Do Donor – Recipient Cultural Differences Matter for Effectiveness of Aid?

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Abstract

Cultural differences between foreign aid donors and recipients may damage effectiveness of aid by giving rise to information asymmetry problem in aid transactions. I test this hypothesis empirically by augmenting two influential growth models of aid effectiveness with aid – weighted genetic distance as a proxy for cultural differences between a recipient and an average donor. Following estimation strategy of Clemens et al. (2012), I find that growth effects of aid are enhanced when the recipient and the average donor are culturally similar and are reduced when they are culturally very different.

1. **Introduction**

Bulk of literature on aid effectiveness analyzes economic growth effects of foreign aid based on recipient country characteristics only, which include a range of economic and social factors such as trade policy, inflation, budget balance, institutions, ethno-linguistic fractionalization, geography, initial GDP per capita and etc. However, forty years of research in aid effectiveness involving only *recipient* factors has shown puzzling and asymmetric results (Doucouliagos and Paldam, 2009). Development assistance is an economic transaction and, alike other transactions, it involves two or more parties. Such economic transactions are plagued with information asymmetry problems that may impair its outcome. Recent findings on role of culture in economic transactions show that culture matters for economic outcomes (Guiso et al., 2009; Sapienza et al., 2006). In development aid transactions culture can be an important factor not only on the part of the recipient but also on the part of the donor. Cultural differences between donors and recipients may give rise to increased information asymmetry problem between the two and negatively affect aid effectiveness. Anecdotal evidence shows that often donor objectives are in conflict with local culture and preferences, which may result in unsustainable aid projects and failure of development paradigms (Gibson et al., 2005; Moyo, 2009; Altaf, 2011; Marchesi et al., 2011).

Hence, this paper is motivated by recent findings on effects of cultural difference on economic outcomes, and aims to analyze aid effectiveness in the presence of cultural differences between donors and recipients. On the one hand, this study fills in the gaps of aid effectiveness literature, by including a determinant of aid effectiveness that captures donor – recipient interaction factor, and on the other hand, it contributes to culture and development literature by studying effects of cultural differences on development assistance. In addition, this paper contributes to the study of Dreher et al. (2013), who analyze growth effects of aid in the presence of political differences between donors and recipients.

In this paper, I study the impact of donor – recipient cultural differences on growth effects of aid. In the context of this paper, culture is understood as those persistent values, beliefs, attitudes, preferences and norms that are transmitted from one generation to another in a fairly unchanged manner (Bisin and Verdier, 2001; Guiso et al., 2006). In Section 2, I link theoretical concepts with anecdotal evidence to establish role of cultural difference in development assistance. I discuss various measures of cultural differences and explicate my choice of genetic distance as proxy for cultural differences in Section 3. Thereafter, I present the measure of genetic distance in detail and construct an aid-weighted genetic distance to average donor in Section 4. As detailed in Section 5, I closely follow estimation methodology of Clemens et al. (2012) and replicate two influential studies in the aid effectiveness literature with inclusion of aid – weighted genetic distance variable. I report empirical results in Section 6, finding that effectiveness of aid is lessened with larger genetic distance to average donor. Section 7 presents checks for robustness of results. Suggestions for further research and policy implications are provided in Section 8.

2. Role of Cultural Differences in Development Assistance

Economists tend to neglect influence of culture on economic matters. Conventional economic theory is based on an assumption of a rational agent who responds to incentives and generates economic output accordingly. Consequently, heterogeneity in individual beliefs, values, preferences and attitudes have been long neglected in economic theory and are yet to be examined in various development issues. Although what economic theory missed out was captured by pioneers in the field of evolutionary psychology, Cosmides and Tooby (1994), who find that individuals exert better than rational behavior depending on existing economic environment: “our evolved psychology may have alternative modes of operation that prompt humans everywhere to find alternative sets of rules to be reasonable, depending on how closely their particular economic environment mimics various Pleistocene ecological conditions” (1994:331).

The probability that cultural ignorance can affect development policies has been noted by renowned development economist Amartya Sen. According to Sen (2004:37), comparative indifference of economists towards culture may also be reflected in views and methods of development agencies, such as the World Bank, because such agencies are “predominately influenced by the thinking of economists and financial experts.” That is, development agendas, most likely, do not necessarily take into full consideration cultural differences that exist between donors and recipients. According to Sen (2004), it is important to study how culture affects development in the presence of aid, and an effort needs to be made to better understand these effects and their potential to alter seemingly appropriate development strategies.

According to Economides et al. (2004), aid, as a form of intervention, can distort incentives and strengthen extractive institutions in vulnerable states because history and economic conditions have shaped *minds* in the developing world differently. That is to say, development paradigms are prone to failure when country – specific circumstances are not taken into account (Hodler and Dreher, 2013).

This link between culture and development aid has been addressed in aid literature but only on the part of the recipients. For example, Knowles (2007) studied the impact of culture (social capital) – in terms of trust, civic norms and membership in voluntary organizations – on the allocation of aid, while Baliamoune-Lutz and Mavrotas (2009) examined aid effectiveness in aid – social capital – growth nexus. They define social capital in terms of social cohesion and use ethno-linguistic fractionalization of a recipient country as a proxy. So, the handful of studies on culture and aid address impact of culture on aid only on the one part, recipient, with the exception of a recent work by Dreher et al. (2013) who study political ideology of both the donor and the recipient to identify its impact on aid effectiveness.

The importance of studying cultural differences on the both parts – donor and recipient – can be described in terms of an information asymmetry problem between donors and recipients. Development aid is plagued by information asymmetries, where two or more people interact without knowing the other's intentions and deeds[1]. According to Gibson et al. (2005), people possess the most local knowledge about the time and the place they live in. By analogy, individuals in developing countries, who live and work in the local setting for a long time, develop own preferences, values and beliefs based on the local knowledge they possess. Such knowledge is difficult to formulate and contrasts scientific knowledge, according to Gibson et al. (2005). Therefore, if such local knowledge is not incorporated in development methods and theories then they will be prone to failure when applied uniformly (Gibson et al., 2005). Thus, construction of sustainable projects by development aid requires the combination of both scientific and local knowledge (Gibson et al., 2005). So far, development paradigms influenced by donor countries' objectives have often failed to address such issues at the operational level. This view is supported by the anecdotal evidence of Moyo (2009) and Altaf (2011).

