1 Introduction

Human mobility can be hugely effective in raising a person income, health and education prospects. And there are some concerns about this elements in the migration literature. But its value depends of others elements. In this paper we will investigate the cultural, institutional and religion factors that could influence the decision to migrate in Brazil. Another point is the fact that be able to migrate is a key element of human freedom Klugman (2009). But, in brazilian case, we have another concern. We get more internal than international migrants. So, in this sense, this paper highlights some considerations at the county level, regarding the cultural, institutional and religion aspects in the brazilian internal migration.

So we intend observe the effects of internal migration flows in brazilian economy. Some articles clearer this relation (Da Mata *et al.* 2007; de Lima *et al.* 2019). While considering traditional elements, for example, age, wage, scholarship, population and GDP are crucial to explain these movements, the are also important differences in using cultural, institutional and religion aspects. Traditional components could be driven by these gaps and their interaction.

We consider the parameters of the gravity model and then we measure in distance terms. And this mean to consider besides the number of migrants, the GDP, the population and the rate of unemployment of the origin and destination county, the cultural, institutional and religion components.

There are push and pull elements for population mobility. This study will explore how the flow of migrants behaves with the population of the municipality and mainly the GDP, showing the weight of cultural, institutional and religion distances exposing the explanatory power of the migratory movement in the people flow of the city.

In view of this, we have two questions: i) what intrinsic migrants characteristics contribute to the internal migration effects using data from the migrant's city of origin and controlling for monetary and non-monetary costs. In addition, we have a second question: ii) there are a cultural, institutional and religion component in the internal migratory movement in Brazil? This question is related to the first one because, for example, cultural component in a society is a non-pecuniary cost and generally not considered in this analysis.

There are several studies analyzing the relationship between the international migration and the cultural, institutional and religion factors among the countries such as (Collier *et al.* 2014; Falck *et al.* 2018). Some studies analyze this relationship with the focus in internal migration such as Molloy *et al.* (2011) but not considering political freedom and culture. Countries like India, China and USA are concerned about this movement of their population. The voluntary process of migration is also a field of study very explored by the brazilian literature. We explore the connection with distance variables and some economic variables that are linked with the gravity model like GDP, population and unemployment rate with others characteristics such as politic system, personal trust, community trust, market orientation, collectivism, personal collectivism, freedom politic, corruption, provision public goods hard work and thrift, intention of migrate to another country, uncertainty avoidance and religious orientation. Beyond of this, our study will focuses in the internal migration in Brazil and in the effects of cultural, institutional and religion

components. Therefore it is far from clear what happens to the cities where people are moving into, especially when we consider that not every one would be affected the same way. We believe that places with some similarities will provide an pleasant environment to be introduced in the new city. Our study expands this field of research by looking at the intra-national economic interaction the role of culture has, to our knowledge, not been addressed for Brazil.

In this article, we use the LAPOP survey beyond the Brazilian Census. Others variables we will chose in the survey of IBGE, Anuario Estatistico do Brasil. Thus we will chose the variables about birth plate at Brazilian Census at year 2010. And integrate this database to cultural, institutional and religious variables at the 2010 year from LAPOP database. Then we will analyze the push and pull factors of internal migration with the background of the gravitational model.

With this model, we will integrate the gravitational model with cultural, institutional and religious distances and these effects in the movements of the people in the Brazilian territory. At the moment, in this field of literature, the act of not considering the cultural, institutional and religion distances are accounting for omitting variables that otherwise bias the coefficient of migration flux.

We expect to find the importance of the cultural, institutional and religion components matters to the flux of the migrants at the cities in Brazil. And we could say that agglomerations are better in this contexts. So we chose to contribute to this literature in this point. The cultural, institutional and religion aspects are an important power factor that an individual choice is faced. We consider the act of migrate as an investment on which the migrant gets a return after. Beyond this, we consider impediments to mobility, such as geographical distance, require increased investments. Cultural, institutional and religion components are consistent factors that facilitate or not the process of migration. There are similarities that attract people to the process of migration and could generate the diaspora effect like explained by Collier and Hoeffler (2018). Among others things, this study focus on the understanding how the host cultural identity and the cultural distance between the host and origin cities might help us understand this relationship.

The results are important to highlight how the Brazilian society has some liability to migrate. We care with some confounding situations that we detail in the empirical analysis. The condition of a people that tend to migrate to a place that is similar to the origin place is a point of concern and we care about this with some strategies.

A large difference in cultures, institutions and religions could, therefore, potentially both impede migration and accelerate its increase. Thus, our article contributes to the migration literature in two ways. First, we improve on existing studies applying the gravity models with a new database (LAPOP) and second, we examine the impact of the cultural, institutional and religion distance between sending and receiving counties in Brazil.

Institutions are another important and extensively studied determinant of entrepreneurial activity. **?** and many other authors understand culture as a part of a country's informal institutional system. Both institutional and cultural factors are in the focus of **?**, **?** or **?** since these factors facilitate the identification, creation and exploration of opportunities (**?**). For their interrelation

with culture, a careful treatment of institutions is indispensable in the present study. In fact, it remains an open question whether individualism - and culture in general - have a mediating effect on institutions (**??**) or whether the quality of institutions and the degree of development moderate the effect of cultural traits on entrepreneurship (Kyriacou 2016; **?**; **?**).

The organization of this paper is as follows. In the second section, we review the literature on the subject and expose how our approach and its results complement previous findings. The third section explains our empirical strategy. The fourth section presents the data and some descriptive statistics. Section five contains the main results, further investigations on the transmission channel of culture and robustness checks. Section six concludes.

2   Empirical Strategy

First, we will show why existing gravity studies are unable to obtain estimates of the effects of county institutions, cultural traits and religious on internal migration flow. In this estimation, a core model based on the assumption that migration is determined by push and pull factors is presented.

This gravity model of migration suggests that differences in unemployment rate and population density between host and origin counties in Brazil are important factors in the migration decision. While the collinearity issue that we describe at this stage is obvious, we present this trivial step as an opportunity to introduce the design of our analysis as well as some notation.

Finally, we show that it is not possible to identify separate effects of institutions, cultural traits and religion on the flow of migrants. So we calculate cultural, institutional and religious distances to proxy this variables in our model.

