# The Role of Geography and History in Cultural Diffusion: A Gravity Approach

Pauline Grosjean

*University of California at Berkeley*

March 4, 2009

*Preliminary and incomplete version*

## Abstract

By using micro-level data from a household survey in 27 European and central Asian transition countries and Turkey, this paper develops a gravitational approach that allows to empirically investigate the respective roles of local social interactions, proxied by geographic localization data, and of distant history, in particular the influence of former dynastic empires, on the distribution of opinions and on some economic outcomes. The focus is on opinions and economic outcomes for which both vertical and horizontal transmission have been shown or conjectured to play a role, such as: preferences for the welfare state, general trust, corruption, economic occupation and female labor force participation. The theoretical model predicts that cultural distance and dissimilarity of economic outcome will in increase in physical distance. This is confirmed by empirical results. Other results show evidence of significant negative "border effects" on cultural and economic dissimilarity, and a strong negative effect of past empires, as well as of EU integration and internet penetration. The results also indicate that Turkey is quite dissimilar to the new Europe, but not fundamentally different from other EU candidates.

Keywords: culture, economic development, Europe, geography, gravity model, Turkey.

JEL classification: F59 ; N50 ; O10 ; P30.

## 1. Introduction

What are the respective roles of geography and history in the formation and transmission of attitudes and in the determination of economic outcomes? The empirical influence of, on the one hand, geography, through local social interactions and, on the other hand, distant history, through the vertical transmission of beliefs (Tabellini 2008a) or the long term persistence of institutions (Acemoglu et al. 2001) have generally been investigated separately in the literature. However, the two may be largely intertwined. For example, geographical factors may contribute to explain the observed divergence between the former Habsburg empire, whose geographical localization facilitated exposure to Enlightment values, and the former Ottoman Empire, who, under the constant threats of Mongol and Russian invasions, had to organize itself as a military state, which had negative subsequent consequences for its economic development (Dimitrova-Grajzl 2008, Pamuk REF). In a recent paper, Guiso, Sapienza and Zingales (2008) observe that neither of the two main competing transmission mechanisms explaining the long term persistence of economic development: the institution transmission mechanism of Acemoglu et al. (2001) and the cultural transmission mechanism of Tabellini (2008a) can fully reject the "alternative" (or rather – complementary) view that the source of persistence is geographical (Guiso, Sapienza and Zingales, 2008). Despite the fact that theoretical models of cultural transmission (Bisin Verdier, 2001) take explicitly into account the influence of social interactions ("oblique" transmission mechanisms) on "vertical" parental transmission in the formation of cultural values or economic outcomes, such as corruption (Hauk and Saez Marti 2001), most empirical studies of vertical transmission, such as Tabellini (2008b) or Fernandez (2006) abstract of such social interactions[1]. This paper attempts at filling this gap in the literature, by estimating jointly the influence of historical and geographic factors.

The role of local social interactions on the determination of attitudes and economic outcome has been well established in the literature. Critical mass models, where the utility of an action is positively related to the number of agents who already have taken the action, or local social interaction models have been applied, for example, to the persistence of income inequality (Durlauf, 1996), crime (Glaeser et al., 1995; Sah, 1991), saving norms (Lindbeck, 1997), the transmission of culture (Bisin and Verdier, 2001) or economic occupation (Topa, 2001).

[1] Despite fact that this geographical component is modeled in the theoretical part of Tabellini (2008b).

Bertrand et al. (2000) develop an empirical application and show the presence of strong network effects in welfare state participation. They argue that this effect is due to the propagation of information among social networks. An alternative explanation could be that it is related to the social acceptance of welfare use among the network. For instance, Fernandez (2006) argue that social acceptability of female work among peer groups has played an important role in the rise of female labor force participation.

The recent surge of interest in the role of culture in economics has also well established the influence of pas historic events on culture and economic development. Many empirical studies have shown how processes of "vertical" or intergenerational transmission of beliefs and preferences can explain the persistence of inefficient institutions (Tabellini 2008a, 2008b, Dimitrova and Grajzl 2008), the formation of social capital (Guiso, Sapienza and Zingales 2007), unemployment (Brugger et al., 2008) and contribute to the understanding of the microeconomic behavior of agents in their fertility decision (Fernandez and Fogli 2007), occupational choice (Botticini and Epstein 2006a 2006b), willingness to trust and to cooperate with others (Tabellini, 2007, 2008) or attitudes towards the welfare state (Alesina and Fuchs Schundeln, 2008). The main idea of this literature is that the backward looking behavior of parents who try and transmit their own values to their children generate some hysteresis that can explain the slow moving character of institutions (Roland, 2004) and the slow adaptation of work or fertility decisions to new economic environment (Fernandez and Fogli 2007). In a seminal paper, Bisin and Verdier (2001) endogenize preference traits (or "culture") in a process of intergenerational transmission of traits. They model how preferences of children are acquired through an adaptation and imitation process which depends on their parents' socialization actions, and on the characteristics of the economic and social environment in which they later evolve. Hauk and Saez-Marti (2001) develop a similar model and show how level of corruption is determined by the effort of parents in transmitting values of honesty, which itself depends on the distribution of ethics in society. Tabellini (2008b) describes a model where individuals cooperative behavior is determined both by economic incentives and by norms of good conduct inherited from earlier generations. In all of these models, parental transmission mechanisms are explicitly influenced by the diffusion of norms and behaviors in society: to keep the epidemiological analogy, "vertical" and "horizontal" transmission mechanisms (Cavalli-Sforza and M. Feldman 1973) are substitute. This theoretical literature hence bridges the gap between the social interaction and the culture and economics

empirical literature. However, a limited number of empirical studies have managed to reconcile the two approaches.

By using micro-level data, we propose a gravity approach that allows to empirically investigate the respective roles of geography and of history on the determinations of opinions and on some economic outcomes. We focus on opinions and economic outcomes for which both vertical and horizontal transmission have been shown or conjectured to play a role, such as: preferences for the welfare state, general trust, corruption, economic occupation and female labor force participation. Indeed, Alesina and Fuchs Schundeln (2007) study the influence of past history on fairness and attitudes towards the welfare state, while Lindbeck and al (2003) study the influence of work norms on voters' preferences for the welfare state and Bertrand et al. (2000) study the influence of local social interactions on welfare use. Tabellini (2008a, 2008) discuss how distant past history, but also local social interactions (see the theoretical model in Tabellini 2008b) act together to determine how much people trust each other (general trust). Hauk and Saez Marti (2001) show how corruption is determined by inherited values of honesty which parents try to transmit to their offspring, but also by the prevalence of ethics in society and the economic payoffs of corruption. Scheinkman and de Paula (2008) study spatial patterns of corruption, and show that the informality of firms is correlated with the informality of firms from which it buys or sell. Botticini and Eckstein (2006b) discuss how economic occupations are path dependent and influenced by changes in distant history, while many social network models since the pioneering work of Granovetter (1973) and economic geography models put forward the role of location in the determination of occupation patterns. Similar arguments can be made in the case of female labor force participation, and more specifically, Fernandez (2007) and Fernandez and Fogli (2007) focus on the role of inherited values, the prevalence of female work in the social environment, and the perception of female work by peer groups and neighbors as determinant of female labor force participation.

The theoretical model in Section 2 of this paper extends previous theoretical models of cultural transmission by specifying that the social interaction which influences vertical transmission mechanism is geographical in nature. Such models usually assume that preferences of children are acquired through an adaptation process which depends on the parents' socialization actions, *and* on the social environment in which children live. However, the nature of social interaction is

not specified: the socialization effort of parents itself depends on the distribution of cultural traits in society as a whole. This assumption is hardly realistic, not the least because of information problems. Instead, we consider that the relevant social environment to which parents refer to is their peer group, which, following Glaeser, Sacerdote and Sheinkman (1996), is assumed to consists of geographical neighbors. We test the predictions of this theoretical model using a gravity model, partly in order to avoid Manski's (1993) reflection bias.

The gravity model developed here proxies geography and horizontal cultural diffusion processes by physical distance between locations and geopolitics characteristics, such as the presence of borders. The role of history and vertical cultural diffusion processes is captured by the distant past of each locality in our sample, namely the inclusion in former empires such as the Ottoman, Habsburg, Russian, or Prussian Empires. We are able to trace back, at the sub-national level, the belonging of each locality (Primary Sampling Unit, or PSU) to former Empires. We are thus able to identify the respective roles of a common past history, though former integration to Empires, a common history today, through integration in nation states or the European Union, and geographic characteristics, namely physical distance. Nevertheless, our results are subject to the caveat that history itself was partly determined by geography.

Gravitational models have almost exclusively been applied to trade models, with two notable exceptions. Kelejian, Murrell and Shepotyloe (2007) develop a spatial analysis of spillover between countries in the development of institutions, but use a spatial lag model instead of a gravity model. Head Mayer (2008) use a gravity model to detect local interactions from the spatial pattern of first names in France.

The main contribution of the paper is thus to model and estimate jointly the roles of vertical and horizontal transmission processes in the determination of values and economic outcomes, by means of one of the few applications of gravity models outside of the trade literature. Thereby, this paper also contributes to the literature on border effects. The trade literature has found evidence for negative and economically very significant effect of geopolitical borders on trade. We find, on the contrary, negative and significant effects of borders on cultural and economic dissimilarity, indicating that non market interactions effects and cultural differences, which have been blamed for large negative border effects on trade, may have been overestimated. Our

results, which take into account precise locations rather than country average as usual on the trade literature, show instead a continuous process of diffusion over geopolitical borders.

