

On the relationship between corruption and migration

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Abstract: This paper argues that there exists a relationship between corruption and migration. In particular, countries with high corruption are expected to encourage emigration and discourage immigration. This hypothesis is tested empirically with a panel dataset of 38 European and OECD economies over a period of 16 years. The results show that low (high) levels of corruption increase (decrease) the net flow of people, on average. To test the robustness, an extreme bounds analysis is done, showing that corruption as well as GDP per capita are robustly related to migration.

JEL classification: F22, D73, P16.

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1 Introduction

A vast amount of research has been conducted to determine how corruption affects the macroeconomic well-being of an economy; that is, its GDP and growth rate. Another strand of research focuses on the factors that cause migration - differences in incomes in different economies have frequently been argued to be the main cause of migration. This paper seeks to combine these two strands of literature by arguing that differences in corruption levels in different economies result in migration. In particular, it is possible that countries with high levels of corruption experience net emigration, particularly to countries with lower levels of corruption. Furthermore, the effect of corruption on migration may be of different magnitudes depending on whether the proportion of self-employed people is high or low in the country in question. To test these hypotheses, a panel dataset of 38 European and OECD countries is used. In addition, to test the robustness of corruption in explaining migration, extreme bounds analyses are undertaken.

The effect of corruption on growth has frequently been analysed. The origin of this debate can be found in Mauro (1995), who argues that corruption is mainly caused by trade restrictions, subsidies, price controls, multiple exchange rate practices and foreign exchange allocation schemes, and sociological factors and shows that corruption lowers investment and thereby retards economic growth. Svendsen (2003) provides similar conclusions, arguing that low-level corruption countries have high GDP levels due to efficient collective good provisions. Similarly, Ehrlich and Lui (1999) show that corruption has a negative effect on both growth and GDP per capita. Also, Djankov, McLiesh and Ramalho (2006) show that the relationship between more business-friendly regulations and higher growth rates is consistently significant in various specifications of standard growth models. While Mauro (1995) argues that corruption decreases growth by decreasing investment, Meon and Sekkat (2005) find that corruption has a negative effect on growth independently from its impact on investment.

So far, the effect of corruption on growth and GDP has been extensively analysed and quantified. However, the effect of corruption on other macroe-

conomic indicators has not been studied in equally great detail.

There are several theories of migration, which Borjas (1989) outlines briefly. However, Stanton Russell (1995) gives a more detailed overview of the five major approaches to explain migration, briefly summarised here. *Neoclassical macroeconomic theory* explains migration by geographic differences in the supply and demand for labour in origin and destination countries, while *neoclassical microeconomic theory* undertakes a cost-benefit calculation that indicates a positive net return to movement; as theory supported by empirics, such as in Gallin (2004). Differences in earnings and employment rates are the key factors in this theory. In contrast, the *new economics of migration* views migration as a family strategy to diversify sources of income and minimise risks to the household. The *dual labour market theory* argues that the demand for low-level workers in developed economies causes migration, because employers seek low-wage migrant workers. Lastly, the *world systems theory* argues that international migration is generated as resources are drawn into the world market economy and traditional systems are disrupted. In this framework, policies toward globalisation and overseas investment are more important than wage differentials in explaining migration.

It appears that, in these predefined groups, it is difficult to see where the political economy aspect of migration fits in, although research has been undertaken in this field already. So, it is possible that new theories must be added to the existing ones to account for the fact that political and social factors also play a role in explaining migration. While most research focuses on the neoclassical micro- and macroeconomic theories, such as Tunali (2000), for example, some studies do consider the political economy aspect of migration. For example, Moore and Shellman (2004) focus on the push factors that cause people to flee their homes, what they refer to as *forced migration*. They show that violent behaviour of state or dissident actors, large numbers of armed attacks and riots, government terror, and human rights violations have a significant effect on the expected number of forced migrants. GNP does not seem to have an effect on the number of forced migrants. The authors summarise that “the push factor of violence drives the

process” directly (p.742). In contrast, Radnitz (2006) finds that nationalism and political factors influence migration decisions only insofar as they affect people’s material well-being and the economic environment.

This paper is structured as follows. Section 2 outlines the theoretical motivation for this paper, identifying the gaps in the existing literature, and describes the methodology. Section 3 presents the results of some basic analyses, while Section 3.3 uses the extreme bounds analysis technique developed by Leamer (1983) and refined by Sala-i-Martin (1997) to test whether corruption can robustly explain migration behaviour. A conclusion summarises the findings and makes suggestions for further research.