The equations are presented in a cross-section way, because we use the 2010 Brazilian Censo year. After this short discussion of the stock and flow data, we provide a more formal description of our model.

First, we have replaced the bilateral migrant costs variables T_{ij} at the log-linearized equation with a vector of migrant cost variables

$$GRAV_{ij}$$

, which we include determinants of bilateral migration influx that we consider that can influence this relation.

And for our purpose, we separate explicitly the three group of variables of interest that measure institutional, cultural and religious aspects of Brazil from both sides (IC_i) and (IC_j). Another concern is include the fixed effects of the counties. So, we regress the same above model with fixed effects to origin and host municipalities. At the literature the inclusion of the multilateral resistance term is an important issue. Normally MRT represent the barriers to migrate. Since we are considering the migration intra-municipality, we define that we do not have barriers to migrate. So we account for the costs, but not to the barriers. Baldwin *et al.* points that the the non-inclusion of the MTR term may bias the coefficients of the cost variables, especially those associated with border dummies.

So in order to isolate the effect of cultural, institutional and religion on the migrants influx, it is important to control for the potential confounding factors discussed in the previous section. For this reason, we use these variable, in distance terms, derived from some questions from LAPOP database. Silva and Tenreyro (2006) demonstrate the presence of these three factors in an exponential multiplicative model that makes it impossible to estimate the coefficients of the gravitational equation using ordinary least squares (OLS). The solution proposed by these authors is the adoption of the non-linear estimator called the Poisson pseudo-maximum likelihood (PPML). In addition the conditions of identification of the PPML are incompatible with the identification of the log-linear models.

After this, we need deal with the inconsistency in the presence of heteroscedasticity at this model form. So Silva and Tenreyro (2006) proposes a estimation model with Poisson Pseudo Maximum Likelihood (PPML). So we made additional regressions with the PPML model and then with fixed effects. In this case, we can estimate efficient parameters with characteristics asymptotically efficient. These problems arise in logarithmic transformation due to heteroscedasticity usually present in migrant data. And as pointed by Silva and Tenreyro (2006), this practice of log linearizing the gravity equation results in errors values depending on the covariates of the regression and hence resulting in inconsistent regression even then all observations of the dependent variables are strictly positive like in our case. We construct a database without zeros. Consequently, due to Jansen inequality doesn't apply, the error term is not equal to the log of the error term as the error terms in the log linear specification of the gravity equation are not statistically independent of the regressors but are rather heteroskedastic, leading to inconsistent estimates of the elasticity coefficients.

Given this Jansen inequality, Silva and Tenreyro (2006) argue that the log linear transformation of the gravity model is intrinsic to heteroscedasticity and applying OLS results into biased and inefficient estimates. However, the PPML estimates the gravity equation in levels instead of taking its logarithms and this is said to avoid the problem posed by using OLS under logarithm transformation. According to them, this model is appropriate: first, the Poisson model takes account of observed heterogeneity. Second, the fixed effects PPML estimation technique gives a natural way to deal with zero valued trade flows because of its multiplicative form. Third, the method also avoids the under-prediction of large trade volumes and flows by generating estimates of trade flows and not the log of the trade flows. In their 2006 influential paper, they find the PPML estimator, which need not be does not need to be log-linearized, to be the best performing estimator that naturally deal with zero trade flows, consistent and gives the lowest bias among the other estimators.

They therefore suggest it as the new workhorse for the estimation of the typical constant elasticity models, such as the gravity model (Silva and Tenreyro 2006, 2011), find that PPML is consistent and generally well-behaved even in the presence of over-dispersion in the dependent variable and that the predominance of large proportion of zeros does not affect its performance.

(Baghdadi *et al.* 2013; Head and Mayer 2014) find that the choice of the best estimator is dependent on the specific dataset, and there is no generally best estimator for these three datasets; thus the appropriate estimator for any application is data specific which could be

determined using a number of model selection tests. Our dataset, for construction, does not have zero migration flow. We select only the cities with individuals with former movement based on the born place.

Returning to the fixed effect, Silva and Tenreyro (2006) and Silva and Tenreyro (2011) consider that the unobserved heterogeneity is correlated with the error term. Usually the model proposed by Anderson and Van Wincoop (2003) is estimated by a fixed-effects PPML approach with these concerns. There are, however, some drawbacks in the fixed effect model in the sense that all time invariant explanatory variables like the perfectly collinearity with the fixed effects would be dropped from the model. Consequently, fixed effect model eliminates some important theoretically relevant variables from the gravity equation which are distance, common language, common borders and the effects of these variables cannot be established. The considerations made above suggest that we need to include in our empirical analysis the PPML model. So, in this paper, following these latest considerations, we estimate the fixed-effects models in **?** and include the PPML and report White heteroscedasticity-consistent standard errors as our basic principle for estimating the gravity model of migration influx. The Gamma Pseudo Maximum Likelihood (GPML), the estimation method is similar to PPML, but utilizes the gamma instead of the poisson distribution, thereby implies different assumptions to the data structure and does not allow for zero trade values.

3 Data

The dataset we assemble for the present study is composed of several sources. The most important data source being the Global Entrepreneurship Index (GEI) from 2017. It is an attempt to measuring the global entrepreneurial ecosystem performed and published by **?**. The 2017 version of the GEI goes far beyond calculating total entrepreneurial activity and features some important refinements over its previous versions. In this section, we will present our data and our strategy to identify the impact of county cultural, institutional and religion factors on the flow of internal migration in Brazil.

We develop and present our identification strategy in three steps based in the work of Falck *et al.* (2018).

So one of the empirical question of this study is whether internal migrants with certain political and cultural or even religion aspects tend to move to locals with more opportunities proxied by density population of the county of attraction.

The gravity model can not detect that probably the migrants with closer characteristics are more prone to move to places with aspects of the origin destiny. This is an unobserved characteristic that we can not control directly. Then we include the dyadic variable unemployment rate that can control for local amenities and disamenities for example. When someone chose the place to work, the cost of living in this place and the amenities are counted for the decision.

The dataset that we assemble for the present study is composed basically of three sources: Brazilian Censo, Brazilian Institute of Geography and Statistics (IBGE), Departamento de Informatica do Sistema Unico de Saude (DATASUS) and latin American Public Opinion (LAPOP).

