1. Introduction

Several studies on the intergenerational transmission of a status show that children inherit some of their characteristics from their parents. The mechanical model on genetic transmission developed by Galton (1886) can be considered, indisputably, as the first one. Similarly, the model developed by Becker and Tomes (1979, 1986) seems to reduce to the Galton's model yielding the intergenerational income transmission equation (Goldberger, 1989; Solon, 2004). Furthermore, Clark (2014) states that intergenerational transmission of social status can be governed by the dynamic law identified in the Galton's model. The common result for genetic, social and economic characteristics in the intergenerational transmission is that higher values of the persistence coefficients will imply a slow intergenerational mobility process. In the transmission of social and economic status, human capital plays a crucial role. In the model developed by Becker and Tomes (1979, 1986), investment in human capital is the main determinant of children's income. But not only investment in child's human capital is of interest for social and income mobility; also, parental human capital is an important transmission channels for subsequent children' outcomes (Hertz et al., 2008; Schneebaum et al., 2015; Behrman, 2019).

A common measure used in literature for human capital is educational attainment, which is the main vehicle for persistence, because parents with higher education are able to afford more and better education for their descendants. Intergenerational educational persistence is measured by means of a regression coefficient linking parents' and adult children's years of schooling. Early estimates of intergenerational persistence in education are available for the United States and Europe (Spady, 1967; Bowles, 1972; Hauser et al., 1976; Blake, 1985; Couch et al., 1997; de Broucker et al., 1998). Later, at the end of the 80', we also find estimates for low income countries (Heckman et al., 1986; Lillard et al., 1994; Thomas, 1996; Ganzeboom et al., 1999). Furthermore, we find in literature international comparisons. Hertz et al. (2008) provide estimates of intergenerational educational persistence for 42 countries, showing that Latin America displays the highest intergenerational persistence; whereas the Nordic countries have the lowest persistence. Similarly, using data from the 2010 European Social Survey, Schneebaum et al. (2015) analyse intergenerational educational persistence in 20 European countries and find that it has declined over time in Nordic and Southern countries, but remaining steady in the rest of Europe. Some studies have given attention to gender analysis in intergenerational educational persistence. Schneebaum et al. (2015) find that mother's education is

a stronger determinant of daughters' education, whereas father's education is a stronger determinant of sons' education. The average trend suggests a substantial decrease in educational persistence in the European countries, which is mainly driven by men in the Anglo-Saxon cluster and by women in the Nordic and Southern cluster (Schneebaum et al., 2015). Similarly, for Canada, focusing on the relationship between mothers' education and children's education, Latif (2021) finds considerable gender differences and shows that educational mobility has increased for the daughters, while it fell for the sons. Although some studies show convergence accross gender in the level of intergenerational educational association, a gender gap in educational mobility in favour of males still exists in the developing countries (Torche, 2021). This comparison of empirical studies shows that there is a country effect in the estimates of educational persistence, but also that gender differences may arise inside the countries.

In this context, our contribution is to investigate the parental role in human capital transmission using clusters of countries and gender analysis. Differently to the existing studies, we analyze intergenerational educational persistence for a larger number of countries; in fact, the sample includes 93 countries clustered in four groups. Data used in this paper are drawn from the recent Global Database of Intergenerational Mobility GDIM (2020), which is a comprehensive and well structured data set containing educational data for parents and their descendants at country level. The GDIM allows a substantial degree of comparability across countries. We use a panel data analysis to take into account the country effect. The novelties of this paper are several. Firstly, we estimate intergenerational educational persistence and explore its drivers across different welfare and institutional context for the clusters of countries. Secondly, we consider the parental role in intergenerational educational persistence not only in terms of educational attainment, but also in terms of educational inequality and privilege. Finally, we identify the effects of educational opportunities for the descendants on the intergenerational educational persistence.

The paper is organized as follows. Section 2 presents the data set. Section 3 reports the cluster analysis. In Section 4 we estimate the cluster's educational correlation under gender differences. In Section 5 we identify and investigate the effects of the determinants of the parents and descendants on the intergenerational educational persistence. Finally, Section 6 concludes.

2. Data

The data used in this study are drawn from the Global Database of Intergenerational Mobility (GDIM, 2020), which contains well-structured educational data for parents and their descendants by 10-year cohorts, covering individuals born between 1940 and 1989 for 153 countries with a coverage of 97 percent of the world's population. Coverage differs by country, cohort and variable.

The GDIM contains cross-country education data which are highly comparable with other studies, such as Hertz et al. (2008) and Schneebaum et al. (2015). However, differently to them, the GDIM includes education data for a larger number of countries, and data are avaible for different gender combinations of parents (father, mother) and descendants (son, daughter).

Amongst the education data, the GDIM reports the correlations between children's and parents' years of schooling, which are a standardized measure of persistence having the advantage to take the dispersion of education into account for each generation and, hence, their use eliminates the possibility that the measurement of the persistence is based on structural change to the educational distribution across generations. Higher correlation between children's and parents' years of schooling indicates higher intergenerational persistence in education. The correlations shown in Table 1 reveal that intergenerational educational persistence is quite different accross the income groups of countries, with large gaps between developing countries, displaying high persistence, and high income economies with the lowest persistence rates. This confirms, as reported in Torche (2021), that developing countries face stronger intergenerational educational persistence than high-income countries .

[Table 1 about here]

3. Cluster analysis

The educational persistence rates reportd in Table 1 show that in developing countries there are less equality of opportunities in education. The question that may arise is if the educational persistence is related not only to the income group, but also to the welfare and political system of the country. We thus investigate intergenerational educational persistence for the so-called country clusters, which have similar redistributive policy, in terms of education and income distribution, and governance profile, in terms of democracy and government effectiveness.

To perform the cluster analysis we use seven variables: GDP per capita; income inequality, measured by the Gini index; public education expenditure as share of GDP; share of graduates in the adult population; domestic credit to private sector as share of GDP; democracy index, which ranges from 0 (no democracy) to 10 (full democracy); government effectiveness, which ranges from low (-2.5) to high (2.5), and is measured as the perception that the government behaves efficiently, is independent from political pressures and has credibility.

For the share of graduates in the adult population we use retrospective data from the GDIM for the 1980's cohort. Data for the other variables have been drawn from the World Bank database, which includes World Development Indicators. We calculate for each variable and country the average over the period 2015-2018, which are the years when the children of the cohort born in 1980 are about 25-35 years old. The sample includes 93 countries. In Appendix, Table A.1 reports descriptive statistics of the variables.