In her 2009 book, Dambisa Moyo argues that development aid itself is the problem of Africa's underdevelopment. Most aid paradigms and policies have been destructive for African economies as they distorted incentives, perpetuated corruption and resulted in unaccountable political elite. In answer to the aid policy for promotion of democracy in Africa, Moyo (2009:44) writes: "In the early stages of development it matters little to a starving African family whether they can vote or not. Later they may care, but first of all they need food for today, and tomorrows to come, and that requires an

1 Marchesi et al. (2011) study the transmission of information between donors and recipients in multilateral reform design.

economy that is growing.” That is, depending on time and place, preferences and values of individuals differ, and, when this factor is neglected, development agendas might not serve the intended goals but rather give rise to corruption and distorted incentives.

Another example is the book by Samia Altaf (2011) who was in charge of a major social program initiative (Social Action Program) in 1992 in Pakistan. Altaf (2011) presents a detailed account of the failure of the Social Action Program, which was developed by the Pakistani government to fulfill the criteria of a donor organization without considering its appropriateness in local setting. She describes, for instance, a part of a program, which carried out medical training for young rural women. The project failed to be sustainable (women either emigrated for employment or were left unemployed) as it not only neglected gaps in the local healthcare system but also ignored certain circumstances related to local culture: perceptions about women's education and their employment in remote areas, superstitious thinking about vaccination and preferences for large families. As Altaf (2011) points out, this is not only a story of one program in one country but it is the story of the majority of aid programs in many if not in every developing country.

Gibson et al. (2005) suggest that there could be two reasons why such local socio-economic complexities are not considered in development assistance at the operational level. One explanation is a lack of motivation and the other is the problem of information asymmetry. Williamson (2010) describes that aid effectiveness often times suffers from misaligned objectives between donors and recipients due to the problem of information asymmetry. Hence, this study suggests that the lack of necessary information (knowledge) on both parts can be partially assigned to cultural differences between the two. For example, lack of donor's knowledge on recipient's preferences and culture at certain time (and place) will lead the donor to set development objectives based on its own knowledge and preferences. This (erroneously) assumes that the recipient has same preferences, cultural values and norms and, hence, the same development objectives must apply. However, as the above – described anecdotal evidence shows, it is not often the case. It is not surprising that cultural differences are not sufficiently encountered in development agendas because culture, per se, is largely embedded in individuals and is hard to tabulate or change. This attribute of culture makes it more difficult for both the donor and the recipient to recognize influence of culture in partner country objectives and address it appropriately in development framework. Thus, the hypothesis of this paper is that cultural differences between a recipient and its average donor may reduce aid effect on economic growth. The larger cultural differences between a recipient and its average donor the less effective is development aid.

3. **Measuring Cultural Differences**

Most known measures of cultural differences are based on survey data conducted in different geographic regions of the world (World Value Survey; Hofstede and Hofstede, 2001; Schwartz, 1994). Gorodnichenko and Roland (2010) study three prominent measures of cultural differences, used in the economic literature; to identify which cultural dimensions matter most for economic growth. These measures are the individualism/collectivism index from Geert Hofstede, the autonomy/embeddedness index from Shalom Schwartz and the trust measure from the World Value Survey.

Cultural dimension of individualism/collectivism is one of the four measures of culture developed by Geert Hofstede. Initially he developed the data using surveys of IBM employees in almost 40 countries in 1994 and has expanded to 80 countries since 2001. Using factor analysis on answers to questions about goals in life and the workplace, he developed four measures of culture – individualism, power distance, masculinity and uncertainty avoidance – in scale from 0 to 100. For instance, a score higher than 60 corresponds to individualism and lower than 60 corresponds to collectivism. The individualism score is the first and most important component in Hofstede's factor analysis. It measures the extent to which it is believed that individuals are supposed to take care of themselves as opposed to being strongly integrated and loyal to a cohesive group (collectivism). People value personal freedom and status more in countries where individualism prevails while people value harmony and conformity more in countries where collectivism prevails. In the analysis performed by Gorodnichenko and Roland (2010), individualism/collectivism index surpasses its other two counterparts (autonomy/embeddedness and trust) as the most important cultural dimension for economic growth.

Measures of cultural dimensions developed by Shalom Schwartz have been also used in the literature to evaluate impact of culture on economic development and growth (Gorodnichenko and Roland, 2011; Granato et al., 1996). Schwartz (1994) gathered survey responses from K-12 schoolteachers and college students for a total of 195 samples drawn from 78 nations and 70 cultural groups between 1998 and 2000. Each sample generally consists of 180-280 respondents for a total of over 75,000 responses. Schwartz's value survey consists of 56-57 value items that ask respondents to indicate the importance of each as "a guiding principle in my life." The growth-related dimension, as showed in Gorodnichenko and Roland (2011), is the embeddedness/autonomy index. In autonomous cultures, people are viewed as autonomous, bounded entities. They are encouraged to cultivate and express their own preferences, feelings, ideas, and abilities, and to find meaning in their own uniqueness by pursuing their own ideas and intellectual directions independently (intellectual autonomy) and by looking for positive experiences for themselves (affective autonomy). In contrast, meaning in life for people living in cultures of embeddedness comes largely through social relationships, through identifying with the group, participating in its shared way of life, and striving toward its shared goals. Embedded cultures emphasize maintaining the status quo and restraining actions that might disrupt in-group solidarity or the traditional order. Countries that score high on embeddedness also score low on intellectual and affective autonomy. Other dimensions in the cultural mappings of Schwartz are as follows. Hierarchy measures the focus on the importance of hierarchical relations within society and in the political system so as to guarantee the stability of power, tradition and conformity. It stands in contrast to egalitarianism which emphasizes norms of universalism and equality of rights of individuals. Harmony measures emphasis on the smoothness of relations and avoidance of change and conflict whereas mastery emphasizes self-assertion and achievement as strong values that are promoted. As studies show, this dimension is also highly correlated with individualism/collectivism index (Gorodnichenko and Roland, 2010; Gouveia and Ros, 2000; Schwartz, 1994).

