Can Social Disconnectedness Inhibit Online Trade? Examining the Effects of Digital Distance on Peer-to-peer Lending

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Short Paper[1]

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Abstract

The extant literature has shown that offline group proximity manifests in online peer-to-peer lending platforms, inhibiting online transactions in those markets. The findings of this research suggest that digital distance, as measured by the rate of Facebook friendship between country pairs, can also influence lending actions in bi-country lending. Building on a dataset from Kiva.org, we show that digital distance significantly and negatively affects bi-country lending actions, on top of other distance-related barriers discussed in the literature. The results also shed light on the role of government policies regarding local IT infrastructure and Internet freedom, revealing that greater levels of IT infrastructure and Internet freedom can compensate for the negative effect of digital distance on prosocial lending.

Keywords: Digital distance, peer-to-peer lending, IT infrastructure, Internet freedom

Introduction

Prior research has demonstrated that funders in crowdfunding platforms tend to favor fundraisers who are in close proximity to them or share similarities (Burtch et al., 2014; Cumming & Dai, 2010; Martin et al., 2005; Sabzehzar et al., 2023). Existing literature has indicated that lenders display preferences based on the physical location of borrowers (home bias: Aigner and Cain (1977); Tilcsik (2021) as well as their shared identities (ingroup favoritism and outgroup avoidance: Becker (1976)). For instance, within online peer-to-peer lending platforms, despite the presence of numerous mechanisms designed to protect borrowers' identities, lenders tend to show a preference for borrowers who are geographically close (Burtch et al., 2014), who share similar cultural traits (Burtch et al., 2014; Elfenbein et al., 2023) or similar religious and political ideologies (Sabzehzar et al., 2023; Wang & Overby, 2022). In this regard, the allocation of funding is influenced by offline group proximity, contradicting the notion of a "flat world" (Gefen & Carmel, 2008).

While the above literature mainly focuses on distances within offline groups, the distances within online groups are overlooked. In a complementary approach, our research explores the role of *digital distance* as a factor influencing peer-to-peer online interactions in crowdfunding. Digital distance refers to a virtual separation between individuals within a social network or an online community. Digital distance assesses the strength of social (dis)connectedness among people in a digital world, i.e., how closely or distantly connected people are within the digital space.

First, we aim to study whether online group distance affects prosocial lending behavior. An important implication underlying the literature on distance-related barriers is that online social behavior often

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mirrors offline preferences and biases (Burtch et al., 2014; Elfenbein et al., 2023; Sabzehzar et al., 2023; Wang & Overby, 2022). These studies examined how offline group distances (e.g., via language, culture, religion, or political ideology) influence online lending activities in peer-to-peer lending markets. However, this line of research has not yet established the relationship between online group proximity and online prosocial lending activities. For instance, two individuals from Japan and Brazil have distinct religious and cultural backgrounds and a significant physical separation. Considering the extensive literature, there should be a lower inclination for lending between a Japanese lender and a Brazilian borrower and vice versa. However, the connections these individuals forge on platforms like Facebook could act as virtual bridges, which may (or may not) facilitate seamless interactions and increase lending activities, transcending their physical distances. Hence, we study how individuals' social media (dis)connectedness (e.g., friendship on Facebook) impacts their willingness to engage in financial transactions, such as lending, across geographical boundaries.

Second, our study aims to address the demand for practical and viable governmental strategies to enhance online trade efficiency. Particularly, we aim to study whether government policies that improve IT infrastructure (e.g., broadening the Internet coverage and increasing the number of Internet users in a country) or improve Internet freedom (e.g., reducing Internet restrictions on social media platforms) can contribute to mitigating distance-related barriers and fostering cross-country interactions and collaborations. While offline group proximity (e.g., geographical, cultural, or religious distance between lenders and borrowers) is difficult or impossible to manipulate, policymakers can influence bi-country online group proximity. For example, regulators can promote social connections among people in different countries on the Internet by reducing restrictions on accessing social media platforms.