Section 2 presents a theoretical model of cultural diffusion in which oblique transmission mechanisms depend on the geographical localization of agents, and the econometric specification. Section 3 discusses the data. Section 4 presents the results. In Section 5, the cultural gravity model is extended to account for the impact of EU integration, with a special focus on the case of Turkey, and to study the effect of internet on cultural homogenization. Section 6 concludes.

## 2. Theoretical Model

In this section, we study a model of cultural evolution that builds on Bisin Verdier (2001) and Hauk Saez-Marti (2001). Such models consider both the influence of cultural parental transmission and social interaction. Preferences of children are acquired through an adaptation process which depends on the parents' socialization actions, *and* on the social environment in which children live. However, the nature of social interaction is not precisely specified: the socialization effort of parents itself depends on the distribution of cultural traits in society as a whole. This assumption is hardly realistic, not the least because of information problems. Instead, we consider that the relevant social environment to which parents refer to is their peer group, which is, as in Glaeser, Sacerdote and Sheinkman (1996), consists of their geographical neighbors.

We consider a two-cultural trait population of individuals. The transmission of cultural traits is modeled as a mechanism which interacts "vertical" socialization inside the family and "horizontal" socialization outside the family, via imitation of role models that the children interacts with. Such social interaction is determined geographically (see also Tabellini 2008a).

Suppose there are two possible cultural traits $\{a, b\}$. Such cultural trait can reflect preferences with regards to female labor force participation, honesty and the inclination to pay bribes, or fairness and preferences for redistribution. Individuals live in different locations, or

neighborhoods, indexed by $l$. There are $L$ possible locations. Localities neighboring to locality $l$ are demoted by $C(l)$. Individuals in each locality are heterogeneous in two different ways. Firstly, as described above, they may differ in their cultural trait. Secondly, they are member of larger groups with different mean preferences (as in Head and Mayer 2007). In each locality, there are $G$ groups, indexed by subscript $g$. The share of each group in each location is given by: $x_{lg}$ with $\sum_{g=1}^{G} x_{lg} = 1$. The portion of each group with cultural trait $a$ is denoted by $s_{lga}$. The prevalence of cultural trait $a$ in neighborhood $l$ is then: $s_{la} = \sum_{g=1}^{G} s_{lga} x_{lg}$. The prevalence of cultural trait $b$ is: $s_{lb} = 1 - s_{la}$.

Following Hauk and Saez-Marti (2001), we consider an overlapping generation model, with a Poisson birth and death process. With probability $\gamma$, an active agent is active the next period. With probability $(1-\gamma)$, an active agent in $t$ has a child, which becomes active in $t+1$. Children are born without predetermined preferences or cultural trait. As in Bisin and Verdier (2001) and Hauk and Saez-Marti (2001), parents' education effort $\tau$ corresponds to the probability of successful "vertical" transmission of cultural traits, that is to say the probability that the child ends up with identical preferences as his parent. If vertical socialization is unsuccessful, the child remains naïve and gets randomly matched with somebody else, whose cultural trait he adopts. The innovation of our model is that this match depends on the geographical localization of agents. As in Tabellini (2008a), we consider that the probability of a match decreases with the distance that separates two agents. More precisely, we consider that agents are either matched with an individual within their neighborhood or with an individual from an adjacent location $n$ with a probability $\vartheta_{tln}$ that reflects the nature of social interactions, and that decreases with distance. $\vartheta_{tln}$is assumed to vary between zero[2] (localized interactions) and $1/(L-1)$ (globalized interactions) (Head and Mayer, 2007). Each household in each of the $G$ groups socializes his children according to this socialization process, but each child only interacts with people of her parents' group.

Let $p^{ij}$ denote the probability that a child from a family with trait $i$ is of type $j$ and $\tau^i$ the education effort by the parent of type i. The socialization mechanism described above implies that:

[2] This brings us back to the models in Bisin and Verdier (2001) and Hauk and Saez-Marti (2001).

$$p_t^{aa} = \tau_t^a + (1 - \tau_t^a)\left(s_{lgat} + \sum_{n \neq l} \vartheta_{tln} s_{ngat}\right) \quad (1)$$

$$p_t^{ab} = (1 - \tau_t^a)\left[1 - \left(s_{lgat} + \sum_{n \neq l} \vartheta_{tln} s_{ngat}\right)\right] \quad (2)$$

Where $s_{kgat}$ , $k \in \{l, n\}$is the proportion of active agents of type $a$ in locality $k$.. Similarly, we get:

$$p_t^{bb} = \tau_t^b + \left(1 - \tau_t^b\right)\left[1 - \left(s_{lgat} + \sum_{n \neq l} \vartheta_{tln} s_{ngat}\right)\right] \quad (3)$$

$$p_t^{ba} = \left(1 - \tau_t^b\right)\left(s_{lgat} + \sum_{n \neq l} \vartheta_{tln} s_{ngat}\right) \quad (4)$$

As in Bisin and Verdier (2001), parents display imperfect empathy. When taking the decision to socialize their children, they maximize their children's utility, but they evaluate such welfare through their own preferences. In addition, we assume that the utility of a child depends on what group $g$ he belongs to[3]. Let $V_g^{ij}$denotes the utility to a type *i* parent belonging to group $g$ of a type $j$ child, $i, j \in \{a, b\}$. In order to determine the optimal socialization effort $\tau_g$, which costs $C(\tau_g)$, parents maximize:

$$p_t^{ii} V_g^{ii} + p_t^{ij} V_g^{ij} - C(\tau_{gt})$$

We obtain the following optimal education efforts:

$$C'\left(\tau_g^a\right) = \left(V_g^{aa} - V_g^{ab}\right)\left[1 - \left(s_{lgat} + \sum_{n \neq l} \vartheta_{tln} s_{ngat}\right)\right] \quad (5)$$

$$C'\left(\tau_g^b\right) = \left(V_g^{bb} - V_g^{ba}\right)\left(s_{lgat} + \sum_{n \neq l} \vartheta_{tln} s_{ngat}\right) \quad (6)$$

We can now characterize the dynamic behavior of $s_{la}$:

$$s_{lgat+1} = \gamma s_{lgat} + (1 - \gamma)\left[s_{lgat} p_t^{aa} + \left(1 - s_{lgat}\right) p_t^{ba}\right]$$

Substituting (1)-(4) and rearranging, we obtain:

$$s_{lgat+1} =$$
$$s_{lgat} + (1 - \gamma)\left\{s_{lgat}\left(\tau_g^a - \tau_g^b\right)\left(1 - s_{lgat} - \sum_{n \neq l} \vartheta_{tln} s_{ngat}\right) + \left(1 - \tau_g^b\right) \sum_{n \neq l} \vartheta_{tln} s_{ngat}\right\} \quad (7)$$

[3] We can think of these groups as socio economic groups, or religious groups.

Under stationary expectations ( $V_{gt}^{aa} - V_{gt}^{ab} = V_g^{aa} - V_g^{ab}$ and $V_t^{bb} - V_t^{ba} = V^{bb} - V^{ba}$ for all *t*),

Hauk and Saez-Marti (2001) show that (5) has three rest points, (i) $s_{lgat} = 0$, (ii) $s_{lgat} = 1$, and an interior rest point. In this modified model, the interior rest point is given by:

$$s_{lga}^* = \frac{V_g^{aa} - V_g^{ab}}{V_g^{bb} - V_g^{ba} + V_g^{aa} - V_g^{ab}} - \sum_{n \neq l} \vartheta_{ln} s_{nga}^* \tag{8}$$

with $\tau_g^a(s_{lga}, V_g^{aa} - V_g^{ab}) = \tau_g^b(s_{lga}, V_g^{bb} - V_g^{ba})$

We can see from (5) and (6) that vertical cultural transmission (parents' effort) and horizontal transmission (from peer groups) are substitutes. Under this condition, the interior rest point is globally stable, while the other rest points are unstable (Bisin and Verdier 2001).

Let us denote $c_g = \frac{V_g^{aa} - V_g^{ab}}{V_g^{bb} - V_g^{ba} + V_g^{aa} - V_g^{ab}}$. and drop the subscript a in what follows.

The total share of type $a$ in locality $l$ is given by $s_l = \sum_{g=1}^{G} s_{lg} x_{lg}$, which, using (8) can be rewritten as:

$$s_l^* = \sum_{g=1}^{G} c_g x_{lg} - \sum_{g=1}^{G} x_{lg} \sum_{n \neq l} \vartheta_{ln} s_{ng}^* \tag{9}$$

Replacing by the value of $s_{ng}^*$, which can be obtained in a similar way as (8), we obtain:

$$s_l^* = \sum_{g=1}^{G} c_g x_{lg} - \sum_{g=1}^{G} c_g x_{lg} \sum_{n \neq l} \vartheta_{ln} + A_l \tag{10}$$

With $A_l = \sum_g x_{lg} \sum_{n \neq l} \vartheta_{ln} \sum_{m \neq n} \vartheta_{nm} s_{mga}$ and $m \in C(n)$.