We use the normalized values of the seven variables running a principal component analysis on them. A Ward's linkage clustering with Euclidean distance as a dissimilarity measure is adopted. As shown in Table 2, the first three components explain 84% of the variance. Each component captures a specific dimension of the variability in the data set.

[Table 2 about here]

Each principal component is explained referring to the redistributive conflict and governance. There is less redistributive conflict in those countries where there is more schooling and less income inequality. There is perception of better governance in those countries with more democracy and government effectiveness. The first component (PC1) has positive association with all the variables except with the Gini index. We interpret this component as capturing the 'egalitarian and majoritarian democracy' dimension: a country scoring high in this dimension exhibits full democracy, low redistributive conflict and high government effectiveness. The second component (PC2) has a positive association only with the share of graduates and strong negative association with income inequality. We interpret this component as capturing the 'egalitarian and controlled-focused democracy' dimension: a country scoring high in this dimension seem to exhibit inclusiveness, but the country has low government effectiveness and there is an elite class that restricts the action of the government with a system of reciprocal mechanisms of oversight. The third component (PC3) is positively correlated only

with public education spending. We interpret this component as capturing the 'conservative and majoritarian democracy' dimension: a country scoring high in this dimension exhibits a voting system based on the majority rule, strong public education investment, but poor economic performance.

Figure 1 identifies the position of each country along the first three principal components and the hierarchical tree-diagram in figure 2 shows four groups of countries at the dissimilarity level shown by the red line. Table 3 reports the list of countries in each cluster.

[Figure 1 about here]

[Figure 2 about here]

[Table 3 about here]

Group 1 contains countries that score high in the second component (egalitarian and controlled-focused democracy) and in the third component (conservative and majoritarian democracy); they have negative scores for the first component (egalitarian and majoritarian democracy). This group mainly includes developing countries of the middle-income group, which have a high share of graduates and low income inequality; but they are characterized by low democracy, limited access to credit and low government effectiveness. We attribute to this cluster a lower middle profile in redistributive policy and governance. Group 2 contains countries that score very high in the first component (egalitarian and majoritarian democracy), have low scores of the second component (egalitarian and controlled-focused democracy) and negative scores for the third component (conservative and majoritarian democracy). This group includes Nordic and Central European countries as well as other high income economies, such as Australia, Japan, Korea Rep. and the USA. This group is characterized to have full democracy, low income inequality and very efficient public spending and government effectiveness. We attribute to this cluster a high profile in redistributive policy and governance. Group 3 includes countries with positive but low scores in the second component (egalitarian and controlled-focused democracy), and high negative scores along all the other two dimensions. These countries spend on public education a small share of their GDP and exhibit low efficiency in public spending, they have poor economic performance and government effectiveness, high income inequality, very limited credit access and low democracy. This group includes lower-middle and low income countries, mainly from Latin America and Sub-Saharan Africa. We

attribute to this cluster a low profile in redistributive policy and governance. Group 4 contains countries that score high in the first component (egalitarian and majoritarian democracy), low in the second component (egalitarian and controlled-focused democracy), and they have negative scores for the third component (conservative and majoritarian democracy). This group includes high income countries from Southern and Eastern Europe as well as other developed countries, such as Israel and Chile. This group is characterized to have full democracy, low redistributive conflict and efficient public spending and governance. We attribute to this cluster an upper middle profile in redistributive policy and governance. In Appendix Table A.2 reports the countries' scores in each principal component.

4. Estimates of intergenerational educational persistence

Given the nature of the GDIM, which is a cross-section data base with observations at country level, we use the panel data method to estimate educational persistence for the clusters of countries identified in the previous section. We use the retrospective data from the GDIM for the cohorts over the years 1950-1980. Two panel models have been used in this study: fixed effects (FE) and random effects (RE) model. The FE model examines group differences in intercepts, assuming the same slopes and constant variance across entities or subjects, reducing the endogeneity bias that may occur from unobserved cross-country heterogeneity in a pooled ordinary least squares (OLS) estimation. A random effect model estimates variance components for groups and error, assuming the same intercept and slopes. We run the incremental F-test and the Breusch-Pagan Lagrange multiplier test to compare pooled OLS, respectively, with fixed and random effect model, and the Hausmann test to determine if a FE or a RE model is more suitable. Furthermore, we use unbalanced panel dataset, because the GDIM has missing values at some cohort years for some countries. In Appendix, Table A.3 reports descriptive statistics of the variables.

In details, the following panel regression model is specified:

$$\frac{h_{it}^{c}}{\sigma_{t}^{c}} = \gamma_0 + \gamma_1 \frac{h_{it}^{p}}{\sigma_{t}^{p}} + \xi_i + \varepsilon_{it} \tag{1}$$

where h^c and h^p are the average schooling years, respectively, of descendants and parents, σ_t^c and σ_t^p represent the standard deviation in the educational distribution, respectively, of the descendants and parents, subscripts denote country i in cohort t, ξ i is a country-specific effect and ε is the stochastic error term. The coefficient γ_1 is the intergenerational educational correlation

(IEC) between parents' and descendants' years of education. The advantage of using IEC is that it is not affected by the dispersion of parents' and children's education, resulting more stable and less biased than the intergenerational educational association coefficient used in several studies (Emran, 2018). Higher values of IEC indicate greater intergenerational educational persistence and, hence, lower education mobility.

The panel regression model specified in Eq.(1) has been applied for each cluster of countries to the combinations of relationship between parents and descendants: father-son; father-daughter; mother-son; mother-daughter.

Table 4 reports the results of the panel estimates of father-son correlation in education, which show that each increase in father's education has positive and statistically significant marginal effect in all the regressions. The estimates of intergenerational educational persistence are quite different across the country clusters. The lowest intergenerational educational persistence is found for the countries with the highest redistributive and governance profile, that is group 2, where each standard deviation increase in fathers' years of schooling would lead to increase son's years of schooling, on average, by almost 0.3 standard deviations. The countries in group 2 are characterized by a meritocratic education system aimed to reduce inequalities that would lead to education mobility, but there is also in these countries an extensive privatisation in the education system, specially, for higher education, that leads to have a greater number of years of schooling for the sons leading to lower the intergenerational persistence. For this group of countries, the R-squared value is really very low, but we report the results because we have a statistically significant coefficient upon the fathers' years of schooling, as well as the F-test of overall significance determines that the relationship is statistically significant at 1%. For the group 4 we estimate low values of educational correlation, here education mobility is supposed to be favoured from a widespread public education system. The highest intergenerational educational persistence is found for groups 1 and 3, which are characterized by low schooling, high inequalities and inefficiency in governance. Table 4 also shows the results for father-daughter relationship. For the groups 1 and 3, there is more intergenerational persistence in education from the father to the daughter rather than to the son, underlying a gender gap in education mobility between sons and daughters. The opposite effect occurs for the countries in the groups 2 and 4, which are charachterized by more education mobility and social policies aiming to reduce the gender gap.

