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The effect of culture on fiscal redistribution: Evidence based on genetic, epidemiological and linguistic data

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Abstract: Using a set of innovative instruments we investigate the effect of collectivist culture on fiscal redistribution. Our analysis suggests that societies characterized by less collectivistic culture present higher levels of fiscal redistribution, as proxied by government subsidies and transfers as well as health and education expenses.

JEL: Z10, Z13, H40, H41

Keywords: Culture, Redistribution, Public goods

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1. Introduction

Numerous theoretical and empirical studies suggest that culture affects economic outcomes and institutions within countries (see e.g., Spolaore and Wacziard, 2013). However, contemporaneous culture might be endogenous to economic outcomes and institutions. In a highly influential paper Gorodnichenko and Roland (2016) employ a set of innovative instruments to address endogeneity concerns and, thus, establish a convincing relationship between individualistic culture and growth.

Following the identification strategy of Gorodnichenko and Roland (2016), this work examines one dimension of culture that can be seen as relevant to welfare policies: *individualism* versus *collectivism*.[1] Fiscal redistribution is proxied by government subsidies and transfers, as well as health and education expenses that entail a dimension of redistribution (Desmet et al., 2009). To deal with the usual identification concerns, we instrument culture by a set of genetic, epidemiological and linguistic data that have been linked empirically to collectivism (see Kashima and Kashima, 1998; Murray and Schaller, 2010; Way and Liebermann, 2010). Our analysis suggests that countries characterized by higher levels of individualism present higher levels of redistributive spending.

2. Data and Theoretical Considerations

Our data covers a wide cross-section of countries. The dependent variables in our analysis are fiscal spending accounts, which are used as proxies redistribution by the relevant literature. (e.g., Desmet et al. 2009). Specifically, we employ as dependent variable interchangeably: (i) government subsidies and transfers (% GDP) and (ii) health and education expenses (% GDP) from 1980-2004.[2]

The key explanatory variable in our analysis is culture. In particular, we focus on one dimension of culture: *individualism* versus *collectivism*. *Individualism* is a cultural trait that emphasizes personal freedom and achievement and awards social status to personal

[1] To the best of our knowledge this is the first study that investigates directly the relationship between individualism/collectivism and fiscal redistribution. However, there are two parallel strands of the literature closely related to our analysis. The first concentrates on the relationship between family structure and implemented welfare policies (e.g., Esping and Andersen, 1999), whereas the second investigates the potential relationship between generalized trust (that is trust in "out-group" relationships) and welfare state (e.g., Berg and Bjørnskov, 2011). Both strands chime with a negative relationship between collectivistic norms and welfare state. More precisely, Esping and Andersen (1999) suggest that close family ties provide a social security net to the individuals that otherwise would be provided by the formal state. Similarly, Berg and Bjørnskov (2011) argue that a higher level of generalized trust - which is a basic characteristic of more individualistic societies - mitigates the temptation of free riding and allows for the universal provision of public goods, transfers and services.

[2] Data are obtained from the World Bank's *World Development Indicators* (*WDI*).

accomplishments that make an individual stand out. On the other hand, *collectivism* emphasizes the embeddedness of individuals in larger groups and encourages conformity to "in-group" relationships (see Triandis, 1995). As a main proxy for individualistic/collectivistic culture, we employ the measure developed by Hofstede (2001) with higher values indicating more individualistic societies (denoted as *individualism*).

The theoretical relationship between this dimension of culture and fiscal redistribution is *a priori* ambiguous. This is because, on the one hand, welfare state is a formal risk sharing institution that provides a safety net to "unlucky" individuals, whereas collectivistic norms -such as strong family ties- serve as informal risk sharing agreements that also protect individuals against risk (see Esping and Andersen, 1999). According to this argument, collectivism and welfare policies operate as substitutes and, thus, we should expect a negative association between the two – or a positive one between more *individualism* and redistribution. The reason is that, in the absence of formal risk sharing institutions (i.e. before the formation of welfare state), societies facing increased risks, such as climate variability or a higher prevalence of lethal diseases, developed informal insurance contracts (i.e. extended networks of "in group" relationships) to tackle the issue of uncertainty (see e.g. Murray and Schaller, 2010). For this reason, more collectivistic (individualistic) societies were in lower (higher) need of protection from the state when welfare policies were put in place. On the other hand, preferences for redistribution are endogenous to formal institutions. Therefore, a larger (narrower) welfare state may lead to collectivistic (individualistic) norms and hence increased (decreased) demand for fiscal redistribution (see e.g., Alesina and Fuchs-Schuendeln, 2007). If this is the case, collectivism and redistributive policies will function as complements rather than substitutes. Being theoretically ambiguous, an empirical investigation will shed more light on the sign of the association between *individualism* and welfare policies.