This expression shows how the share of cultural trait in one locality depends on the share of the trait in the adjacent localities, as well as in all the localities adjacent to it, and so on. The share of cultural trait in one neighborhood depends on this way on the share of the trait in all neighborhoods that are connected with each other.

Estimating equation of type (10) would run into severe complications and shortfall. We would need to specify each neighbor of each localities and so on. Although possible and done in the literature before (see Case, ), this would be a daunting task given the size of the sample we have at hands. Furthermore, as described by Manski (1993) the OLS estimates of this equation would

be biased. The prevalence of the cultural trait a in the adjacent location *n* depends in part on the share of the cultural trait in location *l*. This is what Manski labels the "reflection" problem.

Instead, we are more interested in the dissimilarity in prevalence of cultural traits between any pair of locations: $|s_l - s_n|$. As explained in Head and Mayer (2007), incorporating $s_n$ in the left hand side variable addresses the reflection problem. Let us drop the subscript *a* to make things more tractable.

Following steps (8) and (9), we can define the total share of type *a* in locality *n:*

$$s_n^* = \sum_{g=1}^{G} c_g x_{ng} - \sum_{g=1}^{G} x_{ng} \sum_{m \neq n} \vartheta_{mn} s_{mg}^*$$

Adopting vector notations: $\sum_{g=1}^{G} c_g x_{lg} = \beta . x_l$, and denoting $A_n = \sum_{g=1}^{G} x_{ng} \sum_{m \neq n} \vartheta_{mn} s_{mg}^*$ we obtain the following expression for the dissimilarity in the prevalence of cultural trait a among a pair of locations:

$$|s_l - s_n| = |\beta . (x_l - x_n) - \beta . x_l \sum_{n \neq l} \vartheta_{ln} + A_l - A_n| \quad (8)$$

This equation has three main implications that we can investigate empirically.

Firstly, similar group composition entails more similarity in the prevalence of cultural trait between two locations.

Secondly, distance increases cultural dissimilarity between locations. Indeed, $|s_l - s_n|$ decreases in $\vartheta_{ln}$, which reflects the extent of spatial interaction and decreases with distance.

Prevalence of cultural traits in third locations' $(A_l - A_n)$ influence bilateral dissimilarity. The empirical estimation will attempt to control these by using fixed effects.

We propose the following linear estimation approach that accounts for the properties of the model:

$$MDC_{ln} = \alpha_1 MDS_{ln} + \alpha_2 MDE_{ln} + \alpha_3 MDO_{ln} + \alpha_4 MDR_{ln} + \alpha_5 \mathrm{DIST}_{\ln} + \alpha_6 I + \alpha_7 C + \alpha_8 E + \delta_i + \delta_j + \epsilon_{ln} \quad (9)$$

Where the MD variables are metrics of dissimilarity between pairs of locations *l* and *n*. In each case, following Head and Mayer (2007), we use the Manhattan Distance which sums over the absolute differences in shares of responses for multinomial variables. For example, MDC in the case of general trust is defined as: $MDC_{ln} = \sum_{i=1}^{I} |s_{il} - s_{in}|$ where $s_{il}$ (respectively $s_{in}$) is the share, in location *l* (respectively *n*) of responses allocated to each modality *i* of the *I* modalities of the following *World Values Survey* question on general trust that was replicated in the *Life in Transition Survey*: *"Generally Speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?"* Responses modalities are on a scale of 1 to 5, with 1 corresponding to "Complete Distrust and 5 to "Complete Trust". Dissimilarities across localities for each of the variables of interest (See next Section) are defined in a similar way. For dummy variable: the Manhattan Distance is just the absolute value of the difference between two locations.

The covariates in (9): social class dissimilarity *MDS*, education dissimilarity *MDE*, occupation dissimilarity *MDO* and religious affiliation dissimilarity *MDR* are defined in a similar way.

The next covariate in (9) examines the role of geographic distance between two locations. We expect $\alpha_5$ to be positive. *I* is a dummy variable indicating whether the two districts are located in the same country. As usual in the gravity trade models, *C* is a dummy variable to indicate whether the two countries in which each location belongs are contiguous. The role of history is investigated through the use of a dummy *E* indicating whether two locations belonged to the same Empire in the past. The following section describes in more details the definitions of the different Empires whose role we examine. Finally, the regression specification includes an error term and a set of intercepts $\delta_i, \delta_j$ for each country.

## 3. Data and Preliminary Evidence on the Role of Geography and History

### *3.1.Data and Dependent Variables*

- Data

The data comes from the *Life in Transition Survey* (LITS), a survey conducted by the European Bank for Reconstruction and Development and the World Bank in 2006, in 28 post-transition countries and Turkey[4]. Respondents to the survey were drawn randomly, using a two stage sampling method, with census enumeration areas as Primary Sampling Units (PSUs), and households as secondary sampling units. The definition of locations in this paper corresponds to the PSUs. The data set contains 50 PSUs in each of the 29 countries. There are thus 1450 PSU pairs for which we have observations.

The geographical distance between each pair of PSU is computed from longitudinal and latitudinal coordinates of the geographical center of the PSU using the great circle formula. For each PSU pair, we construct our measures of cultural distance and of covariate dissimilarity defined in (9). The analysis is then conducted on the cross section of $1450^2$ distance measures.

We use the Periodical Atlas of Europe in order to reconstruct Empire delimitations and their evolution across time, from 1300 to 2000. 1300 corresponds to the start of empire consolidation in Medieval Europe and is thus taken as the starting date of this study (Dimitrova-Grajzl 2008). Table A1 presents some descriptive statistics on the length and geographical delimitation of all the empires whose impact we investigate. Figure A1 presents each Empire used in the empirical estimation.

- Dependent variables

<u>Preferences for redistribution and the welfare state:</u>

Preferences for redistribution and the welfare state are assessed using the following survey question:

[4] Turkmenistan was not included in the survey, neither was Kosovo.

*Do you think the state should be involved in the following? (Scale: not involved at all/let the market play =1; Somewhat/moderately involved =2; strongly involved=3)*

*Reducing the gap between the rich and the poor*

Corruption:

Our variable measuring the extent of corruption of public services was built using the following survey question:

*In your opinion, how often is it necessary for people like you to have to make unofficial payments/gifts in these situations?*

*(Scale: Never=1, Seldom=2, Sometimes=3, Usually=4, Always=5)*

*Interact with the road police*

*Request official documents (e.g. passport, visa; birth or marriage certificate, land register, etc…) from authorities*

*Interact with the police on matters other than traffic and other than requesting documents*

*Go to courts for a civil matter?*

*Receive medical treatment in the public health system*

*Receive public education (university, college, vocational training)*

*Request unemployment benefits*

*Request other social security benefits*

General trust:

Here, we use in the LITS survey the widely used World Value Survey question:

*Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people? Please answer on a scale from 1 to 5, where 1 means that you*

*have complete distrust in people, and 5 means that most people can be trusted. What would it be today? And before 1989?*

*Scale: Complete distrust=1, Some distrust=2, Neither trust nor distrust=3, Some trust=4, Complete trust=5*

Occupation and Female labor force participation:

The categories used in the construction of the Occupation Manhattan distance are the following: unemployed; pensioner; student; housewife; or employed, with this last category broken up in different subcategories of: white collar, blue collar service worker and farmer or farm-worker. The different categories of employment were constructed from the responses about the respondent's first job, using the ISCO classification[5].

Our measure of female labor force participation corresponds to the proportion of women of working age in the PSU who are economically active (that is to say who were active in the 7 days preceding the survey or had a job to return to).

Table A2 in the appendix presents descriptive statistics of all the variables.

### *3.2.Preliminary evidence on the role of history:*

Table 1 illustrates the large differences that can be observed within empires in terms of preferences for redistribution , the extent of corruption of public services, general trust or female labor force participation.

[5] The ISCO categories corresponding to our white collar category are: 1: Legislator, Senior Official and Manager, 2: Professionals, and 3: Technicians and Associated Professionals. Our service workers category consists of: 4: Clerks and 5: Service workers and shop and market sales workers. 6: Skilled agricultural and fishery workers are in our "farmer and farm worker category" together with independent farmers. All the remaining ISCO categories are considered as blue collar workers.