Social (dis)connectedness via online networks can facilitate trust built among individuals and thus may potentially influence online peer-to-peer lending activities. With the spread of the Internet, social media has significantly changed how people connect with others and access information. By transcending temporal and spatial limitations, social media allows individuals to connect with geographically distant people from different cultures and exchange opinions and experiences. As a result, social media could potentially erode barriers imposed by geographical distance and thus promote prosocial behaviors among distant individuals.

To implement our research design, we investigate online prosocial lending activities at the bi-countries level. By using data collected from Kiva, a popular online platform for prosocial peer-to-peer lending, we construct a panel dataset at the lender-country-borrower-country-month level (i.e., a monthly panel dataset of the lending activities for each lender-borrower country pair). We measure the digital distance between lenders and borrowers' countries using Facebook's social connectedness index (SCI) as a proxy of indirect interpersonal social connectedness in the digital world. SCI represents the relative likelihood of a Facebook friendship between two given Facebook users in two different countries (Bailey et al., 2018). In other words, if the SCI for a country pair is doubled, the two Facebook users in these countries are twice as likely to be Facebook friends. In order to align with the existing literature on distance-related barriers (Burtch et al., 2014; Sabzehzar et al., 2023), we use the opposite of log-transformed SCI (social disconnectedness) as a measure for the digital distance between two countries. It is worth noting that Facebook friendship ties not only reflect real-world connections among users but also capture online connections with distant individuals they may not interact with in person (e.g., celebrities). In fact, Facebook users typically interact only with a small fraction of their Facebook friends in person. As such, our measure of digital distance captures the indirect interpersonal social connectedness in the digital world, which is beyond the social ties of real-world connections (Kuchler et al., 2022; Nguyen et al., 2021).

Following the empirical methods used in previous studies (Burtch et al., 2014; Elfenbein et al., 2023; Galak et al., 2011; Sabzehzar et al., 2023), we use a gravity model of trade to examine the relationship between digital distance and bi-countries lending activities in online peer-to-peer markets. This model establishes a relationship between the trade volume (the count of lending activities in our case) and several distant-related indicators of the association between two geographic areas (the digital distance and other distances, e.g., religion, language, culture, and geographical distances between countries; Burtch et al., 2014; Elfenbein et al., 2023; Galak et al., 2011; Sabzehzar et al., 2023).

Our study generates two key findings with important implications. First, we find that digital distance between countries has a negative and significant effect on online peer-to-peer lending activities between them, over and above other established offline factors in the literature, such as geographical, cultural, and

religious distances (Burtch et al., 2014; Cumming & Dai, 2010; Martin et al., 2005; Sabzehzar et al., 2023). This implies that lenders exhibit ingroup favoritism based on digital distance in their prosocial lending behavior. Secondly, we find that the advanced IT infrastructure and high Internet freedom in the lender countries can mitigate the negative impact of digital distance on online prosocial lending activities. This finding provides insights to policymakers that government policies can play a significant role in profoundly influencing international trade by moderating the impact of a nation's social connectedness to the world.

Hypotheses Development and Theoretical Foundation

Digital Distance and Ingroup Favoritisms in Prosocial Peer-to-Peer Lending

Our first hypothesis is grounded in extensive research on ingroup favoritism and outgroup avoidance, which reveals that individuals tend to place higher levels of trust in and prefer interacting with others they are familiar with (Tajfel et al., 1971). Socially connected individuals are more likely to interact and share information with each other and thus have greater familiarity and a stronger sense of belonging. In other words, building trust between socially disconnected individuals is often more challenging. This ingroup favoritism, stemming from social connections, has been observed across various traditional financing contexts. Numerous studies have consistently shown that lenders tend to avoid socially disconnected borrowers (Bailey et al., 2021; Rehbein & Rother, 2020). For example, social disconnectedness has been found to decrease the involvement of institutional investors, inhibit cross-country banking, and decrease announcement returns (Kuchler et al., 2022; Nguyen et al., 2021; Rehbein & Rother, 2020).

