
SG × High Risk						0.0000641 (0.0678)
Nearby branch	0.0317*** (38.95)	0.0318*** (28.47)	0.0318*** (28.46)	0.0302*** (25.86)	0.0214*** (14.39)	0.0214*** (14.38)
Uninteracted vars.	✓	✓	✓	✓	✓	✓
Adjusted $R^2$	0.099	0.090	0.090	0.088	0.088	0.088
No. Obs.	2,710,594	1,389,694	1,389,694	1,270,239	647,188	646,221
Dep. Var. Mean	0.0145	0.0160	0.0160	0.0159	0.0157	0.0157
Fixed effects:						
Industry-Location-Year	✓	✓	✓	✓	✓	✓
Bank-Year	✓	✓	✓	✓	✓	✓

*Notes:* The sample consists of all firm-bank-pairs where the firm is located in the South Tyrol and the bank has a branch operating in the same local labor market as the firm between years 2005 and 2015. The dependent variable is *Loan application*, a dummy variable equal to one if the bank lodged a request of new information form the firm, and zero otherwise. *Age* is natural logarithm of the years of activity. *Size* is the natural logarithm of the number of employees. *Growth* corresponds to the yearly sales growth rate. *Same group* is a dummy that equals one if the firm and the bank share the same cultural origin. *Nearby branch* is an indicator variable for the existence of a bank branch in the same municipality as the firm. For the fixed effects: *Industry* are 201 firm sector groups and *Location* are indicators for 14 local labor markets. All other independent variables are defined in Table B1. Apart from the included variables, the regressions include the un-interacted variables which appear in the interaction term. T-stats are in parentheses. \*, \*\*, \*\*\* denotes significance at the 10%; 5%; 1% level, respectively. Standard errors clustered at the bank-firm level.

of Table 4, respectively). Figure D1 shows a decreasing effect of age on demand for loans from new banks of the same culture (red line). The youngest firms in the sample are about 0.5 percentage points more likely to require a loan from a bank of their same cultural group than the oldest firms in the sample. As firms become more mature, the probability of requesting new credit from a bank of a different group increases (blue dotted line). In fact, the youngest firms (i.e., the startups) virtually never seek a new relationship with a bank of a different cultural group, while the oldest firms are 0.4 percentage points more likely than startups to request a loan from a bank of a different group. As a consequence, the difference between asking for a new loan from a bank of the same versus a different cultural group is strongly reduced as firms mature (black dotted line).

Similar results emerge for firm size. The dotted blue line in Figure D2 shows a very steep upward-sloping relation between firm size and the probability of requesting a new loan from banks of a different group, and a more gradual decrease in the likelihood of requesting a loan from a same-group bank as the firm grows larger (red line). The smallest firms in the sample are also essentially unlikely to ever request a loan from a bank of a different group, and become increasingly more likely to do so as they grow larger.

Taken together, results from this section indicate that information asymmetries and search costs represent the major market friction explaining the disproportionately higher share of firms' loan applications from same-culture banks. In contrast, firms' choices of lenders that share the same cultural identity do not seem to be motivated by the expectation of preferential treatment.

## 5. Cultural proximity and loan approvals

In this section, we extend our main results to assess the role of cultural proximity on banks' lending decisions by restricting the credit registry dataset to all the firm-bank matches for which we have information on loan applications. This is used to study whether, conditional on receiving request for a new loan, banks are more likely to grant

credit to firms from the same culture. We estimate the following equation through Ordinary Least Squares:

$$LoanApproval_{ijt} = \beta_0 + \beta_1 Same\ group_{ij} + \beta_2 X_{it} + \beta_3 X_{jt} + \beta_4 X_{ijt} + \epsilon_{ijt}, \quad (2)$$

where  $LoanApproval_{ijt}$  is a dummy variable that equals one if bank  $j$  approves a credit request from firm  $i$  at time  $t$ , and zero otherwise. To construct this variable, we assign the value of one to all observations in the SPI database that eventually ended up in the credit registry, and a zero otherwise. Loan requests reported in the credit registry are informative of the formation of a credit relationship between a bank and a firm that most likely did not have a previous relationship, and hence are a good measure for the approval of a new loan application.  $X_{it}$ ,  $X_{jt}$ , and  $X_{ijt}$  are firm-, bank-, and relationship-specific controls, respectively.