**Table 1: Means of Selected Preferences and Economic Outcomes in Former Empires**

| | Preferences for redistribution | General trust | Corruption | FLP |
|---|---|---|---|---|
| Ottoman Empire | 0.79 (0.41) | 3.62 (1.14) | 1.93 (2.57) | 0.47 (0.19) |
| Habsburg Empire | 0.60 (0.49) | 3.40 (0.99) | 1.11 (1.81) | 0.55 (0.17) |
| Russian Empire | 0.68 (0.47) | 3.83 (1.12) | 1.78 (2.36) | 0.51 (0.22) |
| Prussia | 0.54 (0.50) | 3.45 (1.05) | 0.95 (1.63) | 0.51 (0.20) |
| Ottoman and Habsburg | 0.77 (0.42) | 3.49 (1.13) | 1.40 (2.20) | 0.45 (0.19) |
| Ottoman and Russian | 0.56 (0.50) | 3.59 (1.13) | 2.27 (2.82) | 0.53 (0.20) |
| Habsburg and Russian | 0.68 (0.45) | 3.26 (1.25) | 3.60 (2.50) | 0.59 (0.14) |
| Habsburg and Prussia | 0.45 (0.50) | 3.39 (1.08) | 0.76 (1.21) | 0.42 (0.16) |
| Russian and Prussia | 0.64 (0.50) | 3.57 (0.99) | 0.57 (1.25) | 0.62 (016) |

*Notes to Table 1*: Standard deviations in parenthesis

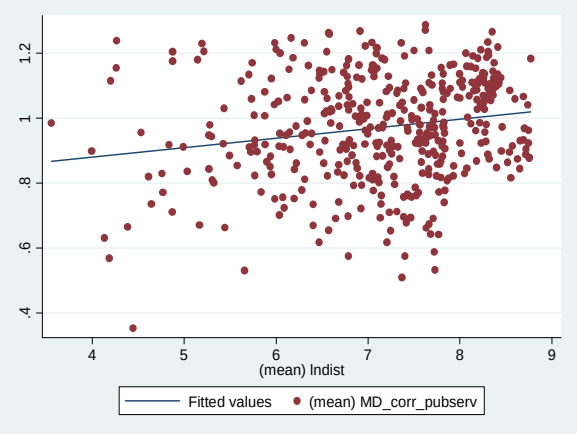
This table illustrates how past institutions may have long lasting effects. For example, preferences for redistribution and corruption are higher in the former Ottoman Empire. Historical studies reveal how the structure of the Ottoman Empire was prone to corruption. Dimitrova Grajzl (2008) cites historical studies that reveal how "Corruption became prevalent with the decline of the Ottoman Empire. "From the seventeenth century onward the typical Ottoman official holding a position of any importance regarded it as a private investment from which he was justified in deriving as large a return as possible" (Stavrianos 2000, p. 120). Similarly, the Ottoman Empire was quite egalitarian (Berend, 2003), which may have had long lasting effects on preferences for redistribution today. On the contrary, corruption is lowest in what was Prussia and in the Habsburg Empire, which also corresponds to historical accounts (REF).

### *3.3.Preliminary evidence on the role of geography*

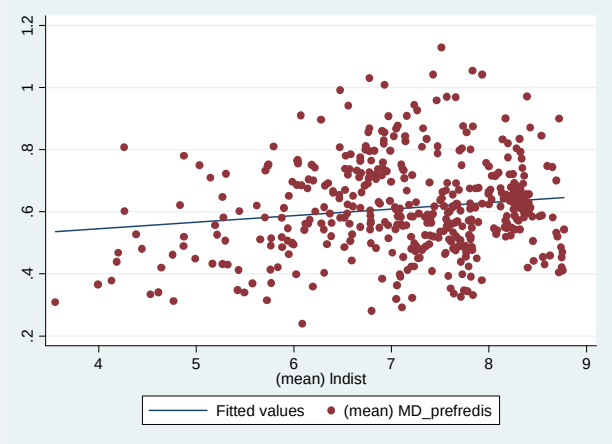
A few graphs can illustrate that cultural dissimilarity increases in physical distance. The following graphs plot our measures of dissimilarity for each of our dependent variables: preferences for redistribution, corruption, general trust, occupation and female labor force participation, against physical distance between pairs of Primary Sampling Units.

**Figure 1: Manhattan Distance of Dependent Variables and Physical Distance**

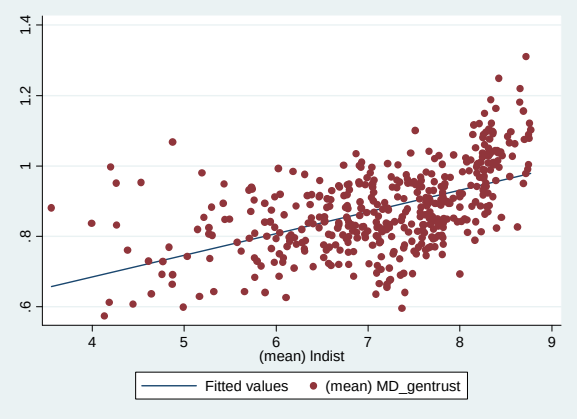
(a) Corruption:



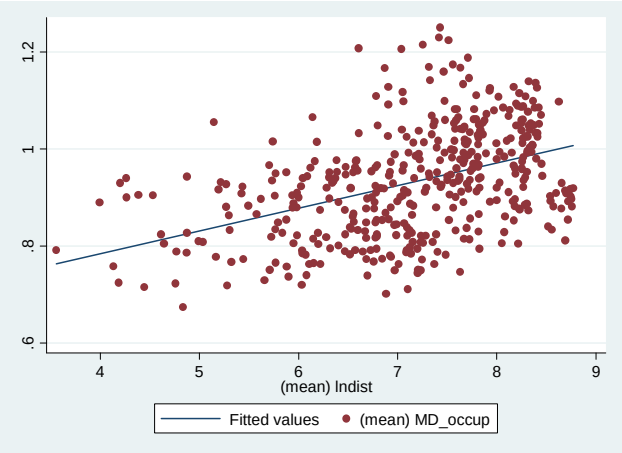

(b) Preferences for redistribution



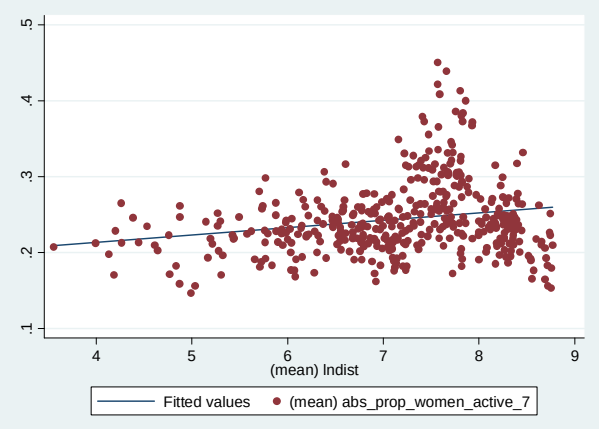

(c) General trust:




(d) Occupation:




(e) Proportion of active women




The influence of distance is not homogenous however. Distance seems to impact dissimilarity in terms of general trust, corruption, or economic occupation more than preferences for

redistribution or female labor force participation. This may be due to the fact that the nature of social interactions may vary across different values or economic outcomes. Female labor force participation, for example, may be more influenced by "culture" or vertical transmission mechanisms, rather than by local interactions. General trust and corruption, on the contrary, are likely to be strongly influenced both by local spatial interactions and by culture. The structure of economic occupations may depend greatly on the nature of social networks (Granovetter 1973), but less on culture and historical background. The question of the relative impacts of "vertical" and "horizontal" transmission mechanisms on different sets of values and economic outcomes is precisely at the core of this paper. We now turn to our integrated gravity equation, which allows to illustrate simultaneously the role of history and geography described in Tabellini (2008a).

## 4. Results of the Gravity Model

### *4.1.Baseline results*

Table 2a to 2d present estimation results of the baseline gravity equation described in (9).

**Table 2a: Results of baseline gravity equation: preferences for redistribution and generalized trust**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| | Pref. redistribution | Pref. redistribution | Pref. redistribution | Pref. redistribution | General trust | General trust | General trust | General trust |
| **Distance** | **0.029*** ** | **0.009*** | **0.024*** ** | **0.007** | **0.024*** ** | **0.022*** ** | **0.023*** ** | **0.021*** ** |
| | [0.003] | [0.005] | [0.004] | [0.005] | [0.003] | [0.003] | [0.003] | [0.004] |
| Same country | | -0.088*** | | -0.084*** | | -0.009 | | -0.008 |
| | | [0.011] | | [0.011] | | [0.008] | | [0.008] |
| Contiguous | | -0.051*** | | -0.048*** | | -0.007* | | -0.006* |
| | | [0.006] | | [0.006] | | [0.004] | | [0.004] |
| **Same empire** | | | **-0.030*** ** | **-0.022*** ** | | | **-0.009** ** | **-0.008** ** |
| | | | [0.007] | [0.007] | | | [0.004] | [0.004] |
| MD Religion | 0.007** | 0.007* | 0.007** | 0.007* | 0.016*** | 0.016*** | 0.016*** | 0.016*** |
| | [0.004] | [0.004] | [0.004] | [0.004] | [0.005] | [0.005] | [0.005] | [0.005] |
| MD occupation | 0.064*** | 0.063*** | 0.064*** | 0.063*** | -0.019* | -0.019* | -0.019* | -0.019* |
| | [0.010] | [0.010] | [0.010] | [0.010] | [0.010] | [0.010] | [0.010] | [0.010] |
| MD social class | 0.026*** | 0.026*** | 0.026*** | 0.026*** | 0.029*** | 0.029*** | 0.029*** | 0.029*** |
| | [0.009] | [0.009] | [0.009] | [0.009] | [0.009] | [0.009] | [0.009] | [0.009] |
| MD education | 0.035*** | 0.034*** | 0.035*** | 0.034*** | 0.033*** | 0.033*** | 0.033*** | 0.033*** |
| | [0.009] | [0.009] | [0.009] | [0.009] | [0.009] | [0.009] | [0.009] | [0.009] |
| Difference in age | 0.001 | 0.001 | 0.001 | 0.001 | 0.003*** | 0.003*** | 0.003*** | 0.003*** |
| | [0.001] | [0.001] | [0.001] | [0.001] | [0.001] | [0.001] | [0.001] | [0.001] |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Observations | 963966 | 963966 | 963966 | 963966 | 963966 | 963966 | 963966 | 963966 |
| R-squared | 0.085 | 0.086 | 0.085 | 0.086 | 0.069 | 0.07 | 0.07 | 0.07 |