3. Identification Strategy

Our analysis relies on contemporaneous measures of culture which might be endogenous to the implemented economic policy. To address the usual endogeneity concerns, we employ a battery of alternative instruments that have been linked empirically to collectivism. Following Gorodnichenko and Roland (2016), our basic instrument is the Mahalanobis distance between the frequency of blood types in a given country and the UK, which is the second most individualistic country in our sample. Genetic markers are probably the cleanest instruments by not being correlated to fiscal redistribution

through any other channel other than culture, thus satisfying the exclusion restriction. We denote this as *blood distance from the UK*. Employing this instrument has two major advantages. First, *blood distance from the UK* is a neutral genetic marker that allows us to rule out reverse causality concerns. This is because different blood types are not expected to affect intelligence and output. Second, the frequency of alleles determining blood types is a widely available genetic information that ensures a large number of cross-country observations. Figure 1 plots government transfers along with health and educational expenses against *blood distance from the UK*. As can be seen, countries that are further away in terms of blood distance from the UK present a lower level of redistributive spending. It must be stressed that the use of genetic data does not surmise any causal effect between genetic and cultural distance. Genetic markers are used exclusively as a proxy for transmission of cultural traits from parents to offspring. In other words, our analysis seeks to exploit the stylized fact that culture is transmitted from parents to offspring (similarly to the genes) and takes the advantage of this correlation between cultural and genetic transmission to investigate the cultural distances that cannot be proxied in a more direct way (see also Gorodnichenko and Roland, 2016). Likewise, we also employ the G allele in polymorphism A118G in the μ-opoid receptor gene that leads to higher stress in case of social rejection (denoted as *A118G*). According to Way and Liebermann (2010) the G allele in polymorphism A118G in the μ-opoid receptor gene is strongly correlated to the collectivistic traits that provide psychological protection from social rejection. Unfortunately, cross-country coverage for the variable *A118G* is limited, which qualifies *blood distance from the UK* as our main instrument.

[Insert Figure 1 about here]

We also use the epidemiological data on pathogen prevalence put together by Murray and Schaller (2010) - denoted as *pathogen prevalence*. The rationale behind the use of epidemiological data is that stronger pathogen prevalence pushed communities to follow collectivist traits that emphasize the embeddedness of individuals to "in-group" relationships and set limits to openness towards foreigners (e.g., Murray and Schaller, 2010).

Apart from the genetic and epidemiological data, we employ the linguistic variable on pronoun drop developed by Davis and Abdurazokzoda (2016) as an instrument for cultural emphasis on autonomy rather than on in-group embeddedness. According to Kashima and Kashima (1998), the

requirement to use pronouns in a language or the license to drop them is linked to the degree of psychological differentiation between the speaker and the social context of speech, including the conversation partner. Therefore, the linguistic practice of "*pronoun drop*" reveals a cultural dimension of central interest, namely the relationship between the individual and the group. Cultures with pronoun drop languages tend to be less individualistic. In turn, we employ the linguistic variable *language* developed by Tabellini (2008) that accounts for both the pronoun drop and the type of second type pronoun (the so-called "*T-V distinction*"). Linguists point out that this T-V distinction is associated with cultures that pay close attention to the hierarchy of interpersonal relations. Therefore, cultures with T-V distinction languages tend to be less individualistic (see Kashima and Kashima, 1998).

4. Results

Table 1 presents the OLS and IV estimates for the effect of *individualism* on fiscal redistribution when the latter is proxied by: (i) government subsidies and transfers (% GDP) [Panel A]; and health and education expenses (% GDP) [Panel B]. Even columns of Table 1 control also for the level of development, as proxied by GDP per capita. The first stage results in columns (3)-(12) for the data described above indicate that the coefficients have the expected sign and are highly significant. Moreover, as can be easily verified *individualism* enters with a positive and highly significant coefficient in all alternative specifications. We interpret this empirical finding in the following way. In collectivistic societies, "in-group" relationships (i.e., stronger family ties) act as a substitute of formal risk sharing institutions (i.e., welfare state). These informal risk sharing agreements provide a safety net against risk that makes the redistributive policy of the state less necessary and consequently the demand for redistribution weaker. Obviously, the opposite holds for societies characterized by higher levels of *individualism*.

[Insert Table 1 about here]

Table 2 presents OLS and IV estimates for the basic instrument of our analysis, namely *blood distance from the UK*, when employing a set of extended controls to account for other potential confounding factors (see Desmet et al., 2009). Thus, we control for: continental effects, legal origins, percentages of religious affiliation, population, share of population above 65, ethno-

linguistic fractionalization and absolute latitude. Economic and demographic controls are obtained from the *WDI*, whereas the remaining controls (i.e., geographical variables, legal origins, major religions etc.) are taken from Gorodnichenko and Roland (2016). Evidently, *individualism* enters again with a positive and significant coefficient in all alternative estimates.