Results from estimating Eq. (2) are shown in Table 5. We report the same specifications as in Table 3.<sup>8</sup> Except for column 1, where we only include year controls, all specifications demonstrate that the effect of cultural proximity is irrelevant to the decision of banks to grant credit conditional on an application: the coefficient of *Same group* cannot be statistically distinguished from zero. The result holds irrespective of the firms' culture (columns 6 and 8) and is robust to potential differences in the sample composition by following the same PSR matching procedure explained in the previous section (columns 7 and 8). Once again, the results show no significant effect of cultural proximity on the banks' decision to supply credit.

The results in Table 5 indicate that within the pool of loan applications a given bank receives, same-culture firms are not more

<sup>8</sup> We would like to point out that for this analysis, the specifications that use firm × time fixed effects considers a very specific sample of firms, as it requires that firms apply for a new credit to multiple banks, with at least one of them from the German group and one from the Italian group. For this reason, our preferred specification is the one containing industry × size × age × location × year fixed effect.



**Table 5**  
Cultural proximity and loan approvals.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Same group	0.0390*** (7.507)	-0.00337 (-0.613)	-0.00676 (-0.874)	-0.00673 (-0.869)	-0.000273 (-0.0210)		0.0000569 (0.00306)	
Italian bank and firm						-0.00545 (-0.492)		-0.0200 (-0.775)
German bank and firm						-0.00833 (-0.582)		0.0350 (0.816)
Nearby branch				-0.00110 (-0.111)	0.0343** (2.007)	-0.00125 (-0.126)	0.0154 (0.611)	0.0176 (0.696)
Observations	31,190	30,830	21,640	21,640	11,662	21,640	4,787	4,787
Adjusted R <sup>2</sup>	0.005	0.100	0.170	0.170	0.193	0.170	0.191	0.191
Dep. Var. Mean	0.229	0.226	0.226	0.226	0.229	0.226	0.231	0.231
<b>PSR</b>							✓	✓
<b>Fixed effects:</b>								
Year	✓							
Bank-Year		✓		✓	✓	✓	✓	✓
Ind-Size-Age-Loc-Yr			✓	✓		✓	✓	✓
Firm-Year					✓			

Notes: This table shows OLS estimates for Eq. (2). The sample consists of firms-bank-year observations in the SPI dataset, indicating loan applications by firms to banks with which they had no prior relationship. The dependent variable is  $LoanApproval_{ijt}$ , a dummy that equals one if firm  $i$  has an outstanding credit relationship appearing in the credit registry with the bank in year  $t$ . *Same group* is a dummy that equals one if the firm and the bank share the same cultural origin. *Nearby branch* is an indicator variable for the existence of a bank branch in the same municipality as the firm. For the fixed effects: *Ind* are 201 firm sector groups; *Size (Age)* are 20 equally-sized size (age) bins; *Loc* are indicators for 14 local labor markets. T-stat are in parentheses. \*, \*\*, \*\*\* denotes significance at the 10%; 5%; 1% level, respectively. Standard errors clustered at bank-firm level

likely to receive a loan than different-culture firms. Thus, banks do not seem to favor firms belonging to the same cultural group when screening loan requests, and the prevalence of culturally proximate lending relationships is mostly driven by loan applications (as shown in the previous section). That is, conditional on advancing a loan request – which, as we have seen, depends on culture – firms belonging to the same culture are able to successfully obtain credit with the same average probability as firms from a different culture.<sup>9</sup>

### 5.1. Heterogeneity analysis for loan approvals

The study of cultural proximity and loan approvals has shown that banks are not more likely, on average, to grant loans to same-culture firms. However, it is still possible that banks exert favoritism towards specific segments of borrowers, for example by approving loan requests from riskier firms. In this section, we test for heterogeneity in cultural proximity on loan approvals along the same firm characteristics studied for heterogeneity on loan applications.

Results are shown in Table 6. Mirroring the analysis reported in Table 4, we control for macroeconomic conditions and demand of credit in the local area by including industry × location × year fixed effects, and by the supply of credit by adding bank × year fixed effects. We also include *Nearby branch* as a proxy for the geographical distance between borrowers and lenders.

Results show that most of the characteristics we consider for heterogeneity analysis (firm size, sales growth, profitability and risk) do not affect the likelihood of approval for loans to same-culture firms. In fact, only the interaction of *Same group* and *Age* is statistically significant in columns 1 and 3, suggesting that same group banks are less likely to approve loans of older firms. However, this effect is not robust to inclusion of other firm controls such as growth, profitability or risk.