[Table 4 about here]

Table 5 reports the results for the mother-son relationship. An increase

in mother's education has positive and statistically significant marginal effect in all the regressions. The educational persistence rates are higher again for the groups 1 and 3, where the mother is less influential than the father in educational transmission. Diffferently, for the groups 2 and 4, we find that there is more intergenerational persistence in education from the mother rather than from the father. The mother's education transmission is stronger for the daughters rather than for the sons for all the groups of countries.

[Table 5 here]

5. Determinants of intergenerational educational persistence

In this section we investigate the determinants related to the education of the parents and sons and their effects on the intergenerational educational persistence. We thus model for each cluster of countries the panel regression

$$COR_{it} = b_i + b^p Z^p_{it} + b^c Z^c_{it} + \epsilon_i + \mu_{it} \quad (2)$$

where subscripts denote country i in cohort t, ϵ_i i is a country-specific effect and μ is the stochastic error term. The variable COR denotes the Pearson's correlation between children's and parents' years of schooling, which is a measure of intergenerational educational persistence. The set Z^p includes the educational variables related to the parents, which are the mean of parents' years of education, Gini index of parents' years of education, that is a measure of educational inequality, and parental educational privilege, that is the probability that the child with parent from top quartile in education stays in top quartile. The set Z^c includes the educational variables related to the descendants, which are the mean of children's years of education, that can be considered as a proxy of the parents' investment in human capital, and the Gini index of children's years of education, that can be considered as a proxy of the education policy system: education inequality is lower in those countries with meritocratic public policies in education. The data are drawn from the GDIM database and we construct an unbalanced panel dataset. In Appendix, Table A.3 reports descriptive statistics of the variables.

Table 6 reports the effects of the explanatory variables related to education of fathers and descendants on educational persistence.

The results of the father-son regressions show that the educational variables related to the father are all statistically significant; differently, a statistically weak role is assumed by the determinants related to the sons. The strongest positive marginal effect of the father's educational privilege is found for the groups 2 and 3. The motivation beyond this result is different

for the two groups. In the countries of group 2 there is an extensive privatisation in the education system to which have mainly access children born to parents in top quartile of educational attainment yielding higher education for the sons. In the countries of group 3, characterized by high inequalities and low government effectiveness, the access to education is guaranteed mainly to children from the highest social class and, hence, for those children born to parents which are usually in top quartile of educational attainment. Differently, the effect of father's educational privilege is lower for the groups 1 and 4, where there is a widespride public education system, that guarantee access to education to all, also for higher education. An increase of the father's years of education will increase educational persistence. The highest marginal effect is for group 1, where we found, in the previous section, more educational persistence, and the marginal effect is lower where there is more education mobility. Thus, we have that the marginal effect of an additional year of father's education on educational persistence from the father to the son is smaller for those countries with higher education mobility. In the association between educational father-son correlation and the Gini index of fathers' years of education we identify two different functional forms for the clusters. Firstly, nonlinearity for the groups 1 and 3 with an inverse U-curve, that means a positive association until a maximum, then when parental inequality in education grows, educational persistence decreases. This is due to the fact that if the parental education inequality increases, then the educational opportunities for the descendants will diverge and the persistence of educational outcomes increases. However, as the educational inequality is higher than the maximum value, there are less educational opportunities, but similar for the majority of sons and then the persistence of educational outcomes starts to decrease. The inverse U-curve is found statistically significant for the groups 1 and 3, respectively, with a maximum value of 0.48 and 0.31. Differently, for the groups 2 and 4, characterized by a meritocratic educational system associated with low inequalities and high government effectiveness, we have an increasing and linear relationship between educational inequality of the fathers and the father-son education correlation, suggesting the existence for education transmission of a plausible Gatsby curve, firstly defined between income inequality and income elasticity Corak (2013). Thus, we can establish that the U-inverse curve occurs for those countries where exist redistributive conflict and low governance; furthermore, the threshold level is smaller in those countries with very high income inequality, poor economic performance and low government effectiveness.

On the side of the set of drivers related to the sons, an increase in invest-

ment for human capital measured by the son's years of education has very small effect on educational persistence; only for the group 4 an increase in son's years of schooling is statistically significant at 10% and beneficial for education mobility. We find opposite effects of the son's educational inequality on educational persistence for the clusters; in detail, there is a positive relationship for the groups 1 and 3; this means that if the sons'education inequality increases, then the educational opportunities for the sons will diverge and the persistence of educational outcomes increases; differently, there is a negative relationship for the groups 2 and 4, which have low values of the children's educational inequality and high education mobility, hence, a small increase in educational inequality does not lead to increase educational persistence.

[Table 6 here]

Table 6 also reports the results of the father-daughter regressions. For the daughters, the main statistically significant determinant of educational persistence is the father's education privilege. The marginal effects of the father's educational privilege for daughters are stronger than those found for the sons for all the groups, except for the group 2, where we find that one of the main determinant is the investment in daughter's human capital, its coefficient is statistically significant and negative and, hence, an increase in the daughter's years of schooling would lead to more education mobility. A similar result occurs for the group 4. These results are consistent with the fact that in the groups 2 and 4 there is less gender gap and the fathers are less influential for the daughters rather than for the sons. The role of father's years of education is statistically weaker for the daughters. We do not find nonlinearity in the relationship between educational inequality of the fathers and the father-daughter education correlation. The association is linear and positive for all the groups, except for the group 3, where we find a negative association, confirming that for the countries with the lowest governance profile characterized also here by gender gap in educational opportunities, the inequalities are so high leading to low persistence in educational outcomes for the daughters. An increase in the daughters' education inequality increases educational persistence, except in group 2.

Table 7 shows the effects of the explanatory variables related to education of mothers and descendants on educational persistence. The main statistically significant determinant of educational persistence is confirmed to be the parental privilege with marginal effects from the mothers to the sons that are stronger than those found from the father for all the groups.