## Table 2b: Results of baseline gravity equation: corruption

| | 1<br>Corruption | 2<br>Corruption | 3<br>Corruption | 4<br>Corruption |
|---|---|---|---|---|
| **Distance** | **0.011*** ** | **0.003** | **0.008*** ** | **0.001** |
| | [0.003] | [0.004] | [0.003] | [0.004] |
| Same country | | -0.059*** | | -0.057*** |
| | | [0.010] | | [0.010] |
| Contiguous | | -0.002 | | 0.000 |
| | | [0.005] | | [0.005] |
| **Same Empire** | | | **-0.017*** ** | **-0.016*** ** |
| | | | [0.003] | [0.003] |
| MD Religion | -0.005 | -0.006 | -0.005 | -0.006 |
| | [0.005] | [0.005] | [0.005] | [0.005] |
| MD occupation | 0.059*** | 0.059*** | 0.059*** | 0.059*** |
| | [0.012] | [0.012] | [0.012] | [0.012] |
| MD social class | 0.029*** | 0.029*** | 0.029*** | 0.029*** |
| | [0.010] | [0.010] | [0.010] | [0.010] |
| MD education | 0.042*** | 0.042*** | 0.042*** | 0.042*** |
| | [0.011] | [0.011] | [0.011] | [0.011] |
| Difference in age | 0.002*** | 0.002*** | 0.002** | 0.002*** |
| | [0.001] | [0.001] | [0.001] | [0.001] |
| Observations | 963966 | 963966 | 963966 | 963966 |
| R-squared | 0.1 | 0.101 | 0.101 | 0.101 |

## Table 2c: Results of baseline gravity equation: occupation and female labor force participation

| | 1<br>Occupations | 2<br>Occupations | 3<br>Occupations | 4<br>Occupations | 5<br>FLP | 6<br>FLP | 7<br>FLP | 8<br>FLP |
|---|---|---|---|---|---|---|---|---|
| **Distance** | **0.021*** ** | **0.015*** ** | **0.019*** ** | **0.014*** ** | **0.016*** ** | **0.015*** ** | **0.015*** ** | **0.015*** ** |
| | [0.002] | [0.003] | [0.002] | [0.003] | [0.001] | [0.002] | [0.001] | [0.002] |
| Same country | | -0.017*** | | -0.015** | | -0.002 | | -0.002 |
| | | [0.006] | | [0.006] | | [0.003] | | [0.003] |
| Contiguous | | -0.022*** | | -0.021*** | | -0.005** | | -0.005** |
| | | [0.004] | | [0.003] | | [0.002] | | [0.002] |
| **Same Empire** | | | **-0.011*** ** | **-0.008** ** | | | **-0.002** | **-0.002** |
| | | | [0.004] | [0.004] | | | [0.003] | [0.003] |
| MD religion | 0.042*** | 0.042*** | 0.042*** | 0.042*** | 0.011*** | 0.011*** | 0.011*** | 0.011*** |
| | [0.003] | [0.003] | [0.003] | [0.003] | [0.002] | [0.002] | [0.002] | [0.002] |
| MD education | 0.196*** | 0.196*** | 0.196*** | 0.196*** | 0.051*** | 0.051*** | 0.051*** | 0.051*** |
| | [0.007] | [0.007] | [0.007] | [0.007] | [0.004] | [0.004] | [0.004] | [0.004] |
| Difference in age | 0.014*** | 0.014*** | 0.014*** | 0.014*** | 0 | 0 | 0 | 0 |
| | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Observations | 963966 | 963966 | 963966 | 963966 | 957036 | 957036 | 957036 | 957036 |
| R-squared | 0.231 | 0.232 | 0.231 | 0.232 | 0.045 | 0.045 | 0.045 | 0.045 |

*Notes to Table 2a, 2b, 2c:*

*All dependent variables are Manhattan Distance measures of dissimilarity between PSU pairs. Distance is expressed as the logarithm of the physical distance between PSUs in km. Same Empire takes value 1 if both PSUs have belonged to the same Empire (as defined in section 4) for more than a 100 years. . All regressions control for country fixed effects.*** indicates significance at 1%, * significance at 10%. Standard errors in brackets. Robust standard clustered by member of the dyad (PSU).*

Most covariates in Table 2a and Table 2b have expected positive signs: dissimilarity in terms of religion, social class composition, education or age increases dissimilarity in terms of preferences for redistribution, general trust and corruption significantly. Dissimilarity in terms of occupation however has an unexpected negative sign on the Manhattan distance of corruption between pairs of PSUs, but it is hardly significant. All covariates in Table 2c also have expected signs: dissimilarities between PSU pairs in terms of age, education or religion increases PSUs' dissimilarities in terms of occupation and female labor force participation, with the strongest effect coming from dissimilarities in education levels.

We can see from Table 2a that geography and history both play an important role in explaining dissimilarity in terms of preferences for redistribution and general trust. Physical distance increases such cultural dissimilarities, while belonging to the same country or former empire or sharing a border tones them down. This is also true of corruption, dissimilarities in terms of occupation, and female labor force participation. The effect of physical distance, which in our theoretical model is a proxy for local social interactions, remains important, even once past and modern geopolitical considerations are taken into account, except in the case of corruption (column (4) of Table 2b).. The effect of past empires has the consistent and robust effect of diminishing dissimilarities between pairs of PSUs in all the dimensions under consideration, except for female labor force participation. This is also true of today's geopolitical borders: contiguous countries are much more similar in terms of preferences for redistribution, general trust, patterns of economic occupations and female labor force participation . The effect is quite strong. One of the advantage of using such a gravity model to explore cultural differences is that it is possible to express the impact of each variable in terms of a common metric, here geographical distance. For example, belonging to the same country reduces our measure of

dissimilarity in terms of general trust by the equivalent of 995 km[6]. Belonging to 2 different but contiguous countries has a comparable negative effect on this measure: it decreases it by the equivalent of 663 km. Interestingly, the effect of past history is even stronger than the impact of today's geopolitical borders: having been integrated in the same former empire during more than 100 years decreases the measure of general trust by the equivalent of 1106 km. For female labor force participation, the strongest effect comes from belonging to the same country today: it decreases the dissimilarity between locations pair by an equivalent of nearly 3100 km. Belonging to two adjacent countries has a rather strong effect as well, by reducing the dissimilarity between PSU pairs in terms of female labor force participation by the equivalent of 2322 km, while the effect of former integration in empires is to reduce it by "only" slightly more than 1000 km.

### *4.2.More recent history: the effect of the USSR and Yugoslavia*

We add to the specification in (9) two dummy variables investigating further the role of past, albeit more recent history: USSR and Yugoslavia, which take value 1 if both PSUS in the pair used to belong to, respectively, the former USSR and former Yugoslavia. Results are displayed in Table 3. Results are very clear-cut in the case of the former USSR: dissimilarity in all of the dimensions measured in this paper is larger within the former USSR than it is on average when the whole sample is considered. Results are more contrasted in the case of the former Yugoslavia. PSUs in countries of the former Yugoslavia are more similar to each other in terms of preferences for redistribution and corruption, while the opposite is true in all four other dimensions. In any case, the contrast with the effect of the variable that reflects the influence of former dynastic Empires is flagrant. Locations that belonged to the former Russian, Ottoman, Habsburg or Prussian empires for more than a 100 years are more similar to each other than locations that were integrated in the former USSR or Yugoslavia, despite the fact that these last two historical episodes are closer, albeit briefer, events in the countries' past.

[6] Computed as 23.22*0.009/(0.021/100), 23.22 is equivalent to a 1 % change in the average distance.

## Table 3: The Effect of the former USSR and Yugoslavia

| | 1<br>Pref. redistribution | 2<br>General trust | 3<br>Corruption | 4<br>Occupation | 5<br>FLP |
|---|---|---|---|---|---|
| Distance | 0.003 | 0.023*** | 0.002 | 0.016*** | 0.016*** |
| | [0.005] | [0.004] | [0.004] | [0.003] | [0.002] |
| Same country | -0.069*** | -0.013* | -0.055*** | -0.018*** | -0.004 |
| | [0.011] | [0.008] | [0.010] | [0.006] | [0.003] |
| Contiguous | -0.044*** | -0.008** | 0 | -0.022*** | -0.006** |
| | [0.006] | [0.004] | [0.005] | [0.003] | [0.002] |
| Same empire | -0.027*** | -0.007 | -0.017*** | -0.007** | -0.001 |
| | [0.007] | [0.004] | [0.003] | [0.004] | [0.003] |
| USSR | 0.039*** | 0.003 | 0.022** | 0.005 | 0.009*** |
| | [0.005] | [0.012] | [0.010] | [0.007] | [0.002] |
| Yugoslavia | -0.142*** | 0.047*** | -0.016* | 0.025*** | 0.015*** |
| | [0.014] | [0.006] | [0.009] | [0.005] | [0.002] |
| Observations | 963966 | 963966 | 963966 | 963966 | 957036 |
| R-squared | 0.089 | 0.07 | 0.101 | 0.232 | 0.046 |

