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Do social networks shape the geography of crowdfunding?¹

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Preliminary draft

Abstract

Does the distance still matters in a context where digital technologies promised to eliminate distance-related costs? In crowdfunding platforms, the founder of a project and the backers mainly exchange tacit information (trustworthiness and seriousness of the founder, feasibility of a project), challenging the ability of the Internet to abolish the cost of distance. We investigate how the existence of social ties between two geographical areas, by lowering the asymmetry of information, can shape the flow of funding in a given country. We take advantage of a unique database provided by the French leader of reward-based Crowdfunding. With a dataset containing 12887 projects and 452 850 contributions representing a value of 19 million euros over the period 2012/2015, we estimate, for each pair of the 94 French regions, the number and the amount of bilateral funding as well as their determinants in a gravity-like equation model. To account for the existence of social ties between French regions we exploit information of the French national Census of 2013 about regional migration. Our mains results are first that the elasticity of distance is still important (around 0.5) in the context of reward-based crowdfunding platforms. We then show that taking into account the existence of social ties between regions strongly reduces and even annihilates (under some specifications) the impact of distance. This result suggest that if digital technology could have reduced the geographical distance, only social proximity seems able to decrease the information-related costs.

JEL classification: O30, R12, R23

Keywords: Crowdfunding, economic geography, gravity, social networks

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1. Introduction

By enabling to share information at the speed of light Internet should have abolished the distance. The so-called weightless economy brought the hopes of a new era of economic prosperity (Quah, 1999). Among these hopes, the use of technology to improve financial activities has attracted the interest of researchers and practitioners as well as the curiosity of a large audience. Companies that embrace these activities, are part of the “Fintech” industry and bring the promise of both democratizing access to funding, optimizing transactions and even improving the wisdom of investment choices. To achieve this goal information asymmetry between investors and project developers should be reduced with obvious consequences on the geography of investment.

Crowdfunding platforms are the precursors of technology-based financial industry. They have received an important attention from the academics (Agrawal et al., 2014; Belleflamme et al., 2014, 2015; Schwienbacher and Larralde, 2012). On these platforms, users propose projects looking for financial support and ask the crowd to fund it. In theory, as the project is exposed online, the opportunity to take part to the financing of the project is the same for a distant funder and for a local one. In Agrawal et al. (2015), the distance between funders and founders is 5000km in average, others evidences on the ability of these platforms to enable distance financing is present in Kim and Hann (2015) and Mollick (2014).

However, the fact that distance would no longer be an impediment to investment is not self-evident. Previous literature which studied the impact of digital technology have shown that the geographical distance still plays a role in the electronic-based exchanges (Blum and Goldfarb, 2006; Gomez-Herrera et al., 2014; Hortaçsu et al., 2009; Lendle et al., 2012). As the traditional distance-related costs (tariffs/taxes, transportation cost) cannot explain the persistence of this effect, the literature has focused on the way information-related costs could still be dependent on the spatial distance.

On crowdfunding platforms, the existence of social ties between projects founders and funders are a natural way to reduce the asymmetry of information. Agrawal et al., (2015) have exhibited the importance of social networks in funding decisions. In their article the authors study the timing of investments and the characteristics of funders of 34 artists on the Sellaband platform². They've first shown that distant funders are more sensitive than local ones to the amount already collected by the project, which suggest that distant users rely on information revealed by other's decision to overcome a higher asymmetry of information. In a second step, the authors were able to identify social proximity between funders and founders and thus, for couples of projects, to estimate the share of “friends and families” financial support. Controlling for the social networks of founders, the authors show that the difference between the timing of investment for local and distant funders tends to disappear. This result is important as it reveals that social ties more than distance can explain the decision to invest in a project. This result is the starting point of our contribution.

In the present work we try to contribute to two questions. First, does the distance still matters in a context where digital technologies promised to eliminate distance-related cost on crowdfunding platforms. Secondly, how the existence of social ties between two areas can explain the geographical flow of contributions between these areas on crowdfunding platforms?

In this article we take advantage of a unique database provided by the French European leader of reward-based Crowdfunding. With a dataset containing 11000 projects and 41000 contributions representing a value of 19 million euros over the period 2012/2015, we estimate, for each pair of the 94 French regions, the number and the amount of bilateral funding as well as their determinants in a gravity-like equation

²Sellaband was a precursor of crowdfunding platforms, dedicated to funding musical project. The company wasn't still active since the mid of 2016.

model. To account for the existence of social ties between French regions we exploit information of the French national Census of 2013 about regional migration.

Our main results are first that the elasticity of distance is still important (around 0.5) in the context of reward-based crowdfunding platforms. We then show that taking into account the existence of social ties between regions strongly reduces and even annihilates (under some specifications) the impact of distance. This result suggests that if digital technology could have reduced the geographical distance, only social proximity seems able to decrease the information-related costs.

Digital technology and geographical distance

Blum and Goldfarb, (2006) was among the first to investigate the effect of distance in a pure electronic context. Based on the web navigation history of 2500 internet users, they have shown that distance between the localization of internet users and the hosting country of the website visited is still determinant in the choice of Internet navigation and thus can't be explained by trade-related cost. Elasticities derived from their gravity equation model show that a 1% increase in distance reduce the number of visits on a website by 2.7% when there is a financial transaction and to 1.1 when there is no financial transaction. Interestingly, the more homogenous (independent of tastes) the product the less is the effect of distance on visits. As a result when traditional distance-related costs approach zero, cultural differences can explain the persistence of distance. The same conclusion appears in Gomez-Herrera et al. (2014), based on an European survey on individual online consumption, they confirm that despite the reduction in the role of distance, cultural differences, proxy by the common language between trading partners, is an important determinant of trade.