We do not use the World Value Survey (WVS) could not used because the differences between inter-local and intralocal applications of the model cannot be handled with the available data due to the low number of the observations.

LAPOP use the approaches and innovative methods to carry out targeted national surveys. Brazilian Censo and others variables from IBGE are traditionally collected.

We use a full list of xx counties in Brazil that are listed at table **??** and **??**. Migrants are defined as people living in one county at last ten years and having been born in another county. This is justified by the fact that a migrant normally make the decision of the place and the decision of time period in which must move between locations Molloy *et al.* (2011). And this mean 450 counties pairs randomly selected on a set of 54 counties. We chose the county geographic unit of measurement. This is one form in that the data are more available. At brazilian studies, is more common state datasets. But both suffer the problem of misclassification like pointed by Molloy *et al.* (2011). This could occur because that some between-county movers remain within the same local labor market.

The UN Report 2013 points that migrant is the person who stay abroad for more than one year, so our understanding are in line with the UN definition.

Thus, the concept of internal migration is based on where people are born. And, for construction, there are not counties with zero migrant flux.

All of this datasets are from 2010. Of course, the data limitations of a one-year time series cannot report for a temporal order of preferences, but it can offer a hint on the general tendency measured in absolute levels, which is then a matter of further exploitation. Individuals who have moved many times at this 2010 year will be indistinguishable from individuals who have only moved once. If the lifetime is bigger this situation is more common. This could affect the measurement of migrants because some movers will have returned to their birth county after spending some time elsewhere Molloy *et al.* (2011). One of the consequences of that is the fact of the data do not reflect recent migrant decision Molloy *et al.* (2011). About the variables to measure the migration effect, this subject deserves some considerations. Several studies have adopted different variables like birth place, last residence, reasons of migration and duration of residence at the village. About the variables of social distances, we follow Kogut and Singh (1988) and the hypothesize that the more culturally distant the origin county migration in Brazil, the more likely the choice to set a place with similarities with the destiny place. The distance variables were calculated by the quadratic distance between the origin and destiny. We also include the linear distance to offer another way to see the results. The list of variables chosen by the LAPOP questionary are at A.1.

We chose to use the time travel in place of distance in kilometers because we believe that the former incorporate more appropriately the effective distance and account for the infrastructure between the cities.

We work with the fact that individuals with specific characteristics acquired in their birthplaces are prone or not to migrate. Particularly, when dealing with people who have migrated from small towns to large urban agglomerations. And this confirms the effects of the dynamic advantages such as learning, sharing and matching that are associated to large agglomerations.

There are some studies, particularly, Chetty and Hendren (2018a, b) that explains the effects of children living in places that could shape their earnings.

At the recent literature, we can observe by some empirical papers using the work force of migration from the labor market ((Combes *et al.* 2010; Combes and Gobillon 2015; Glaeser and Mare 2001; Roca and Puga 2017)). Thus, movements occurred prior to the period of entry into the labor market are not count as an intrinsic effect that could qualify this type of labor. Then we chose the birth place to better consider our concern about cultural, institutional and religion factors. In brief, this variable could represent the trade-off in income for distance Ritchey (1976). But this variable would misrepresent the psychic costs. In the literature, there are structural attributes and social-psychological attributes. In brief, people more extrovert, less agreeable, less conscientious, more open minded report more likely migration intentions. So, this factors reflect personal traits. About the general cultural aspects we use xxxx variables. We use this approach because is notoriously difficult to measure and then we use these variables cited above to highlight the cultural, institutional and religion aspects.

Appendix table A.1 provides an overview of the descriptions and sources of the variables used in this study.

Table **??** depicts the respective summary statistics like mean, standard deviation, minimum and maximum value of each variable. The table **??** with complete data used in the present analysis.

4 Results

4.1 Baseline results

Table 1 presents the FPRM estimation results. In the basic specification in column (1), the dependent variable is the opportunity startup index and Hofstede's individualism index is the only explanatory variable. According to the previous theoretical considerations, the coefficient of individualism is positive and significant. The (standardized) beta coefficient indicates that an increase in the degree of individualism by one standard deviation would foster the number of opportunity startups by 0.68 standard deviations.

In this section, we provide some estimations on gravity models accounting for several issues like heretogeneity and fixed effects. We use the distance proxied by the time travel like introduced by Weber and Péclat (2017) in this approach of gravity model. In this context, we include time travel, origin and destination GDP, origin and destination population densities, origin and destination unemployment rate to account for the structural attributes used in this study. We test whether fourteen cultural, institutional and religious variables are helpful to explain the variations in the migrant flux in brazilian cities. We believe these variables could affect people's behavior, attitudes and thoughts. Further, we consider that these different variables act in different ways and this might shape people's behavioral patterns within a country such as Brazil. The social-psychological attributes used in this study are politic system, personal trust, community trust, market orientation, collectivism, personal collectivism, freedom politic, corruption, provision public goods, hard work and thrift, evangelic trust, intention of migrate to

Table 1: Baseline fractional probit regressions

	(1)	(2)	(3)	(4)	(5)
	dep. var.: opportunity startup index				
individualism	0.785***	0.618***	0.562***	0.531***	0.327***
	(0.078)	(0.111)	(0.104)	(0.120)	(0.087)
fertility rate		-0.059***	-0.045**	-0.070***	0.022
		(0.020)	(0.018)	(0.020)	(0.027)
unemployment rate		-0.011***	-0.013***	-0.011***	-0.009***
		(0.003)	(0.004)	(0.004)	(0.003)
years of schooling		0.015	0.009	0.019*	0.011
		(0.011)	(0.011)	(0.010)	(0.010)
ease of doing business			0.722***	0.735***	0.721***
			(0.252)	(0.244)	(0.169)
networking					0.356***
					(0.082)
log GDP per worker					0.119***
					(0.027)
religion controls	✗	✗	✗	✓	✓
Observations	69	69	69	69	69
Chi-squared	58.42	89.28	110.5	161.9	305.3
LL	-42.05	-40.94	-40.49	-39.49	-37.82
AIC	88.10	93.90	95	107	107.6
individualism (beta)	0.677	0.533	0.485	0.458	0.282

Notes: The table shows average marginal effects and its robust standard errors in parentheses. The individualism index is that of Hofstede and Minkov (2010). The last two regressions include the percentages of population practicing the main religions (Protestants, Catholics, Jews, Muslims, Buddhists, Hindus and no religion) in a country.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

another country, uncertainty avoidance and religious orientation. It is important highlight that this factors could be divided in the personal and social factors. We consider personal factors and social factors. We include these variables because legal institutions has been shown to be related to cultural features Stulz and Williamson (2003) and we need to rule out this additional information to make sure that our cultural variables only capture the behavioral information of a county. We include the unemployment rate as an indicator of the better adjustment of the labor market. So, in this sense, the greater the unemployment rate is in some county, the greater will be the rate of out-migration and smaller will be the rate of migration flow into the county. It is interesting regard that the migration effect at the county could affect employment change because of the possibility of simultaneous equation bias.

