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Does Corruption Promote Emigration? An Empirical Examination

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ABSTRACT

Does Corruption Promote Emigration? An Empirical Examination

This paper empirically investigates the relationship between corruption and the emigration of those with high, medium and low levels of educational attainment. The empirical results indicate that as corruption increases the emigration rate of those with high levels of educational attainment also increases. The emigration rate of those with middle and low levels of educational attainment, however, increases at initial levels of corruption and then decreases beyond a certain point. Splitting the sample by income inequality suggests that increased inequality reduces the ability to emigrate. The policy conclusion is, that government actions should focus on controlling corruption, which in turn would lead to funds being channeled more productively into education and also lead to a fall in inequality which would reduce emigration.

JEL Classification: O17, O5, D78, H2, H11, H26

Keywords: corruption, emigration, educational attainment, government expenditures, income inequality, labor markets

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1. Introduction

Neo-classical migration theory views emigrants as individual, rational players who decide to move on the basis of a cost-benefit calculation. This theory perceives migration as leading to an optimal allocation of resources through which wages are equalised across countries due to the movement of labour, from surplus to scarce countries. Structuralists critique the neo-classical theory stating that individuals do not have a free choice to move as they are fundamentally constrained by structural forces or alternatively, are forced to move due to economic and political reasons (de Haas 2007). Dependency theorists argue that migration is not necessarily an overall beneficial process as it leads to an extraction of labour from the periphery to core deepening the vicious cycle of poverty in the periphery and accelerating growth of the core. There are however, a number of push and pull forces brought about by demographic change, globalization, political conflict, institutions and climate change that have increased migration pressures both within and across borders (de Haas, 2007) [1] .

In the present study, we focus on corruption as a push factor for labour emigration. The existence of corruption could lower the returns to education slowing down the process of economics growth acting as a push factor for out-migration (Dimant et al. 2013). In the presence of corruption, jobs are not granted based upon merit but political connections. This could lead to higher levels of unemployment and/or underemployment, lowering the returns to the stock of human capital. Corruption has been also been found to change the size and composition of public expenditure away from vital sectors such as health and education (Mauro 1998, Wei 2001) toward sectors which involve greater secrecy and less transparency such as defence. Gupta et al. (2002, 2000) argue that corruption affects the provision of

[1] See de Haas (2007) for a survey of the literature. Much of the theoretical work on remittances has been devoted to the primary motive of migrants to remit. Among the motives put forward are, altruism (Banerjee 1984), insurance (Rosenzweig, 1988), investment (Lucas and Stark 1985), inheritance (Hoddinott 1994), risk diversification (Stark and Levhari 1982).

health and education services, by increasing the cost and lowering the quality of these services. Similarly, Kaufmann et al. (1999), show that corruption reduces life expectancy and literacy, and increases infant mortality rates. Following from this, corruption can therefore, lower the stock of human capital and reduce the returns to education by slowing down growth, generate unemployment and/underemployment (or reduce labour force participation), increase inequality and reduce welfare (Gould and Amaro-Reyes, 1983, Dimant et al. 2013) acting as a push factor for labour migration.

The limited literature that exists on corruption and migration focuses on the impact of corruption on skilled migration (Dimant et al. 2013, Ariu and Squicciarini 2013). The impact of corruption on other migrant categories has been overlooked in the literature. Therefore, our contribution to the literature is threefold: (1) Employing the panel dataset of Brücker et al. (2013) for emigration, we hypothesise that corruption not only increases the emigration rate of those with high levels of educational attainment, but also, those with medium and low levels of educational attainment; (2) we also investigate, for the first time, potential non-linearities in the relationship between corruption and emigration. This question has not been addressed in the literature. Studies have found a non-linear relationship between corruption and growth (Aidt 2003, Méndez and Sepúlveda 2006). However, we wish to understand if corruption has the same effect on the emigration of those with different levels of educational attainment; (3) we also for the first time, split the sample into two groups by country and time: those with low levels of income inequality (below the mean Gini index in the sample) and those with high levels of income inequality (above the mean Gini index in the sample), to investigate if the effect of corruption on emigration is dependent on the level of income inequality.

The results suggest that corruption beyond a certain threshold level of corruption reduces the emigration rates of those with medium and low levels of educational attainment. Results also indicate that income inequality reduces the ability to emigrate. Results are tested for robustness in a number of ways: additional control variables to capture a range of possible influences on emigration, interaction terms, different estimation methods including fixed effects estimation to account for country level time invariant unobservable influences on emigration, system GMM and IV estimation to correct for any potential endogeneity bias. Given the uncertainty and likely measurement errors in corruption, the robustness of the results are tested using two different data sets on corruption: the Transparency International (TI) and Kaufmann et al. (2012) data sets.

The rest of this paper is structured as follows: Section 2 discusses the literature. Section 3 presents the data and methodology. Section 4 evaluates the results and section 5 concludes.

2. Literature

Corruption is the result of poor institutions. Despite the large literature investigating the relationship between institutions and corruption (Lederman et al. 2005, Méndez and Sepúlveda 2006, Aidt 2009, Dreher et al. 2009, Meon and Weill 2009, among others), there is a very limited literature which investigates the relationship between corruption and emigration.

Lederman et al. (2005) investigating the role of political institutions in determining the existence of corruption argue that parliamentary systems, higher levels of democracy, political stability, and freedom of press are all associated with lower levels of corruption.