Cultural and others tacit information are still highly dependent on distance. If Internet is unable to reduce these asymmetries of information, very proximate interaction is needed (Storper and Venables 2004). This is particularly true in the context of online auctions (Ebay) studied by Hortaçsu et al., (2009). The authors observe a lower elasticity of distance as compared to non-internet transaction but also highlight the importance of "local trade" for goods which can only be consumed locally or when uncertainty exists in the achievement of the transaction, as for instance the reputation of a seller. This bias toward very "local interaction" confirms that geographical distance can still be an impediment to transactions over the Internet. In a close methodology, Lendle et al. (2012) show that the effect of distance is reduced by 65% on Ebay as compared to this offline counterpart.

The geography of crowdfunding

Crowdfunding provides a new and original way to study the role of distance in electronic-based transactions. That is even more interesting than these interactions imply financial settlements and strong asymmetry of information between the stakeholders. Indeed, projects on crowdfunding platforms are experience goods and the ability of the founders to carry out the venture remains unknown to the funders, signaling the quality of the project or the trustworthiness of the founders becomes a key issue in completing the fundraiser on these electronic platforms (Ahlers et al., 2015; Belleflamme et al., 2014). This need for trust and the difficulties to codify this kind of information is a strong impediment to distant interactions and a justification for the remaining importance of distance in the digital age. The existence of a "home bias effect" is a consequence of the need for proximity to settle financial investments. This phenomenon has been extensively documented in the literature in finance (Ahearne et al., 2004; Coval and Moskowitz, 1999) and have been more recently studied in an online context. Lin and Viswanathan (2015) have shown using three different experimental designs that the local preferences still exist when the choice of investment is done via a lending crowdfunding platform. They also highlighted the importance of irrational factors in its tendency to favor proximate investments.

However if reward-based crowdfunding platforms foster distant investment this is because there exists ways to reduce the asymmetry of information. The first is to rely on the others behavior, most platforms

display the amount raised by each project in real time that act as a signal for potential backers. Zhang and Liu (2012) have shown that funders in loaning based crowdfunding engage in rational herding observing both the decision of peers to engage in funding, but also their characteristics as a moderating element of their decision. The second element that seem to moderate the effect of information asymmetry is the previous interaction between the funder and the founders. However, it's rare that a founder propose more than one project on the same platform, thus experiencing funding transaction with the same founders is pretty unlikely. As a result, and following Agrawal et al. (2015) the existence of social ties between backers and founders should be considered as a strong determinant of funding decision. "Friend and Families" not only follow a patronage model of funding but are also the most aware about the reputation and the trustworthiness of the founders. It's of course almost impossible to elicit the share of F&F financing in the thousands of project proposed on the crowdfunding platforms. But based on the huge number of small projects (both in terms of amount raised and number of backers) and the experience of manager's platform it seems legitimate to consider that "friends and family" represents the major part of the funding, especially on the early stage of financing (Agrawal et al., 2015)

Mollick (2014) was among the first to investigate the question of the geography of crowdfunding. His findings have highlighted the way spatial localization can have an impact on the success of a project and the way there exists obvious correlation between the geographical specialization of a region and the category of projects developed. As exposed previously, the article of Agrawal et al. (2015) went further in understanding the spatial dynamics of online investment and especially how the existence of social ties can moderate the effect of distance in the choice to make a contribution. However, and to the best of our knowledge, few researches have tried to evaluate the cost of distance and the way the existence of social ties shapes the geographical flows of funding.

Taking the geographical area as the unit of analysis enable to understand why two particular regions exchange funds and if there exists local determinants to explain these bilateral investments.

Studying bilateral funding of French metropolitans regions have an important implication, especially as regard to the previous literature which focused on less local exchanges. Considering bilateral investments in a given country should lower the impact of distance. For geographical reasons (France is 10 times smaller than the US which is the most studied country) but also because people share the same culture and commons institutions, difference in language, means of payment, banking system or consumption habits can't explain the persistence of asymmetry of information.

The reward proposed in exchange of funding also have the specificity of being highly symbolic. As opposed to lending or equity crowdfunding platforms, backers don't receive part of the benefit or a risk premium. Rewards can just be a private or a public acknowledgment, a goodies or a privilege (being an extra in a movie or meet the musicians backstage in a concert). Consequently and because the mean investment is only 46€ (with a median at 25€), the risk incurred is low (dissatisfaction or the loss of couples of euros) for those who make the choice of backing a project.

All these reasons make that our estimation of the elasticity of distance appears surprising. 0.5 is closed to elasticities found in Hortaçsu et al., (2009) and even higher than in Lendle et al., (2012) who were both studying online sells on e-bay. In a context of a low-risk investment and in a geographical area sharing the same culture we could have expected a lower elasticity of distance online.

The fact that the effect of distance in bilateral regional funding strongly decreases when controlling for regional migrations assume that the existence of social ties between regions plays an important role in shaping the geography of crowdfunding.

The article is organized as follows, in section 2 we present the gravity-like equation model used in this article. The different database involved in the econometric analysis are exposed in section 3, section 4 displays the results and section 5 discusses the mains implications as well as the limits of our findings.

2. The gravity model

To study the role of distance and the impact of social networks on the flow of crowdfunding between regions, we use a gravity-like equation model. Initially developed to study the determinants of international trade (Anderson, 1979; Bergstrand, 1985) they have been used to study exchanges in different contexts including e-commerce (Blum and Goldfarb, 2006; Hortaçsu et al., 2009; Lendle et al., 2012) and recently lending-based crowdfunding (Burtch et al., 2014). As regard to Newton's gravity theory, this specification aims to consider that relationship between two entities is proportional to the size of these two entities and inversely related to the distance between them. In this article we consider the flow of crowdfunding from region i to region j . These funds are the aggregation of individual investment on different projects. As discussed earlier, in the reward-based crowdfunding, there exists a wide range of motivations behind the act of "funding". All in all, even if the reasons behind the contributions on a crowdfunding reward-based platform are various and often incorporate an important symbolic dimension, we can confidentially consider that the flow of crowdfunding between two regions is a market-based exchange between the developer of the project and the funder/consumer/patron who transfer funds. It legitimates the use of gravity equation toolbox to study the cost of distance and the impact of social networks.