The larger the distance measure, the greater the cultural, institutional and religion distance between county i and county j. Normally studies observe the trade-off in income for distance. But we work with another point of view. This results agrees with the arguments of gravity models, saying that large geographic, standing for higher transaction costs and unfamiliarity effects, may attenuate internal migration influx. Our empirical models have a good fitness to the data and explain a substantial proportion of variation in unconditional correlations. The adjusted R-square is relatively high across specifications, generally between x per cent. F-tests indicate that all models are jointly significant all one percent level.

Mobility usually is pro-cyclical, so the economic contraction would be expected to reduce movers intentions Molloy *et al.* (2011). We argue that the individual's culture identity is mainly tied

to their religion, institutions and the set of cultural values and beliefs. In summary, we find evidence that the migration influx at 2010 is related to cultural, institutional, religious factors among others.

Ritchey (1976) explain that structural attributes and social-psychological attributes contribute in conjunction to the migration flow. Social-psychological attributes are motives, aspirations, values, perceptions and modes of orientation among others. And structural attributes indicates the individual's status in society as lifecycle position. This author points that few studies examine variables that could be use the community ties in the context of migration. At the international literature of migration we can see some insights (Alesina and Giuliano 2015; Collier *et al.* 2014). But at national level, specifically with brazilian data this is an issue unexplored yet. In our regressions with quadratic and linear distance at the cultural, institutional and religion levels we found significant results in some variables such as personal trust, personal collectivism, freedom politic, hard work and thrift, market orientation and religious orientation. And with the linear distance, only the freedom politic is significant at 10 per cent level. The variables such as politic system, community trust, corruption, provision public goods, hard work and thrift, intention to migrate to another country and evangelic trust do not play role at this level of analysis. Culture could be defined by the social norms and values, religion beliefs, family structures. This is a difficult field of definition. We select this variables based on this concept. And with this first result, we can note that trust, for example, is a manner to induce some movement of people. Our regression results indicate that migration flux is positively related with xxxx and negatively related to cultural aspects such as xxxxx at one per cent significance level. This suggests that the smaller the cultural distance between two counties, the higher/lower xxxx. Consider two pairs of counties one has the largest cultural distance and the other has the smallest cultural distance - defined by KS measure; a disparity of xxxx in correlation is observed between the two pairs. This roughly equals an increase of xx per cent in correlation for the lower correlated pair. The cultural effect is both statistically and economically significant. In this sense, the result of the importance of the freedom politic represented by the question "you believe that when the country is facing difficulties it is justifiable for the president of the republic to dissolve the supreme federal court and govern without the federal supreme court". The expected result of this question is negative when considering the linear distance and positive when considering the quadratic distance. So, our first result comply with this analysis. Yap (1977) found that population density in the destination is positively correlated with interstate migration. And our results are in line with this results. While Yap (1977) found that long distances between new and old location reduce the chance for frequent visits back and consider this as a psychic costs.

Continuing our analysis and at the same sense of Collier and Hoeffler (2018), we could see the results only with the view of the origin and destination effects of the cultural, institutional and religion variables. This is interesting because with the distance analysis we do not specify the influence of the origin or the destiny to the effects. So, we include two more regressions. At the destiny, we found significant variables: freedom politic, provision public goods, hard work and thrift, market orientation and religious orientation. And at the origin, we do not found relevance at the variables community trust, collectivism, personal collectivism, intention to migrate to

another country and evangelic trust. These variables do not contribute to increase the migration flow. Another variable at this model that deserves some consideration is the unemployment rate that we do not found relevance to explain the migration flux. The GDP per capita and the population density are far more relevant. And the cultural, institutional and religion variables are more applicable. At this level of analysis, we can observe that characteristics like freedom politic, market and religious orientation are important to the destiny host city. So we can infer that this values are attraction elements to the movement of the people. Beyond this characteristics were predominant when the distance was determined. When the origin effects of the culture, institutions and religion are pointed, we can deserve some attention to the strong effect of the corruption and to the lack of significant of the community trust. These are intuitive situations to determine the push factors of the internal migration in Brazil.

There are unobserved effects that may affect the results presented in the previous regression tables. Then we inserted OLS regressions with fixed effects for the municipalities of origin and destination to mitigate this problem. At the literature, we also can see evidence in clarifying the fact that there exist endogenous locational choice to residents and local migrants. For example, Card *et al.* (2008) points that there are support to the preference of neighborhoods for race-based tipping. In the same line, Damm (2009) argues that the ability to classify enclaves by exploring a Danish policy of space dispersal under which refugees are placed at random. And the author finds empirical evidence that refugees with unobserved unfavorable characteristics self-select ethnic enclaves. More recently with the debate promoted by (Chetty and Hendren 2018a, b). In this case, we believe that this concerns deserve attention and we regress a model with fixed effects to afford this issues. We do this because we understand that the OLS estimates of migration influx are likely to be downward biased and inconsistent. We found that others variables became significant with this attempt. Now we have personal collectivism, corruption, justice trust, uncertainty avoidance and religious orientation being significant variables. But the more relevant information is the bigger R statistic that we have. Until the inclusion of the fixed effects, we found around 35 per cent and with this new specification we have nearly 70 per cent of explication power. So we believe that the new significant variables are more prone to explain the migration flux between the cities in this study. We highlight that religious orientation and personal collectivism are relevant to explain the migration flux even considering the fixed effects. The religion orientation could give to us one view of the similarities with the host city. So with this regard, there are fewer differences between the cities at this point of view. In the same line, we can observe the result to the personal collectivism. This variable is defined by the "in general, how satisfied are you with your life". This means that the people are more prone to migrate if they are unsatisfied with the own life.