The marginal effects of the mother's years of schooling on educational persistence for the sons are positive in all the regressions, but weaker than those found for the father, except for the group 1. Nonlinearity between educational inequality of the mother and intergenerational educational persistence for the sons is confirmed for the groups 1 and 3. However, for the group 3, the threshold level is so lower, that the decreasing relationship is prevalent in the countries with the highest inequalities. The coefficients upon the investment for human capital for the sons are not statistically significant, whereas the Gini of son's year of education is statistically significant only for the group 4, where an increase in educational inequality for the sons would lead to more educational persistence.

[Table 7 here]

The results in table 7 related to the mother-daughter regressions show that the marginal effects of mother's educational privilege on educational persistence are slightly lower than those of the father for the daughters. The marginal effects of the mother's years of schooling are decisively higher (in absolute terms) than those found for the father, leading to more educational persistence, for the groups 1 and 4, and to more education mobility for the groups 2 and 3. Although weakly statistically significant, nonlinearity between education inequality of the mothers and intergenerational educational persistence for the daughters is found in the regressions only for group 4, for the others the linear relationship results to be more approriate, with a positive association for the group 1 and a negative association for the groups 2 and 3. The marginal effects of the investment for daughter's human capital on educational persistence from the mothers are very small, except for the group 4, which reports a negative effect approximately equal, in terms of magnitude, to that found in the father-daughter combinations. Furthermore, a change in the Gini index of daughter's years of education would lead on the educational persistence of the mother the same sign in the marginal effects for the fathers, but lower in terms of magnitude. Finally, comparing the results with those of the mother-son regressions, we have that the marginal effects of the parental privilege for daughters are stronger than those for the sons for all the groups, except for the group 2; an increase in the mother's years of education has higher effects for the sons rather than for the daughter in group 1, the opposite occurs in group 4.

6. Conclusions

The main aim of this paper has been to examine the parental role in intergenerational educational transmission. We provide a panel data analysis using a sample of 93 countries, clustered in four groups. We also consider gender differences in parents and descendants.

Although our findings are mixed and differ across the country clusters, they are relevant for understanding the drivers of intergenerational educational persistence under different welfare and institutional context of the countries. Intergenerational educational mobility is higher in those countries which have made explicit efforts to reduce inequalities and to raise the educational levels of the children by a meritocratic and efficient public education system. Differently to the results in literature, we do not find that the descendants are more likely to follow in education their same gender parent. In the educational transmission, fathers and mothers are more influential for the daughters rather than for the sons in the clusters of countries characterized by high inequalities and poor governance, highlighting that a gender gap in education mobility for the descendants in these countries still exist. Furthermore, in these clusters, the role of the mothers is less influential than that of the fathers. Differently, in the countries where a wider-system of redistributive policies and better governance exist, the role of the mothers is stronger and education mobility for the daughters is higher than that for the sons. The main statistically significant driver of educational persistence is parents' educational privilege. The marginal effect of an additional year of parents' years of schooling on educational persistence is smaller for those countries with higher education mobility We find nonlinearity in the association between parent's education inequality and intergenerational educational persistence in the parents-son combinations in those countries characterized by low schooling, high inequalities and poor governance, which assumes an inverse-U relationship, that implies a positive association until a maximum, then when parental inequality in education grows, educational persistence decreases. In the other parents-descendants combinations we mainly find a linear and increasing association underlying the existence of a plausible Gatsby curve. Investment for human capital increases education mobility, particularly, for the daughters.

Our findings suggest that policy reforms should be coupled to the parental role to raise education mobility. Policies oriented to reduce educational inequality are likely to yield higher education mobility, as well as policies that encourage human capital investment increase educational mobility and reduce barriers for the daughters. Finally, education mobility occurs in those

countries where there is a widespread public education system associated with low redistributive conflicts and high government effectiveness.

Appendix

A.1 Descriptive statistics (cluster analysis)

[Table A.1 here]

A.2 Principal component analysis

[Table A.2 here]

A.3 Descriptive statistics (panel analysis)

[Table A.3 here]

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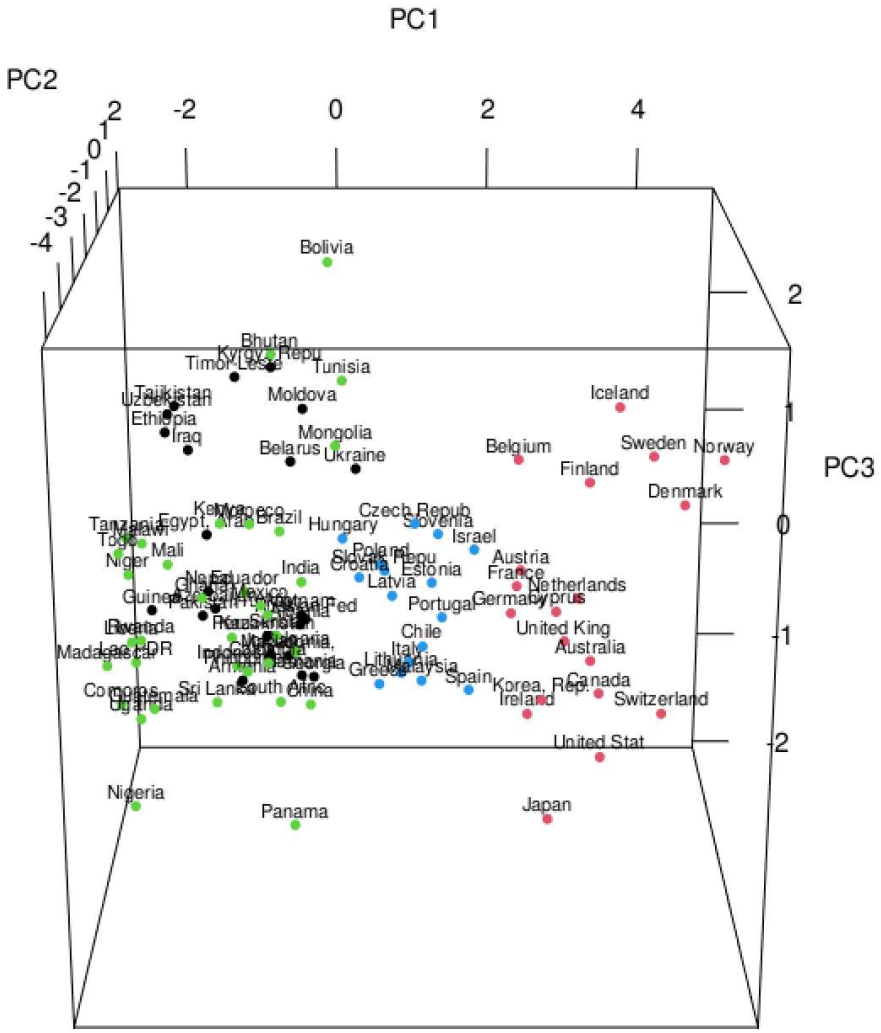