Trust has been extensively used in economic literature to analyze impact of culture on economic outcomes (Beugelsdijk, 2006; Bjørnskov, 2009; Guiso et al., 2009; Tabellini, 2008). Data on trust (generalized and bilateral) is from World Value Surveys (WVS), which are opinion-based interviews designed to allow for cross-country comparison of individual values and attitudes on variety of topics. The coverage of countries ranges from 21 to 70, depending on the wave. The question on generalized trust asks the respondent whether “Most people can be trusted” or “Can’t be too careful”, thereafter, usually scores 0 and 1 are assigned based on the answer. According to Tabellini (2008:261), in the literature this variable of trust is interpreted as “belief about the behavior of others, and as a indicator of moral values and trustworthiness.” WVS also includes a question on bilateral trust where respondents are asked whether they trust nationals of one country more than the other. For example, an influential study by Guiso et al. (2009) uses bilateral trust as a measure of cultural differences to evaluate the impact of cultural biases on trade, portfolio investment and FDI flows. To further capture cultural similarities between countries, they include other cultural proxies as controls such as common linguistic roots, religious similarity, somatic distance, history of wars and genetic distance. Guiso et al. (2009) find trade, portfolio investment and direct investment is less between two countries with lower bilateral trust. Gordonichenko and Roland (2010) find that the trust measure from WVS is highly correlated with individualism/collectivism and autonomus/embeddedness indices described above.

One can argue that culture might be endogenous to economic outcomes. Perhaps individuals adjust their preferences, attitudes and behavior depending on the economic payoffs from certain transactions. It could be possible that persistent political and economic institutions as well as stable (higher) income lead to cultural change in the society (Acemoglu and Robinson, 2012). Therefore, several studies have employed instrumentation methodology to tackle possible endogeneity of culture and establish a causal effect of culture on economic outcomes. For instance, Guiso et al. (2009) instrument trust with commonality in religion and ethnic origin as well as with somatic distance[2]. However, as Guiso et al. report these instruments can also pick up set of cultural, institutional and legal connections that, in turn, affect economic transactions analyzed in the study. In contrast, Gorodnichenko and Roland (2011) instrument individualism/collectivism cultural dimension with genetic distance between populations. They base their choice of instrument on the below-described model of Bisin and Verdier (2001) on cultural transmission.

In their model of economics of cultural transmission and dynamics of preferences, Bisin and Verdier (2001), show that globally stable heterogeneous preferences can exist among populations if children either inherit preferences, norms and, more general cultural attitudes from their parents or adapt and imitate cultural traits most prevalent in a society. Moreover, parents are more prone to transfer their preferences and cultural traits to their offspring, if the set of cultural traits they possess prevails only among minority of the population. However, when parents' cultural traits are common to the majority of the population, they are less motivated to spend resources on their children's socialization, since the children will, in any case, imitate and adopt the cultural traits dominant in society. That is, family and society are considered as substitutes. Thus, preferences and cultural traits are either inherited by genetic transmission from parents to offspring (vertical) or acquired through imitation and adaptation processes (horizontal), depending on parents' socialization actions. Bisin and Verdier (2001) stress that dynamic preferences are endogenous to such vertical and horizontal intergenerational

2 An indicator based on the average frequency of specific traits (hair color, height, etc.) present in the indigenous population, according to Guiso et al. (2009)

transmission and consider cultural traits as part of those intergenerational characteristics transmitted from parents to children.

As Gorodnichenko and Roland (2010:3) argue, based on the model of Bisin and Verdier (2001), “genetic distance can be seen as a proxy measure of differences in parental transmission of cultural values.” In addition, Desmet et al. (2007) find a strong correlation between genetic distance and cultural differences among European populations. In particular, they find that genetically closer populations give more similar answers to the World Values Survey regarding questions on norms, cultural traits and values as well as perception of life, religion, family and morals. In their study, Desmet et al. (2007) show that genetic distance is robust to inclusion of linguistic and geographic distances.

Spolaore and Wacziarg (2009) develop an analytical framework linking genetic distance, as a measure for intergenerationally transmitted characteristics, with income differences across countries to explain the diffusion of development. The findings show that income differences across countries are positively correlated not only with bilateral genetic distance but also with relative genetic distance to the technological frontier[3]. They stress that genetic distance captures the degree of genealogical relatedness among populations and also the differences in characteristics that are transferred from one generation to another in a fairly unchanged manner (vertically transmitted characteristics) over many periods. According to Romain Wacziarg, genetically close populations can “communicate more easily, understand each other’s cultural norms and values, and adopt practices conducive to human development – such as rapid human capital accumulation, low fertility and better political institutions.[4]” In other words, genetically distant populations would have a harder time communicating, understanding each other’s cultural norms and values and may resist adoption of advantageous practices. The correlation between genetic distance and income differences is shown to be robust to geographic differences and the share of European ancestry in a country’s population. In result, Spolaore and Wacziarg (2009) find that larger relative genetic distance from technological frontier is a barrier for adaption technology and diffusion of development from rich to poor countries.

3 Authors consider US (also UK) as being the technological frontier

4 A university article on link between genetic distance and income differences: http://www.anderson.ucla.edu/knowledge-assets/romain-wacziarg

In addition, Spolaore and Wacziarg (2009) point out that other cultural proxies often used in the literature such as religion, language and ethnicity are also captured by genetic distance because those are part of intergenerationally transmitted characteristics, i.e. they are transferred from parents to children along with parental genome. On the same note, Bisin and Verdier (2000) show that ethnic and religious minorities persist in the USA, in contrast to "melting pot" theory, due to parental preferences for transmission of certain cultural traits to their offspring, such as strong preferences for marriages within same religion and ethnicity.

In sum, recent findings and research on measures, proxies and instruments for culture permit usage of genetic distance as, by far, the only exogenous measure for cultural differences across countries. Therefore, this study further analyzes the effect of genetic distance (as proxy for cultural differences) on aid effectiveness.