N*otes to Table 3:*

*All dependent variables are Manhattan Distance measures of dissimilarity between PSU pairs. Distance is expressed as the logarithm of the physical distance between PSUs in km. Regressions columns 1 to 4 control for dissimilarity between pairs of PSUs in terms of religious affiliation, occupation, social class composition, education, age, as well as country fixed effects. Regressions in columns 5to control for dissimilarity between pairs of PSUs in terms of religious affiliation, education, age, as well as country fixed effects.*

*Same Empire takes value 1 if both PSUs have belonged to the same Empire (as defined in section 4) for more than a 100 years. USSR is a dummy variable that takes value 1 if both PSUs in the pair used to belong to the former USSR. Yugoslavia is a dummy variable that takes value 1 if both PSUs in the pair used to belong to the former Yugoslavia.*

*The former USSR comprises Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, the Russian Federation, Tajikistan, Ukraine and Uzbekistan. Former Yugoslavia consists of Bosnia and Herzegovina, Croatia, FYR Macedonia, Montenegro, Serbia and Slovenia.*

**** indicates significance at 1%, * significance at 10%. Standard errors in brackets. Robust standard clustered by member of the dyad (PSU).*

## 5. Extensions

### *5.1. The effects of EU integration*

This cultural gravity model can be used in order to investigate the cultural and economic proximity of European Union members. Many countries in our sample are either member states of the European Union or candidate countries. The Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, the Slovak Republic and Slovenia are member states of the EU since 2004; Bulgaria and Rumania since 2007. Other countries, such as Croatia, the Former Yugoslav Republic of Macedonia and Turkey are candidate countries. We construct several dummy variables that reflect the status of each country in our sample relative to the EU, and we evaluate the impact of EU status on cultural dissimilarity and our measures of economic outcomes heterogeneity. We construct two dummy variables, which take value one if each member of the PSU pair belongs to countries that are both EU members (*EU*), or are both candidate countries (*EU candidates*). We the construct a dummy variable that takes value one if one PSU belongs to a member states and the other to a candidate country (*EU-candidate EU*). The last dummy variable (*EU- nonEUnocand*) takes value one if one PSU belongs to a EU member states and the other is neither a member state nor a candidate country. The purpose of these last two variables is hence to reflect whether countries that are not yet in the EU but are candidates are culturally and economically more similar to EU member states rather than countries which do not have any perspective of adhesion yet.

**Table 4: The Effects of actual and future EU integration. Results of the Gravity Model**

| | 1<br>Pref. redistribution. | 2<br>Corruption | 3<br>Gen. trust | 4<br>Occupation | 5<br>FLP |
|---|---|---|---|---|---|
| Distance | 0.006 | 0.014*** | 0.001 | 0.010*** | 0.014*** |
| | [0.005] | [0.004] | [0.004] | [0.003] | [0.002] |
| Same country | -0.084*** | -0.001 | -0.060*** | -0.010* | -0.001 |
| | [0.011] | [0.008] | [0.010] | [0.006] | [0.003] |
| Contiguous | -0.057*** | -0.006* | 0 | -0.022*** | -0.006** |
| | [0.006] | [0.003] | [0.005] | [0.003] | [0.002] |
| **EU members** | **0.096**** | **-0.166***** | **-0.004** | **-0.035** | **-0.013** |
| | **[0.040]** | **[0.037]** | **[0.036]** | **[0.022]** | **[0.013]** |
| **EU candidate** | **-0.070***** | **-0.002** | **-0.022** | **0.013** | **-0.005** |
| | **[0.025]** | **[0.010]** | **[0.017]** | **[0.010]** | **[0.007]** |
| **EU-candidate EU** | **0.116***** | **-0.016***** | **-0.025**** | **0.029***** | **0.010**** |
| | **[0.017]** | **[0.005]** | **[0.012]** | **[0.005]** | **[0.004]** |
| **EU- nonEUnocand** | **0.055**** | **-0.038*** | **0.01** | **0.01** | **-0.003** |
| | [0.023] | [0.019] | [0.015] | [0.012] | [0.008] |

| | | | | | |
|---|---|---|---|---|---|
| Observations | 963966 | 963966 | 963966 | 963966 | 957036 |
| R-squared | 0.089 | 0.072 | 0.101 | 0.234 | 0.046 |

*Notes to Table 4:*

*All dependent variables are Manhattan Distance measures of dissimilarity between PSU pairs. Distance is expressed as the logarithm of the physical distance between PSUs in km. All regressions control for country fixed effects. Regressions in columns 1 to 3 control for dissimilarity between pairs of PSUs in terms of religious affiliation, education, age, occupation and social class composition. Regressions in columns 4 to 6 control for dissimilarity between pairs of PSUs in terms of religious affiliation, education and age. *** indicates significance at 1%, * significance at 10%. Standard errors are in brackets. Robust standard clustered by member of the dyad (PSU).*

The effects are unclear. The negative coefficient on the EU dummy variable indicates that EU members are much more similar to each other than to the rest of the sample in terms of corruption, and the effect is rather large. However, the coefficient is insignificant for dissimilarities in terms of general trust, occupation or female labor force participation, and actually positive for preference for redistribution. EU candidate countries are more similar to current EU members in terms of prevailing corruption and general trust, but more dissimilar in all other dimensions. On the whole, this does not indicate neither a strong converging effect of EU membership (except for corruption) or EU adhesion perspective nor a strong selection effect that would consist in privileging adhesion of countries that are more similar to each other and to existing EU members. One country for which there is much heated debate regarding EU adhesion is Turkey, which leads us to the question in the next subsection: Is Turkey in Europe?

### *5.2. Is Turkey in Europe?*

Is Turkey closer to European member states in terms of the values and economic outcomes we measure in this paper, or is it closer to other –non EU members- countries of our sample, including the other candidate to the EU?

We keep only PSU pairs in which at least one PSU is situated in Turkey. Results are displayed in Table 5a.

**Table 5a. Is Turkey in Europe? Results of the cultural gravity model**

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | Pref. redistribution | Corruption | General trust | Occupation | FLP |
| Distance | 0.010 | -0.009 | -0.061*** | 0.084*** | 0.045*** |
| | [0.013] | [0.012] | [0.017] | [0.014] | [0.006] |
| **EU-nonEU** | **0.543*** ** | **-0.133** ** | **0.169*** ** | **-0.162*** ** | **0.117*** ** |
| | [0.067] | [0.056] | [0.054] | [0.041] | [0.023] |
| **EU candidates** | **-0.137** | **-0.256*** ** | **-0.071** | **-0.069*** | **0.005** |
| | [0.089] | [0.088] | [0.049] | [0.037] | [0.017] |
| Observations | 68175 | 68175 | 68175 | 68175 | 67925 |
| R-squared | 0.222 | 0.121 | 0.036 | 0.216 | 0.082 |

*Notes to Table 5a:*

*All dependent variables are Manhattan Distance measures of dissimilarity between PSU pairs. Distance is expressed as the logarithm of the physical distance between PSUs in km. All regressions control for country fixed effects. Regressions in columns 1 to 3 control for dissimilarity between pairs of PSUs in terms of religious affiliation, education, age, occupation and social class composition. Regressions in columns 4 to 6 control for dissimilarity between pairs of PSUs in terms of religious affiliation, education and age. *** indicates significance at 1%, * significance at 10%. Standard errors are in brackets. Robust standard clustered by member of the dyad (PSU).*

Results indicate that Turkey is significantly more dissimilar to EU member states than to the rest of the sample in most dimensions: preferences for redistribution, general trust and female labor force participation. However, it is more similar to EU member states for corruption and the patterns of economic occupations. An interesting and unequivocal result concerns the cultural distance between Turkey and the other EU candidate states: Turkey is more similar to the other EU candidates countries in all dimensions under investigation here. This result is likely due to the fact that candidate countries include countries that were formerly part of the Ottoman Empire. For this reason, it may be interesting to distinguish between countries of the first wave of EU adhesion, and countries of the second wave: Bulgaria and Romania, two countries that belonged (at least partly for the case of Romania) to the former Ottoman Empire. Results are displayed in Table 5b. Here, results are unequivocal: Turkey is radically dissimilar to the first wave of EU member states (which include mainly countries that were formerly part of the Habsburg Empire) except for the pattern of economic occupations. The proximity found in terms of the level of corruption between turkey and EU member states found in Table 5a is wholly due to the similarity, in terms of prevalence of corruption, of Turkey with countries of the second round of adhesion, which were, at least partly, part of the former Ottoman Empire.