The specification of the gravity-like model is as follow:

$$\ln(F_{ij} + 1) = \alpha_1 + \alpha_2 \ln(pop_i \times pop_j) + \alpha_3 \ln(creativ_i \times creativ_j) + \alpha_4 \ln(chomage_i \times chomage_j) - \alpha_5 \ln(distance_{ij}) + \alpha_6 \ln(migrori) + \alpha_7 \ln(migrdest) + \varepsilon_{ij} \quad (eq1)$$

Where F_{ij} is the number of investment from region j to region i . In this first specification, we control for economic variables which presumably impact the propensity of a region to generate online exchange in crowdfunding platform. POP_i and POP_j are respectively the population of region i and j while $JOBLESS_i$ and $JOBLESS_j$ are the rate of unemployment, used as a proxy for the economic activity in region i and j . To account for the important specialization of crowdfunding platforms in cultural projects (Mollick, 2014) we also consider the share of the active population ($creativ_i$ and $creativ_j$) employed in cultural and art sector as a proxy for local skills in the creative industries. This variable is also the opportunity to indirectly account for the impact of the creative classes (Florida, 2005) on the regional success of crowdfunding.

Our strategy to take into account the impact of social networks is based on the article of Combes et al., (2005) in which they have estimated the trade creative effect of migrants in metropolitan French region. We define $MIGRORI_{ij}$ as the number of people living in region i but born in region j , respectively $MIGRDEST_{ji}$ are those who live in region j but was born in region i . Even if these two variables have in common to define the social networks of the stakeholders of crowdfunding campaigns, they've potentially different implications. $MIGRORI_{ij}$ are the immigrant, they reflect the ability of project founders to mobilize the social network of his region of origin to help funding his project. Inversely, $MIGRDEST_{ji}$ are the migrants, those who potentially invest in a project because there exists social ties with their region of origin.

In a second specification, we consider a fixed-effect model to take into account all region specific characteristics that may influence the flow of fundings. As region specific variables are dropped from the estimation, the model takes the following form:

$$\ln(F_{ij} + 1) = \alpha_1 + \alpha_2 \ln(distance_{ij}) + \eta_i + \eta_j + \varepsilon_{ij} \quad eq(2)$$

Where η_i and η_j are the unobserved characteristics of region i and j .

We estimate these models by OLS using a standard log-linearized equation. The drawback of this method is that it provides inefficient estimates in the presence of heteroscedasticity and consider observations when the dependent variable equals zero. We deal with this second issue by using $\ln(F_{ij} + 1)$ as the dependent variable and also propose to estimate equation (1) and (2) using the poisson maximum likelihood (PML) estimator proposed by Silva and Tenreiro (2006).

3. The data

For estimating the model describes above, we took advantage of a unique database provided by Ulule, the French European leader of reward-based Crowdfunding. Since it was launch in 2010 the platform has funded more than 17K projects for a value of more than 78 million €. For the present article, the platform provided us all the projects available on the platform over the period 2012/2015 which represent 15k projects and one million investments for a value of 35 millions €. Once we have dropped projects and funds originated from a foreign country and cleaned from aberrant observations, it remains 14800 projects and 732 686 contributions.

An important point is that the geographical identification is not mandatory during the subscription to the platform, nor for the founder of a project nor for the backer who decide to invest in a particular project. Geographical identification is available for 87% of projects and 62% of contributions, representing 12887 projects and 452 850 bilateral funding for a total value of 19 millions €. We're aware of the potential limitation of observing only a part of the total funding during this period. However, this is only a concern if there exists a selection bias in the declaration of the location by the funders. This issue, discussed in section 5, seems to have very limited consequence on our results.

When users have declared a location, it takes the form of a postal code where the two first digits correspond to department identification numbers. We exploit this information to build our dependent variable which is, over the period 2012 to 2015, the sum of funds from the region of the backer to the region where the project is originated. As exposed in table 1, the mean of bilateral contributions between two regions is 33.3 with important standard errors suggesting strong heterogeneity in the distribution of bilateral funding (for instance, 9.7% of bilateral funding along the French regions equal zero). Intra-regional investment (when backer and founder are living in the same region) are also an important part of the total funding as it represents 28% of the total number of investments and 29% in value.

The French “department” is our unit of analysis. To simplify and because department is a French specificity, we refer to this geographical unit as “region” in this article, the number of such unit is 94. The department is an administrative division of French, created in 1790 and modified along political changes and European conflicts. As mentioned in Combes et al. (2005), this spatial delimitation is not neutral and shapes economic activities and social networks in France. The French department has his own budget, which mainly comes from two different sources, the first is a transfer from the central government and the second comes from local taxes. The competencies of department have also been subject to important changes overtime but have been recently clarified by the law of “modernization of territorial public action”³. The main prerogative of the department remains social policy towards persons in need, this action takes the form of support to family with financial difficulty, help for disabled persons or funding for retirement home. The department is also in charge of financing the RSA (minimum income for person with no other financial resources). This social expenditures account for 50% of total department budget. The rest is mainly devoted to infrastructure for transports, education or public services. Road, airport and ports maintenance which account for 10% of expenditures play a significant

³ <https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000028526298&categorieLien=id>

role in shaping networks inside and between this geographical area and legitimate the choice of departments as a unit of analysis.

The key variables for our demonstration are the two representing social networks between French regions. To build them, we took advantage of the 2013 French census provided by the national institute of statistics. We exploited the database named “residential migrations: localization at the city of residence and at the city of anterior residence”. This dataset provides for 19 million of French resident the region of living at the period of the census and the region of birth. Each individual surveyed is weighted according to his weight in the overall population. These data enable to build a matrix of interregional migration estimating the number of people born in region $i(j)$ and living in region $j(i)$ in 2013. The legitimacy of these variables for proxying the geographical pattern of social networks comes from their ability to provide a picture of the stock of social ties than the individuals in a particular region have accumulated until 2013. Obviously, only considering the region of birth and of living doesn’t provide the whole picture, people can have visited lot of different regions between their birth and 2013 and can also have spent few times in one of this two regions. However, we know that a connection exists between the region of living and birth and if we also consider the size of the sample delivered by the French census (and its adjustment over the whole population), we can be confident in the ability of our matrix to provide, at mean, a faithful picture of the regional migrations and thus a proxy for the existence of social ties between regions.