Figure 1. Countries' position in the three principal component space

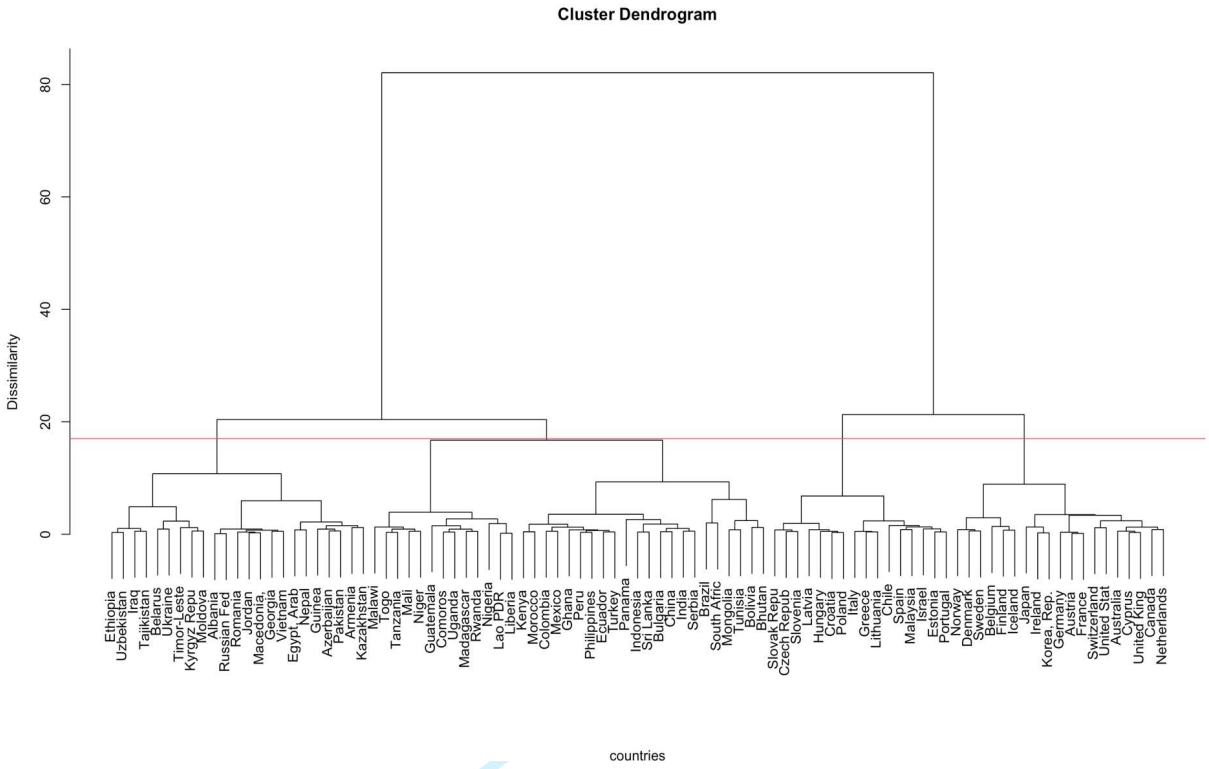

Figure 2. Dendrogram

Table 1. Intergenerational educational correlations between parents' education (average) and descendants' education (average)

Income group	Correlation
High-income economies	0.36
Upper middle income	0.42
Lower middle income	0.42
Low income	0.43

Source: GDIM (2020)

Table 2. Principal component analysis

Component	Proportion	Cumulative	Principal component correlation						
			Public education expenditure (% GDP)	Domestic credit to private sector (% GDP)	Income inequality (Gini index)	Democracy index	Government effectiveness	Share of graduates in the adult population	GDP per capita (current $)
Component 1	0.590	0.590	0.285	0.400	-0.185	0.410	0.461	0.380	0.447
Component 2	0.148	0.738	-0.088	-0.291	-0.876	-0.235	-0.056	0.286	-0.016
Component 3	0.105	0.843	0.932	-0.174	-0.098	-0.025	-0.146	-0.243	-0.099
Component 4	0.067	0.910	-0.187	-0.436	-0.187	0.536	0.139	-0.588	0.296
Component 5	0.046	0.956	0.050	-0.569	0.267	0.442	-0.078	0.587	-0.236
Component 6	0.026	0.982	-0.061	0.412	-0.284	0.486	-0.086	-0.126	-0.698
Component 7	0.018	1.000	-0.029	0.204	-0.052	0.239	-0.855	0.091	0.399
Number of observations=93									
Number of components=7									