<sup>9</sup> This is a relevant qualification to interpret our results. As we have seen in the previous section, culture is extremely relevant in the demand for loans. This implies that the loan approval process occurs in a selected sample. Stated in a different way, our coefficients in this section must be interpreted as a “treatment effect on the treated” rather than a (more general) “treatment effect” (Heckman et al., 2006).

## 6. Extensions: Loan terms and loan performance

So far, results on loan approvals show that conditional on a loan application, the bank’s decision to grant credit is not sensitive to the cultural proximity of the borrower. This is an interesting finding that warrants further analysis. We hence focus on the loan terms and loan performance of same-culture matches. For this analysis, we use information from the full credit registry, and we estimate the following OLS specification:

$$Y_{ijt} = \beta_0 + \beta_1 Same\ group_{ij} + \beta_2 X_{it} + \beta_3 X_{jt} + \beta_4 X_{ijt} + \epsilon_{ijt}, \quad (3)$$

where as before,  $X_{it}$ ,  $X_{jt}$ , and  $X_{ijt}$  are firm-, bank-, and relationship-specific controls, respectively. Table 7 contains the results from estimating different specifications of Eq. (3): Panel A presents results for loan terms; Panel B for loan performance.

We consider two outcome variables for loan terms: term loans and collateralization. *Term loans* is a dummy variable that takes the value one if all the loans between the firm and the bank have a contractually established maturity (i.e. are term loans), and zero for other types of credit (essentially credit lines). Credit lines can swiftly be withdrawn by the lender, and hence are typically unsecured. For relationships consisting of term loans only, *Collateral* is a dummy variable taking the value one if all loans are collateralized.<sup>10</sup>

If credit markets are imperfect, lenders may prefer granting credit lines to culturally distant borrowers for which there are more information asymmetries. This will reduce moral hazard problems through more frequent monitoring (Diamond and Rajan, 2001). Alternatively, a larger proportion of lines of credit loans among same-group borrowers would be consistent with the idea that same-group borrowers are riskier, and thus, require closer monitoring. Similarly, theories of collateral as a screening device assume that riskier borrowers should face higher collateral requirements (Bester, 1985; Chan and Kanatas, 1985; Inderst and Mueller, 2007). If same-group borrowers apply for credit expecting preferential treatment, banks should hedge their risks

<sup>10</sup> We do not analyze interest rates because this information is collected by Bank of Italy only for a sample of large banks, and is therefore missing for large fraction of the observations in our sample, consisting mostly of small banks.

**Table 6**  
Cultural proximity and loan approvals: Heterogeneity.

	(1)	(2)	(3)	(4)	(5)	(6)
Same group (SG)	0.0462*** (3.063)	0.000915 (0.0609)	0.0382 (1.612)	-0.0105 (-0.364)	0.00247 (0.0662)	0.0203 (0.442)
SG × Age	-0.0258*** (-4.402)		-0.0188** (-2.172)	0.00336 (0.330)	-0.00977 (-0.703)	-0.0101 (-0.717)
SG × Size		-0.00656 (-1.162)	-0.00461 (-0.804)	-0.00745 (-1.250)	0.00509 (0.560)	0.00214 (0.230)
SG × Growth				0.00624 (0.748)		
SG × Profitability					0.0359 (0.362)	
SG × Medium Risk						0.0254 (0.821)
SG × High Risk						-0.0449 (-1.403)
Nearby branch	-0.00151 (-0.198)	0.00205 (0.196)	0.00254 (0.246)	0.0000 (-0.00898)	0.0133 (0.795)	0.0127 (0.754)
Uninteracted vars.	✓	✓	✓	✓	✓	✓
Adjusted R <sup>2</sup>	0.152	0.125	0.143	0.130	0.175	0.175
No. Obs.	27,789	16,438	16,431	14,885	6,813	6,796
Dep. Var. Mean	0.228	0.252	0.252	0.227	0.238	0.237
Fixed effects:						
Industry-Location-Year	✓	✓	✓	✓	✓	✓
Bank-Year	✓	✓	✓	✓	✓	✓

Notes: The sample consists of all firm-bank-pairs where the firm is located in the South Tyrol and the bank has a branch operating in the same local labor market as the firm between years 2005 and 2015. The dependent variable is *LoanApprovals*, a dummy variable equal to one if the bank lodged a request of new information from the firm, and zero otherwise. *Age* is natural logarithm of the years of activity. *Size* is the natural logarithm of the number of employees. *Growth* corresponds to the yearly sales growth rate. *Same group* is a dummy that equals one if the firm and the bank share the same cultural origin. *Nearby branch* is an indicator variable for the existence of a bank branch in the same municipality as the firm. For the fixed effects: *Industry* are 201 firm sector groups and *Location* are indicators for 14 local labor markets. All other independent variables are defined in Table B1. Apart from the reported variables, the regressions include the un-interacted variable in the interaction term. T-stats are in parentheses. \*, \*\*, \*\*\* denotes significance at the 10%; 5%; 1% level, respectively. Standard errors clustered at the bank-firm level.

by asking more often for collateral from these borrowers than from distant ones. Alternatively, if there is better enforcement for same-group borrowers, we can expect a lower collateralization rate for this group relative to the culturally distant borrowers.