According to the descriptive statistics in Table 1 and consistent with estimation found in Combes et al., (2005) the average share of migrants per region is 0.4% and the share of people still living in the region where they were born is 51.4%⁴.

Figure 1 displays spatial patterns of our main variables of interest. We show for three different regions the geographical distribution of crowdfunding, immigrants and emigrants. We chose three different regions to highlight potential different patterns. The region “Rhones-Alpes” which hosts the regional metropolis Lyon, the third biggest city in France, The region of Paris which concentrate a disproportionate number of crowndfunding projects and the “Finistère” the westernmost region in France with a strong cultural identity. Figure 1 shows an obvious correlation between flow of crowdfunding in the three regions and migration, even if inward funds appear, at first sight, less concentrated around the region of destination than the flow of migrants that seems more closely related to spatial proximity. This higher dispersion of flow of crowdfunding seems partly driven by the biggest cities in France (Toulouse, Bordeaux, Marseille..) which concentrate an important number of potential backers. The migration of people to and from the region exhibits sometimes different patterns (this is especially true for “Rhônes-alpes”) suggesting the existence of distinct social networks and thus a potential different impact on bilateral funding.

Data used for population and unemployment per region also come from the National French Institute of Statistics for the year 2015, population is counted in number of inhabitants and unemployment is relative to the active population. The share of the active population working in the cultural and art sector in a given region is calculated from the number of jobs available in active establishments in this sector over the number of active people.

Finally, the distance between two regions is simply the geodesic distance in kilometers between the most important cities of each region. The importance of the city is measured by its population and is, with the exception of few cases, the administrative center of the region. Contrary to articles, which used the

⁴ As a comparison in Combes et al., (2005) who studied the migration of workers, these average shares were respectively 0.5% and 52.6%

gravity equation model to study bilateral trade, we don't control for "real" transport costs as the content exchanged in these platforms is mainly made of information and only rarely requires physical shipment.

Table 1: descriptive statistics

VARIABLES	Mean	S.D	Min	Max
JOBLESS	9.95	1.808	6.4	15.4
DISTANCE	404.6	196.3	7.15	1262
FUNDING ij	33.30	119	0	4564
AMOUNT FUNDED ij	1510	6086	0	280007
POPULATION	682984	509167	76204	2607174
CREATIVE	1.518	1.252	0.37	11.77
MIGRATIONij	2568	8670	4.04	287219

4. Findings

Table 2 provides the results of the OLS estimates of regional bilateral crowdfunding without considering intraregional investments, making this specification closer to the canonical model of gravity. Column (1) and (2) estimate the model without the effect of social networks, the elasticity of distance is around 0.5, suggesting that doubling the distance between two regions divides the number of funding by two. At first sight, this elasticity seems important if one consider that there is no systematic shipping costs associated with a contribution on this platform and that no significant cultural differences exist inside France. As a comparison, using international trade data on E-bay Lendle et al., (2012) have found an elasticity between 0.35 and 0.5 (depending on their specification), with comparable sample but considering only intra-country trade, Hortaçsu et al., (2009) found a much lower elasticity between 0.05 and 0.1. This result suggests the existence of important information-related costs in the choice of funding a project and the inability of the platform to disseminate this information online.

Introducing the variables on regional migrations to account for the existence of regional social networks strongly reduces the elasticity of distance. It legitimates social ties as the main means to convey the necessary trust to generate contributions in crowdfunding projects. Column (3) and (4) show the result when adding alternatively the immigrant and emigrant networks. If the elasticity of distance decreases sharply, the network of immigrants (i.e those who live in the region where the project is proposed and were born in the region where the funds are originated) have a stronger positive impact on bilateral investments than the network of migrants. Say differently the impact of social networks is more important when the flow of funding follows the migration of individuals. Interestingly when both the networks of immigrants and migrants are present in the regression (column 5) the effect of distance mostly disappears and stops to be significant.

Table 3 incorporates the intraregional funding by adding the variable HOME (a dummy which equals one when the funder and the founder are in the same region) in the estimate. The elasticity of distance is close to those provided in table 2 and still approaches zero when taking into account the impact of social networks. The most striking result is the magnitude of the "home effect". In the more complete specifications (column 2 to 5) being in the same region increases the number of funding by 300% to 400%. This "prime" to the very close location between funders and project developers suggest a strong non-linearity in the effect of distance, even when controlling for the existence of social networks. Being located in the same region undoubtedly increases the probability of direct or indirect social interactions with the project developer by reducing the uncertainty about the viability of the project. It also increases the probability of being concerned by the project if it has a local impact (opening a bar, a service activity or promoting a local project with an important social value). Once the border of the region is crossed,

the distance has a very limited impact especially when controlling for potential social relationships between funders and project developers.

The others dependent variables likely to have an impact on the bilateral regional crowdfunding have the expected effect whatever the specification of table 2 and 3. The number of funding between two regions is increasing with the size of the population as with the share of employees in the sector of art and creative industries and the economic wealth of both regions.

Table 4 shows the result of the fixed-effect specification. Introducing dummies for regions of origin and destination captures all regions specific effects. The results are consistent with the previous specifications. Doubling the number of immigrants increase the number of funding by 25% as compared to 17% when doubling the number of emigrants. The effect of distance remains negatively significant with an elasticity of -0.05.