Examining the effect of corruption on growth under different political regimes, Méndez and Sepúlveda (2006), find evidence of a non-monotonic relationship between corruption and growth. They show that corruption promotes economic growth at low levels of incidence and affects growth negatively at high levels of incidence. Aidt (2003), similarly argues that in countries with well developed institutions, corruption has a significant negative impact on growth, while in countries with poor institutions, corruption has no effect on growth. Dreher et al. (2009) construct a model which captures the relationship between institutional quality, the shadow economy and corruption. They show that an improvement in institutional quality reduces the size of the shadow economy directly, and corruption both directly and indirectly[2]. Meon and Weill (2009) on the contrary, show that the adverse effects of corruption are lower in countries with less well developed institutions.

Studies on the relationship between emigration and source country institutions are undertaken by Beine and Sekatt (2013) and Docquier et al. (2010). Beine and Sekatt (2013) dividing emigration into two groups, total emigration and skilled emigration, conclude that total emigration affects all institutions positively with the exception of voice and accountability. Similarly, Docquier et al. (2010) examining the influence of emigration on source country institutions, observe that brain drain has an ambiguous effect on institutions, while unskilled emigration has a positive effect on institutions.

The literature which investigates the influence of corruption on emigration is sparse. Dimnat et al. (2013) examining the influence of corruption on out-migration, by dividing migration into two groups – skilled migration and average migration for a group of countries over the 1985 to 2000 period, show that corruption acts as a push factor for out-migration,

[2] See Schneider and Enste (2000) for a survey of the consequences of shadow economies.

particularly skilled migration. They observe that corruption weakens the returns to education, in particular, that of the skilled group. Ariu and Squicciarini (2013) investigating how corruption affects the inflows and outflows of migration for a group of countries, show that corruption is detrimental for both migrant inflows and outflows. They argue that corruption leads to the emigration of highly skilled nationals, and reduces the immigration of foreign workers, thus leading to a net shortage of high skilled workers. This effect has adverse effects in the long run, as it leads to a continuous decline of a nation's human capital stock.

The present study extends upon the existing literature by arguing that corruption not only affects the migration decisions of those with high levels of educational attainment, but also those with middle and low levels of educational attainment. Corruption can increase the emigration rate of the tertiary qualified group due to high levels of human capital investment and expectation of high skill premiums (Dimant et al. 2013). Additionally, if the inequality generated by corruption leads to an increase in progressive tax rates, this could act as a disincentive to those with higher educational qualifications (Dimnat et al. 2013). If jobs are granted on the basis of political connections rather than merit, this could also de-motivate those with high levels of educational attainment, encouraging them to emigrate to countries that are less corrupt. Corruption however, may not only increase the emigration rates of those with high levels of educational attainment, but also those with medium and low levels of educational attainment. Higher levels of unemployment and inequality generated by corruption can induce those with medium and low levels of educational attainment to emigrate. Dincer et al. (2012) argue that individuals belonging to low income groups (low levels of educational attainment) could pay a higher proportion of their income in the form of bribe payments. Similarly, corruption can channel government expenditure away from the provision of essential services such as education and health that benefit those with lower

levels of educational attainment most. Therefore deteriorating living conditions could also increase the emigration rates of those with medium and low levels of educational attainment.

Studies have indicated that the relation between corruption and growth may well be non-linear (Méndez and Sepúlveda 2006, Aidt et al. 2008). Méndez and Sepúlveda (2006) argue that the type of political regime is important for the relation between corruption and growth. They find evidence in favour of a non-linear relationship between corruption and growth in countries that are politically free, as opposed to those which are not. A growth maximizing level of corruption is observed for countries which are politically free. Aidt (2003), also investigating for threshold effects between corruption and growth, argues that corruption has a significant negative impact on growth in countries with well developed institutions and no effect on growth in countries with weak institutions. It is therefore not unreasonable to expect corruption to have non-linear effects on emigration with emigration rates initially increasing at low levels of corruption and then declining as corruption increases. If living conditions continue to deteriorate as corruption increases, the increased inequality generated by corruption can increase liquidity constraints, particularly among those with medium and low levels of educational attainment, reducing their ability to emigrate[3]. Corruption can additionally, by weakening the tax systems increase tax evasion. This reduces resources available for social welfare spending (Gupta et al. 2002) which primarily benefit those from the lower income groups, making it more difficult for them to emigrate. Therefore, as corruption continues to increase, the emigration rates among those with low and medium levels of educational attainment could decline.

[3] See Mckenzie and Rapoport (2007) for non linear effects between wealth and emigration .

Following from this, the three core hypotheses, we investigate are the following:

(1) If corruption in a country increases, the emigration rates of those with high educational attainment increases, ceteris paribus;

(2) If corruption in a country increases, the emigration rate of those with middle and low levels of educational attainment increases up to a certain threshold and then decreases.

(3) The ability of those with medium and low levels of educational attainment to emigrate falls as inequality increases.

3. Description of the Data

Panel data covering the 1995-2010 period with observations corresponding to five year intervals are used. Data on emigration rates by educational level are from Brücker et al. (2013). This includes data for the emigration rate of men and women over 25 by three educational levels, high, middle and low. Emigrants with upper-secondary education are classified as middle, those with post-secondary education as high and those with less than upper-secondary education (including lower-secondary, primary and no schooling) as low.

The main independent variable of interest, is corruption. Two measures of corruption are used in the empirical study that follows. One is the corruption measure from Transparency International (TI). Here the estimate of corruption ranges from 0 (totally corrupt) to 10 (not corrupt). The other is the estimate of corruption from Kaufmann et al. (2012) which ranges from approximately -2.5 (totally corrupt) to 2.5 (not corrupt). In order to simplify the interpretation of empirical results the measures of corruption have been reversed so that 0 stands for not corrupt and 10 totally corrupt on the TI measure. The Kaufmann et al. measure has been rescaled so that 0 stands for not corrupt and +5 for totally corrupt to maintain

consistency with the TI measure. Therefore, higher values on these two indices indicate higher levels of corruption.