Column 1–4, Panel A of Table 7 show results for term loans, while Column 5–8 of Panel A for collateralization. Notice that this analysis contains all approved loans in the credit registry, and hence the number of observations is larger than the sample in Table 5, which only considers new credit applications. We also acknowledge – especially in light of the results from the previous sections – that this analysis is not free from sample selection issues. The inclusion of fixed effects allows us to mitigate these issues by comparing loan terms for groups of similar firms, or, in our most stringent specifications, for the same firm applying to two banks in the same year, one of which is from the same culture and another from a different culture.

All reported specifications include bank × time fixed effects and firm-bank controls. The specifications in columns 1, 3 and 4 (term loans) and columns 5, 7 and 8 (collateral requirements) contain industry × size × age × time fixed effects, and in column 2 and 6 we include firm × time fixed effects. Since these regressions include all observations in the credit registry, and not only new credit relationships, we also control for the length of the relationship in these specifications. Results show no average effect of cultural proximity on term loans, also after controlling for potential differences in the composition of the sample firms across different cultures: They are robust to the PSR procedure explained in the previous section (column 3 and 7). In terms of cultural differences, we similarly observe almost no effects: there is only a weak negative effect for same-culture German firms for collateral (column 8), but not for Italian firms, and there are no observed effects for term loans.

Altogether, results from Panel A of Table 7 confirm our prior findings that cultural proximity is not an important determinant of loan supply: neither the decision to grant credit nor the loan terms are

affected by cultural proximity. This important finding highlights the central role the demand side of credit plays in the observed prevalence of culturally proximate relationships.

Analysis of loan performance is the next step. We consider minor anomalies and bad loans as our measures of loan quality in Panel B of Table 7. We measure minor anomalies with a dummy equal to one if at least one loan of firm  $i$  is recorded by bank  $j$  as unlikely-to-be-paid, overdrawn or past-due over 90 days exposure anytime in the three years after it was granted. We use a three-year moving window because banks usually take up to three years to report a loan as non-performing on their balance sheet. Bad loans are a more restrictive definition of non-performing bank-firm relationships, whereby the bank classifies the borrowing firm as insolvent anytime between years  $t$  and  $t + 3$ .

Results in Column 1, Panel B show that loans to same-culture firms are about 1 percentage point less likely to have minor anomalies than loans to different-culture firms. However, this result loses its statistical significance as soon as we introduce firm × time fixed effects (column 2). The result is also not statistically significant when we use the PSR procedure (column 3). When we split the *Same group* coefficient into the two cultural groups (column 4), we do find a weak negative coefficient for *German bank and firm*, but not for *Italian bank and firm*. Column 5–8 of Panel B show similar findings: the coefficient of *Same group* is negative and statistically significant only in column (5), but we do not find any effect of cultural proximity on bad loans in the other specifications.

Overall, results from our analysis of loan performance reinforce our interpretation that firms do not seek preferential treatment from a same-group lender: We do not detect negative effects of same-culture borrowing in terms of loan performance.

## 7. Robustness checks

In this final section, we discuss additional robustness checks that validate our main findings on the effect of culture on loan applications.