As the projects are classified in 15 categories, we were able to estimate our model for each category. Table 6 provides the estimate for some categories including those which have the most important volume of projects. We have to note that categories are self-determined by the owner of the project who decide to link his project to a tag proposed by the platform. Results suggest that elasticities of distance as well as the magnitude of the effect of social networks vary with categories, even if it's difficult to infer general conclusion for each category, some results can be highlighted. The impact of social networks seems more important for "charity" and "music" than for "comics" or "stage" suggesting that the former are more dependent on social ties than the latter. We can also note that funding in "charity" and "music" categories are more impacted by the emigrants than the immigrants social networks. The category "stage" also concentrate a strong "home bias effect" and an important elasticity of distance which can be explained by the nature of these projects which are produced and consumed locally. If we should be cautious about these interpretations, especially for categories which only gather few hundreds of projects, these results suggest that some particular characteristics of the projects induce different geographical patterns.

Test of robustness

Table 5 questions the choice of the number of funding as the dependent variable, column 1 and 2 can be compared respectively with column 5 in table 3 and column 4 in table 4. Results show that considering the amount of funds instead of the number of funding doesn't change the result and marginally the elasticities. The main difference is that the coefficient associated with the log of distance remains non-significant even with fixed-effect specification.

The impact of Paris and its region in the result can also be a concern. The predominance of the capital in the French economy is well known, Paris and its region represent 3.4% of the total population but concentrate 11.7% of the projects developed in our dataset, it also concentrated the creative industries employing, 11.4% of its active population when the national mean is 1.5%. 17% of the number of funding in our sample goes to Paris and 11% are originated from it. For economic reason the region is also very attractive for workers. That's why we make the choice of estimating the gravity-like model without observations concerning the region of Paris to ensure the robustness of our main findings. Results are presented in table 7 and are plainly comparable with those in table 3 showing that the predominance of Paris doesn't drive our mains findings.

5. Conclusive discussion.

By estimating the effect of distance on the regional flow of crowdfunding and showing the importance of social ties between regions in the geography of crowdfunding, we have completed and extended the results of Agrawal et al., (2015). However, before discussing the implications of our main findings we have to discuss the potential limitation of our results.

Others factors than social ties between regions can explain the correlation between the migration of individuals and the flow of crowdfunding. People are looking for professional opportunities and thus choose to locate where economic activity is growing. This is also where ideas and projects emerge making it a natural destination for funding. However the fact that our result is robust to the fixed-effect specification limits the possibility that omitted variables or endogeneity weaken our result.

The significance of the variable MIGRDEST also shows that there is a correlation between the number of people who leave the region and the funding which goes to this region. This relationship is probably a better marker of the existence of social link with the region of origin, links which could be decisive in the decision to fund a project.

As mentioned in section 3, we were only able to consider 67% of the total contributions of the whole database. The reason is that a user on this platform doesn't have to declare his location to make a contribution. Does it has an impact on our result? Does it exist a selection bias making that a user who declared his location is different from the one who doesn't ? A way to control for this potential bias is to compare the two subsample using a common attribute. The distribution of the contributions can be a good candidate. Comparing the means and the standard deviation of the two sample (with and without declared localization) reveals no significant difference in the mean of the two distributions and a significant difference of the standard errors as exposed in the following table 8.

Tableau 8: comparison of the two subsample with and without location of contributors

Group	Obs	Mean	Std. Err.	Std. Dev.
Without location	279836	46.03	.20	106.2
With location	452850	45.93	.13	91.3
combined	732686	45.971	.113708	97.33074
difference		.1068415	.2340347	

* Significant difference at 1%

However even if the standard deviation is lower for the subsample we used in this article, it seems unlikely that it hides a significant difference in the nature, motivations or locations of contributions. Another way to highlight differences in the sample with and without localization is to use the tag or category associated with each project. The main categories of projects (music, film and video, stage, publishing) are present in the same proportion in the two subsample. The only difference comes from the under-representation of contributions made to projects labeled "charity" (respectively 14% and 19% of the sample with and without declared localization) and an over representation of contributions made to "games" and "comics" (90% of the investments in these two categories are geographically located). It seems obvious that projects which aim to produce physical goods as for video games or comics probably provide physical rewards which make more likely that a contributor declares his location to receive some of these rewards. However because these categories only represent 10% of total projects and considering that, in term of amount contributed, no difference in mean exists between the two subsample we can be confident that our result are weakly affected by the non systematic declaration of localization.

As exposed in the introduction, different promises go with the rise of crowdfunding. Among them the hope of the democratization of access to funding. A corollary is that places where a project is developed matter less in a world where crowdfunding exists. Our result tends to mitigate this assertion, flow of funding is higher between crowded and dynamic regions and nothing suggests that opportunities arise for the less dynamic region thanks to crowdfunding platforms. By following the migration of the

populations, financial exchanges partly reflect the geography of social ties. More than generating news opportunities for project founders, crowdfunding platforms seem to be used as a tool to fluidize a market where the strong asymmetry of information makes potential investment less likely to happen. The fact that two different regions exhibit important bilateral contributions when they share common migration history can also suggest that platforms users are looking for projects which involve emotional components. Social ties but also regional attachment or distant engagement to particular community can lead these emotions.

For a managerial point of view, our finding implies that, everything equals, a project in a particular region is more able to attract contribution from a region with which important social ties have been established. Implementing in algorithms, recommendations based on interregional migration data can help to optimize the impact of these recommendations. Some of the reasons that link two different regions are obvious because led by cultural history or geographical proximity but others reasons can be the consequence of past industrial relationship or even the existence of infrastructure facilitating interregional mobility. All these information can help to understand motivations that drive funding between two regions and then target projects that are more likely to spark the interest of funders.

We also have to keep in mind that the reward-based crowdfunding mainly aims to fund “cultural” projects, those where the asymmetry of information is consubstantial to the nature of these projects. This is probably why the impact of digitalization is longer to be observed, in studies of Gomez-Herrera et al. (2014) or Lendle et al. (2012), products sold on Ebay are more standardized and less subject to asymmetry of information between buyers and sellers. It explains why the elasticity of distance in our study is higher when social ties are not took into account but also why a proxy for social proximity shrinks these elasticities.