A number of other control variables are used in the empirical analysis. GDP per capita is used to control for the level of development of a country. Mauro (1998) and Wei (2001) argue that corruption changes the size and composition of public expenditure away from vital sectors such as health and education. This could increase the emigration rate, in particular, that of the group with low and medium levels of educational attainment. We incorporate government expenditure devoted to education as a percentage of GDP to control for this. Evidence shows that corruption can also increase unemployment and inequality thus reducing welfare (Gould and Amaro-Reyes, 1983, Dimant et al. 2013), acting as a push factor for labour migration. We control for inequality by using the Gini coefficient and for employment by using the labour force participation rate. The literature also shows that institutions affect corruption (Lederman et al. 2005) and also the rate of emigration (Borjas 1987). The polity index is used to capture institutions (Docquier et al.2010). Table 1 provides summary statistics for the data used in the empirical analysis.

[Table 1, about here]

We also include non-linear terms for corruption (Méndez and Sepúlveda 2006, Aidt 2003). A preliminary inspection of scatter plots between the TI corruption index and emigration rates indicate non-linearity in the relationship between corruption and emigration rates for those with middle and low levels of educational attainment.

[Figures 1-3, about here]

4. The Model and Estimation Methodology

The preliminary estimation is carried out using panel fixed effects. Both fixed and random effects models were estimated. However, based on the results of the Hausman test, the fixed effects model was found to be relatively more reliable. Therefore the paper reports results only for panel fixed effect estimation. The fixed effects estimator permits controlling for any unobserved country-specific time-invariant effects. The panel data model can be expressed by equation (1) as follows:

$$M_{it} = X_{it}\beta + \varpi_i + \eta_t + \mu_{it} \quad (1)$$

where M_{it} is the rate of emigration from country *i*, in period *t*. The estimation is carried out by disaggregating emigration by education level, high, medium and low. X_{it} is a vector which includes all independent variables, including corruption and the control variables. ϖ_i captures the country specific effect and $\eta_{t,}$ takes into account the relevant time effect. u_{it} is a random error term that captures the effect of all omitted variables. Interaction terms are added to the above specification to investigate desired differential effects.

It can be argued that all explanatory variables used in our empirical model are not strictly exogenous. An approach that allows controlling for the joint endogeneity of explanatory variables through the use of internal instruments is the Arellano-Bover (1995) -Blundell Bond (1998) system GMM estimator. In summary, equation (2), which involves variables in levels, is combined with equation (3), which involves variables in first differences. Equation (2) is instrumented by lagged first differences of the variables, whereas equation (3) is instrumented by lagged variables in levels.

$$M_{it} = \gamma y_{it-1} + X_{it}\beta + \varpi_i + \eta_t + \mu_{it} \quad (2)$$

$$M_{it} - M_{it-1} = \gamma(M_{it-1} - \mathrm{M}_{it-2}) + \beta(X_{it} - X_{it-1}) + \eta_t + (\mu_{it} - \mu_{it-1}) \quad (3)$$

The variable definitions are the same as above for equation (1), with lagged values of the variables now entering the equation. The system GMM estimation is also carried out by disaggregating emigration by education level. Two diagnostic tests, the Hansen test for over-identifying restrictions under which the null hypothesis is that the instruments are not correlated with the residuals, and the Arellano-Bond test for second order correlation in the first differenced residuals are carried out.

As a further test for endogeneity, instrumental variable (IV) estimation could be useful in addition to the system GMM. In the IV estimation, a good instrument should be correlated to corruption and not influence public debt through other channels. Among the variables used as instruments for corruption are: ethnolinguistic fractionalization (Mauro 1995), the settler mortality data of Acemoglu et al. (2001) (Ahlin and Pang 2008), latitude (Gupta et al. 2002, Delavallade 2006), the initial level of corruption (Gupta et al. 2002). Following Gupta et al. (2002), we use the initial level of corruption as an instrument for corruption. A Sargan test for over-identifying restrictions under which the null hypothesis is that the instruments are not correlated with the residuals is carried out under the IV estimation.

5. Empirical Results

5.1 Fixed Effects Estimation

The preliminary estimation is carried out using fixed effects estimation to control for time invariant country effects. Results are reported in Table 2. Column (1)-(3) reports results for high, middle and low levels of educational attainment respectively, using the TI corruption index and columns (4)-(6) for the same, using the Kaufmann et al. corruption index. Control variables are included for per capita income to account for the level of development of the country, government expenditure on education to GDP as higher levels of government

expenditure on education can reduce emigration, and the polity index to capture institutions. All variables except for the polity index have been converted into logarithmic form for the empirical estimation.

[Table 2, about here]

For emigrants with high levels of educational attainment, columns (1) and (4), only the linear coefficient on the TI and Kaufmann et al. corruption index is statistically significant. The quadratic term is not significant. The results suggest that as corruption increases, the emigration rate of those with high levels of educational attainment increase. In column (1) for example, the linear coefficient on the TI corruption index suggests that a 1 unit increase in the corruption index increases the emigration rate by 0.34%. For those with medium and low levels of educational attainment however, columns (2) and (3) and columns (5) and (6), the linear terms are positive, and the quadratic terms are negative, suggesting that the emigration rate of those with medium and low levels of educational attainment increase at low levels of corruption and then begins to decline beyond a certain point[4]. This is observed for both the TI and Kaufmann et al. corruption indices. Calculated threshold points for those with medium levels of educational attainment indicate that beyond a threshold point of 3.5 on the TI index and 3.6 on the Kaufamann et al. index, that emigration begins to decline. Similarly, beyond a threshold point of 3.6 on the TI index and 3.9 on the Kaufmann et al. index, the emigration of those with low levels of educational attainment begins to decline. The linear coefficient on the TI corruption index in column (2) for those with medium levels of educational attainment suggests that a 1 unit increase in the corruption index initially increases the emigration rate by 0.20%.