4. Measuring Genetic Distance

According to Spolaore and Wacziarg (2009), measures of genetic distance between populations are based on aggregate differences in gene variations – allele (unit of measure) frequencies for various loci on chromosome. Differentiations in genes tend to accumulate over time, which results in a linear link between genetic distance and the time since two populations last shared common ancestors (Spolaore and Wacziarg 2009). Following Cavalli-Sforza et al. (1994), Spolaore and Wacziarg (2009) consider certain type of genetic distance measure, namely F_{ST} distance, also known as "coancestor coefficient", which captures the time-span since two populations shared common ancestors. As Spolaore and Wacziarg (2009) explain, F_{ST} distances alike most measures of genetic differences are derived from heterozygosity indices, which capture the probability that two gene variants of the similar DNA sequences (allele) at a given locus selected randomly from two populations will be similar. F_{ST} takes value of zero only in the case of identical allele distributions across two populations, whereas it takes positive values where allele distributions differ. The larger the difference in allele distributions between two populations the higher is the F_{ST} genetic distance between them. In addition, F_{ST} genetic distance is strongly associated with the time since two populations split apart as isolation may cause change in genes as a result of random genetic drift or natural selection. Following the practice of geneticists, Spolaore and Wacziarg (2009) focus on *neutral* characteristics of genetic variations, which are affected only by random drift rather than natural selection. This measure also applies for this study because common ancestors would assume similar inetgenerationally transmitted characteristics based on the model of Bisin and Verdier (2001). Plus, the longer the time since two populations split the less similar are their culture and preferences, probably, based on the theory of Gibson et al. (2005) on local knowledge discussed in Section 2.

Using data from Alesina et al. (2003) and Cavalli-Sforza et al. (1994), Spolaore and Wacziarg (2009) construct two measures of genetic distance between countries. First measure is plurality based genetic distance between two countries, which is derived from the genetic distance between dominant population groups in each country. The second measure is weighted genetic distance, which accounts for immigrant based countries, such as the United States, where population is made up of genetically distant subpopulations. Spolaore and Wacziarg (2009) compute the weighted F_{ST} genetic distance between two countries in the following way:

$$Fst_{ij}^{W} = \sum_{n=1}^{N} \sum_{a=1}^{A} (s_{¿} \times s_{ja} \times d_{na}),$$

where $s_{¿}$ is the share of group n in country i and d_{na} is the Fst genetic distance between groups n and a. They also report that the two measures, weighted and based on the dominant groups, are highly correlated with each other (0.94). Following Spolaore and Wacizarg (2009), I use weighted F_{ST} genetic distance rather than the plurality based measure as it more accurately captures average genetic distance between two countries.

However, in terms of development aid effectiveness, genetic distance between two populations would matter more or less depending on the magnitude (involvement or degree of intervention) of the aid received. To capture this influence, I follow Dreher et al. (2013) and compute an aid-weighted measure of the above-described weighted F_{ST} genetic distance:

$$AwGD_{i,t} = \sum_{i=1}^{n} s_{ij,t} * Fst_{ij}^{W},$$

where $s_{ij,t}$ is donor $j's$ share of total bilateral aid in country i, in year t. Fst_{ij}^{W} is the weighted genetic distance between recipient i and donor j. Thus, $AwGD_{i,t}$ is the aid-weighted genetic distance to the average donor for each recipient in period t. The correlation between Fst_{ij}^{W} and $AwGD_{i,t}$ is 0.9. Thus, the aid-weighted genetic distance to country's average donor does not diverge much from donor-recipient weighted F_{ST} genetic distance. In line with the argument in the previous section, larger aid-weighted genetic distance between a recipient and an average donor indicates bigger difference in intergenerationally transmitted characteristics, including preferences and culture, between the two. In accordance with the hypothesis of this paper, I expect aid effectiveness to decrease with larger aid-weighted genetic distance to average donor.

5. Data and Method

I use data on genetic distance developed by Spolaore and Wacizarg (2009) as described in the previous section. Bilateral aid data on gross disbursements from 23 Development Assistant Committee (DAC) donors is taken from the OECD's Aid Statistics. As in Dreher et al. (2013), this paper closely follows the approach of Clemens et. al. (2012) and evaluates the effects of genetic distance in interaction with bilateral aid on economic growth, using two different models from the aid effectiveness literature: Burnside and Dollar (1997) (hereafter BD) and Rajan and Subramanian, (2008) (hereafter RS). Each of the models is categorized as belonging to one of the two strands of aid effectiveness literature: the conditional strand (BD) and null strand (RS). The BD specification shows that aid is more effective in good policy environments while the null strand, RS specification, finds little robust evidence of a positive (or negative) relationship between aid inflows and economic growth. In addition, both studies, RS and BD, use instrumentation methods to capture the endogeneity of aid. However, as Clemens et al. (2012) argue, and as demonstrated in Clemens and Bazzi (2009), the aid effectiveness literature is based on invalid instrumentation and GMM methodology ("black-box"),which undermines the accuracy of the empirical results. Instead, Clemens et al. (2012) lag aid by one period to allow for a causal effect of aid on growth and, this way, they tackle the problem of reversed causality. In addition to lagged aid, they use first differences to capture country specific time-invariant effects and omitted variable problem. This paper follows the same procedure and adds an additional variable of aid-weighted genetic distance and its interaction with bilateral aid to the existing specifications in Clemens et al. (2012). The reduced-form empirical model is:

$$\Delta G_{i,t} = \beta + \delta \Delta Aid_{i,t-1} + \gamma \Delta AwGD_{i,t-1} + \zeta \Delta Aid_{i,t-1} * \Delta AwGD_{i,t-1} + \eta \Delta \left(Aid^2_{i,t-1} \right) + \theta \Delta X_{i,t} + \epsilon_{i,t}$$

(1)

where, $G_{i,t}$ – is a recipient country's annual GDP per capita growth rate averaged over period t, $Aid_{i,t-1}$ denotes total bilateral aid as a percentage of GDP received (disbursed aid) by country i in the from 23 Development Assistance Committee (DAC) donors, $AwGD_{i,t-1}$ is the aid–weighed measure of genetic distance as described in the previous section, and $Aid^2_{i,t-1}$ is a squared term of aid to account for the nonlinear effects of aid as in Clemens et al. (2012). $X_{i,t}$ is a vector of control variables as used in the original studies of RS[5] and BD[6], and $\epsilon_{i,t}$ – is the error term.