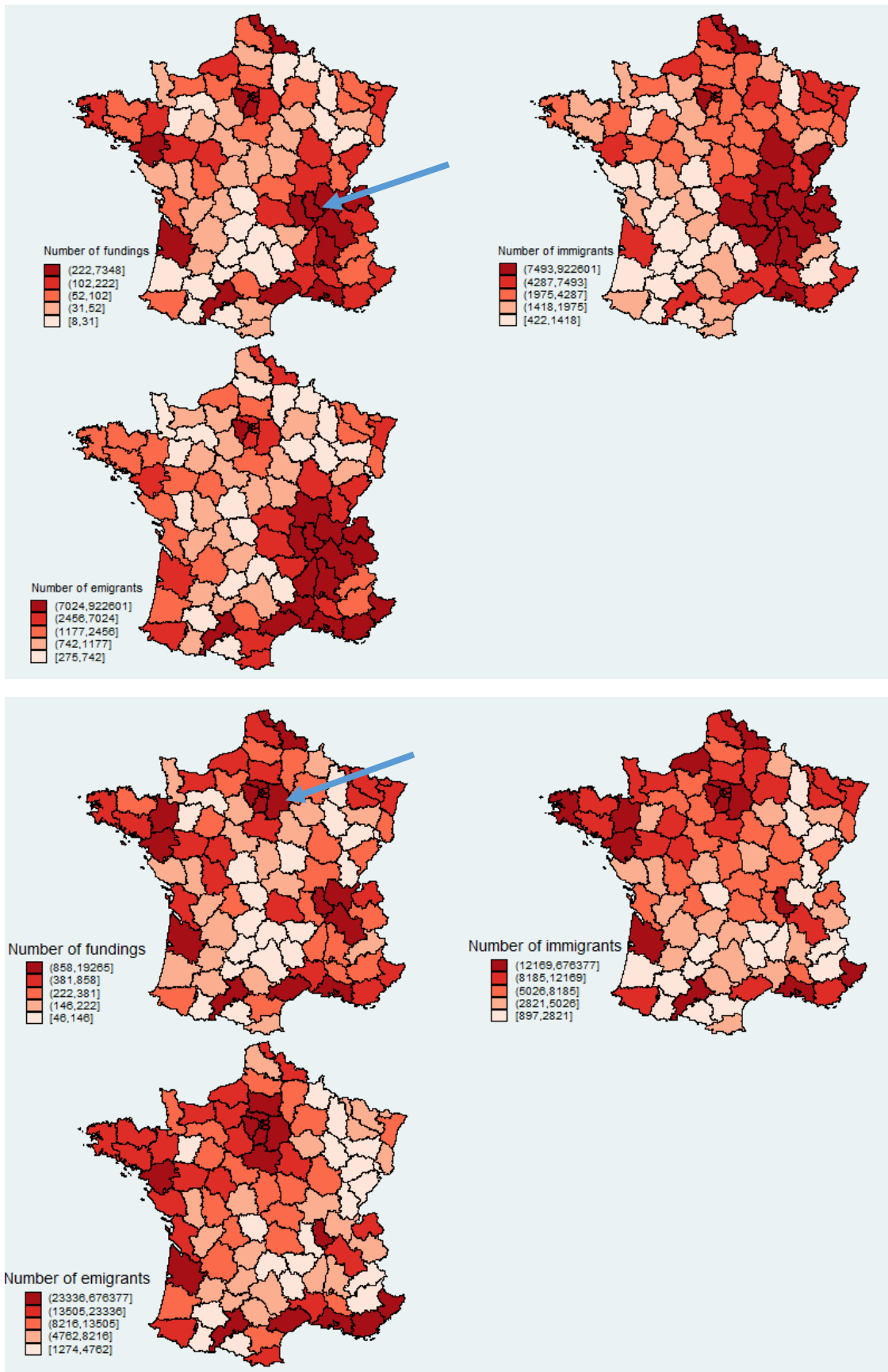
Eventually our findings show that social networks shape the geography of crowdfunding. Digital platforms have definitely fluidized exchanges and, in our case, financial contributions but for many information-demanding interactions, it probably fails to deeply change the opportunities for the protagonists of this market. In the case of asking the crowd to fund project it seems more accurate to pretend that crowdfunding platforms helped to concretize latent interactions more than creating and extending the field of possibilities.

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Figure 1: Geographical pattern of funding and migration