Considering the same logic of ingroup favoritism (outgroup avoidance) stemming from social (dis)connectedness, we can extend these insights to the relationship between digital distance and online lending between countries. In addition to their preferences influenced by offline group proximity factors, lenders are more likely to prefer and trust borrowers in a country with which they are more socially connected (i.e., smaller digital distance). Consequently, fewer lending activities will happen between digitally distant countries and more frequent between digitally proximate countries. Hence, we propose the following hypothesis:

H1 (digital distance effect): *Digital distance between a lender country and a borrower country has a negative impact on the lending volumes between these two countries.*

Digital Distance, IT Infrastructure, and Internet Freedom

While most individuals tend to form connections with ingroup people (i.e., people similar to themselves), a few individuals, known as social brokers, establish networks that extend beyond their ingroup by connecting with outgroup members (Burt, 1995; McPherson et al., 2006; Wood et al., 2022). Social media users who connect with outgroup members can serve as social brokers. These social brokers can build bridges between their own and outgroup communities, facilitate the exchange of information between communities, and foster cultural diversity within their communities (Burt, 1995; Erickson, 2003).

The presence of advanced IT infrastructure in lenders' countries can increase the number of potential social brokers and encourage their active participation. More specifically, a well-developed IT infrastructure, characterized by widespread Internet availability and Internet adoption, can expand the pool of potential social brokers and enhance the intensity of information transmission. Additionally, greater Internet freedom in terms of fewer limitations on digital content and accessing social media platforms like Facebook can foster the greater engagement of social brokers. Brokers help establish communication between cross-cultural networks, which might remain disconnected without the bridging role of brokers (González-Bailón & Wang, 2016). Thus, social brokers' increased presence and involvement can expose lenders to greater diversity. Greater exposure to diversity, in turn, helps alleviate the impact of established social norms and challenge stereotypes and also helps reduce ingroup favoritism by transcending group boundaries (Stolle et al., 2008). Therefore, we anticipate that lenders from areas with advanced IT infrastructure and greater Internet freedom will exhibit a reduced preference for digital proximity when engaging in lending activities. In other words, a more robust IT infrastructure and greater Internet freedom in the lenders' areas can mitigate the lenders' ingroup favoritism with respect to digital distance. Hence, we hypothesize:

H2-a (moderating effect of IT infrastructure): *IT infrastructure in a lender country will attenuate the negative effect of digital distance on lending volumes.*

H2-b (moderating effect of Internet freedom): *Internet freedom in a lender country will attenuate the negative effect of digital distance on lending volumes.*

Study Context, Data, and Empirical Model

Study Context and Data

To examine the relationship between digital distance and online prosocial lending behavior, we situate our study in the context of Kiva. Kiva collaborates with local Micro-Finance Institutions (MFIs) (referred to as "Kiva partners" hereafter) in over 70 countries worldwide. Kiva partners establish connections with potential local borrowers and facilitate loans by creating loan projects on borrowers' behalf on Kiva. On Kiva, lenders voluntarily give borrowers a loan in increments of $25 to support borrowers' various financial needs, such as small businesses and education. It is important to note that lending on Kiva is prosocial. Neither the Kiva platform nor its lenders accrue interest from loans, although most Kiva partners earn a percentage of interest (usually 2%). It is worth mentioning that Kiva operates on an all-or-nothing basis, whereby the fundraising period of a loan lasts for 30 days or until the loan is fully funded within the 30-day period. If a loan does not reach its funding goal within 30 days, the raised money will be refunded to lenders.

We collect data on all the lending transactions from individual lenders to individual borrowers on Kiva from 2019 to 2020. With our interest in lending activities at the bi-countries level, we group these transactions by the lender's country, borrower's country, and year-month. This aggregation allows us to create a panel dataset that operates at the level of bilateral relationships between countries.

Dependent Variable

Lending Volume: Our outcome of interest, similar to the studies conducted by Burtch et al. (2014) and Sabzehzar et al. (2023) is the number of lending transactions between the lender and borrower countries (*LendingVolume*). To generate *LendingVolume*, we aggregate the number of lending transactions between a lender country and a borrower country on a monthly basis. Specifically, in our bilateral countries-level panel dataset, the dependent variable *LendingVolume* for each observation represents the number of lending transactions from a lender country (e.g., the United States) to a borrower country (e.g., Jordan) during a given month (e.g., January 2020) between 2019 and 2020. Due to the limitation that Kiva's API does not provide information on the monetary lending amount for each transaction, we choose to aggregate the number of lending transactions rather than the monetary value of loans.