Table 3. List of countries in the clusters

Group 1	*Income group*	*Region*	*Group 2*	*Income group*	*Region*	*Group 3*	*Income group*	*Region*	*Group 4*	*Income group*	*Region*
Albania	Upper middle	Europe & Central Asia	Australia	High	East Asia & Pacific	Brazil	Upper middle	Latin America & Caribbean	Chile	High	Latin America & Caribbean
Armenia	Lower middle	Europe & Central Asia	Austria	High	Europe & Central Asia	Bulgaria	Upper middle	Europe & Central Asia	Croatia	High	Europe & Central Asia
Azerbaijan	Upper middle	Europe & Central Asia	Belgium	High	Europe & Central Asia	Bolivia	Lower middle	Latin America & Caribbean	Czech Republi	High	Europe & Central Asia
Belarus	Upper middle	Europe & Central Asia	Canada	High	North America	Bhutan	Lower middle	South Asia	Estonia	High	Europe & Central Asia
Ethiopia	Low	Sub-Saharan Africa	Cyprus	High	Europe & Central Asia	China	Upper middle	East Asia & Pacific	Greece	High	Europe & Central Asia
Egypt, Arab R	Lower middle	Middle East & North Africa	Denmark	High	Europe & Central Asia	Colombia	Upper middle	Latin America & Caribbean	Hungary	High	Europe & Central Asia
Georgia	Upper middle	Europe & Central Asia	Finland	High	Europe & Central Asia	Comoros	Low	Sub-Saharan Africa	Israel	High	Middle East & North Africa
Guinea	Low	Sub-Saharan Africa	France	High	Europe & Central Asia	Ecuador	Upper middle	Latin America & Caribbean	Italy	High	Europe & Central Asia
Iraq	Upper middle	Middle East & North Africa	Germany	High	Europe & Central Asia	Ghana	Lower middle	Sub-Saharan Africa	Latvia	High	Europe & Central Asia
Jordan	Upper middle	Middle East & North Africa	Iceland	High	Europe & Central Asia	Guatemala	Lower middle	Latin America & Caribbean	Lithuania	High	Europe & Central Asia
Kazakhstan	Upper middle	Europe & Central Asia	Ireland	High	Europe & Central Asia	India	Lower middle	South Asia	Malaysia	Upper middle	East Asia & Pacific
Kyrgyz Repub	Lower middle	Europe & Central Asia	Japan	High	East Asia & Pacific	Indonesia	Lower middle	East Asia & Pacific	Poland	High	Europe & Central Asia
Moldova	Lower middle	Europe & Central Asia	Korea, Rep.	High	East Asia & Pacific	Kenya	Lower middle	Sub-Saharan Africa	Portugal	High	Europe & Central Asia
Mongolia	Lower middle	East Asia & Pacific	Netherlands	High	Europe & Central Asia	Lao PDR	Lower middle	East Asia & Pacific	Slovak Republ	High	Europe & Central Asia
Nepal	Low	South Asia	Norway	High	Europe & Central Asia	Liberia	Low	Sub-Saharan Africa	Slovenia	High	Europe & Central Asia
North Macedo	Upper middle	Europe & Central Asia	Sweden	High	Europe & Central Asia	Madagascar	Low	Sub-Saharan Africa	Spain	High	Europe & Central Asia
Pakistan	Lower middle	South Asia	Switzerland	High	Europe & Central Asia	Malawi	Low	Sub-Saharan Africa			
Romania	Upper middle	Europe & Central Asia	United Kingdc	High	Europe & Central Asia	Mali	Low	Sub-Saharan Africa			
Russian Feder	Upper middle	Europe & Central Asia	United States	High	North America	Mexico	Upper middle	Latin America & Caribbean			
Timor-Leste	Lower middle	East Asia & Pacific				Morocco	Lower middle	Middle East & North Africa			
Tajikistan	Lower middle	Europe & Central Asia				Mongolia	Lower middle	East Asia & Pacific			
Uzbekistan	Lower middle	Europe & Central Asia				Niger	Low	Sub-Saharan Africa			
Ukraine	Lower middle	Europe & Central Asia				Nigeria	Lower middle	Sub-Saharan Africa			
Vietnam	Lower middle	East Asia & Pacific				Panama	Upper middle	Latin America & Caribbean			
						Peru	Upper middle	Latin America & Caribbean			
						Philippines	Lower middle	East Asia & Pacific			
						Rwanda	Low	Sub-Saharan Africa			
						Serbia	Upper middle	Europe & Central Asia			
						South Africa	Upper middle	Sub-Saharan Africa			
						Sri Lanka	Lower middle	South Asia			
						Tunisia	Lower middle	Middle East & North Africa			
						Tanzania	Low	Sub-Saharan Africa			
						Togo	Low	Sub-Saharan Africa			
						Turkey	Upper middle	Europe & Central Asia			
						Uganda	Low	Sub-Saharan Africa			

Table 4. Panel estimates of father-descendant education correlation (dependent variable: standardized mean of descendant's years of education)

	Sons				Daughters			
	Group 1	Group 2	Group 3	Group 4	Group 1	Group 2	Group 3	Group 4
Mean of fathers' years of schooling	0.858***	0.289**	0.876***	0.470***	0.902***	0.254**	0.904***	0.428***
	(0.061)	(0.129)	(0.044)	(0.134)	(0.049)	(0.114)	(0.040)	(0.137)
R-squared	0.74	0.06	0.74	0.21	0.83	0.08	0.79	0.17
Fixed vs. Random Effects (Hausman test)	7.988***	1.079	1.224	21.019***	15.144***	47.011***	0.858	13.539***
Model	FE	RE	RE	FE	FE	FE	RE	FE
Observations	92	76	140	63	92	75	139	63
Number of countries	23	19	35	16	23	19	35	16

Robust standard errors in parentheses *** p<0.01. **p<0.05. *p<0.1

Table 5. Panel estimates of mother-descendant education correlation (dependent variable: standardized mean of descendant's years of education)

	Sons				Daughters			
	Group 1	Group 2	Group 3	Group 4	Group 1	Group 2	Group 3	Group 4
Mean of mothers' years of schooling	0.833***	0.295**	0.826***	0.465***	0.877***	0.371***	0.894***	0.453***
	(0.065)	(0.135	(0.052)	(0.136)	(0.053)	(0.110)	(0.042)	(0.133)
R-squared	0.70	0.06	0.64	0.20	0.79	0.17	0.81	0.20
Fixed vs. Random Effects (Hausman test)	3.949**	0.004	2.173	11.568***	10.364***	19.179***	5.173**	8.114***
Model	FE	RE	RE	FE	FE	FE	FE	FE
Observations	92	76	141	63	92	76	139	63
Number of countries	23	19	35	16	23	19	35	16

Robust standard errors in parentheses *** p<0.01. **p<0.05. *p<0.1

Table 6 Panel estimates of intergenerational persistence (dependent variable: correlation between descendant's and fathers' years of schooling)

	Sons				Daughters			
	Group 1	Group 2	Group 3	Group 4	Group 1	Group 2	Group 3	Group 4
Mean of fathers' year of education	0.052***	0.025***	0.046***	0.028***	0.041*	-0.004	-0.004	0.023*
	(0.016)	(0.009)	(0.014)	(0.010)	(0.021)	(0.010)	(0.012)	(0.011)
Gini of fathers' years of schooling	1.444***	0.714***	0.924**	0.348*	0.468	0.057	-0.287*	0.106
	(0.375)	(0.248)	(0.396)	(0.206)	(0.405)	(0.265)	(0.158)	(0.210)
Gini of fathers' year of education square	-1.030***		-0.508**					
	(0.224)		(0.228)					
Intergenerational privilege from fathers	0.408***	0.696***	0.790***	0.508***	0.618***	0.505***	1.082***	0.900***
	(0.095)	(0.101)	(0.073)	(0.125)	(0.130)	(0.144)	(0.084)	(0.148)
Mean of son 's year of education	0.003	0.004	0.008	-0.032*				
	(0.015)	(0.013)	(0.013)	(0.019)				
Gini of son's year of education	0.479*	-0.055	0.306	-0.427				
	(0.257)	(0.440)	(0.205)	(0.581)				
Mean of daughter 's year of education					-0.012	-0.041***	-0.004	-0.026*
					(0.020)	(0.012)	(0.010)	(0.012)
Gini of daughter's year of education					0.194	-1.169**	0.382***	0.481
					(0.290)	(0.485)	(0.143)	(0.425)
Threshold level of Gini index of father's years of education	0.476	-	0.314	-	-	-	-	-
R-squared	0.40	0.46	0.65	0.47	0.36	0.28	0.58	0.51
Fixed vs. Random Effects (Hausman test)	4.887	5.068	13.25**	14.101**	13.786**	3.384	2.049	4.188
Model	RE	RE	FE	FE	FE	RE	RE	RE
Observations	92	76	140	63	92	75	139	63
Number of countries	23	19	35	16	23	19	35	16