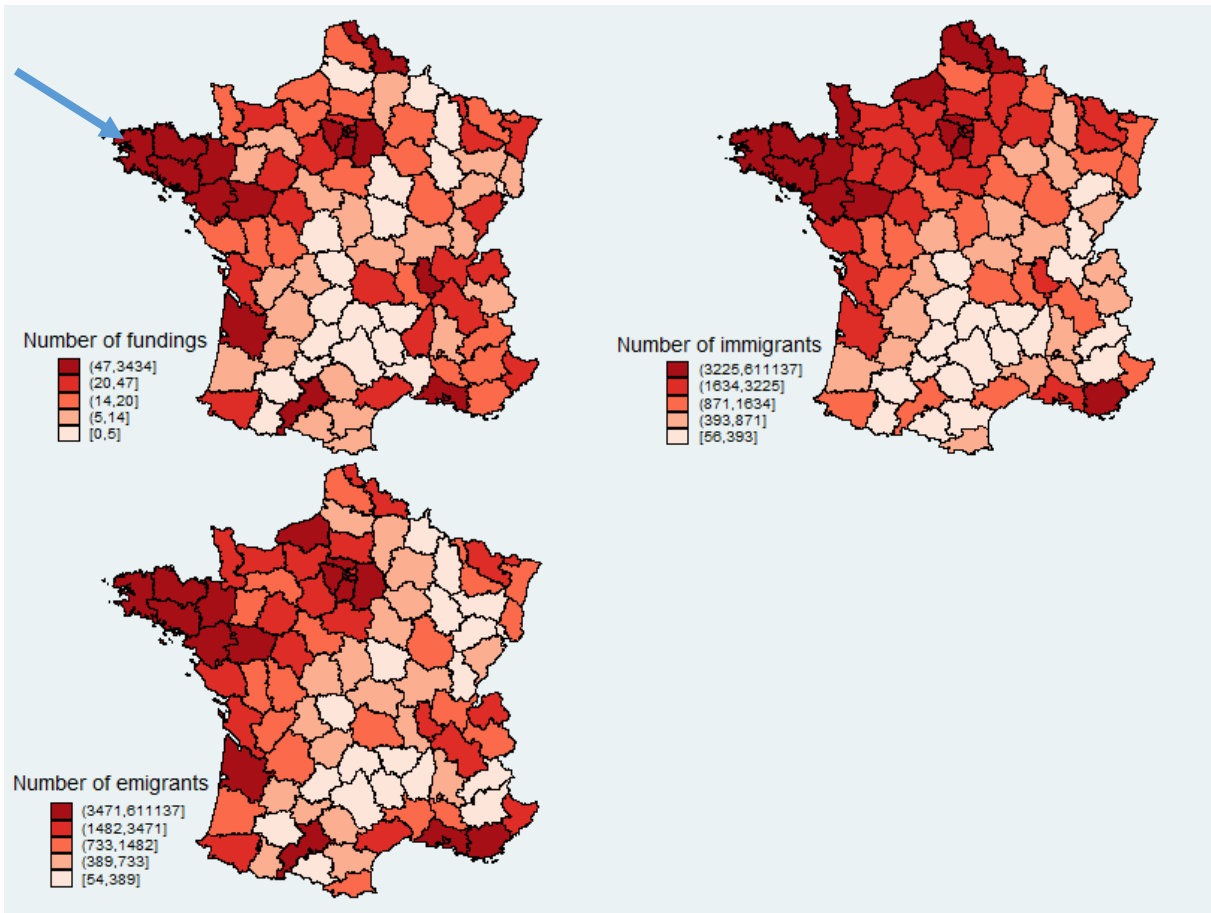


Tableau 2: OLS Estimation of the bilateral regional funding

VARIABLES	Ln(F _{ij}) (1)	Ln(F _{ij}) (2)	Ln(F _{ij}) (3)	Ln(F _{ij}) (4)	Ln(F _{ij}) (5)
Ln(distance)	-0.538*** (0.0162)	-0.478*** (0.0158)	-0.190*** (0.0193)	-0.275*** (0.0203)	0.00798 (0.0236)
Ln(POP _i * POP _j)	1.059*** (0.0092)	0.906*** (0.0102)	0.675*** (0.0151)	0.744*** (0.0164)	0.517*** (0.0189)
Ln(JOBLESS _i * JOBLESS _j)		-0.360*** (0.0376)	-0.400*** (0.0370)	-0.388*** (0.0373)	-0.428*** (0.0366)
Ln(CREATIV _i * CREATIV _j)		0.425*** (0.0151)	0.387*** (0.0148)	0.398*** (0.0146)	0.361*** (0.0144)
Ln(MIGRORI _{ij})			0.255*** (0.0127)		0.253*** (0.0123)
Ln(MIGRDEST _{ji})				0.179*** (0.0135)	0.177*** (0.0129)
Ln(MIGRORI _{ij} * MIGRDEST _{ji})					
Constant	-22.46*** (0.271)	-17.36*** (0.294)	-14.46*** (0.321)	-15.32*** (0.337)	-12.47*** (0.349)
Observations	8,742	8,742	8,742	8,742	8,742
R-squared	0.617	0.653	0.669	0.661	0.677

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3: OLS Estimation of the bilateral regional funding with intraregional investment

VARIABLES	Ln(F _{ij}) (1)	Ln(F _{ij}) (2)	Ln(F _{ij}) (3)	Ln(F _{ij}) (4)	Ln(F _{ij}) (5)
Ln(DISTANCE)	-0.525*** (0.0168)	-0.463*** (0.0165)	-0.168*** (0.0195)	-0.248*** (0.0207)	0.0249 (0.0223)
Ln(POP _i * POP _j)	1.050*** (0.00963)	0.899*** (0.0102)	0.659*** (0.0149)	0.725*** (0.0162)	0.503*** (0.0181)
Ln(JOBLESS _i * JOBLESS _j)		-0.370*** (0.0375)	-0.408*** (0.0366)	-0.397*** (0.0370)	-0.433*** (0.0360)
Ln(CREATIV _i * CREATIV _j)		0.420*** (0.0151)	0.383*** (0.0146)	0.393*** (0.0145)	0.358*** (0.0142)
Ln(MIGRORI _{ij})			0.267*** (0.0126)		0.259*** (0.0120)
Ln(MIGRDEST _{ji})				0.194*** (0.0135)	0.183*** (0.0126)
HOME	1.080*** (0.151)	1.429*** (0.151)	1.551*** (0.117)	1.518*** (0.125)	1.631*** (0.104)
Constant	-22.29*** (0.271)	-17.20*** (0.294)	-14.22*** (0.318)	-15.03*** (0.333)	-12.27*** (0.339)
Observations	8,836	8,836	8,836	8,836	8,836
R-squared	0.644	0.676	0.693	0.685	0.701

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4 : Fixed effect estimation of bilateral regional funding

VARIABLES	Without intraregional funding		With intraregional funding	
	Ln(F _{ij}) (1)	Ln(F _{ij}) (2)	Ln(F _{ij}) (3)	Ln(F _{ij}) (4)
Ln(DISTANCE)	-0.564*** (0.0132)	-0.0611*** (0.0164)	-0.551*** (0.0141)	-0.0476*** (0.0174)
Ln(MIGRORI _{ij})		0.251*** (0.0214)		0.257*** (0.0215)
Ln(MIGRDEST _{ij})		0.164*** (0.0219)		0.170*** (0.0220)
HOME			0.932*** (0.143)	1.304*** (0.0914)
Constant	8.097*** (0.116)	2.593*** (0.194)	8.031*** (0.120)	2.412*** (0.198)
Observations	8,742	8,742	8,836	8,836
R-squared	0.864	0.880	0.870	0.888