Further analysis deserves the relation between the cities. So we include the fixed effects at origin and destination with the intention to separate the effects at the origin and destination levels. At the destiny, are relevant community trust, market orientation, intention to migrate to another country and evangelic trust. And surprisingly, almost all variable are relevant to explain the migration flux at the origin city with the exception of the provision of public goods and evangelic trust. And is interesting that is expected that these variables are far more relevant at destiny place than origin. But we can see that the evangelic trust is relevant to explain the

destiny place, but not the origin place of migration. And the provision of public goods is not relevant at the destiny nor at origin place. So this is a manner to see the relevance of the trust at the informal institutions like the evangelic church to influence the migration flux. And the provision of public goods through provision of education in general could be not relevant. This is a manner of evaluate the necessity of public choices by the government. Usually we expect that the provision of public goods is more relevant to the people migrate between cities, but the confidence in general is widely relevant to improve the economic activity and impulse the migration flux between cities.

At this moment, we will present the model Poisson Pseudo Maximum Likelihood (PPML). Silva and Tenreyro (2006) postulate that estimating gravity equations in their additive form by OLS leads to inconsistency in the presence of heteroscedasticity and advice to estimate gravity models in their multiplicative form. So, in this sense, we use this model to provide some insights. First, the baseline results are in line with the traditional gravity model because we can se the negative relation between the migration influx and the time between the cities. Beyond this we can see that the time, the origin GDP, the origin and destiny population are common points observed by this literature. So we append others variables that are igualy important to explain the influx of migrants between Brazilians counties. As we could observe by the previous results, at this estimation there are a lot of heterogeneity in cultural values and beliefs between the home and host cities. So we believe that PPML results are the more reliable. For this, we consider that institutional, cultural and religious distances are relevant to account for the push and pull factors to migrate. The baseline results indicate that the personal trust, personal collectivism, freedom politic, hard work and thrift and religious orientation are relevant to explain the attraction and repulse effects through this gravity model with quadratic distance. Besides we can see the effect of freedom politic that is the only significant variable with the linear distance.

Continuing the analysis with separate effects at the destiny and at the origin. At the destiny, we have significant variables like politic system, market orientation, provision of public goods, hard work and thrift and intention to migrate to another country. And at the origin, only do not account community trust, collectivism, intention to migrate to another country and evangelic trust. At this level of analysis, we have around 30 to 40 per cent to explain this relation. The PPML results modify the former. At the destiny, is relevant the politic system that is represented by the question "to what extent do you think you should support the Brazilian political system". And the value is positive showing the materialism of this characteristic to the society. In some sense, this could explain the necessity of a politic system confident. Another point is the importance of the characteristic hard work and thrift that is represented by the question "a person who can depend and be disciplined". This is an feature expected to the people that migrate. The new situations that the people will face require discipline. At the origin level of the analysis, we account for the corruption significance. The question related to this variable is "you think that the way things are sometimes justifies paying a bribe" an this could represent a relevant factor to repulse the people to another city.

We consider the PPML results with fixed effects the more robust model. And at this novel, the variables relevant accounting for the quadratic distance are personal trust, corruption, intention to migrate to another country, evangelic trust and religious trust. And to linear distance, we

have only two variables that are not significant: evangelic trust and provision of public goods. The model more consistent to explain the relation between the migration flux and the cultural, institutional and religions factors is the PPML with fixed effects. But, we consider two ways to explain this relation and account for quadratic and linear distance. Over the extent of this analysis, we could see that the quadratic distance is more parsimonious in relation to considering the relevance of the variables at this analysis.

5 Conclusion

The present paper provides strong and robust evidence that living in an individualistic culture positively affects opportunity entrepreneurship, accounting for reverse causality using highly exogenous instruments based on genetic data and the Fractional Probit Regression Model in order to correct for the fact that both individualism and entrepreneurship are indices. Our preferred estimation indicates that a potential increase in individualism by one standard deviation would bring a country like Chile halfway to the level of the United States, which corresponds to an increase of 0.2 standard deviations in the opportunity startup index. Confounding factors, especially institutional differences, were controlled for as good as possible in a cross-section estimation considering that the cultural dimension lacks variation over time. The effects of individualism are also independent from the potential effects of religion. Thanks to the disaggregation of entrepreneurial activity in the latest version of the GEI provided by **?**, we could show that more individualistic countries tend to have a more optimistic perception of opportunities and a higher innovation potential. The combination of these indirect effects explains about half of the total effect of individualism on the number of opportunity startups. The present paper provides strong and robust evidence that living in a culture may positively affect evaluates the effect of the influx migration in the Brazilian economy accounting for movements that occurred since the born place period and accounting for the cultural, institutional and religious factors. At this process of migration, we have two situations. First that the labor market has lower frictions. Second that high levels of migration may reduce situations in that the provision of local public goods could be affected negatively or that could corrode social ties in other ways. Molloy *et al.* (2011) cite that lower mobility could raise aggregate well-being and possibly economic output. And we can show at some level this result at brazilian cities. Through the incorporation of variables of culture, institutions and religion that naturally affect the well-being of people in a model that considers the role of population density among other factors, this work sought to provide evidence on the determinants of inter-county migration in Brazil at year 2010. The effect of the variables included in the gravitational model with the novel of the PPML regression accounting for the fixed effects were capable to capture the effect of local attractiveness, be it cultural, institutional or religious, had the expected effects, especially for politic system, personal trust, community trust, market orientation, collectivism, personal collectivism, freedom politic, corruption, provision public goods, intention of migrate to another country, uncertainty avoidance and religious orientation. We believe that our findings have important implications for the incipient debate about internal migration in Brazil.