[4] The R^2 terms in the quadratic models indicated that the explanatory power of the model is increased when the quadratic term was incorporated into the models. A F test further rejected the hypothesis that the regression was linear at the 1% and 5% significance levels against the alternative that it was quadratic.

The results also suggest that the level of development of a country as measured by per capita income has a significant effect on the emigration rates of all three groups. A higher per capita income reduces the incentive of those with high educational attainment to emigrate, while it increases the incentive of those with low and middle levels of educational attainment to emigrate. This is possibly because it increases the ability of these two groups to emigrate. The coefficients on government expenditure devoted to education is statistically significant at the 10% level for the emigration rate of those with medium levels of education and significant at the 5% and 1% levels in columns (3) and (6) for the emigration rate of those with low levels of education, indicating that if the government devotes a larger proportion of GDP to education, it would lead to a fall in the emigration rates of those with medium and low levels of educational attainment. This perhaps is because these groups stand to gain most from the government provision of services. The coefficients on the polity index are statistically significant at the 10% level for emigrants with high and medium levels of education suggesting that better institutions act as a deterrent to the emigration of these groups.

5.2 Additional Control Variables

[Table 3, about here]

We re-estimate the model by incorporating more control variables for inequality (the Gini coefficient), population density and employment (the labour force participation rate). The results are reported on Table 3. The highest emigration rate is observed for those with high levels of educational attainment consistent with the results obtained in Table 2. In column (1) for example, the coefficient on the TI index suggests that a 1 unit increase in the corruption index leads to an increase of 0.36% in the emigration rate of those with high levels of

educational attainment. Once again, the coefficient on the quadratic term for this group is not statistically significant. The estimated linear and quadratic coefficients on the corruption indices are statistically significant for those with medium and low levels of educational attainment, suggesting that the emigration rate of those with middle and low levels of educational attainment increase, and then begins to decline beyond a certain point. Calculated threshold points suggest that the emigration rate of those with medium levels of educational attainment decline after corruption reaches a level of 3.7 and 3.4 on the TI and Kaufmann et al. corruption index respectively and the emigration of those with low levels of educational attainment decline when corruption reaches a level of 3.4 and 3.6 on the TI and Kaufmann et al. index respectively. The coefficients on per capita income are positive and statistically significant at the 1% level for all groups. Government expenditure influences the emigration rate of those with middle and low levels of educational attainment, while the polity index has a significant effect on those with high levels of educational attainment. An increase in inequality as indicated by the Gini coefficient leads statistically significant fall in the emigration rate of those with middle and low levels of educational attainment, in particular those with low levels of educational attainment. The coefficient on population density is statistically significant in all columns with the exception of column (6). The results indicate that the higher the LFPR, the lower will be the emigration rate of all groups.

[Table 4, about here]

In Table 4 we incorporate an interaction term for the Gini coefficient x corruption, in order to see if inequality increases the impact of corruption on emigration. We also include wage and salaried workers as a % of total employed as wages act as a push factor for emigration. The results suggest that greater inequality does intensify the impact of corruption on emigration, that is, reduces the ability to emigrate. Similarly, earning a wage reduces the

incentive for those from all educational groups to emigrate. The linear coefficients on the main variable of interest, corruption, is statistically significant for all groups and the quadratic term is statistically significant for those with middle and low levels of educational attainment as before. The results are in general, qualitatively similar to those obtained above.

5.3 Correcting for Endogeneity

Next the estimation is carried out by using the system GMM and IV methods to address potential endogeneity concerns. Columns (1)-(3) report results for system GMM estimation and columns (4)-(6) reports results for IV estimation. Given that the estimation using the TI index and Kaufmann et al. index yield similar results, we report only results using the TI index[5].

[Table 5, about here]

The GMM estimates indicate once again, a linear relationship between corruption and emigration rate for the group with high levels of educational attainment, and a quadratic (inverted U) shaped relationship between corruption and the emigration rate of those with medium and low levels of educational attainment. High per capita income has a positive statistically significant effect on the emigration rates of those with middle and low educational attainment and a negative impact on those with high levels of educational attainment. The results are in general, broadly consistent with those obtained above. The Hansen test and the serial correlation test in the system GMM estimation confirm that the moments conditions cannot be rejected.

[5] Results using the Kaufmann et al. index yield qualitatively similar results.

The correlation between corruption and emigration appears to be robust to the inclusion of a number of control variables. We need however, to ensure that the direction of causality is from corruption to emigration. For this, using instrumental variable (IV) estimation could be useful in addition to fixed effects and system GMM. To serve as a good instrument, the instrument should be correlated to corruption and not influence emigration through other channels. Among the variables used as instruments for corruption are: ethnolinguistic fractionalization (Mauro 1995), the settler mortality data of Acemoglu et al. (2001) (Ahlin and Pang 2008), latitude (Gupta et al. 2002, Delavallade 2006), the initial level of corruption (Gupta et al. 2002)[6]. As the ethnolinguistic fractionalization index could also be correlated with emigration, and the settler mortality rate and latitude lead to a significant fall in number of observations, we use the initial level of corruption as an instrument for corruption (see Gupta et al. 2002) in the IV estimation. The results of the IV estimation are consistent with those obtained under the fixed effects and system GMM estimation methods. Corruption has a linear effect on the emigration rate of those with high educational attainment and a non-linear effect on those with middle and low educational attainment. The general conclusions broadly remain the same. The Sargan test indicates that the instruments are valid and uncorrelated with the error term.