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Tableau 5: Estimation with the amount of bilateral funding as dependent variable

VARIABLES	Ln(A _{ij}) (1)	Ln(A _{ij}) (2)
Ln(DISTANCE)	0.0524 (0.0387)	0.0119 (0.0350)
Ln(POP _i * POP _j)	0.778*** (0.0321)	
Ln(JOBLESS _i * JOBLESS _j)	-0.441*** (0.0708)	
Ln(CREATIV _i * CREATIV _j)	0.449*** (0.0276)	
Ln(MIGRORI _{ij})	0.391*** (0.0226)	0.460*** (0.0496)
Ln(MIGRDEST _{ji})	0.268*** (0.0234)	0.235*** (0.0503)
HOME	1.340*** (0.171)	0.910*** (0.174)
Constant	-18.09*** (0.652)	5.125*** (0.363)
Fixed-effect	NO	YES
Observations	8,836	8,836
R-squared	0.571	0.759

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 6: Estimation of bilateral funding for different categories of projects

VARIABLES	Ln(F _{ij}) Comics	Ln(F _{ij}) Vidéo	Ln(F _{ij}) Music	Ln(F _{ij}) Publishing	Ln(F _{ij}) Charity	Ln(F _{ij}) stage	Ln(F _{ij}) Pre-sale
Ln(DISTANCE)	-0.114*** (0.0323)	-0.0662** (0.0324)	-0.180*** (0.0231)	-0.00615 (0.0290)	-0.0475* (0.0254)	-0.147*** (0.0243)	-0.0308 (0.0328)
Ln(POP _i * POP _j)	0.452*** (0.0213)	0.301*** (0.0218)	0.221*** (0.0185)	0.274*** (0.0206)	0.301*** (0.0180)	0.121*** (0.0161)	0.257*** (0.0214)
Ln(JOBLESS _i * JOBLESS _j)	-0.177*** (0.0349)	-0.407*** (0.0387)	-0.411*** (0.0296)	-0.234*** (0.0359)	-0.314*** (0.0325)	-0.225*** (0.0255)	-0.151*** (0.0351)
Ln(CREATIV _i * CREATIV _j)	0.211*** (0.0156)	0.302*** (0.0172)	0.276*** (0.0136)	0.373*** (0.0161)	0.303*** (0.0139)	0.262*** (0.0124)	0.223*** (0.0169)
Ln(MIGRORI _{ij})	0.0325*** (0.0124)	0.116*** (0.0142)	0.0939*** (0.0113)	0.132*** (0.0127)	0.112*** (0.0118)	0.0468*** (0.00927)	0.0189 (0.0131)
Ln(MIGRDEST _{ji})	0.00222 (0.0130)	0.102*** (0.0141)	0.177*** (0.0113)	0.0185 (0.0123)	0.136*** (0.0113)	0.0601*** (0.00922)	0.0593*** (0.0127)
HOME	0.762*** (0.192)	1.354*** (0.163)	1.127*** (0.147)	1.481*** (0.179)	1.743*** (0.142)	1.445*** (0.169)	0.844*** (0.203)
Constant	-10.12*** (0.373)	-6.518*** (0.373)	-4.043*** (0.339)	-6.593*** (0.369)	-7.174*** (0.332)	-1.835*** (0.274)	-6.063*** (0.385)
Observations	8,836	8,836	8,836	8,836	8,836	8,836	8,836
R-squared	0.378	0.441	0.577	0.427	0.556	0.473	0.276
Number of projects concerned	293	2312	1725	683	2542	1006	249

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 7: OLS Estimation of the bilateral regional funding with intraregional investments and without Paris

VARIABLES	Ln(F _{ij}) (1)	Ln(F _{ij}) (2)	Ln(F _{ij}) (3)	Ln(F _{ij}) (4)	Ln(F _{ij}) (5)
Ln(DISTANCE)	-0.518*** (0.0171)	-0.475*** (0.0171)	-0.176*** (0.0202)	-0.277*** (0.0218)	0.0140 (0.0234)
Ln(POP _i * POP _j)	1.011*** (0.00939)	0.902*** (0.0102)	0.665*** (0.0151)	0.745*** (0.0165)	0.514*** (0.0186)
Ln(JOBLESS _i * JOBLESS _j)		-0.308*** (0.0380)	-0.361*** (0.0373)	-0.343*** (0.0376)	-0.394*** (0.0367)
Ln(CREATIV _i * CREATIV _j)		0.353*** (0.0159)	0.331*** (0.0155)	0.338*** (0.0155)	0.317*** (0.0152)
Ln(MIGRORI _{ij})			0.262*** (0.0129)		0.259*** (0.0123)
Ln(MIGRDEST _{ji})				0.174*** (0.0138)	0.169*** (0.0128)
HOME	1.142*** (0.151)	1.383*** (0.152)	1.549*** (0.119)	1.494*** (0.129)	1.655*** (0.106)
Constant	-21.32*** (0.263)	-17.48*** (0.297)	-14.48*** (0.323)	-15.49*** (0.340)	-12.57*** (0.348)
Observations	8,649	8,649	8,649	8,649	8,649
R-squared	0.632	0.652	0.669	0.660	0.677

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Tableau 8: Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)
(1) DISTANCE	1.00					
(2) POP	0.07	1.00				
(3) JOBLESS	0.11	0.06	1.00			
(4) CREATIV	-0.04	0.56	-0.04	1.00		
(5) MIGRORI	-0.24	0.20	-0.02	0.14	1.00	
(6) MIGRDEST	-0.24	0.26	-0.02	0.30	0.62	1.00