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Table 2: Baseline OLS regressions

	(1)	(2)
dep. var.: Migration flux		

	quadratic	linear
travel time	-0.37***	-0.34***
	[0.07]	[0.07]
destiny GDP	0.54***	0.62***
	[0.16]	[0.16]
origin GDP	0.14	0.37**
	[0.15]	[0.16]
origin population density	0.17***	0.14***
	[0.03]	[0.05]
destiny population density	0.25***	0.17***
	[0.04]	[0.05]
origin unemployment rate	-0.31	-0.05
	[0.20]	[0.25]
destiny unemployment rate	0.06	0.43*
	[0.19]	[0.23]
politic system	0.01	0.19
	[0.02]	[0.13]
personal trust	0.07***	-0.08
	[0.02]	[0.25]
community trust	-0.01	-0.18
	[0.02]	[0.36]
collectivism	0.00	-0.02
	[0.02]	[0.21]
personal collectivism	-0.12***	-0.05
	[0.02]	[0.34]
freedom politic	-0.03***	1.33**
	[0.01]	[0.65]
corruption	0.01	0.08
	[0.02]	[0.75]
provision public goods	-0.03	0.03
	[0.02]	[0.19]
justice trust	0.01	-0.11
	[0.03]	[0.15]
hard work and thrift	0.04***	-0.05
	[0.01]	[0.16]
intention to migrate country	0.03	0.65
	[0.02]	[0.80]
uncertainty avoidance	0.01	0.13
	[0.02]	[0.12]
evangelic trust	-0.02	0.04
	[0.02]	[0.11]
market orientation	-0.03*	-0.03
	[0.02]	[0.17]
religious orientation	-1.72**	0.28
	[0.71]	[0.42]
Constant	-1.90	-6.14***
	[2.85]	[2.07]
Observations	448	448
R-squared	0.36	0.29

Notes: The table Robust standard errors in brackets and the variables migration flux, travel time, GDP per capita, density population and unemployment rate are in logarithm. In all equations standard deviations are robust to heteroscedasticity by the white method.

* p < 0.10, ** p < 0.05, *** p < 0.01

Table 3: Baseline OLS regressions with origin and destiny values

	(1)	(2)
dep. var.: Migration flux		
	destiny	origin
time travel	-0.40***	-0.40***
	[0.07]	[0.06]
destiny GDP	0.70***	0.74***
	[0.16]	[0.13]
origin GDP	0.37***	0.64***
	[0.13]	[0.15]
origin population density	0.15***	0.17***
	[0.03]	[0.05]
destiny population destiny	0.25***	0.22***
	[0.05]	[0.03]
origin unemployment rate	-0.09	-0.31
	[0.20]	[0.25]
destiny unemployment rate	-0.14	0.43***
	[0.27]	[0.15]
politic system	0.27**	0.90***
	[0.11]	[0.19]
personal trust	-0.27	-0.68*
	[0.31]	[0.36]
community trust	0.14	0.11
	[0.46]	[0.48]
market orientation	0.53**	0.49**
	[0.22]	[0.20]
collectivism	-0.05	-0.06
	[0.29]	[0.27]
personal collectivism	-0.46	-0.68
	[0.38]	[0.42]
freedom politic	-0.36	3.02***
	[0.87]	[0.76]
corruption	2.87**	2.65***
	[1.16]	[0.98]
provision public goods	-0.54**	-0.56**
	[0.25]	[0.26]
justice trust	0.05	-0.46**
	[0.20]	[0.21]
hard work and thrift	-0.89***	-0.95***
	[0.21]	[0.20]
intention to migrate country	-1.62	0.67
	[1.09]	[1.03]
uncertainty avoidance	0.09	0.36**
	[0.14]	[0.16]
evangelic trust	0.21	0.22
	[0.15]	[0.14]
Constant	-0.93	-14.13***
	[3.94]	[3.37]
Observations	448	450
R-squared	0.33	0.38

Notes: The table Robust standard errors in brackets and the variables migration flux, travel time, GDP per capita, density population and unemployment rate are in logarithm. In all equations standard deviations are robust to heteroscedasticity by the white method.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4: Baseline OLS Fixed Effects regressions

	(1)	(2)
dep. var.: Migration flux		
	quadratic	linear
travel time	-0.80***	-0.84***
	[0.06]	[0.06]
destiny GDP	-2.47*	1.66
	[1.49]	[1.19]
origin GDP	-0.61	-7.25***
	[1.81]	[2.02]
origin population density	0.36	1.00
	[0.52]	[1.51]
destiny population density	1.32***	1.47
	[0.49]	[1.30]
origin unemployment rate	2.54*	7.49***
	[1.44]	[2.01]
destiny unemployment rate	2.67***	-2.02
	[1.02]	[1.30]
politic system	0.02	0.45
	[0.03]	[1.19]
personal trust	0.02	2.88
	[0.03]	[3.48]
community trust	0.02	4.69*
	[0.02]	[2.66]
collectivism	-0.00	2.82
	[0.03]	[2.93]
personal collectivism	-0.05**	1.55
	[0.02]	[1.82]
freedom politic	-0.03	-5.03
	[0.03]	[5.44]
corruption	-0.06**	-7.03
	[0.03]	[7.06]
provision public goods	0.00	0.34
	[0.02]	[0.47]
justice trust	-0.06**	-3.05
	[0.03]	[4.76]
hard work and thrift	0.04	-1.33*
	[0.03]	[0.79]
intention to migrate country	-0.02	22.13
	[0.02]	[16.01]
uncertainty avoidance	0.05*	-0.94
	[0.03]	[1.83]
evangelic trust	-0.03	-1.90
	[0.03]	[1.65]
market orientation	-0.02	-0.86
	[0.03]	[0.82]
religious orientation	-1.92**	-1.64
	[0.78]	[6.47]
Constant	24.57	46.41***
	[23.26]	[14.24]
Fixed Effects	Yes	Yes
Observations	448	448
R-squared	0.74	0.72

Notes: The table Robust standard errors in brackets and the variables migration flux, travel time, GDP per capita, density population and unemployment rate are in logarithm. In all equations standard deviations are