2 The Model

2.1 Basic Setup

The goal of this paper is to merge two strands of literature that have not been previously combined. Firstly, the corruption literature has mainly focused on the effects of corruption on wealth. Secondly, most of the migration literature identifies differences in incomes as the main cause of migration. This paper seeks to combine these two fields of expertise, by arguing that corruption may well affect macroeconomic indicators other than GDP and migration may well be caused by factors other than income differences.

This paper tests the hypothesis that corruption affects migration, in the sense that high corruption discourages immigration and encourages emigration in any given country. The logic behind this claim is as follows: Countries with high levels of corruption provide a less secure business environment and worse working conditions and encourage individuals to move to countries where less corruption is present. To test this, one must regress migration behaviour on a set of explanatory variables of both an economic and social nature. In addition to a corruption index, log GDP per capita (*GDPpc*), GDP growth (*GDPgrowth*), government spending as a fraction of GDP (*gov*), the openness of the economy (*open*), and the average unemployment duration

(*Udur*) can be thought of as macroeconomic variables that result in migration. We would expect countries with high GDP per capita levels, good labour market conditions, and high growth rates to attract outsiders, and we would expect that natives are less likely to leave if the economic prospects in their home country are good. So, GDP growth, GDP per capita, government spending, openness, and the unemployment duration will all be included as explanatory variables in the analysis. Furthermore, net incomes (*netinc*) are interesting because, unlike GDP per capita, they capture the tax burden imposed on individuals. Because this paper also seeks to identify in what way the migration rate depends on the self-employment rate, this is also included. To determine whether this effect changes with the corruption rate, an interaction term is used. We would expect self-employed individuals (*self*) to react more sensitively to high corruption rates because their job depends more extensively on government officials and the official as well as unofficial rules of running a business. The following equation is then estimated:

$$\Delta M = \alpha X + \beta \text{corruption} + \varepsilon \quad (1)$$

where X is a vector of explanatory variables containing GDP growth, GDP per capita, government spending as a fraction of GDP, openness, average unemployment duration, the self-employment rate, net incomes, and the interaction term $\text{self} * \text{corruption}$ ¹. We are primarily interested in β , although the values obtained in the α -vector will be discussed, too. For the regressions, a panel dataset of 38 European and OECD countries is used, for the period 1993 to 2007. It would be desirable to have a dataset with which more homogeneous countries can be compared, but the lack of sufficiently good migration data over a long time span and a wider variety of countries does not permit this. Of course, it is important that β be robust to the addition and removal of other explanatory variables; for this purpose, different models will be tested below, and an extreme bounds analysis is undertaken as an additional robustness check. In the growth literature, the use of the extreme bounds analysis (EBA) methodology can be frequently found

¹where, depending on which measure of corruption is used, the interaction term varies

as a robustness check, for example in Levine and Renelt (1992). Leamer (1983) developed the extreme bounds analysis scheme to test whether a set of potential explanatory variables could robustly explain a certain dependent variable, Sala-i-Martin (1997) later modified it. To test whether corruption can explain migration even if other variables, such as income differences, unemployment rates, and other macroeconomic variables are included, the extreme bounds analysis method will be applied here.

2.2 Data Sources

The dataset used in this analysis consists of several corruption measures, wealth measures, labour market conditions, and other macroeconomic variables that are used to explain migration behaviour in 38 European and OECD economies over the period 1993 to 2008². Several measures of migration will be used interchangeably as the dependent variable in the analysis below, mainly for robustness check purposes, but also to analyse the development of both migration rates and the migrant stock over time. Data on the number of foreigners in a country, the inflow and outflow of foreigners in any given year, and the net migration rate are from the OECD and Eurostat databases. In particular, bilateral migration data are provided by Eurostat. For most of the analysis, the net migration rate will be used as the dependent variable.

Data on GDP per capita, government spending as a percentage of GDP, GDP growth, the population size, and an openness index are from the Penn World Tables. Eurostat also provides data on the average unemployment duration, net incomes, and the number of self-employed individuals in an economy.