5.4 Splitting the Sample

Given the robust evidence in favour of an inverted U-shaped relationship between corruption and the emigration rate of those with medium and low levels of educational attainment, we split the sample into two by country and time – those falling below the mean Gini index of 43

[6] Triesman (2000) finds that countries with British heritage, Protestant tradition, higher per capita GDP, uninterrupted democracy, and greater openness to imports rank lower on the corruption index, and those with Federal states tend to rank higher compared to those with unitary states.

(low inequality in income distribution) and above the mean Gini index (high inequality in income distribution), to investigate if the effect of corruption on the emigration rates of these two groups is conditional on income distribution. Each of these groups is divided into two groups based upon inequality in income distribution. Columns (1) and (2) of Table 6 reports regression results for the influence of corruption on the emigration rate of those with medium and low levels of educational attainment; and columns (3) and (4) report regression results for countries with high levels of income inequality. We only report results for the estimation carried out with the TI index. The estimation using the Kaufmann et al. index yields similar results.

[Table 6, about here]

The results in columns (1) and (2) indicate that in countries with low levels of income inequality, the emigration rate of both groups with medium and low levels of education, increase, and then decreases beyond a certain threshold. Calculated threshold points indicate that for the group with medium levels of educational attainment, emigration rates begin to fall after reaching a threshold point of 3.44 and for those with low levels of educational attainment at a threshold point of 3.73. Per capita income has a statistically significant positive effect on emigration and increased government expenditure on education reduces emigration. Increased labour force participation reduces emigration while the coefficient on population density is statistically significant only in column (1).

Columns (3) and (4) report results for countries with high levels of income inequality. Note that here only the linear term is statistically significant and negative, suggesting that in the presence of high income inequality, corruption reduces the ability of those with both medium and low levels of educational attainment to emigrate.

6. Conclusions

This paper examines the relationship between corruption and the emigration rate of those with high, medium and low levels of educational attainment. The results support our three hypotheses. The empirical results indicate that as corruption increases the emigration rate of those with high levels of educational attainment also increase. The emigration rate of those with middle and low levels of educational attainment however, increases at initial levels of corruption and then decreases beyond a certain point exhibiting an inverted U-shaped pattern. When we split emigrants with medium and low levels of educational attainment by income distribution, we find evidence of a fall in the emigration rate of both these groups due to an increase in income inequality. It is possible that increased inequality generated by corruption increase liquidity constraints faced by those with middle and low levels of educational attainment, thus reducing their ability to emigrate beyond a certain point. Calculated threshold points are in the range of 3.4 – 3.9 on the TI and Kaufmann et al. index. Government policy should focus on controlling corruption which in turn would lead to funds being channelled more productively into education and also lead to a fall in inequality which would reduce emigration. The control of corruption would also lead to the retention of those with high levels of educational attainment and lead to better labour market outcomes with employment based on merit rather than political connections.

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Table 1: Summary Statistics

Variable	Obs	Mean	Standard Deviation	Minimum	Maximum	Source
Emigration of Low Educational Attainment	460	4.32	9.70	0.02	64.34	Brücker et al. (2013)
Emigration of Middle Educational Attainment	460	4.52	7.18	0.04	42.01	Brücker et al. (2013)
Emigration of High Educational Attainment	460	17.44	17.66	0.14	84.89	Brücker et al. (2013)
GDP per capita (constant 2005 US$)	441	2068.29	1974.06	50.04	8610.02	WDI
Government Expenditure on Education (% GDP)	419	14.54	6.47	3.86	54.80	WDI
Labour Force Participation Rate (% of total population 16-64)	448	66.95	10.88	42.40	90.80	WDI
Population Density (people per square km of land area)	460	100.57	156.63	1.48	1160.99	WDI
Wage and Salaried Workers (% of total employed)	260	49.56	22.96	5.00	93.20	WDI
Gini Index	285	43.42	9.00	25.62	62.78	WDI
Corruption Index Kaufmann et al.	450	3.05	0.61	0.93	4.42	Kaufmann et al. (2012)
Corruption Index TI	405	6.90	1.15	2.80	10.00	Transparency International (2013)
Polity Index (ranges from -10 (hereditary monarchy) to +10 (consolidated democracy)	460	2.99	5.80	-9.00	10.00	Marshall and Jaggers (2013)

Note: Corruption K = Corruption index of Kaufmann et al. has been rescaled so that 0 stands for not corrupt and +5 for totally corrupt and Corruption TI = Corruption index Transparency International has been reversed so that 0 stands for not corrupt and 10 totally corrupt.

Table 2: Fixed Effects Estimation

Dependent Variables: Emigration Rate of those with High, Middle and Low Levels of Educational Attainment

	(1)	(2)	(3)	(4)	(5)	(6)
	High	Medium	Low	High	Medium	Low
Corruption TI	0.344	0.201	0.156	-	-	-
	(0.166)**	(0.040)***	(0.112)**			
Corruption TI^2	-0.055	-0.029	-0.020	-	-	-
	(0.040)	(0.014)**	(0.008)***			
Corruption K	-	-	-	0283	0.232	0.195
				(0.041)***	(0.103)**	(0.085)***
Corruption K^2	-	-	-	-0.132	-0.032	-0.027
				(0.133)	(0.012)***	(0.012)**
Per Capita Income	-0.554	0.330	0.707	-0.707	0.306	0.617
	(0.073)***	(0.064)***	(0.072)***	(0.072)***	(0.067)***	(0.074)***
Government Expenditure on Education	-0.139	-0.117	-0.103	-0.103	-0.171	-0.173
	(0.160)	(0.063)*	(0.032)**	(0.093)	(0.102)*	(0.070)***
Polity	-0.020	0.031	0.011	0.011	-0.025	0.014
	(0.010)*	(0.017)*	(0.019)	(0.005)*	(0.015)*	(0.017)
R^2	0.48	0.55	0.58	0.52	0.53	0.56
Observations	345	345	345	377	377	377

Note: Robust standard errors reported in parenthesis. *, **, *** Significant at the 10%, 5% and 1% levels.