The estimation specification in this paper is in line with the estimation strategy in Clemens et al. (2012), as it also lags aid to allow for its impact on growth and removes time-invariant country characteristics via first differencing and includes a squared term of aid to account for a non-linear relationship between aid and growth. According to Clemens et al. (2012) such a strategy is preferred to instrumentation as it better addresses reversed causality (lagged aid) and omitted variable bias (first differences). To further address doubts on exogeneity and consistency of the variable of interest in this study (the interaction term), the argument in Nizalova and Murtazashvili (2012) can be applied: interactions of (possibly) endogenous (aid) and exogenous (genetic distance) variables produce consistent OLS estimates. Furthermore, as Nunn and Qian (2012) point out, the interaction between an exogenous term (genetic distance to average donor) and a potentially endogenous term (bilateral aid), can be interpreted as exogenous since the main effect of the endogenous variable is

5 In RS model controls are: log of initial GDP/capita, initial Sachs-Warner trade policy index, log of initial life expectancy, log of inflation, initial M2/GDP, budget Balance/GDP, revolutions, and period dummies

6 In BS model controls are: log of initial GDP/capita, assassinations, ethnic fractionalization*assassinations, initial M2/GDP, an index for economic policy, and period dummies.

directly controlled for in the estimation[7]. That is, the variable of interest in this paper does not seem to suffer from a potential endogeneity bias and is consistent.

6. Empirical results

Table 1 presents regression results according to the BD specification presented in Clemens et al. (2012). The sample of countries is from the original study (Burnside and Dollar, 1997). The panel data cover 53 countries over 9 periods of 4 years, from 1970 to 2005. In all regressions aid and aid-weighted genetic distance are lagged and differenced and the regressions are in first differences[8]. Column (1) includes bilateral aid to GDP without the measure of genetic distance and its interaction term. In such a specification, aggregate bilateral aid has a positive but statistically insignificant effect on economic growth. In column (2), aid weighted genetic distance is included together with the variable of interest - the interaction between aggregate bilateral aid and genetic distance. Although the coefficient of the interaction term is negative as expected, it is statistically insignificant. Column (3) displays the same estimation but with a non-linear relationship between aid and growth by including a squared aid term. Here the effect of aggregate bilateral aid on growth turns positive and significant at the 5 percent level. The statistically significant (5% level) and negative coefficient of the squared aid term shows that, beyond a turning point, aid effect on growth is negative. In this case the turning point is 20 percent. This result is in line with the findings of Clemens et al. (2012). Thus, according to the Burnside and Dollar Specification in Table 1, columns (2) and (3) show that at aggregated level, when all countries are pooled together, the impact of aid on growth does not change with changes in aid-weighted genetic distance.

To further test whether aid has different growth effects in genetically relatively distant rather than genetically closer countries, I split the sample into two groups: smaller than the mean distance (4) and larger than the mean distance (5). The results in columns (4) and (5) confirm the expectations: the coefficient of the interaction term in column (4), where countries are genetically much closer to their average donor, is positive and statistically significant at the 5 percent level and negative and

7 Nunn and Qian cite section 2.3.4 of Angrist and Krueger (1999) for technical details.

8 In contrast to Drehel et al. (2013), the aid-weighted (genetic) distance measure in this paper is not only lagged but also differenced because by first differencing I can control for other country-specific time invariant fixed effects that genetic distance may capture (religion, language and etc.) as discussed in sections 3 and 4.

statistically significant at the 10 percent in column (5), where countries are genetically much distant from their average donor. [9]

Table 1. Burside and Dollar Specification

Dependant Variable: Economic Growth	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Aid/GDP	0.080	0.108	0.514***	0.382**	0.533*	0.546	-0.015
	[0.090]	[0.098]	[0.181]	[0.162]	[0.316]	[0.438]	[1.941]
Aid-weighted genetic distance		-0.004	-0.004	-0.002	-0.003	-0.003	-0.000
		[0.003]	[0.004]	[0.003]	[0.008]	[0.008]	[0.012]
Aid*Aid-weighted genetic distance		-0.001	-0.001	0.002**	-0.003*	-0.003*	0.030*
		[0.001]	[0.001]	[0.001]	[0.002]	[0.002]	[0.015]
Aid Squared/GDP			-0.013***	-0.012***	-0.009	-0.010	0.250
			[0.004]	[0.004]	[0.013]	[0.015]	[0.333]
Initial GDP per capita	-7.338***	-7.396***	-7.093***	-6.050***	-7.671**	-9.188**	-9.837*
	[2.101]	[2.089]	[2.066]	[1.878]	[3.603]	[3.799]	[5.157]
Initial M2/GDP	4.745	4.487	4.227	-0.798	19.648**	18.636*	6.252
	[3.905]	[3.937]	[3.911]	[4.095]	[9.736]	[10.870]	[8.447]
Policy Index(B-D)	0.721***	0.743***	0.771***	0.642***	0.543	0.311	-0.743
	[0.221]	[0.226]	[0.222]	[0.246]	[0.396]	[0.515]	[1.982]
Assasinations	-0.154	-0.177	-0.185	-0.261	-2.327	-4.345	-11.998*
	[0.202]	[0.207]	[0.209]	[0.251]	[2.715]	[7.333]	[6.088]
Ethnolinguistic Fractionalization*Assasinations	0.283	0.319	0.319	0.439	1.553	0.544	15.860*
	[0.359]	[0.371]	[0.370]	[0.409]	[3.940]	[10.513]	[8.519]
Adj. R-Squared	0.152	0.153	0.167	0.273	0.130	0.148	0.436
Observations	334	334	334	205	129	103	36
Countries	53	53	53	31	26	19	5
Aid squared			yes	yes	yes	yes	yes
Sub-saharan Africa						yes	
East Asia							yes
Distance>Mean					yes		
Distance<Mean				yes			

Next, I test whether genetic distance to average donor can also be applied to successes and failures of aid effectiveness in different regions. Therefore, in last two columns I consider Sub-Saharan African countries where aid, generally, has been the least effective (Moyo, 2009). Column (6) shows that genetic distance (cultural differences) has negative effect on aid effectiveness for the sample of 19 Sub-Saharan African economies and it is statistically significant at 10 percent level. Additionally, column (7) considers a sample of five East Asian economies (Asian Tigers) to test whether aid effectiveness is hurt by genetic distance to average donor. Although the sample is very small and one cannot infer much from it, in contrast to Sub-Saharan Africa the effect is positive for East Asian

9 In addition, genetic distance has measurement errors (Spolaore and Wacziarg, 2009), which can cause downward bias in coefficient of aid-weighted genetic distance.

economies. Plus, Sub-Saharan African countries have much larger distance to average donor their East Asian counterparts[10].