[Insert Table 2 about here]

It should be noted that when these controls are incorporated in the specifications of the alternative instruments presented in Table 1, it turns out that *blood distance from the UK* displays by far the strongest first stage results. In a battery of robustness checks, we have replaced redistributive expenses with tax variables (e.g., direct taxes (% of GDP)), and results, although weaker, provide further evidence in favour of a positive relationship between *individualism* and fiscal redistribution. Finally, our results are insensitive to dropping one continent at a time.[3]

5. Conclusions

Building on the identification strategy employed by Gorodnichenko and Roland (2016) this study seeks to provide evidence for the association between culture and welfare policies. Our empirical findings suggest that countries characterized by more individualistic cultural values present higher levels of fiscal redistribution.

[3] All unreported results are available upon request.

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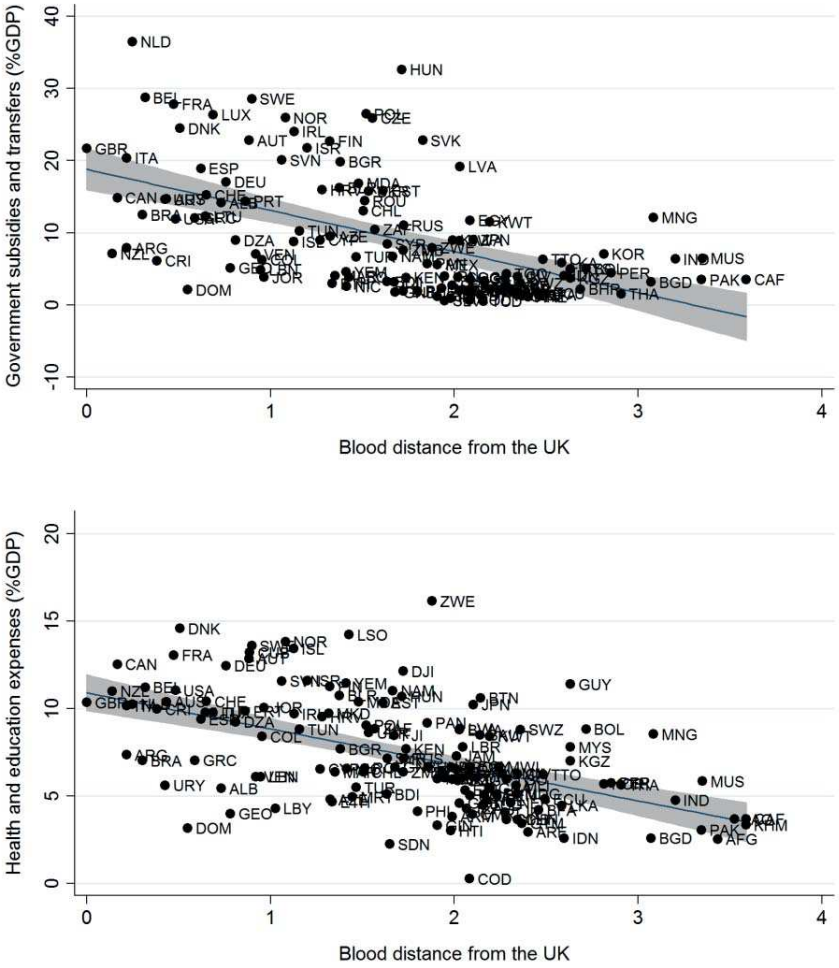

Figure 1: Reduced form relationship between blood distance from the UK and governmental transfers and between blood distance from the UK health and education expanses.