² The 38 countries are: Austria, Australia, Belgium, Bulgaria, Canada, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Latvia, Lithuania, Luxembourg, Malta, Mexico, New Zealand, Norway, Poland, Portugal, Romania, Slovak Republic, Slovenia, Korea, Spain, Sweden, Switzerland, the Netherlands, Turkey, United Kingdom, and the United States. Years range from 1993 to 2008.

2.2.1 Measures of Corruption

Several measures of corruption are available and have been used in the recent literature. Most often, the Corruption Perception Index (*CPITI*), provided by Transparency International, is used, for example in Svendsen (2003) and Meon and Sekkat (2005). The CPI ranks countries by their perceived levels of corruption, as determined by expert assessments and opinion surveys. Kaufmann, Kraay and Zoido-Lobaton (1999) create an alternative index (*KKZ*) that is used in many other studies, such as Meon and Weill (2010). This composite index of corruption extracts information from seventeen different sources. In addition, the Heritage Foundation provides a *Freedom from Corruption* indicator (*CorrHer*), but this indicator relies heavily on that by Transparency International. These indicators, namely *KKZ*, *CPITI* and *CorrHer*, are highly correlated (see Table 1) because they do not differ greatly in the methodology of data collection, and can therefore be used interchangeably. Indeed, in this paper, they will continuously be used as robustness checks for one another. Note also that the indicators have very different scales but have all been rescaled so that they range from 1 to 10, with higher scores meaning lower corruption.

	CorrHer	CPITI	KKZ
CorrHer	1		
CPITI	0.9543	1	
KKZ	0.941	0.9651	1

Table 1: Correlation coefficients between different corruption measures

	net migr.	% foreign	CorrHer	GDPpc	GDPgrowth	open	gov	self	Udur	netinc
net migr.	1									
% foreign	0.4444	1								
CorrHer	0.3721	0.4751	1							
GDPpc	0.2529	0.5029	0.6103	1						
GDPgrowth	-0.197	-0.5103	-0.7321	-0.6701	1					
open	-0.4106	-0.2254	-0.6443	-0.3726	0.5835	1				
gov	-0.5763	-0.8057	-0.7758	-0.6977	0.6149	0.5769	1			
self	0.2272	-0.0806	-0.3398	-0.4301	0.2618	-0.3637	0.0815	1		
Udur	-0.1684	-0.0237	-0.7126	-0.6522	0.6014	0.6511	0.4426	0.313	1	
netinc	0.4772	0.6875	0.874	0.8014	-0.7421	-0.6021	-0.9129	-0.2756	-0.616	1

Table 2: Correlation coefficients of the considered variables (with Heritage corruption index only)

3 Results

3.1 Descriptive Statistics

Table 2 shows the pairwise correlation coefficients for the other considered variables and the corruption index by the Heritage Foundation³. The correlation coefficients indicate that corruption and growth are positively correlated, while corruption and GDP are negatively correlated⁴. It makes intuitive sense that countries with higher levels of corruption should be poorer, but it is not immediately clear why corruption is generally higher in fast-growing economies - in fact, Mauro (1995) argues that corruption negatively affects growth. This can be explained, however, by simple convergence theory, which tells us that countries that are initially poorer grow faster. Yet, these correlation coefficients contradict the findings of Ehrlich and Lui (1999) who find that both GDP and growth are negatively affected by corruption. Regression analysis will shed light onto this unclarity.

The correlation between corruption and the net migration rate is positive albeit relatively weak. The data thus indicates that there may exist a relationship between corruption and migration. If one looks at the data more closely by grouping observations into high, medium and low corruption, it

³Since this is the index that is most frequently employed in this study, the other corruption indices are left out for space reasons.

⁴Note that all corruption indices, freedom indices and governance indicators are such that high values are desirable and imply low corruption, high economic freedom, and good governance, respectively.

turns out that for countries with low corruption the net migration rate is 3.31 on average, while for countries with high corruption the mean net migration rate is -0.69; this supports the hypothesis that more people leave and fewer people enter countries in which corruption is high. Of course, one should not draw conclusions from this too quickly because other variables have not been taken into account. This will be done in the next section.

3.2 Basic Regressions

This section will show regressions results from the evaluation of Eq. (1). Column 1 of Table 3 shows a regression with only the KKZ corruption indicator as explanatory variable. It is positive and highly significant. This is exactly what one would expect: Countries with a higher corruption index (i.e. lower actual corruption) have a higher net migration rate on average. That is, more people enter and/or less people leave a country with low corruption⁵. In particular, if the KKZ indicator increases by one, the net migration rate increases by 1.5. Column 2 also accounts for per capita GDP in the destination country. As one would expect, countries with high GDP per capita levels experience higher net migration rates, on average. An increase in log GDP per capita by 1 increases net migration by 0.3 percentage points. Corruption is still significant in explaining migration behaviour even if measures of economic prosperity are included.