**Table 5b: Is turkey in the (very new) Europe?**

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | Pref. redistribution | Corruption | General trust | Occupation | Prop. active women |
| Distance | 0.010 | -0.009 | -0.061*** | 0.084*** | 0.045*** |
| | [0.013] | [0.012] | [0.017] | [0.014] | [0.006] |
| **First Wave EU** | **0.265*** ** | **0.199*** ** | **0.140*** ** | **-0.082** ** | **0.059*** ** |
| | **[0.057]** | **[0.067]** | **[0.050]** | **[0.039]** | **[0.021]** |
| **Second Wave EU** | **0.135** | **-0.376*** ** | **0.003** | **0.041** | **0.117*** ** |
| | [0.096] | [0.080] | [0.043] | [0.037] | [0.023] |
| EU candidates | -0.137 | -0.256*** | -0.071 | -0.069* | 0.005 |
| First Wave EU | [0.089] | [0.088] | [0.049] | [0.037] | [0.017] |
| Observations | 68175 | 68175 | 68175 | 68175 | 67925 |
| R-squared | 0.222 | 0.121 | 0.036 | 0.216 | 0.082 |

*Notes to Table 5b:*
*All dependent variables are Manhattan Distance measures of dissimilarity between PSU pairs. Distance is expressed as the logarithm of the physical distance between PSUs in km. All regressions control for country fixed effects. Regressions in columns 1 to 3 control for dissimilarity between pairs of PSUs in terms of religious affiliation, education, age, occupation and social class composition. Regressions in columns 4 to 6 control for dissimilarity between pairs of PSUs in terms of religious affiliation, education and age *** indicates significance at 1%, * significance at 10%. Standard errors are in brackets. Robust standard clustered by member of the dyad (PSU).*

### *5.3.Internet and cultural (and economic) homogenization*

Estimating the impact of internet access on cultural values, as well as on economic activity, runs into an endogeneity problem. People who chose and can afford to have internet may be very different culturally, as well as in their patterns of economic activity, from people who do not. To try and alleviate this problem, we do not rely on internet access at the household level, but instead we construct a dummy equal to one if at least one household in the PSU has internet access at home (instead of using the mean value of internet users in the PSU). This variable is intended to reflect whether internet access is available in the village or town in which household lives. Less than half of the PSU pairs both have internet access in our sample. Of course, the roll out of installing internet technologies is not exogenous either. Our dummy variables does not alleviate this issue, but alleviates the endogeneity of internet access at the household level.

In the table that follows, the variable Internet indicates whether cultural dissimilarity and the heterogeneity of economic outcomes in terms of corruption, occupation, or female labor force participation is lessened when both PSU have internet access. Our results indicate that internet access reduces the heterogeneity between PSUs in terms of general trust and female labor

participation. PSUs that both have internet are also more similar in terms of economic occupations, but this result is more likely attributable to the endogeneity problem mentioned earlier. Although the coefficient might be upward biased because of the endogeneity problem mentioned earlier, the effect is quite strong. For example, having internet access in both PSUs is equivalent to decreasing the physical distance by 2786 km in terms of dissimilarity between PSU in their general trust attitude and by more than 5280 km in terms of their heterogeneity in their occupation structure.

**Table 6a: Internet and cultural (and economic) homogenization. Results of the gravity model**

| | 1<br>Pref. redistribution | 2<br>Corruption | 3<br>General trust | 4<br>Occupation | 5<br>Prop. active women |
|---|---|---|---|---|---|
| Distance | 0.009* | 0.003 | 0.020*** | 0.009*** | 0.013*** |
| | [0.005] | [0.004] | [0.004] | [0.003] | [0.002] |
| Same country | -0.089*** | -0.059*** | -0.012 | -0.026*** | -0.006** |
| | [0.011] | [0.010] | [0.008] | [0.006] | [0.003] |
| Contiguous | -0.051*** | -0.002 | -0.008** | -0.024*** | -0.006** |
| | [0.006] | [0.005] | [0.004] | [0.003] | [0.002] |
| **Internet** | **-0.009** | **0.000** | **-0.024*** ** | **-0.091*** ** | **-0.034*** ** |
| | [0.010] | [0.013] | [0.008] | [0.007] | [0.004] |
| Observations | 963966 | 963966 | 963966 | 963966 | 957036 |
| R-squared | 0.086 | 0.101 | 0.07 | 0.245 | 0.051 |

*Notes to Table 6a:*

*All dependent variables are Manhattan Distance measures of dissimilarity between PSU pairs. Distance is expressed as the logarithm of the physical distance between PSUs in km. All regressions control for country fixed effects. Regressions in columns 1 to 3 control for dissimilarity between pairs of PSUs in terms of religious affiliation, education, age, occupation and social class composition. Regressions in columns 4 to 6 control for dissimilarity between pairs of PSUs in terms of religious affiliation, education and age. *** indicates significance at 1%, * significance at 10%. Standard errors are in brackets. Robust standard clustered by member of the dyad (PSU).*

One interesting question to study is to which sort of values internet makes users converge to. Using a Manhattan Distance measure only gives an idea of the scope of cultural differences, not in which direction the values evolve. An important question is whether internet use make people converge towards "universal" values, or towards communautarism. In order to get an idea, I re run the above regressions by including an interaction between the Same country dummy and the internet dummy. This interaction term gives an indication as to whether internet users converge

more towards each other within the same country or whether this effect is oblivious of political borders. Results are displayed in Table 6b. The coefficient on the interaction is negative and significant in columns 1 to 3, indicating that internet reduces cultural distance, that is to say our measures of dissimilarity in general trust, preferences for redistribution, as well as corruption, all the more so *within* the same country, but the opposite is true for the heterogeneity of economic outcomes in terms of occupation and female labor force participation.

**Table 6b: Does internet homogenize within or across borders?**

| | 1<br>Pref. redistribution | 2<br>Corruption | 3<br>General trust | 4<br>Occupation | 5<br>Prop. active women | 6<br>FLP transition |
|---|---|---|---|---|---|---|
| Distance | 0.009* | 0.003 | 0.020*** | 0.010*** | 0.013*** | 0.009*** |
| | [0.005] | [0.004] | [0.004] | [0.003] | [0.002] | [0.001] |
| Same country | -0.076*** | -0.031*** | 0.001 | -0.057*** | -0.013*** | -0.008*** |
| | [0.012] | [0.012] | [0.009] | [0.007] | [0.004] | [0.003] |
| Contiguous | -0.051*** | -0.002 | -0.008** | -0.024*** | -0.006** | 0 |
| | [0.006] | [0.005] | [0.004] | [0.003] | [0.002] | [0.002] |
| Internet | -0.009 | 0.001 | -0.024*** | -0.092*** | -0.034*** | -0.014*** |
| | [0.010] | [0.013] | [0.008] | [0.007] | [0.004] | [0.003] |
| Internet*country | -0.024** | -0.052*** | -0.024*** | 0.056*** | 0.012*** | 0.006* |
| | [0.011] | [0.011] | [0.009] | [0.007] | [0.005] | [0.003] |
| Observations | 963966 | 963966 | 963966 | 963966 | 957036 | 957036 |
| R-squared | 0.086 | 0.101 | 0.07 | 0.245 | 0.051 | 0.036 |

*Notes to Table 6b:*

*All dependent variables are Manhattan Distance measures of dissimilarity between PSU pairs. Distance is expressed as the logarithm of the physical distance between PSUs in km. Regressions control for country fixed effects. *** indicates significance at 1%, * significance at 10%. Standard errors are in brackets. Robust standard clustered by member of the dyad (PSU).*

## 6. Conclusion

This paper presents a novel approach to model and empirically estimate jointly the role of history and geography as determinants of some political and economic attitudes and the pattern of economic occupation and female labor force participation. An interesting feature of this model is to provide a joint metric, physical distance, to express the contribution of different –past and present- geopolitical and social factors to cultural distance. I find evidence of a strong and long lasting influence of past dynastic empires in central and eastern Europe, but no evidence of a lasting impact of more recent influences such as the Former Soviet Union or the Yugoslav Federation. This may seem surprising given that the latter events were more recent events. One

explanation could be related to the different time spans of dynastic empires, which lasted several centuries, versus the Soviet or Yugoslav Federation, which only lasted decades. More work is needed to model the influence of the time span of integration on attitudes. In particular, one extension of the paper is to deal with the relative contribution of the time spent in integrated political entity and time spent since regions broke out of such political ensembles. This will be the object of a future paper that builds a model of cultural capital accumulation as a function of time spent in political entity, time since broke out, and distance to the cultural center (Istanbul, Vienna, Moscow).

One interesting application of the model developed in this paper is to investigate the "cultural" distance of Turkey to EU member states or other EU candidates Here, the conclusion is that, compared with countries that joined the EU in 2004, Turkey is not European, from the point of view of political-economic attitudes and female labor force participation. However, Turkey is quite similar to countries that joined the EU in 2007, Bulgaria and Romania, and very similar to other candidate countries. Of course, an important extension of this paper is to model not only absolute differences but the direction of these differences. This will be the object of another paper.

## 7. References


**Alesina, Alberto and Nicola Fuchs-Schundeln**. 2007. "Goodbye Lenin (or Not?): The Effect of Communism on People." *The American Economic Review*, 97(4): 1507-1528.

Berend, Ivan T. History Derailed: Central and Eastern Europe in the Long Nineteenth Century. Berkeley: University of California Press, 2003. xix, 330 pp

Botticini, Maristella & Eckstein, Zvi, 2006a."From Farmers to Merchants, Voluntary Conversions and Diaspora: A Human Capital Interpretation of Jewish History," CEPR Discussion Papers 5571, C.E.P.R. Discussion Papers.

Botticini, Maristella & Eckstein, Zvi, 2006b. "Path Dependence and Occupations, Boston University - Department of Economics - The Institute for Economic Development Working Papers Series DP-154, Boston University - Department of Economics.

Bruegger, Beatrix, Rafael Lalive and Josef Zweimuller (2008) Does culture affect unemployment? Evidence from the Barriere des Roestis.