Table 1: The effect of culture on fiscal redistribution

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	OLS	**OLS**	**IV (blood distance from the UK)**		**IV (A118G)**		**IV (pathogen prevalence)**		**IV (pronoun drop)**		**IV (language)**	
Panel A: government subsidies and transfers (%GDP)												
Individualism	0.273***	0.195***	0.360***	0.312**	0.415***	0.454***	0.411***	0.474***	0.268***	0.191**	0.222***	0.170**
	(0.036)	(0.044)	(0.058)	(0.122)	(0.062)	(0.082)	(0.054)	(0.127)	(0.060)	(0.089)	(0.054)	(0.067)
GDP per capita		1.853***		0.701		-1.403		-0.887		1.739*		1.947**
		(0.532)		(1.233)		(1.330)		(1.303)		(0.896)		(0.770)
					First-stage results							
Instrumental variable			-15.600***	-7.974***	-1.457***	-1.068***	-23.425***	-14.891***	-27.620***	-17.071***	-22.691***	-17.465***
			(2.491)	(2.798)	(0.330)	(0.187)	(2.411)	(3.674)	(5.257)	(4.442)	(3.447)	(2.540)
F-stat			39.22	8.122	19.45	32.76	94.40	16.43	88.35	40.03	43.32	47.29
Observations	83	83	83	83	33	33	83	83	72	72	61	61
R^2	0.486	0.543	0.437	0.490	0.297	0.252	0.361	0.244	0.491	0.535	0.516	0.548
Panel B: health and education expenses (%GDP)												
Individualism	0.091***	0.057***	0.135***	0.128***	0.107***	0.079***	0.131***	0.113***	0.119***	0.093***	0.100***	0.086***
	(0.009)	(0.012)	(0.019)	(0.046)	(0.020)	(0.021)	(0.015)	(0.030)	(0.018)	(0.028)	(0.015)	(0.019)
GDP per capita		0.761***		0.096		0.838***		0.234		0.561*		0.567**
		(0.195)		(0.442)		(0.240)		(0.302)		(0.316)		(0.250)
					First-stage results							
Instrumental variable			-15.994***	-8.332***	-1.508***	-1.036***	-23.620***	-15.213***	-27.398***	-17.153***	-21.498***	-16.926***
			(2.437)	(2.670)	(0.318)	(0.185)	(2.282)	(3.620)	(5.053)	(4.281)	(3.408)	(2.357)
F-stat			43.08	9.736	22.47	31.21	107.1	17.66	94.83	38.63	39.78	51.56
Observations	91	91	91	91	33	33	91	91	64	64	64	64
R^2	0.485	0.578	0.376	0.410	0.577	0.714	0.395	0.473	0.539	0.613	0.563	0.637

Notes: The table shows two panels one for each of the two dependent variables, *government subsidies and transfers* and *health and education expenses*. The F-stat is the F statistic for the explanatory power of the excluded instrument in first stage regressions. Robust standard errors are in parentheses. *** (**, *) denotes statistical significance at the 1 (5, 10) percent level.

Table 2: The effect of culture on fiscal redistribution: Extended set of controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	government subsidies and transfers (%GDP)				**health and education expenses (%GDP)**			
	OLS	**IV (blood distance from the UK)**			**OLS**	**IV (blood distance from the UK)**		
Individualism	0.184***	0.222***	0.103**	0.122**	0.053***	0.102***	0.107***	0.120***
	(0.054)	(0.074)	(0.049)	(0.053)	(0.016)	(0.021)	(0.031)	(0.035)
GDP per capita	0.458	0.341	0.722	0.895	0.885***	0.376*	0.337	0.413
	(1.012)	(0.920)	(0.668)	(0.769)	(0.193)	(0.226)	(0.303)	(0.284)
Ethno-linguistic fractionalization	-4.780*	-5.795**	-4.834**	-4.487**	-0.974	-1.283	-1.343	-1.190
	(2.594)	(2.926)	(2.427)	(2.230)	(0.963)	(0.926)	(0.908)	(0.853)
Population	-0.704	-0.900	-0.130	-0.210	-1.019***	-1.360***	-1.435***	-1.502***
	(1.175)	(1.293)	(0.907)	(0.912)	(0.370)	(0.328)	(0.410)	(0.421)
Population above 65	-0.197	0.023	-0.169	-0.167	0.074	0.027	0.018	0.020
	(0.197)	(0.191)	(0.153)	(0.168)	(0.052)	(0.061)	(0.057)	(0.056)
Latitude	-0.063	0.045	0.014	-0.015	-0.030	-0.048***	-0.058***	-0.074**
	(0.068)	(0.058)	(0.058)	(0.071)	(0.020)	(0.018)	(0.022)	(0.029)
			First-stage results					
Instrumental variable		-12.884***	-12.076***	-11.359***		-11.752***	-10.656***	-9.632***
		(2.485)	(2.448)	(2.497)		(2.280)	(2.368)	(2.419)
F-stat		26.87	24.34	20.70		26.57	20.25	15.86
Legal Origins	Y	Y	Y	Y	Y	Y	Y	Y
Continent dummies	Y	N	Y	Y	Y	N	Y	Y
Religion	Y	N	N	Y	Y	N	N	Y
Observations	68	68	68	68	77	77	77	77
R^2	0.847	0.712	0.832	0.841	0.804	0.749	0.741	0.735
F-stat		26.87	24.34	20.70		26.57	20.25	15.86

Notes: The instrument is the blood distance from the UK. The F-stat is the F statistic for the explanatory power of the excluded instrument in first stage regressions. Robust standard errors are in parentheses. *** (**, *) denotes statistical significance at the 1 (5, 10) percent level.