Independent Variables

Digital Distance: The key variable of interest is the digital distance between lender and borrower countries ($DigitalDistance$), which is a bi-countries level variable. It refers to the degree of online social disconnectedness between two countries. Equation (1) shows our approach to measuring digital distance. In this measure, we define the digital distance as the opposite of Facebook's log-transformed social connectedness index (SCI). The SCI represents the relative likelihood of Facebook users in one country being friends with users in another. It is important to note that Facebook friendship ties not only reflect users' real-life interactions (Freedman & Jin, 2008; Lin et al., 2013; Liu et al., 2015) but also capture their online connections with people whom they may never meet in person, such as celebrities. Therefore, while a portion of the variation in SCI represents online digital friendships due to real-life connections, SCI also encompasses online digital friendships established solely through online interactions. Consequently, SCI does not exclusively reflect real-life connections but reflects overall online social connections originating from both the real world and the digital world. Hence, we employ the SCI as a proxy of online social connectedness to construct our key independent variable *DigitalDistance*.

$$DigitalDistance_{ij} = -ln(SCI_{ij} + 1) \quad (1)$$

$DigitalDistance_{ij}$ is the digital distance between country i and country j. SCI_{ij} is the social connectedness index (SCI) of Facebook between country i and country j, representing the relative likelihood of a random Facebook user in country i being Facebook friends with another random Facebook user in country j.

IT Infrastructure and Internet Freedom: We use several different measures of IT infrastructure (*PenetrationRate*, *InclusiveIndex*, *BroadbandSpeed*, and *MobileSpeed*) and Internet freedom (*AccessObstacles*, *ContentLimits*, and *RightsViolation*) to examine the moderating effect of IT infrastructure and Internet freedom in lender countries on the relationship between digital distance and lending activities. The four variables measuring IT infrastructure represent the penetration rate of Internet users, the accessibility and affordability of the Internet, broadband Internet speeds, and mobile Internet speeds in a country, respectively.[2] The three variables measuring Internet freedom represent the obstacles to access, limits on content, and violations of user rights in a country, respectively.[3]

Control Variables

Following prior studies (Blum & Goldfarb, 2006; Burtch et al., 2014; Hortaçsu et al., 2009; Sabzehzar et al., 2023), we include a set of control variables that potentially affect the supply and demand forces of lending activities between countries in our model. These control variables include the geographical distance (*GeographicalDistance*), cultural distance (*CulturalDistance*), religion distance (*ReligionDistance*), the difference in the yearly gross domestic product (*GDPDifference*) between lender and borrower countries, the number of lenders in a lender country (*LenderNum*), and the number of borrowers in a borrower country (*BorrowerNum*). Variable descriptions, statistics summaries, and the correlation matrix can be found in Tables 1 and 2.

Concept	Variable Name	Raw Data Level	Variable Definition	Data Source
Dependent Variable	$LendingVolume_{ijt}$	Country pair-month	The count of lending transactions from lender country *i* to borrower country *j* in month *t* (January 2019- December 2020)	Kiva
Variable of Interest	$DigitalDistance_{ij}$	Country pair	Online social disconnectedness between an undirected country pair (countries *i* and *j*)	Facebook
IT Infrastructure	$PenetrationRate_i$	Country	The percentage of individuals using the Internet in lender country *i* (2017)	The World Bank
	$InclusiveIndex_i$	Country	The accessibility and affordability of the Internet, as well as its capacity to facilitate social and economic mobility in lender country *i*	Facebook
	$BroadbandSpeed_i$	Country	The average broadband Internet speeds in Mbps in lender country *i* (2023)	World Population Review
	$MobileSpeed_i$	Country	The average mobile Internet speeds in Mbps in lender country *i* (2023)	World Population Review
Internet Freedom	$AccessObstacles_i$	Country	The degree of obstacles to access based on a scale of 0 (least free) to 100 (most free) in lender country *i* (2022)	Freedom House
	$ContentLimits_i$	Country	The degree of limits on content based on a scale of 0 (least free) to 100 (most free) in lender country *i* (2022)	Freedom House
	$RightsViolation_i$	Country	The degree of violations of user rights based on a scale of 0 (least free) to 100 (most free) in lender country *i* (2022)	Freedom House
Control Variables	$ReligionDistance_{ij}$	Country pair	The likelihood that two individuals selected at random from two given countries (countries *i* and *j*) belong to different religious groups during the time period spanning from 2006 to 2016	Sabzehzar et al. (2023)
	$CulturalDistance_{ij}$	Country pair	The cultural distance between an undirected country pair (countries *i* and *j*)	World Value Survey (WVS) wave 6
	$Geographical\ Distance_{ij}$	Country pair	The physical geographical distance between an undirected country pair (countries *i* and *j*)	CEPII
	$GDPDifference_{ijt}$	Country pair-month	The GDP (in billions of dollars) difference between a lender country *i* and a borrower country *j* in the year of month *t* (2019-2020)	The Word Bank