L. L. Cavalli-Sforza and M. Feldman, Cultural versus biological inheritance: phenotypic transmission from parent to children, Amer. J. Human Genetics 25 (1973), 618_637.

de Paula, Ãureo & JosÃ© A. Scheinkman, 2007. "The Informal Sector," NBER Working Papers 13486, National Bureau of Economic Research, Inc.

Durlauf, Steven N, 1996. " A Theory of Persistent Income Inequality," Journal of Economic Growth, Springer, vol. 1(1), pages 75-93, March

Fernandez, Raquel, 2007. **Culture as Learning: The Evolution of Female Labor Force Participation over a Century**.

Fernandez, Raquel Culture: An Empirical Investigation of Beliefs, Work, and Fertility with A. Fogli, January 2007

Guiso, Luigi, Paola Sapienza & Luigi Zingales, 2008. "Long Term Persistence," NBER Working Papers 14278, National Bureau of Economic Research, Inc.

Head, Thierry and Keith Head (2008). Detection of local interactions from the spatial pattern of names in France. Journal of Regional Science, vol 48, number, pp 67-95.

Kelejina, Harry H., Peter Murrell and Oleksandr Shepotyloe (2007). Spatial Spillovers in the Development of Institutions.

Lindbeck, Assar & Sten Nyberg & Jörgen W. Weibull, 2003. "Social Norms and Welfare State Dynamics," Journal of the European Economic Association, MIT Press, vol. 1(2-3), pages 533-542, 04/05"Incentives and Social Norms in Household Behavior," American Economic Review, American Economic Association, vol. 87(2), pages 370-77, May.

Manski, Charles F. (1993), "Identification of Endogenous Social Effects: The Reflection Problem" The Review of Economic Studies, 60(3), 531–542

Bertrand, Marianne, Erzo F. P. Luttmer & Sendhil Mullainathan, 2000."Network Effects And Welfare Cultures," The Quarterly Journal of Economics, MIT Press, vol. 115(3), pages 1019-1055, August

Glaeser, Edward L & Sacerdote, Bruce & Scheinkman, Jose A, 1996. "Crime and Social Interactions," The Quarterly Journal of Economics, MIT Press, vol. 111(2), pages 507-48, May

Tabellini, Guido 2008a: Culture and Institutions: Economic Development in the Regions of Europe**,** Forthcoming in the *Journal of the European Economic Association*

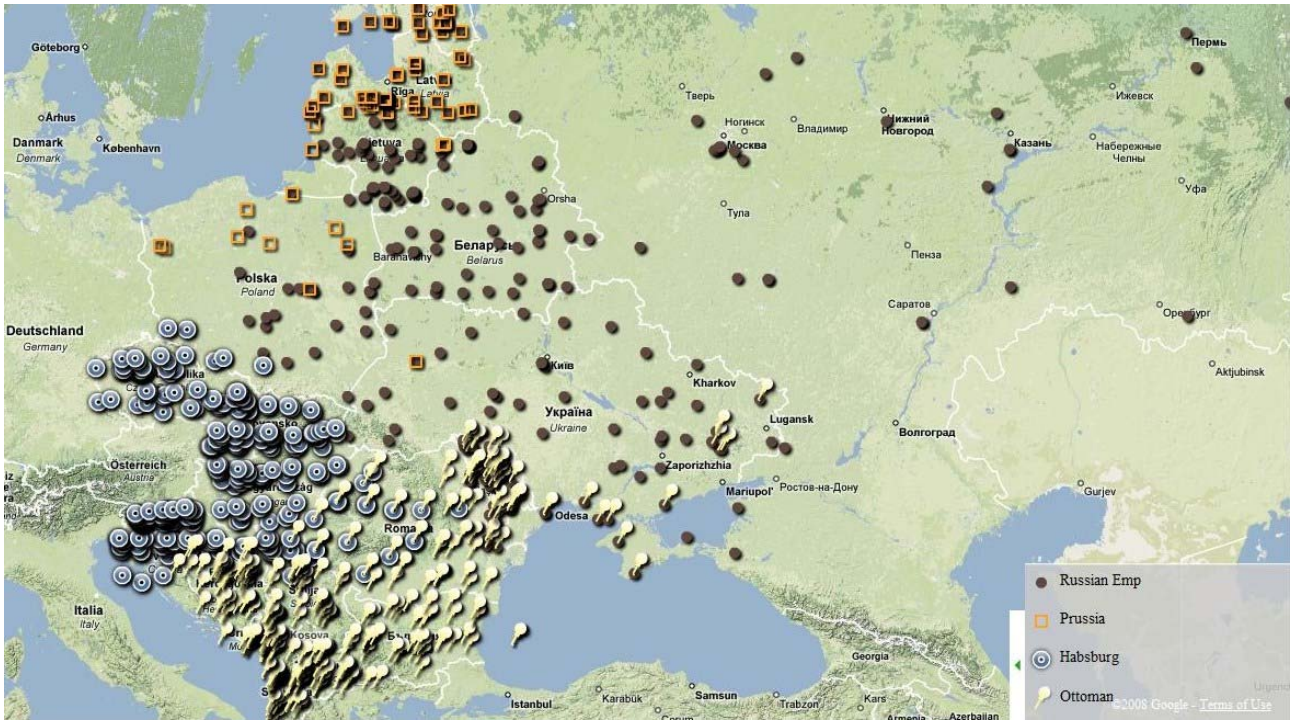
Tabellini, Guido. 2008b. The Scope of Cooperation: Norms and Incentives, 2008b, QJE, forthcoming

# 8. Appendix

**Table A1: Geographical and temporal delimitations of Empires in our sample**

| | 600 years or more | 300 to 500 years | 200 years or less |
|---|---|---|---|
| **Ottoman Empire** | Bulgaria (except part which became independent in 1878), FYROM, Turkey | Albania, Bosnia, Bulgaria which became independent in 1878, Bessarabia, Crimea, Moldavia, outer Montenegro, Serbia except Vojvodina, Wallachia | Transylvania, Vojvodina, southern Hungary, eastern Croatia |
| **Habsburg Empire** | Slovakia, Hungary (except southern-ottoman Hungary) | Croatia (except Dalmatia), Czech Republic, Southern (ottoman) Hungary , Polish Silesia, Slovenia, Transylvania, Vojvodina | Dalmatia, Galicia, Habsburg Poland (Krakow, Rzeszow), Bosnia, western Ukraine (Lviv) |
| **Prussia** | Pomerania (Poland) | Estonia, Latvia, Polish Silesia, Royal Prussia | Polish Silesia, Kaliningrad, Klaipeda (Lithuania) |
| **Russian Empire** | | Russia (except Kaliningrad), Ukraine (except Crimea and Kouban) | Armenia, Azerbaijan, Belarus, Baltic states (except Klaipeda), Georgia, , Kazakhstan, Kyrgyzstan, Moldova, eastern-central Poland (Warsaw, Lodz), rest of Ukraine, Tajikistan |

**Figure A1. Map of Dynastic Empires in Central and Eastern Europe**




*Notes to Figure A1:*

*The figure indicates PSUs that belonged to the Russian, Prussian, Habsburg and Ottoman Empires for more than 200 years.*

## Table A2: Descriptive statistics

| Variable | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|
| **Dependent variables** | | | | |
| **dist** | 2321.998 | 1892.778 | 0 | 14397.8 |
| **ln (distance)** | 7.340031 | 1.035817 | 0 | 9.5749 |
| **MD preferences redistribution** | 0.6187724 | 0.4451283 | 0 | 2 |
| **MD corruption** | 0.9744148 | 0.4848529 | 0 | 2 |
| **MD general trust** | 0.8738906 | 0.3855833 | 0 | 2 |
| **MD occupation** | 0.9366432 | 0.3202894 | 0.0374922 | 2.477694 |
| **Abs. diff Proportion active women** | 0.2479292 | 0.1806491 | 0 | 1 |
| **Abs. diff Proportion women active in 1989 still active** | 0.1885439 | 0.1428231 | 0 | 0.9411765 |
| | | | | |
| **Independent variables** | Mean | Std. Dev. | Min | Max |
| **MD religion** | 0.9368525 | 0.7540388 | 0 | 2 |
| **MD social class** | 0.6488456 | 0.3626464 | 0 | 2 |
| **MD education** | 0.896283 | 0.3744252 | 0.0049547 | 2 |
| **(abs) difference age** | 8.113819 | 6.067242 | 0.0000114 | 49.45921 |
| **Same country** | 0.0350334 | 0.1838643 | 0 | 1 |
| **contiguous** | 0.1300554 | 0.3363646 | 0 | 1 |
| **Same Empire** | 0.1495613 | 0.3566411 | 0 | 1 |
| **USSR** | 0.2465906 | 0.4310266 | 0 | 1 |
| **Yugoslavia** | 0.0465265 | 0.2106226 | 0 | 1 |
| **EU** | 0.1288956 | 0.3350846 | 0 | 1 |
| **candEU** | 0.0077804 | 0.0878626 | 0 | 1 |

| | | | | |
|---|---|---|---|---|
| **EUcandEU** | 0.077648 | 0.267617 | 0 | 1 |
| **EUnonEUnoc~d** | 0.4088422 | 0.4916203 | 0 | 1 |
| **Dinternet** | 0.4328379 | 0.495469 | 0 | 1 |