To interpret the effect of the coefficient of the interaction term on growth, I take the first derivative in regards to aid in equation (1). By construction, aid-weighted genetic distance changes simultaneously with the change in aid. Thus, one percentage point change in aid amounts to $\delta+\zeta \, \Delta \, AwGD_{i,t-1}+2\eta$ percentage point change in growth. This shows that aid effect on growth is now dependant on changes in aid-weighted genetic distance. For example, Armenia's aid-weighted genetic distance to the average donor was 430 in 1998 – 2001 period and bilateral aid was 5.2 percent of its total GDP. In the subsequent period, 2002 – 05, aggregate bilateral aid decreased to 4.5 percent (a decrease of 0.7 percentage points) and its aid-weighted genetic distance decreased from 446 in 1998 – 2001 to 423 in 2002 – 05. Estimates from column (4) of Table 1 (Armenia's genetic distance to average donor is less than the mean) show that the estimated impact of aid on growth is negative 0.26 percentage points due to the positive relation between aid and growth in this model. However, it is 0.03 percentage points less negative due to its relative smaller genetic distance to the average donor.

Another example, consider Tanzania, a country with larger changes in aid and larger genetic distance to the average donor, located in Sub-Saharan Africa. Aggregate bilateral aid in Tanzania increased from 15.8 percent of GDP in 1986 – 89 to 19.8 percent (4 percentage points) in 1990 – 93. Meanwhile, its aid-weighted genetic distance increased from 1995 to 2008. Tanzania's genetic distance from the average donor is larger than the sample mean so estimates from Column (5) in Table 1 can be applied, according to which the effect of aid on growth is reduced with larger genetic distance. These estimates imply that 4 percentage point increase in aggregate bilateral aid increases the country's growth by 2 percentage points. This effect is 0.12 percentage points less than expected due to the effects of the larger genetic distance to the average donor.

Thus, estimations in Table 1 produce statistical significant results consistent with the hypothesis of this paper; larger cultural differences (measured by genetic distance) hurt the effectiveness of development assistance.

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10 See Figure I in Appendix C

Table 2 replicates the analysis in Table 1 for RS specification using extended sample in Clemens et al. (2012). The panel data includes 63 countries over 7 periods of five years from 1971 to 2005. One can see that throughout the regressions total bilateral aid and squared term of aid are statistically insignificant. This result is in line with RS original result as well as the result in Clemens et al. (2012) when long – term effects of aid are considered.

Table 2. Rajan and Subramanian Specification

Dependant Variable: Economic Growth	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Aid/GDP	0.067	0.099	0.113	0.384	0.092	0.372	-0.732
	[0.103]	[0.100]	[0.226]	[0.255]	[0.356]	[0.419]	[1.084]
Aid-weighted genetic distance		-0.006**	-0.006**	-0.005	-0.009	-0.003	-0.007
		[0.003]	[0.003]	[0.003]	[0.006]	[0.006]	[0.006]
Aid*Aid-weighted genetic distance		-0.002*	-0.002*	0.000	-0.003*	-0.001	0.013
		[0.001]	[0.001]	[0.001]	[0.001]	[0.002]	[0.009]
Aid Squared/GDP			-0.001	-0.009	0.000	-0.012	0.275
			[0.007]	[0.007]	[0.013]	[0.011]	[0.220]
Initial GDP per capita	-9.574***	-9.659***	-9.655***	-9.430***	-10.917***	-11.522***	-10.624***
	[1.602]	[1.600]	[1.616]	[1.324]	[3.321]	[3.578]	[2.290]
Initial M2/GDP	-0.004	0.000	0.000	0.018	-0.195	-0.319	0.033
	[0.029]	[0.027]	[0.027]	[0.024]	[0.166]	[0.226]	[0.046]
Log Inflation	-1.449***	-1.460***	-1.464***	-1.042***	-2.019*	-2.238**	-30.529***
	[0.490]	[0.507]	[0.513]	[0.384]	[1.028]	[1.105]	[7.010]
Budget Balance/GDP	0.281**	0.278**	0.274*	0.153	0.428	0.298	1.193
	[0.124]	[0.127]	[0.139]	[0.168]	[0.322]	[0.371]	[1.984]
Openness	0.530	0.527	0.521	-0.483	2.039**	1.859**	-6.791***
	[0.466]	[0.463]	[0.460]	[0.602]	[0.831]	[0.900]	[2.078]
Initial Life Expectancy	-0.037	-0.040	-0.040	-0.330	-0.146	-0.219**	0.473
	[0.075]	[0.079]	[0.079]	[0.231]	[0.101]	[0.108]	[0.646]
Revolutions	-0.662*	-0.730**	-0.730**	-1.170***	-0.106	-2.040*	-1.886***
	[0.358]	[0.359]	[0.361]	[0.347]	[0.900]	[1.162]	[0.647]
Adj. R-Squared	0.285	0.291	0.289	0.359	0.259	0.359	0.577
Observations	342	342	342	216	126	96	43
Countries	63	63	63	40	27	20	7
Aid squared		yes	yes	yes	yes	yes	yes
Sub-saharan Africa						yes	
East Asia							yes
Distance>Mean					yes		
Distance<Mean				yes			

The results in Table 2 confirm the overall pattern in the previous analysis in terms of variable of interest, although they are weaker in columns (4) – (7). However, the variable of interest in column (3), the interaction term of total bilateral aid and aid-weighted genetic distance, is negative and statistically significant at 10 percent level, a stronger result as in Table 1, and it confirms the hypothesis of this paper.

To illustrate results in Table 2, consider the example of Senegal. The country's share of aid in GDP increased from 7.4 percent to 9.7 percent from 1981 – 85 to 1986 – 90 while its genetic distance to the average donor increased from 1520 in 1981-85 to 1583 in 1986 – 90. Estimates from Table 2, column (3) show that 2.4 percentage point increase in Senegal's total bilateral aid decreased growth by 0.03 percentage points, statistically significant at 10 percent level. Note this negative effect is mainly due to the effect of large genetic distance which is negative 0.3 (effect of the interaction term). Hence, the possibly positive effect of aid on growth (+0.27) yields negative results due to the large genetic distance (cultural differences) between the recipient and the average donor.

In sum, the estimates in Table 1 and Table 2 show that aid is less effective in countries with larger genetic distance to the average donor and more effective in countries with smaller genetic distance to the average donor. This confirms the hypothesis in Section 2. As genetic distance is the proxy for cultural differences these results can be interpreted in terms of cultural differences as follows.