[2] Data source of *PenetrationRate* is The World Bank (https://data.worldbank.org/indicator/IT.NET.USER.ZS). Data source of *InclusiveIndex* is Facebook (https://dataforgood.facebook.com/dfg/tools/inclusive-internet-index). Data source of *BroadbandSpeed and MobileSpeed* is the World Population Review (https://worldpopulationreview.com/country-rankings/internet-speeds-by-country).

[3] Data source of *AccessObstacles*, *ContentLimits*, and *RightsViolation* is the Freedom House (https://freedomhouse.org/countries/freedom-net/scores).

	$LenderNum_{it}$	Country-month	The number of unique lenders from each lender country i in month t (January 2019- December 2020)	Kiva
	$BorrowerNum_{jt}$	Country-month	The number of unique borrowers from each borrower country j in month t (January 2019- December 2020)	Kiva

Table 1. Variable Description

Variables	Obs.	Mean	Std. dev.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) *LendingVolume*	21876	62.70	553.162	1									
(2) *DigitalDistance*	21876	-7.211	1.807	-0.066	1								
(3) *Log(PenetrationRate)*	21651	0.156	0.388	0.086	0.014	1							
(4) *Log(InclusiveIndex)*	17202	0.049	0.112	0.129	0.101	0.782	1						
(5) *ReligionDistance*	21876	0.657	0.303	-0.067	0.37	0.044	0.06	1					
(6) *Log(CulturalDistance)*	21876	0.143	0.080	0.024	0.112	0.312	0.307	0.268	1				
(7) *Log(GeographicalDistance)*	21876	8.706	1.032	0.013	0.756	0.079	0.138	0.293	0.245	1			
(8) *Log(GDPDifference)*	21876	10.038	0.352	-0.543	0.021	-0.117	-0.198	0.014	-0.078	-0.009	1		
(9) *Log(LenderNum)*	21876	3.250	2.200	0.341	0.015	0.487	0.715	0.026	0.379	0.124	-0.494	1	
(10) *Log(BorrowerNum)*	21876	4.829	1.482	0.12	-0.053	-0.022	-0.031	-0.113	-0.068	0.051	-0.04	-0.018	1

Table 2. Statistics Summary and Correlation Matrix

Empirical Model

To examine the relationship between digital distance and lending volume, we utilize the gravity model of trade in Equation (2). Previous research in the field of economics pertaining to international trade adopted a similar approach, proposing that bilateral trade volumes are positively associated with the size of two economies but negatively associated with the distance between them (Anderson, 2011; Bergstrand, 1985, 1989). It is worth noting that our model is similar to those presented by Burtch et al. (2014), Hortaçsu et al. (2009), and Sabzehzar et al. (2023). This is because we posit that lenders on the Kiva platform face a multinomial choice framework, in which potential borrowers are presented as alternative borrowers to whom the lender can choose to give a loan. Because our dependent variable $LendingVolume$ represents the count of lending transactions between two countries, it can only take on values from 0 to infinity. Hence, we employ a Poisson regression model when we use the gravity model of trade for empirical analyses.