**Table 7**  
Loan Terms and Loan Performance.

Panel A: Loans Terms								
	Term loans				Collateral Requirements in term loans			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Same group	0.00062 (0.123)	0.00210 (0.330)	0.00250 (0.354)		-0.0206 (-1.326)	-0.00998 (-0.414)	-0.0255 (-0.591)	
Italian bank and firm				-0.00701 (-0.543)				0.0869 (1.227)
German bank and firm				0.00923 (0.821)				-0.143* (-1.872)
Nearby branch	-0.0489*** (-8.162)	-0.0742*** (-9.247)	-0.0402*** (-4.231)	-0.0397*** (-4.156)	-0.0298 (-1.618)	0.00204 (0.0788)	0.00408 (0.0854)	-0.00452 (-0.0935)
Length relationship	-0.505*** (-16.02)	-0.0476*** (-11.47)	-0.0314*** (-5.894)	-0.0314*** (-5.914)	0.0221** (2.534)	0.0197 (1.439)	0.000222 (0.0101)	-0.000255 (-0.0117)
Adjusted R <sup>2</sup>	0.256	0.406	0.349	0.349	0.340	0.568	0.416	0.421
Observations	126,698	80,299	36,346	36,346	18,870	6,737	2,696	2,696
Dep. Var. Mean	0.199	0.186	0.136	0.136	0.554	0.496	0.345	0.345
Panel B: Loan Performance								
	Minor Anomalies				Bad Loans			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Same group	-0.00898** (-2.032)	0.00121 (0.269)	-0.00243 (-0.464)		-0.00343** (-2.032)	-0.00164 (0.269)	-0.00069 (-0.464)	
Italian bank and firm				0.0155 (1.473)				0.00747 (1.624)
German bank and firm				-0.0145* (-1.698)				-0.00618 (-1.698)
Nearby branch	-0.0133*** (-2.782)	-0.00290 (-0.606)	-0.00938 (-1.280)	-0.0102 (-1.394)	-0.00482*** (-3.633)	0.00263* (1.951)	-0.00178 (-0.641)	-0.00216 (-0.773)
Length relationship	0.00706*** (3.146)	0.00961*** (4.194)	-0.000966 (-0.274)	-0.000797 (-0.226)	0.00150** (2.210)	0.000749 (0.990)	-0.00291* (-1.747)	-0.00283* (-1.696)
Adj. R <sup>2</sup>	0.159	0.493	0.249	0.250	0.179	0.616	0.281	0.281
No. Obs	115,304	71,028	32,815	32,815	117,048	72,367	33,388	33,388
Dep. Var. Mean	0.0865	0.0770	0.0610	0.0610	0.0135	0.0150	0.0153	0.0153
<b>PSR</b>			✓	✓			✓	✓
<b>Fixed effects:</b>								
Bank-Year	✓	✓	✓	✓	✓	✓	✓	✓
Ind-Size-Age-Loc-Yr	✓		✓	✓	✓		✓	✓
Firm-Year		✓				✓		

Notes: This table shows OLS estimates for Eq. (3). The sample consists of firms-bank-year observations for firms located in the South Tyrol Region appearing in the Italian credit registry between 2005 and 2015. The dependent variables are: a dummy that takes the value of one if all the loans are term loans (Panel A, column 1–4); and a dummy variable equal to one if all the loans are term loans and they are collateralised (Panel A, column 5–8); a dummy equal to one if at least one loan of firm  $i$  at time  $t$ , anytime between years  $t$  and  $t + 3$ , is recorded by bank  $j$  as unlikely-to-be-paid, overdrawn or past-due over 90 days exposure (Panel B, column 1–4); a dummy taking a value one if the borrowing firm is classified as insolvent by the bank, zero otherwise, anytime between years  $t$  and  $t + 3$  (Panel B, column 5–8). *Same group* is a dummy that equals one if the firm and the bank share the same cultural origin. *Nearby branch* is an indicator variable for the existence of a bank branch in the same municipality as the firm. For the fixed effects: *Ind* are 201 firm sector groups; *Size (Age)* are 20 equally-sized size (age) bins; *Loc* are indicators for 14 local labor markets. *Length Relationship* corresponds to the natural logarithm of one plus the length of the bank-firm relationship, measured in years since 1997. T-stat are in parenthesis. \*, \*\*, \*\*\* denotes significance at the 10%; 5%; 1% level, respectively. Standard errors clustered at bank-firm level

### 7.1. Placebo simulation

To rule out that the significantly higher rate of loan applications to culturally close banks observed in Table 3 is mechanically driven by the distribution of culture of banks and firms within the local labor market, we perform a placebo simulation. We first randomly assign the cultural origin to firms and banks in our dataset, following their true population distribution within the loan labor market area. Then, we estimate the specification in column 5 of Table 3 using the simulated culture of banks and firms in place of the true one. We repeat this exercise 200 times, and obtain the distribution of the estimated coefficients. Results are graphically shown in Figure D3 in Online Appendix D. The distribution of the coefficient of  $Same\ group_{ij}$  with random pair allocations is centered around zero, and several standard deviations away from the coefficient estimated in column 5 of Table 3. This finding leads us to reject the hypothesis that the analysis shown in Table 3 is mechanically biased, and confirms the central and unique role of cultural proximity in the demand for loans.