Table 3: Fixed Effects Estimation with Additional Control Variables

Dependent Variables: Emigration Rate of those with High, Middle and Low Levels of Educational Attainment

	(1)	(2)	(3)	(4)	(5)	(6)
	High	Medium	Low	High	Medium	Low
Corruption TI	0.363	0.212	0.128	-	-	-
	(0.074)***	(0.102)**	(0.019)***			
Corruption TI^2	-0.021	-0.029	-0.019	-	-	-
	(0.040)	(0.018)*	(0.008)**			
Corruption K	-	-	-	0.376	0.290	0.122
				(0.105)***	(0.060)***	(0.024)***
Corruption K^2	-	-	-	-0.102	-0.043	-0.017
				(0.113)	(0.023)*	(0.0101)*
Per Capita Income	-0.526	0.364	0.420	-0.502	0.308	0.405
	(0.108)***	(0.102)***	(0.109)***	(0.111)***	(0.108)***	(0.166)***
Government Expenditure on Education	-0.040	-0.029	-0.125	-0.045	-0.120	-0.136
	(0.129)	(0.018)*	(0.061)**	(0.013)	(0.065)*	(0.053)***
Polity	-0.031	-0.020	-0.011	-0.011	-0.018	-0.011
	(0.010)*	(0.020)	(0.021)	(0.014)*	(0.014)	(0.012)
Gini Index	-0.012	-0.007	-0.013	-0.010	-0.007	-0.015
	(0.008)	(0.003)**	(0.005)***	(0.007)	(0.004)*	(0.005)***
Population Density	0.513	0.121	0.124	0.604	0.207	0.054
	(0.231)**	(0.055)*	(0.074)*	(0.213)***	(0.120)*	(0.044)
LFPR	-0.180	-0.254	-0.217	-0.190	-0.481	-0.201
	(0.073)***	(0.122)**	(0.071)***	(0.070)***	(0.239)**	(0.079)***
R^2	0.60	0.67	0.70	0.62	0.68	0.71
Observations	229	229	229	243	243	243

Note: Robust standard errors reported in parenthesis. *, **, *** Significant at the 10%, 5% and 1% levels

Table 4: Fixed Effects Estimation with More Control Variables and Interaction Terms

Dependent Variables: Emigration Rate of those with High, Middle and Low Levels of Educational Attainment

	(1)	(2)	(3)	(4)	(5)	(6)
	High	Medium	Low	High	Medium	Low
Corruption TI	0.305	0.247	0.124	-	-	-
	(0.047)**	(0.062)***	(0.062)**			
Corruption TI^2	-0.009	-0.035	-0.018	-	-	-
	(0.008)	(0.023)*	(0.009)**			
Corruption K	-	-	-	0.307	0.290	0.108
				(0.038)***	(0.103)***	(0.008)***
Corruption K^2	-	-	-	-0.080	-0.043	-0.014
				(0.102)	(0.019)**	(0.007)**
Per Capita Income	-0.334	0.197	0.673	-0.215	0.172	0.666
	(0.149)***	(0.065)***	(0.163)***	(0.081)***	(0.070)***	(0.174)***
Government Expenditure on Education	-0.049	-0.132	-0.148	-0.142	-0.059	-0.269
	(0.138)	(0.082)*	(0.051)***	(0.113)	(0.029)**	(0.148)*
Polity	-0.050	-0.041	0.003	0.023	-0.014	0.020
	(0.025)**	(0.015)	(0.004)	(0.011)**	(0.014)	(0.022)
Gini Index	-0.085	-0.050	-0.081	-0.063	-0.031	-0.052
	(0.029)***	(0.019)***	(0.031)***	(0.022)***	(0.014)**	(0.024)**
Population Density	0.104	0.270	0.124	0.129	0.255	0.516
	(0.027)***	(0.271)	(0.074)*	(0.028)***	(0.220)	(0.314)*
LFPR	-0.161	-0.415	-0.016	-0.160	-0.425	-0.130
	(0.034)***	(0.157)***	(0.009)*	(0.050)***	(0.153)***	(0.084)*
Wage	-0.300	-0.523	-0.495	-0.404	-0.367	-0.425
	(0.110)***	(0.132)***	(0.148)***	(0.192)**	(0.153)***	(0.129)***
Employment						
Gini Coefficient* Corruption	-0.022	-0.015	-0.026	-0.015	-0.009	-0.016
	(0.008)***	(0.008)*	(0.009)***	(0.006)***	(0.003)***	(0.007)**
R^2	0.73	0.72	0.75	0.78	0.73	0.79
Observations	159	159	159	156	156	156

Note: Robust standard errors reported in parenthesis. *, **, *** Significant at the 10%, 5% and 1% levels

Table 5: System GMM and IV Estimation

Dependent Variables: Emigration Rate of those with High, Middle and Low Levels of Educational Attainment