$$LendingVolume_{ijt} = \beta_0 + \beta_1 \cdot DigitalDistance_{ij} + \beta_2 \cdot ReligionDistance_{ij} + \beta_3 \cdot ln(CulturalDistance_{ij}) + \beta_4 \cdot ln(GeographicalDistance_{ij}) + \beta_5 \cdot ln(GDPDifference_{ijt}) + \beta_6 \cdot ln(LenderNum_{it}) + \beta_7 \cdot ln(BorrowerNum_{jt}) + \phi_i + \delta_j + \lambda_t + \varepsilon_{ijt} \quad (2)$$

Here, the dependent variable $LendingVolume_{ijt}$ represents the number of lending transactions from lender country i to borrower country j in each month t (January 2019 - December 2020). Our key variable of interest is $DigitalDistance_{ij}$, which represents the online social disconnectedness between an undirected country pair (countries i and j) demonstrated in Equation (1). β_1 is the coefficient of interest. In a Poisson regression model, the value of β_1 indicates that for a one-unit change in $DigitalDistance$, the estimated value of dependent variable $LendingVolume$ (i.e., the estimated count of lending transactions between two countries) changes by a factor of e^{β_1}. For instance, a negative value for β_1 indicates that for one standard deviation (SD) increase in $DigitalDistance$ (one SD of $DigitalDistance$ is 1.8 unit), the estimated value of dependent variable $LendingVolume$ changes by $100 * (e^{1.8*\beta_1} - 1)\%$. As mentioned earlier, $ReligionDistance_{ij}$, $CulturalDistance_{ij}$, $GeographicalDistance_{ij}$, $GDPDifference_{ijt}$, $LenderNum_{it}$ and $BorrowerNum_{jt}$ are control variables. ϕ_i , δ_j , and λ_t are lender-country fixed effects, borrower-country fixed effects, and year-month fixed effects, respectively. ε_{ijt} represents an error term. We report robust standard errors.

Empirical Analysis and Results

Table 3 shows the results of the main effect of digital distance on lending volume. In Column (1), the coefficient of $DigitalDistance_{ij}$ is negative and statistically significant, indicating that one standard deviation (SD) increase in the digital distance between a lender country and borrower country corresponds

to an 11% decrease in lending volume between these two countries.[4] Thus, this result implies that the digital distance between borrower and lender countries discourages lending activities, supporting H1.

Dep. Vars.	(1) $LendingVolume_{ijt}$
Model	Poisson
$DigitalDistance_{ij}$	-0.0671***
	(0.0132)
$ReligionDistance_{ij}$	-0.428***
	(0.0790)
$ln(CulturalDistance_{ij})$	-2.465***
	(0.426)
$ln(GeographicalDistance_{ij})$	-0.125***
	(0.0213)
$ln(GDPDifference_{ijt})$	0.254***
	(0.0501)
$ln(LenderNum_{it})$	0.662***
	(0.173)
$ln(BorrowerNum_{jt})$	0.706***
	(0.0546)
Lender Country, Borrower Country, and Year-month FEs	Yes
Observations	21,876

Table 3. Impact of Digital Distance

Note: Robust standard errors are reported. *** p<0.01, ** p<0.05, * p<0.1

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dep. Vars.	$LendingVolume_{ijt}$						
Model	Poisson						
$DigitalDistance_{ij}$	-0.186***	-0.256***	-0.137***	-0.178***	-0.254***	-0.145***	-0.145***
	(0.0179)	(0.0250)	(0.0178)	(0.0142)	(0.0228)	(0.0181)	(0.0176)
$DigitalDistance_{ij}$ $\cdot ln(PenetrationRate_i)$	0.281***						
	(0.0303)						
$DigitalDistance_{ij}$ $\cdot ln(InclusiveIndex_i)$		1.426***					
		(0.155)					
$DigitalDistance_{ij}$ $\cdot ln(BroadbandSpeed_i)$			0.0929***				
			(0.0136)				
$DigitalDistance_{ij}$ $\cdot ln(MobileSpeed_i)$				0.161***			
				(0.0117)			
$DigitalDistance_{ij}$ $\cdot ln(AccessObstacles_i)$					0.507***		
					(0.0491)		
$DigitalDistance_{ij}$ $\cdot ln(ContentLimits_i)$						0.231***	
						(0.0322)	
$DigitalDistance_{ij}$ $\cdot ln(RightViolationss_i)$							0.196***
							(0.0220)
Controls	Yes (in all columns)						
Lender Country, Borrower Country, and Year-month FEs	Yes (in all columns)						
Observations	21,651	17,202	21,876	21,103	14,789	14,789	14,789