### 7.2. Alternative interpretations

As discussed before, our empirical setup is particularly suitable to identify the effects of culture on economic outcomes, as we can control

for many confounding factors (such as regulation, economic activity, institutions, etc.) relative to international comparisons. However, the differences identified in our analysis allow for an alternative interpretation, namely, that they are driven not by the shared culture among borrowers and lenders, but by other factors that affect the level of trust among individuals — such as coming from the same town or region, having a similar degree of education, or belonging to a similar socio-economic class.

To explore this issue, we perform our analysis of loan applications and approvals in a more homogeneous setting. In particular, we consider a subsample containing only observations in the local labor market areas of the two largest cities in South Tyrol: Bolzano and Merano. In addition to being large, the distribution of Italian and German populations is very homogeneous in these two cities. Results, reported in Table D3 for loan applications and in Table D4 for approvals, are economically and statistically similar to those shown in the paper. We also estimate, but do not report, results for loan terms and loan performance on this subsample. Results are likewise similar.

Restricting the study sample to Bolzano and Merano also addresses the concern that our results are driven by local markets where the German versus Italian culture distributions are particularly skewed and might not be representative of South Tyrol as a whole. For example, the

Germanic population is over-represented in many of the less populated cities in the mountain regions, while the Italian population is concentrated in the valleys around Bolzano and Merano. A similar concern is that the set of industry  $\times$  location  $\times$  firm size  $\times$  firm age  $\times$  year fixed effects we use in our main specifications (Degryse et al., 2019) may underlie an uneven cultural distribution that could in turn bias our results. To account for this, we run our estimates excluding bins with a disproportionate shares of Italian versus German firms. Results from this robustness analysis are also reported in Table D5, and do not significantly differ from our main findings.

## 8. Conclusions

In this paper, we study the effect of culture on firms' borrowing decisions. For this purpose, we use a comprehensive dataset that contains all bank-firm relationships for the population of firms and banks that operate in a bicultural region in Italy. Most importantly, our database allows us to observe loan applications, the culture of the board members of banks and firms, and a large number of accounting variables about firms and loan outcomes.

Our analysis uncovers several novel facts. First, we find that firms are significantly more likely to apply for a loan from a bank of their same culture, than to apply from a different-culture bank. Second, we find that the larger propensity to apply for loans of the same cultural group is highest for relatively opaque borrowers, but loan applications to culturally proximate banks decrease sharply as firms become more transparent (as measured by size and age). In contrast, we find no evidence that firms with lower profitability or higher risk are more likely to apply for a loan with a same-culture lender. Third, conditional on loan applications, lenders are neither more likely to approve loans from same-group borrowers, nor to give them preferential loan terms relative to different-group borrowers. Fourth, we do not find that loans to same-culture firms perform worse than loans to different-culture firms.

Our findings suggest that firms endogenously self-select into same-culture relationships when they apply for credit, especially when information asymmetry and search frictions are high. Our findings are not consistent with same-group lending leading to favoritism and resource misallocation, as indeed we find no effects of cultural proximity on the supply side of credit nor negative effects on loan performance.

To the best of our knowledge, ours is the first study to analyze the selection of firms into culturally proximate lending relationships. Our paper allows us to qualify previous results in the literature by showing that culture plays an active role in borrowers' selection of lenders, and that information asymmetries and search frictions are fundamental drivers of this selection.

From a policy perspective, our findings highlight the importance of local banks with close cultural ties to the local population in lending to small businesses (e.g., Angelini et al., 1998; Alessandrini et al., 2009; Barboni and Rossi, 2019). Diversified banking systems increase opportunity for smaller and more opaque firms, especially if they belong to minority groups, to access credit without negative consequences in terms of loan quality. We believe that this is an important result for many culturally heterogeneous countries, such as Belgium, Canada, India, Switzerland or United States.

Our results can also provide novel insights for international agreements on cross-border lending. In the last decade, the Eurozone has witnessed a process of cross-country banking consolidation as a consequence of the introduction of the Single Supervisory Mechanism. While mergers and acquisitions are important tools for stable and capitalized credit institutions, we show that local banks are still necessary to promote access to credit, particularly in areas where minorities are likely to be marginalized in the creation of firm-bank ties.

## Data availability

The data that has been used is confidential.

## Appendix A. Supplementary data

Supplementary material related to this article can be found online at <https://doi.org/10.1016/j.jfi.2023.101018>.

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