	(1)	(2)	(3)	(4)	(5)	(6)
	System GMM			IV Estimation		
	High	Medium	Low	High	Medium	Low
Corruption TI	0.316	0.217	0.120	0.334	0.210	0.126
	(0.045)***	(0.051)***	(0.042)***	(0.041)***	(0.101)**	(0.103)**
Corruption TI^2	-0.010	-0.031	-0.016	-0.018	-0.030	-0.016
	(0.009)	(0.015)**	(0.005)***	(0.017)	(0.014)**	(0.009)*
Per Capita Income	-0.315	0.184	0.520	-0.219	0.181	0.520
	(0.109)***	(0.045)***	(0.142)***	(0.080)***	(0.069)***	(0.160)***
Government Expenditure on Education	-0.123	-0.130	-0.132	-0.131	-0.044	-0.230
	(0.118)	(0.061)**	(0.096)*	(0.123)	(0.022)**	(0.140)**
Polity	-0.040	-0.030	-0.003	-0.020	-0.017	-0.021
	(0.020)*	(0.015)**	(0.003)	(0.010)**	(0.010)*	(0.023)
Gini Coefficient	-0.045	-0.047	-0.075	-0.052	-0.030	-0.041
	(0.039)	(0.016)***	(0.021)***	(0.022)***	(0.015)**	(0.020)**
Population Density	0.110	0.215	0.120	0.120	0.240	0.452
	(0.017)	(0.121)*	(0.056)**	(0.024)***	(0.110)**	(0.114)***
LFPR	-0.167	-0.420	-0.018	-0.154	-0.420	-0.126
	(0.030)***	(0.147)***	(0.009)*	(0.050)***	(0.150)***	(0.064)***
Gini Index * Corruption	-0.018	-0.020	-0.024	-0.015	-0.010	-0.018
	(0.007)***	(0.008)***	(0.009)***	(0.006)***	(0.004)***	(0.009)**
Lagged Dependent Variable	0.665	0.671	0.712	-	-	-
	(0.312)**	(0.221)***	(0.245)			
Hansen Test for Overidentifying Restrictions: p value	0.21	0.25	0.19			
Arellano-Bond Test for 2^{nd} order autocorrelation: value	0.16	0.18	0.21	-	-	-
Hansen Test for Overidentifying Restrictions: p value	-	-	-	0.32	0.30	0.27
R^2	-	-	-	0.77	0.74	0.70
Observations	165	165	165	243	243	243

Note: Standard errors reported in parenthesis. ***, **, *, significant at the 1%, 5% and 10% levels respectively.

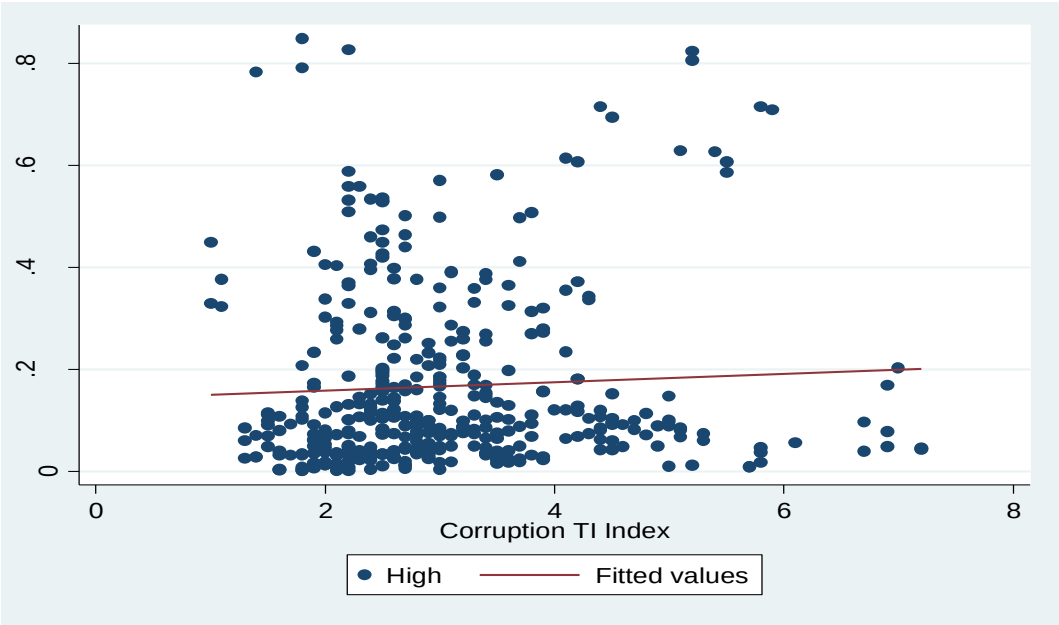
Table 6: Splitting the Sample by Income Distribution

Dependent Variable: Emigration rate of those with Medium and Low Levels of Educational Attainment

	(1)	(2)	(3)	(4)
	Below Mean Gini Index (Low Income Inequality)		Above Mean Gini Index (High Income Inequality)	
	Medium	Low	Medium	Low
Corruption TI	0.131	0.112	-0.140	-0.118
	(0.043)***	(0.016)***	(0.040)***	(0.040)***
Corruption TI^2	-0.014	-0.015	-0.010	-0.121
	(0.007)*	(0.007)**	(0.011)	(0.131)
Per Capita Income	0.126	0.164	0.110	0.131
	(0.050)***	(0.050)***	(0.005)***	(0.015)**
Government Expenditure	-0.018	-0.020	-0.015	-0.018
	(0.010)*	(0.012)**	(0.007)*	(0.008)**
Polity	-0.003	-0.002	-0.002	-0.002
	(0.002)	(0.002)	(0.001)*	(0.003)
Population Density	0.131	0.119	0.114	0.113
	(0.081)*	(0.155)	(0.061)*	(0.131)
LFPR	-0.120	-0.212	-0.134	-0.101
	(0.027)***	(0.102)**	(0.032)***	(0.071)*
R^2	0.78	0.74		
Observations	123	123	219	219