Robust standard errors in parentheses *** p<0.01. **p<0.05. *p<0.1

Table 7. Panel estimates of intergenerational persistence (dependent variable: correlation between descendant's and mothers' years of schooling)

	Sons				Daughters			
	Group 1	Group 2	Group 3	Group 4	Group 1	Group 2	Group 3	Group 4
Mean of mothers' year of education	0.073***	0.014*	0.031*	0.011	0.049***	-0.009	-0.006	0.033***
	(0.021)	(0.007)	(0.018)	(0.008)	(0.017)	(0.007)	(0.013)	(0.010)
Gini of mothers' years of schooling	1.496***	0.208	0.738	0.022	0.567*	-0.026	-0.263*	0.707*
	(0.561)	(0.171)	(0.571)	(0.144)	(0.304)	(0.164)	(0.160)	(0.381)
Gini of mothers' year of education square	-0.885***		-0.522*					-0.526
	(0.280)		(0.306)					(0.378)
Intergenerational privilege from mothers	0.478***	0.815***	0.811***	0.516***	0.479***	0.326**	0.922***	0.800***
	(0.113)	(0.127)	(0.103)	(0.141)	(0.116)	(0.134)	(0.085)	(0.126)
Mean of son's year of education	-0.014	0.018	-0.005	0.009				
	(0.023)	(0.014)	(0.017)	(0.013)				
Gini of son's year of education	0.022	0.417	-0.145	1.278***				
	(0.349)	(0.492)	(0.248)	(0.406)				
Mean of daughter 's year of education					-0.003	-0.003	-0.005	-0.029**
					(0.020)	(0.012)	(0.011)	(0.012)
Gini of daughter's year of education					0.166	-0.099	0.200	0.392
					(0.290)	(0.490)	(0.156)	(0.402)
Threshold level of Gini index of mother's years of education	0.576	-	0.018	-	-	-	-	0.402
R-squared	0.48	0.43	0.63	0.41	0.45	0.14	0.57	0.53
Fixed vs. Random Effects (Hausman test)	15,439**	3.431	12,426*	5.490	11,984**	7.301	3.810	8.679
Model	FE	RE	FE	RE	FE	RE	RE	RE
Observations	92	76	141	63	92	76	139	63
Number of countries	23	19	35	16	23	19	35	16

Robust standard errors in parentheses *** p<0.01. **p<0.05. *p<0.1

Table A.1 Descriptive statistics (cluster analysis)

Variable	Obs	Mean	S.D.	Min	Max
Public education expenditure (% GDP)*	93	4.49	1.41	0.53	8.84
Domestic credit to private sector (% GDP)*	93	62.99	45.70	9.52	197.00
Income inequality (Gini index)*	93	35.81	7.04	24.75	63.00
Democracy index*	93	6.19	2.00	1.93	9.90
Government effectiveness*	93	0.24	0.93	-1.65	2.02
Share of graduates in the adult population**	93	0.34	0.18	0.01	0.78
GDP per capita (current US $)*	93	16266	20063	432	83358

*World Development Indicators, World Bank (https://databank.worldbank.org/source/world-development-indicators)

** Global Database on Intergenerational Mobility Development (https://datacatalog.worldbank.org/search/dataset/0050771/global-database-on-intergenerational-m