Table 5: Baseline OLS Fixed Effects regressions with destiny and origin values

	(1)	(2)
	destiny	origin
dep. var.: Migration flux		
travel time	-0.84***	-0.84***
	[0.06]	[0.06]
destiny GDP	1.38	-3.66***
	[0.84]	[0.86]
origin GDP	-1.68	-0.87
	[1.34]	[0.60]
origin population density	0.27***	0.75***
	[0.10]	[0.15]
destiny population density	1.09	1.70***
	[0.77]	[0.33]
origin unemployment rate	3.55*	-11.79***
	[2.04]	[2.24]
destiny unemployment rate	-1.85*	2.69***
	[0.96]	[0.72]
politic system	-0.77	9.49***
	[0.76]	[1.82]
personal trust	-1.72	8.24***
	[1.41]	[2.15]
community trust	-5.85***	-42.32***
	[1.30]	[7.10]
market orientation	1.11*	9.54***
	[0.57]	[1.72]
collectivism	-2.20	-14.61***
	[1.46]	[2.62]
personal collectivism	-2.38	-43.72***
	[3.37]	[9.01]
freedom politic	3.80	7.86***
	[4.64]	[2.16]
corruption	8.99	-14.65**
	[13.16]	[6.46]
provision public goods	-0.37	-0.50
	[0.41]	[0.44]
justice trust	1.52	-11.52***
	[1.29]	[2.62]
hard work and thrift	1.25	3.95***
	[1.16]	[1.05]
intention to migrate country	-18.65***	-31.00***
	[6.98]	[6.02]
uncertainty avoidance	0.53	4.39***
	[1.12]	[0.87]
evangelic trust	1.44***	0.19
	[0.54]	[0.30]
Constant	37.70*	254.10***
	[19.36]	[44.30]
Observations	448	450
R-squared	0.72	0.72

Notes: The table Robust standard errors in brackets and the variables migration flux, travel time, GDP per capita, density population and unemployment rate are in logarithm. In all equations standard deviations are robust to heteroscedasticity by the white method.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: Baseline PPML Fixed Effects regressions with linear and quadratic distance

	(1)	(2)
dep. var.: Migration flux		
	quadratic	linear
travel time	-0.09***	-0.08***
	[0.02]	[0.01]
destiny GDP	0.13***	0.15***
	[0.04]	[0.04]
origin GDP	0.02	0.09**
	[0.04]	[0.04]
origin population density	0.05***	0.04***
	[0.01]	[0.01]
destiny population density	0.07***	0.05***
	[0.01]	[0.01]
origin unemployment rate	-0.09*	-0.02
	[0.05]	[0.06]
destiny unemployment rate	0.01	0.10*
	[0.05]	[0.06]
politic system	0.00	0.05
	[0.01]	[0.03]
personal trust	0.02***	-0.03
	[0.00]	[0.07]
community trust	-0.00	-0.03
	[0.00]	[0.09]
collectivism	0.00	-0.00
	[0.01]	[0.05]
personal collectivism	-0.03***	-0.00
	[0.01]	[0.08]
freedom politic	-0.01***	0.29*
	[0.00]	[0.16]
corruption	0.00	0.03
	[0.00]	[0.20]
provision public goods	-0.01	0.01
	[0.01]	[0.05]
justice trust	0.00	-0.02
	[0.01]	[0.04]
hard work and thrift	0.01***	-0.02
	[0.00]	[0.04]
intention to migrate country	0.01	0.17
	[0.00]	[0.21]
uncertainty avoidance	0.00	0.03
	[0.01]	[0.03]
evangelic trust	-0.01	0.01
	[0.00]	[0.03]
market orientation	-0.01*	-0.01
	[0.01]	[0.04]
religious orientation	-0.46***	0.05
	[0.18]	[0.11]
Constant	0.07	-1.13**
	[0.70]	[0.50]
Observations	448	448
R-squared	0.39	0.31

Notes: The table Robust standard errors in brackets and the variables migration flux, travel time, GDP per capita, density population and unemployment rate are in logarithm. In all equations standard deviations are robust to heteroscedasticity by the white method.

Table 7: Baseline PPML Fixed Effects regressions with linear and quadratic distance

	(1)	(2)
dep. var.: Migration flux		
	destiny	origin
time travel	-0.10***	-0.10***
	[0.01]	[0.01]
destiny GDP	0.16***	0.18***
	[0.04]	[0.03]
origin GDP	0.07**	0.16***
	[0.03]	[0.04]
origin population density	0.03***	0.04***
	[0.01]	[0.01]
destination population density	0.07***	0.06***
	[0.01]	[0.01]
origin unemployment rate	-0.00	-0.08
	[0.04]	[0.06]
destiny unemployment rate	-0.03	0.10***
	[0.07]	[0.04]
politic system	0.09**	0.24***
	[0.04]	[0.05]
personal trust	-0.10	-0.20**
	[0.08]	[0.09]
community trust	0.06	0.08
	[0.12]	[0.12]
market orientation	0.16***	0.14***
	[0.06]	[0.05]
collectivism	-0.01	-0.02
	[0.07]	[0.07]
personal collectivism	-0.15	-0.19*
	[0.10]	[0.10]
freedom politic	-0.07	0.72***
	[0.22]	[0.19]
corruption	0.55*	0.65***
	[0.30]	[0.24]
provision public goods	-0.14**	-0.16**
	[0.06]	[0.07]
justice trust	-0.04	-0.12**
	[0.06]	[0.05]
hard work and thrift	-0.23***	-0.24***
	[0.05]	[0.05]
intention to migrate country	-0.50*	0.16
	[0.26]	[0.26]
uncertainty avoidance	0.04	0.10**
	[0.04]	[0.04]
evangelic trust	0.04	0.05
	[0.04]	[0.04]
Constant	0.63	-3.11***
	[0.95]	[0.85]
Observations	448	450
R-squared	0.34	0.40

Notes: The table Robust standard errors in brackets and the variables migration flux, travel time, GDP per capita, density population and unemployment rate are in logarithm. In all equations standard deviations are robust to heteroscedasticity by the white method.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 8: Baseline PPML Fixed Effects regressions with linear and quadratic distance