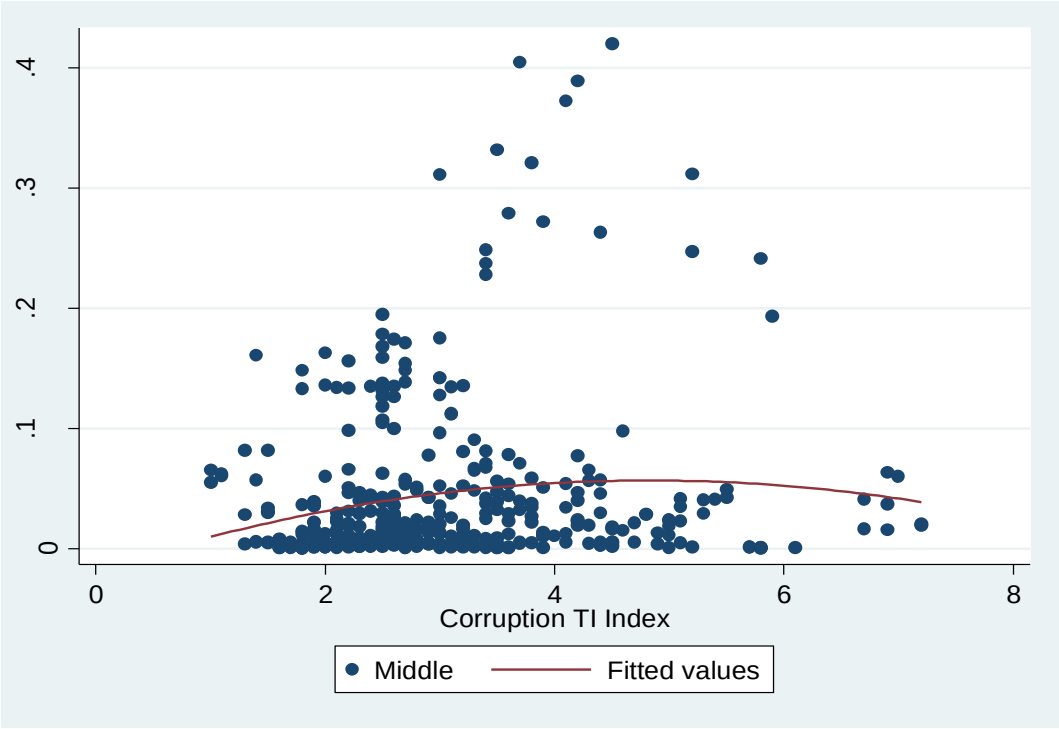
Note: Robust standard errors reported in parenthesis. ***, **, *, significant at the 1%, 5% and 10% levels respectively.

Figure 1: Emigration Ratio of those with High Levels of Educational Attainment and TI Corruption Index



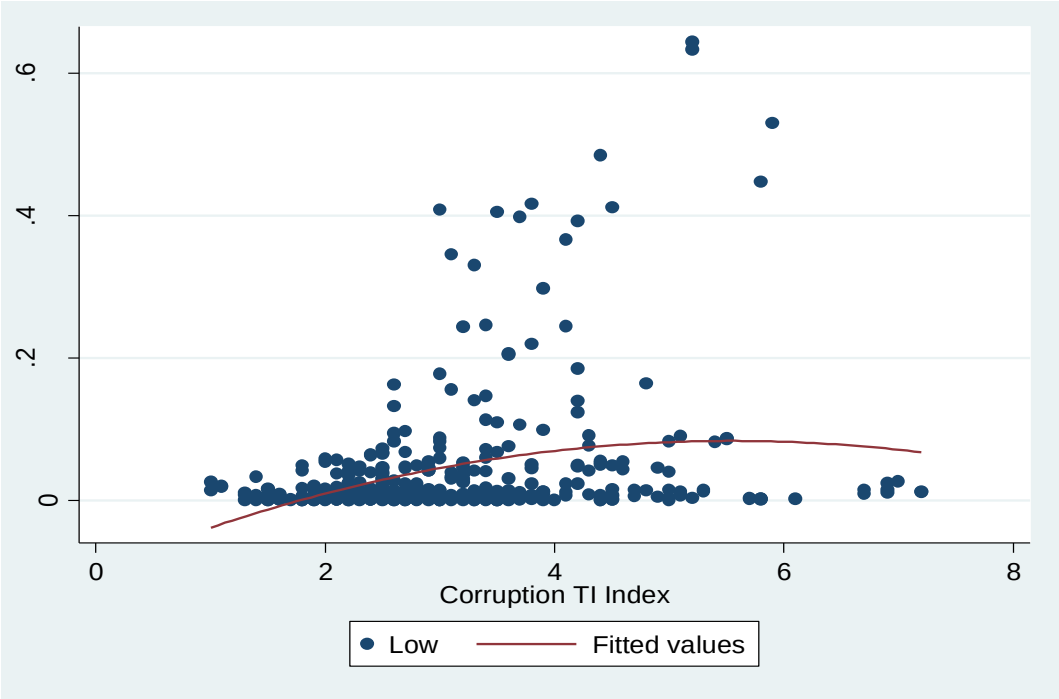
Note: The TI corruption index has been reversed so that 0 stands for not corrupt and 10 totally corrupt.

Figure 2: Emigration Ratio of those with Medium Levels of Educational Attainment and TI Corruption Index



Note: The TI corruption index has been reversed so that 0 stands for not corrupt and 10 totally corrupt.

Figure 3: Emigration Ratio of those with Low Levels of Educational Attainment and TI Corruption Index



Note: The TI corruption index has been reversed so that 0 stands for not corrupt and 10 totally corrupt.