The findings of this paper suggest that aid effectiveness is enhanced with greater cultural similarities between donors and recipients and reduced with larger cultural differences between them. This is also in line with the notion that culturally (genetically) closer populations find it easier to communicate and understand each other and adopt policies conducive to human development. In the context of development aid it means that if the average donor is culturally more similar to the recipient then the designed polices would be more appropriate for the recipient country. The recipient country, on its part, would find it easier to adopt such development policies and paradigms. In the case of larger cultural differences between the average donor and the recipient, design of appropriate development strategies and their adoption by recipient countries might not result in positive economic growth but rather retard the otherwise positive effects of development assistance.

7. **Tests for Robustness**

Checks of robustness are conducted for regression results in Tables 1 and 2. In Table 1, the sample is from the original Burnside and Dollar study, which excludes outliers defined in the original paper. Table A, in the appendix, includes the whole set of countries and years available. Thus the period is extended from 1961 to 2005, and the number of countries is increased from 53 to 71. It can be seen that the signs of coefficients do not change, but the results become weaker in columns (5) and (6). Nevertheless, column (4) confirms that a smaller genetic distance (less than mean) increases the effect of aid, a robust result that is statistically significant at the 5 percent level. This result holds for East Asian countries at the 1 percent level of statistical significance. Table B in the appendix presents a robustness check for the Rajan and Subramanian specification from Table 2. As in BD specification, Table 2 excludes outliers defined by RS original study. In Table B, the outliers are included and the number of countries is increased to 66. This change in the sample, however, does not affect the results in Table 2: they remain robust.

8. Concluding remarks

Previous studies analyze economic growth effects of development aid concentrating on recipient country characteristics only. This paper, in contrast, studies the effects of cultural differences on both part the donor and the recipient. I use aid-weighted genetic distance to average donor to proxy for cultural differences between donors and recipients and incorporate it in two influential empirical growth models presented in Clemens et al. (2012). The findings show negative and robust effect of genetic distance on aid effectiveness with statistically significance of 10 percent. In particular, aid effectiveness is enhanced when the average donor and a recipient are culturally (genetically) similar and is reduced when cultural differences between them are large. Hence, one can conclude that development objectives set by donors work better in culturally similar countries while in culturally very dissimilar environments, such policies result in forgone growth effects.

Future research could help to reveal channels through which cultural differences affect aid effectiveness. Comprehensive surveys among donors and recipients in different regions and countries can help to reveal those “conflicting” preferences and cultural attributes that are most crucial for development assistance effectiveness. A relevant research agenda could try to establish a link between cultural differences and information asymmetry in a theoretical microeconomic model of development aid. A further research question would be to analyze role of cultural differences in growth effects of aid in African setting in the presence of newly emerging (and genetically much closer) donors such as China and India.

In general, findings of this paper suggest that aid effectiveness can be improved if, before disbursements of funds, donors allocate sufficient time to learn about and adjust development strategies in accordance with local preferences and culture. This invites to rethinking of development strategies in terms of cultural appropriateness. The findings imply that information asymmetries between donors and recipients can be reduced if country development strategies included more detailed analysis on those characteristics of local culture that could potentially be in conflict with the development agendas. Thereafter, such issues shall be addressed in the development projects case by case at operational level.

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Appendix A: Tests for Robustness

Table A. Burside and Dollar Specification: Robustness

Dependant Variable: Economic Growth	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Aid/GDP	0.032	0.040	0.345**	0.356**	0.265	0.265	0.148
	[0.081]	[0.085]	[0.173]	[0.160]	[0.304]	[0.398]	[1.781]
Aid-weighted genetic distance		-0.002	-0.002	-0.000	0.000	0.001	0.005
		[0.003]	[0.003]	[0.004]	[0.008]	[0.008]	[0.006]
Aid*Aid-weighted genetic distance		-0.000	0.000	0.002**	-0.002	-0.002	0.038***
		[0.001]	[0.001]	[0.001]	[0.002]	[0.002]	[0.010]
Aid Squared/GDP			-0.011**	-0.012***	-0.007	-0.006	0.275
			[0.004]	[0.004]	[0.012]	[0.014]	[0.253]
Initial GDP per capita	-8.815***	-8.846***	-8.627***	-8.464***	-8.808***	-9.141***	-7.566**
	[1.803]	[1.811]	[1.824]	[2.050]	[3.221]	[3.380]	[3.365]
Initial M2/GDP	6.833**	6.794**	6.533**	4261	19.851**	19.017*	7,287
	[2.716]	[2.756]	[2.756]	[2.995]	[8.691]	[9.714]	[4.443]
Policy Index(B-D)	0.843***	0.851***	0.890***	0.763***	0.813*	0.617	0.113
	[0.223]	[0.226]	[0.220]	[0.234]	[0.416]	[0.520]	[1.560]
Assasinations	-0.087	-0.094	-0.096	-0.123	-6.330**	-10,012	-12.352**
	[0.225]	[0.228]	[0.229]	[0.276]	[3.054]	[8.569]	[5.240]
Ethnolingustic Fractionalization*Assasinations	-0.029	-0.019	-0.029	-0.010	6,845	8322	17.061**
	[0.516]	[0.522]	[0.525]	[0.582]	[4.454]	[12.093]	[7.293]
Adj. R-Squared	0.165	0.162	0.169	0.252	0.131	0.137	0.602
Observations	420	420	420	266	154	122	48
Countries	71	71	71	43	32	24	7
Aid squared			yes	yes	yes	yes	yes
Sub-saharan Africa						yes	
East Asia							yes
Distance>Mean					yes		
Distance<Mean				yes			