	(1)	(2)
dep. var.: Migration flux		
	quadratic	linear
time travel	-0.19***	-0.20***
	[0.01]	[0.01]
destiny GDP	-0.72**	-1.30***
	[0.32]	[0.45]
origin GDP	-0.39	-0.32**
	[0.38]	[0.13]
origin population density	0.17	0.20***
	[0.11]	[0.03]
destiny population density	0.35***	0.47***
	[0.10]	[0.12]
origin unemployment rate	0.77**	-3.19***
	[0.30]	[0.50]
destiny unemployment rate	0.71***	4.80***
	[0.21]	[0.44]
politic system	0.00	2.60***
	[0.00]	[0.40]
personal trust	0.00	2.27***
	[0.01]	[0.48]
community trust	0.00	-11.76***
	[0.00]	[1.54]
collectivism	0.00	-3.98***
	[0.01]	[0.57]
personal collectivism	-0.01***	-12.18***
	[0.00]	[1.99]
freedom politic	-0.01	1.83***
	[0.01]	[0.47]
corruption	-0.02***	-4.59***
	[0.01]	[1.38]
provision public goods	-0.00	-0.13
	[0.01]	[0.10]
justice trust	-0.01	-3.24***
	[0.01]	[0.58]
hard work and thrift	0.01	1.27***
	[0.01]	[0.21]
intention to migrate country	-0.01*	-9.16***
	[0.00]	[1.22]
uncertainty avoidance	0.01	1.31***
	[0.01]	[0.18]
evangelic trust	-0.01*	0.02
	[0.01]	[0.06]
market orientation	-0.01	2.58***
	[0.01]	[0.39]
religious orientation	-0.44**	
	[0.18]	
Constant	9.20*	13.51***
	[4.93]	[2.92]
Observations	448	448

A Appendix – additional figures and tables

Table A.1: Data Description

	Variable	Description
Migration flux	value of flow of migrants in logarithm	Brazilian Censo of 20
destiny GDP	destin's current GDP in logarithm	IBGE of 2010
origin GDP	origin's current GDP in logarithm	IBGE of 2010
time travel	bilateral Google Maps time in logarithm	Google Maps
origin population	density population of origin's county in logarithm	IBGE of 2010
destiny population	density popultion of destiny's county in logarithm	IBGE od 2010
origin unemployment	percentage of the population aged 16 and over, economically active, unemployed of origin's county	DATASUS of 2010
destiny unemployment	percentage of the population aged 16 and over, economically active, unemployed of destiny's county	DATASUS of 2010
politic system	politic system	LAPOP of 2010
personal trust	personal trust	LAPOP of 2010
community trust	comunity trust	LAPOP of 2010
collectivism	coletivism	LAPOP of 2010
personal collectivism	personal coletivism	LAPOP of 2010
freedom politic	freedom politic	LAPOP of 2010
corruption	corruption	LAPOP of 2010
provision public goods	provision public goods	LAPOP of 2010
market orientation	market orientation	LAPOP of 2010
justice trust	justice trust	LAPOP of 2010
religious orientation	religious orientation	LAPOP of 2010
hard work and thrift	hard work and thrift	LAPOP of 2010
intention to migrate to another country	intention to migrate to another country	LAPOP of 2010
unvertainty avoidance	uncertainty avoidance	LAPOP of 2010
evangelic church trust	evangelic church trust	LAPOP of 2010

Table A.2: Summary statistics

Variable	Mean	Std. Dev.	Min.	Max.	N
value of flow of migrants in logarithm	3.96	1.55	0.75	8.79	450
(sum) num_mig	225.91	647.68	2.11	6589.73	450
destin's per capita GDP in logarithm	9.92	0.53	8.44	10.98	450
origin's per capita GDP in logarithm	9.93	0.52	8.33	10.98	450
Google Maps distance(km) in logarithm	8.10	0.3	7.72	8.77	450
Google Maps time in logarithm	6.87	1.03	3.34	8.49	450
origin' density popultion in logarithm	6.21	2.16	0.64	8.99	450
destiny's density popultion in logarithm	5.84	2.1	1.89	8.96	450
denpopi	2247.44	2919.03	1.9	8000	450
denpopi	1723.56	2645.82	6.62	7786.52	450
origin's unemployment rate	1.96	0.32	0.89	2.94	450
destiny's unemployment rate	1.88	0.37	0.89	2.65	450
politic system	2.32	3.51	0	22.05	450
quadratic religious distance	0.14	0.09	0.01	0.56	450
market orientation	2.02	3.22	0	24.23	450
personal trust	1.87	3.34	0	23.72	450
comunity trust	2.2	3.86	0	30.5	450
coletivism	1.89	3.45	0	27.56	450
personal coletivism	1.77	2.52	0	14.19	450
freedom politic	2.23	5.84	0	50.47	450
corruption	1.91	3.28	0	21.19	450
provision public goods	2.02	2.46	0	12.82	448
justice trust	2.19	3.06	0	20.82	450
hard work and thrift	2.14	5.28	0	58.12	450
intention of migration to another country	2.2	3.08	0	19.43	450
uncertainty avoidance	1.76	2.68	0	20.93	450
religious orientation	1.94	3.01	0	30.46	450
politic system	-0.02	0.81	-2.5	2.5	450
linear religious distance	0.02	0.22	-0.77	0.81	450
market orientation	0.02	0.63	-1.95	2.2	450
personal trust	0.01	0.46	-1.64	1.64	450
community trust	0.03	0.36	-1.35	1.35	450
collectivism	0.04	0.52	-1.77	2	450
personal collectivism	-0.02	0.26	-0.73	0.70	450
freedom politic	0.01	0.12	-0.58	0.58	450
corruption	0	0.1	-0.32	0.33	450
provision public goods	0.02	0.4	-1.01	0.99	448
justice trust	-0.04	0.86	-2.66	2.66	450
hard work and thrift	0.02	0.68	-3.53	3.19	450
intention of migration to another country	-0.01	0.12	-0.34	0.3	450
uncertainty avoidance	-0.06	0.61	-2.03	2.1	450
religious orientation	0.01	0.83	-3.3	2.13	450

Table A.3: List of the 50 counties included in this study

Aloandia	Goiania	Mogi das Cruzes	Sao Lourenco
Belem	Itagiba	Passos	Senador Guiomard
Belo Horizonte	Itaguaje	Possoes	Sao Jose dos Campos
Brasilia	Itumbiara	Ponta Grossa	Sao Paulo
Blumenau	Itupeva	Porecatu	Timbauba
Branquinha	Jaboatao dos Guararapes	Porto Espiridiao	Uaua
Capela	Jaciara	Porto Velho	Vilhena
Coronel Ezequiel	Ji Parana	Pelotas	Vera Cruz
Cuiaba	Jijoca de Jericoacoara	Progresso	
Curitibanos	Juazeiro	Redencao	
Duque de Caxias	Jaragua do Sul	Rio Bonito	
Embu-Guacu	Minacu	Rio Branco	
Fortaleza	Mossoro	Rio de Janeiro	
Franca	Marilia	Sao Jose del Rei	