Table A.2 Principal component scores

Country	Principal component 1	Principal component 2	Principal component 3	Principal component 4	Principal component 5	Principal component 6	Principal component 7
Albania	-0.504	0.876	-0.540	-0.135	0.630	0.218	-0.153
Armenia	-1.292	0.824	-1.018	-0.415	-0.201	0.044	-0.046
Australia	3.306	-0.466	-0.453	0.150	-0.338	-0.140	0.377
Austria	2.427	0.228	0.108	0.823	-0.179	-0.329	-0.124
Azerbaijan	-1.739	1.861	-0.685	-0.155	-0.731	-0.268	-0.396
Belarus	-0.679	2.154	0.547	-1.016	0.206	-0.308	0.014
Belgium	2.413	0.837	0.881	0.530	0.109	-0.494	-0.217
Bhutan	-0.730	-0.647	2.063	0.334	-0.859	0.108	-0.920
Bolivia	0.004	-1.192	2.864	-1.443	0.753	-0.195	0.205
Brazil	-0.545	-2.419	1.132	-0.435	0.779	-0.251	0.246
Bulgaria	-0.484	-0.576	-0.342	0.271	0.476	0.276	-0.021
Canada	3.472	0.056	-0.892	-0.374	0.589	-0.034	-0.026
Chile	1.140	-1.564	-0.002	-0.505	0.279	0.428	-0.266
China	-0.296	-0.688	-0.750	-1.451	-1.953	0.326	-0.337
Colombia	-0.753	-1.740	-0.081	-0.337	1.040	-0.225	-0.013
Comoros	-2.784	-0.306	-0.875	-0.785	0.731	-0.648	0.914
Croatia	0.303	0.658	-0.070	0.264	0.059	0.365	-0.217
Cyprus	2.858	-0.418	-0.056	-1.474	-0.879	1.049	0.403
Czech Rep	1.042	1.124	0.265	0.956	-0.004	0.474	-0.457
Denmark	4.530	0.064	0.694	-0.394	-0.510	0.080	0.294
Ecuador	-1.091	-0.980	0.268	-0.175	0.757	-0.280	0.078
Egypt	-1.748	1.022	0.197	-0.288	-0.458	-0.223	-0.074
Estonia	1.263	-0.076	0.090	0.161	0.587	0.143	-0.472
Ethiopia	-2.176	0.279	1.238	0.216	-0.690	-0.224	-0.147
Finland	3.333	0.505	0.771	0.632	-0.017	-0.057	-0.416
France	2.375	0.141	-0.001	0.039	-0.016	-0.156	-0.187
Georgia	-0.294	0.209	-0.794	-0.436	0.512	0.155	-0.459
Germany	2.303	0.142	-0.230	0.943	0.016	-0.263	-0.323
Ghana	-1.624	-0.991	0.219	0.844	0.451	0.091	-0.157
Greece	0.578	-0.124	-0.753	-0.038	-0.232	0.617	0.419
Guatemala	-2.191	-1.572	-0.505	0.529	0.091	-0.102	0.248
Guinea	-2.578	1.499	-0.595	0.085	-0.423	-0.136	0.318
Hungary	0.081	0.785	0.227	0.604	0.240	0.132	-0.333
Iceland	3.698	0.471	1.398	1.029	-0.086	-0.629	0.442
India	-0.427	-0.079	0.096	0.589	0.301	0.818	-0.135
Indonesia	-1.246	-0.503	-0.485	0.796	0.088	0.412	-0.140
Iraq	-1.989	1.236	0.866	0.180	-0.249	-0.112	0.580
Ireland	2.558	0.557	-1.230	1.428	0.616	-1.312	0.389
Israel	1.794	-0.631	0.514	0.371	0.400	-0.739	-0.354
Italy	0.963	-0.256	-0.526	0.573	-0.055	0.043	0.370
Japan	2.813	-0.109	-1.936	-0.520	-0.584	0.437	-0.089
Jordan	-0.888	0.578	-0.714	-0.699	-0.566	0.091	-0.339
Kazakhstan	-1.037	1.996	-0.976	-0.727	-0.098	-0.471	-0.209
Kenya	-1.421	-0.520	0.697	-0.034	0.123	-0.053	-0.077
Korea, Rep.	2.749	0.502	-1.089	-1.153	0.472	0.392	0.304
Kyrgyz Rep	-0.874	1.390	1.527	-0.297	0.318	0.243	0.367
Lao PDR	-2.651	0.255	-0.687	-0.219	-0.615	-0.686	-0.331
Latvia	0.745	0.262	-0.116	0.192	0.816	0.005	-0.609
Liberia	-2.708	0.311	-0.530	0.879	-0.249	0.308	0.708
Lithuania	0.863	0.182	-0.751	-0.086	1.311	-0.164	-0.584
Macedonia	-0.646	0.515	-0.706	-0.199	0.276	0.229	-0.078
Madagascar	-2.903	-0.621	-0.448	0.723	-0.046	-0.040	0.508
Malawi	-2.337	-1.123	0.694	0.734	0.069	-0.123	0.048
Malaysia	1.129	-0.799	-0.515	-1.259	0.257	0.404	-0.403
Mali	-2.158	-0.039	0.230	0.813	-0.316	0.395	0.437
Mexico	-0.867	-1.345	0.258	0.056	0.757	-0.378	-0.122
Moldova	-0.467	1.519	1.149	-0.048	0.494	0.450	0.370
Mongolia	0.007	0.470	1.082	-0.392	0.503	0.518	0.228
Morocco	-1.033	-0.718	0.742	-0.328	-0.795	0.270	-0.067
Nepal	-1.674	0.305	-0.091	0.113	-0.865	0.701	0.585
Netherlands	3.196	0.406	-0.180	0.532	-0.236	-0.026	-0.194
Niger	-2.679	0.024	0.127	0.709	-0.612	-0.141	-0.071
Nigeria	-2.771	0.556	-2.057	0.351	0.154	-0.113	0.492
Norway	5.024	0.111	1.053	0.310	-0.395	-0.582	0.577
Pakistan	-1.859	1.301	-0.586	0.096	0.021	0.024	0.125
Panama	-0.442	-1.965	-1.326	-0.094	0.333	0.014	0.180
Peru	-1.258	-1.043	-0.086	0.547	0.161	0.159	0.089
Philippines	-1.070	-1.034	-0.369	0.473	0.367	0.273	-0.241
Poland	0.581	0.757	0.011	0.048	0.414	0.244	-0.319
Portugal	1.392	-0.428	-0.099	0.280	-0.429	0.593	-0.426
Romania	-0.472	0.553	-0.889	0.027	1.009	-0.035	0.112
Russian Fed	-0.426	0.831	-0.480	-2.008	0.737	-0.856	0.039
Rwanda	-2.449	-0.703	-0.210	0.189	-0.596	-0.632	-0.875
Serbia	-0.764	-0.138	-0.335	0.359	0.350	0.247	-0.116
Slovak Rep	0.631	1.249	-0.176	0.768	-0.205	0.569	-0.242
Slovenia	1.359	1.467	0.086	0.539	0.396	0.190	-0.427
South Africa	-0.438	-4.290	0.415	-0.621	0.015	0.193	-0.001
Spain	1.746	-0.290	-0.751	-0.021	0.096	0.356	-0.030
Sri Lanka	-1.510	-0.551	-0.775	0.919	-0.222	0.417	-0.111
Sweden	4.110	0.062	1.093	-0.022	0.005	-0.057	0.177
Switzerland	4.215	-0.702	-0.824	0.801	-1.478	-0.799	0.559
Tajikistan	-2.124	0.954	1.300	-1.014	-0.301	-0.734	0.109
Tanzania	-2.645	-0.296	0.515	0.203	-0.582	-0.521	-0.239
Timor-Leste	-1.298	0.692	1.597	1.198	0.056	0.866	0.667
Togo	-2.709	-0.615	0.475	-0.220	-0.576	-0.418	0.281
Tunisia	0.119	-0.003	1.718	-0.240	-0.266	0.746	0.053
Turkey	-0.822	-0.778	0.024	-0.369	-0.355	-0.236	-0.191
Uganda	-2.498	-0.570	-0.912	0.662	0.134	-0.104	0.019
Ukraine	0.229	1.991	0.522	-1.238	1.117	0.389	0.499
United Kingdom	2.980	-0.329	-0.329	-0.271	-0.093	0.000	-0.004
United States	3.365	-1.500	-0.926	-0.659	-0.896	-0.455	0.484
Uzbekistan	-2.174	0.585	1.315	-0.544	-0.668	-0.791	-0.341
Vietnam	-0.456	0.384	-0.318	-1.726	-0.547	0.040	-0.195