Table 4. Moderating Role of IT Infrastructure and Internet Freedom

Note: Robust standard errors are reported in parentheses. The measures of IT infrastructure and Internet freedom are demeaned for the convenience of interpretation. The results of the main effects are dropped from the table for the sake of brevity. *** p<0.01, ** p<0.05, * p<0.1

[4] One standard deviation of *DigitalDistance*$_{ij}$ is 1.8, and $100 * (e^{(1.8*(-0.0671))} - 1)\% = -11\%$. Hence, one SD increase in *DigitalDistance*$_{ij}$ is associated with a decrease in lending volume by 11%.

Table 4 shows the results of the moderating effect of the IT infrastructure in lender countries on the relationship between digital distance and lending volume. In all columns, the coefficients of $DigitalDistance_{ij}$ are negative and statistically significant, indicating that digital distance has a negative effect on lending volume, providing additional support to H1. In Column (1), the coefficient of the interaction term $DigitalDistance_{ij} \cdot ln(PenetrationRate_i)$ is positive and statistically significant, indicating that one standard deviation increase in the $ln(PenetrationRate_i)$ mitigates the negative impact of digital distance on the lending volume between countries by 12%.[5] This implies that advanced IT infrastructure in terms of a higher Internet penetration rate can alleviate the negative effect of digital distance on lending volume, supporting H2-a. Similarly, in each of Columns (2) to (7), the coefficient of the corresponding interaction term is positive and statistically significant. These results suggest that lender countries' well-developed IT infrastructure and high Internet freedom can mitigate the negative effect of digital distance on the lending volume between countries, supporting H2-a and H2-b. In conclusion, results in all columns of Table 4 consistently support H2-a and H2-b.

Conclusion

Our study has two key findings and corresponding implications. First, we find that digital distance between two countries decreases lenders' online peer-to-peer lending activities between them. This finding implies that lenders exhibit ingroup favoritism based on online social connectedness, and thus high (low) online social connectedness can be a booster of (barrier to) online prosocial lending activities. This finding further implies that in addition to offline group proximity (e.g., geographical distance and cultural distance) (Burtch et al., 2014; Elfenbein et al., 2023; Galak et al., 2011; Sabzehzar et al., 2023), lenders' lending behavior is influenced by preferences or biases stemming from online group proximity (e.g., digital distance). Second, we find that advanced IT infrastructure and high Internet freedom in lender countries can mitigate the negative effect of digital distance on prosocial lending activities. This finding implies that online group proximity (e.g., digital distance) interacts with offline hardware and policy contexts (e.g., IT infrastructure and Internet freedom), affecting lenders' prosocial lending behavior. These findings also have important practical implications. First, peer-to-peer lending platforms can leverage lenders' and borrowers' online social networks to identify potential lenders, provide targeted recommendations, and enhance the prediction of the performance and success of loan projects. Second, for policymakers and regulators, improving IT infrastructure and Internet freedom can be an effective strategy to overcome the barriers posed by digital distance and foster prosocial lending behavior across countries in online markets.

Our work is not without limitations. Our study leverages the Facebook SCI to measure social (dis)connectedness without using additional measures based on different social media (e.g., Twitter). We plan to replicate our results based on the Twitter-based SCI in the future. Moreover, our analyses are at the bi-countries level, and we plan to replicate our results at a granular level in the future (e.g., bi-states level within the United States). These bi-states level analyses can help mitigate the concerns of potentially omitted confounders (if any) regarding offline group proximities.

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[5] One standard deviation of $ln(PenetrationRate_i)$ is 0.39, and $100*(e^{(0.39*0.281)} - 1)\% = 12\%$. Hence, one SD increase in the $ln(PenetrationRate_i)$ mitigates the negative impact of digital distance on lending volumn by 12%.

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