Table B. Rajan and Subramanian Specification: Robustness

Dependant Variable: Economic Growth	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Aid/GDP	0.037	0.067	0.084	0.376	0.067	0.299	-0.732
	[0.100]	[0.097]	[0.219]	[0.251]	[0.337]	[0.383]	[1.084]
Aid-weighted genetic distance		-0.006**	-0.006**	-0.004	-0.008	-0.001	-0.007
		[0.003]	[0.003]	[0.003]	[0.006]	[0.006]	[0.006]
Aid*Aid-weighted genetic distance		-0.002*	-0.002*	0.001	-0.003**	-0.002	0.013
		[0.001]	[0.001]	[0.001]	[0.001]	[0.002]	[0.009]
Aid Squared/GDP			-0.001	-0.009	-0.002	-0.013	0.275
			[0.007]	[0.007]	[0.012]	[0.011]	[0.220]
Initial GDP per capita	-9.672***	-9.749***	-9.745***	-9.385***	-10.869***	-11.522***	-10.624***
	[1.581]	[1.579]	[1.591]	[1.314]	[3.215]	[3.469]	[2.290]
Initial M2/GDP	-0.003	0.002	0.002	0.021	-0.192	-0.286	0.033
	[0.029]	[0.026]	[0.026]	[0.023]	[0.166]	[0.219]	[0.046]
Log Inflation	-1.466***	-1.483***	-1.488***	-1.055***	-1.992**	-2.187**	-30.529***
	[0.479]	[0.495]	[0.500]	[0.382]	[0.995]	[1.079]	[7.010]
Budget Balance/GDP	0.292**	0.297**	0.292**	0.157	0.513	0.436	1,193
	[0.126]	[0.129]	[0.141]	[0.169]	[0.314]	[0.345]	[1.984]
Openness	0.546	0.489	0.484	-0.533	1.679**	1.637**	-6.791***
	[0.450]	[0.447]	[0.445]	[0.590]	[0.757]	[0.772]	[2.078]
Initial Life Expectancy	-0.021	-0.022	-0.022	-0.334	-0.105	-0.159*	0.473
	[0.076]	[0.080]	[0.080]	[0.226]	[0.095]	[0.094]	[0.646]
Revolutions	-0.687**	-0.752**	-0.753**	-1.214***	-0.218	-2.049*	-1.886***
	[0.349]	[0.350]	[0.351]	[0.339]	[0.846]	[1.080]	[0.647]
Adj. R-Squared	0.290	0.296	0.294	0.366	0.267	0.371	0.577
Observations	354	354	354	223	131	101	43
Countries	66	66	66	41	29	19	7
Aid_squared			yes	yes	yes	yes	yes
Sub-saharan_Africa						yes	
East_Asia							yes
Distance>Mean					yes		
Distance<Mean				yes			

Appendix B. Descriptive Statistics

Variables	Observations	Mean	Std. Dev.	Min	Max
Burnside and Dollar Specification, Table 1 Column 3					
GDP p.c. growth	334	1.243	3.333	-9.963	14.19
Total Bilateral aid to GDP	334	3.027	4.042	0.0185	34.18
Aid-weighted Genetic Distance	334	1045	508	252.8	2219.5
Initial GDP p.c. (log)	334	8.032	0.79	6.14	9.616
Initial M2 to GDP	334	0.285	0.146	0.0221	1.025
Assasinations	334	0.432	1.226	0	11.5
Ethnolinguistic franctionalization	334	0.467	0.299	0	0.93
Policy index	334	1.465	1.389	-5.572	3.353
Rajan and Subramanian Specification, Table 2 Column 3					
GDP p.c. growth	342	1.576	3.136	-12.3	10.12
Total Bilateral aid to GDP	342	2.838	3.769	0.00743	26.69
Aid-weighted Genetic Distance	342	996.7	522.8	56.88	2211.9
Initial GDP p.c. (log)	342	8.171	0.851	5.852	10.27
Initial life expectancy (log)	342	62.23	10.05	36.55	79.41
Openness	342	0.45	0.498	0	1
Inflation(log)	342	0.234	0.491	-0.00474	4.192
Initial M2 to GDP	342	3.264	8.325	0.00231	60.76
Budget Balance to GDP	342	-0.0946	0.53	-5.509	2.352

Appendix C

Figure I. Aid-weighted genetic distance versus initial GDP per capita

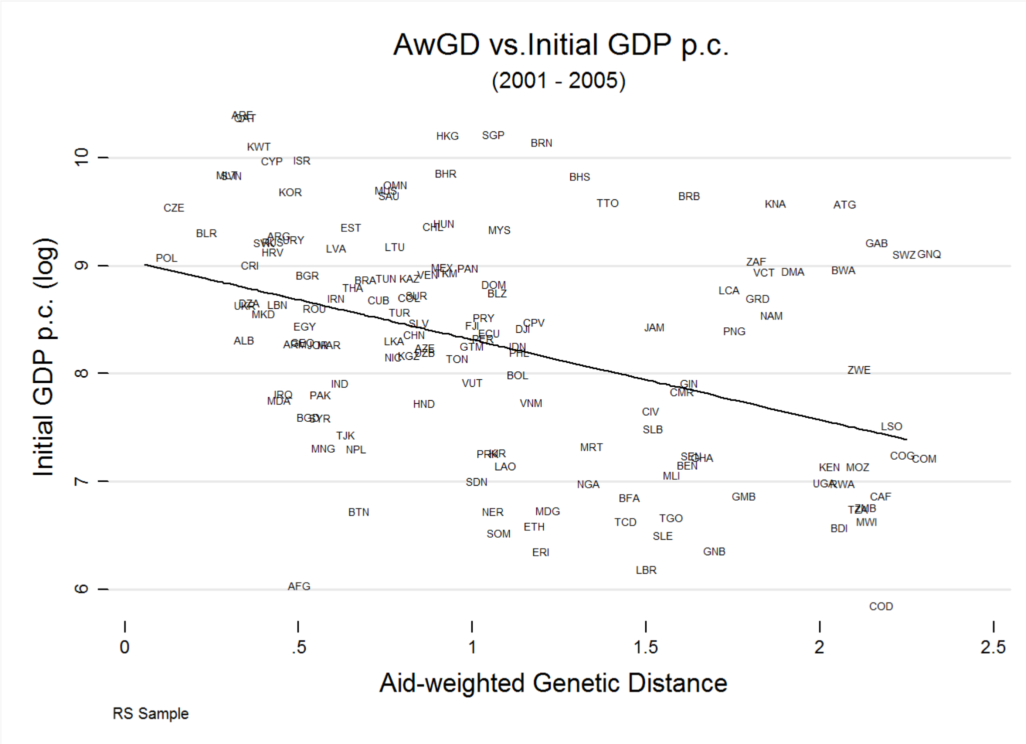

Figure II. Partial leverage plot of the interaction term aid and aid-weighted genetic distance