As can be seen in column 3, the same is true for growth rates. Growth influences the decision of where to migrate to, with more people going to countries where growth is high. These results support the neoclassical micro and macro theories of migration, but also indicate that factors other than income differences do indeed matter. Interestingly, the effect of government spending on the net migration rate is negative and highly significant, indicating that countries with low government spending attract people, on average. If government spending increases by one percentage point as a percentage of GDP then the net migration rate decreases by 0.4 percent, on average. This

⁵We cannot say whether the net migration rate is higher because more people enter or because fewer people leave. This is only possible if we have bilateral migration data.

may well have something to do with the fact that high government spending goes hand in hand with high taxation. This is furthermore reflected by the fact that net incomes seem to matter greatly, more so than GDP per capita.

The last column shows the regression results when an interaction term between the self-employment rate and corruption is included. Now, corruption is no longer significant, and neither the self-employment rate nor the interaction term are. Furthermore, the coefficient for corruption changes sign. In this regression, it appears that the self-employment rate does not have an effect on migration.

	(1)	(2)	(3)	(4)	(5)	(6)
	net_migr	net_migr	net_migr	net_migr	net_migr	net_migr
KKZ	1.568*** (3.34)	1.202** (2.37)	1.135** (2.25)	1.191** (2.42)	0.370 (0.79)	-2.058 (-1.01)
GDPpc		0.335** (2.43)	0.337** (2.48)	0.328** (2.47)	0.00906 (0.08)	
GDPgrowth			0.125** (2.32)	0.0728 (1.28)	-0.0106 (-0.19)	
Open				0.0218** (2.40)	0.0166** (2.07)	
Gov					-0.428*** (-6.06)	
Netinc						0.000318*** (5.28)
Self						-1633.7 (-1.21)
Self*KKZ						605.1 (1.59)
Cons.	-2.808 (-1.57)	-2.464 (-1.31)	-2.904 (-1.55)	-4.888** (-2.47)	6.792*** (2.59)	1.454 (0.19)
<i>N</i>	356	356	356	352	352	130

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Regressions of net migration on corruption (*KKZ*) and other variables

Table 4 shows the regression results when *CorrHer* is used as an explanatory variable to explain migration behaviour. Columns 1 and 2 show that the results are generally similar to those in Table 3. Interestingly, however,

the self-employment rate is now significant, and so is the interaction term between *self* and *corrHer*. However, the coefficient of corruption has changed sign and is significant, a finding that seems illogical. It would imply that the lower corruption the lower the net migration rate, which is not in line with the hypothesis.

	(1)	(2)	(3)
	net_migr	net_migr	net_migr
CorrHer	0.673*** (4.70)	0.427*** (3.20)	-3.696*** (-2.81)
GDPpc		-0.0559 (-0.54)	
Open		0.0153** (2.23)	-0.0491** (-2.31)
Gov		-0.428*** (-7.13)	0.0277 (0.04)
GDPgrowth			0.634** (2.06)
Gov ²			-0.0163 (-0.61)
Self			-3983.3*** (-2.93)
Udur			-0.124 (-0.67)
Netinc			0.000219 (1.18)
Self*corrHer			693.9*** (2.86)
Cons.	-1.735* (-1.67)	5.472*** (3.16)	29.07** (2.46)
<i>N</i>	460	456	260

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Basic regressions of net migration on *CorrHer* and other variables

Table 5 shows some basic regressions where CPITI is used as an explanatory variable. Overall, the coefficients are similar and are of the same magnitude as for the other corruption measures. Again, on its own, corruption is very significant. The explanatory variables have the expected sign.

The interaction term between *self* and *CPITI* is significant.

To summarise, these regressions show that, no matter which corruption index is used, corruption has a positive and significant effect on the net migration rate, which is in line with what one would expect. This supports the theory that the higher the corruption index (i.e. the lower corruption) the higher the net migration rate; meaning that more people enter a country and fewer people leave a country if its corruption is low. However, it has also become clear that it is possible that the relationship between corruption and migration changes if other variables are accounted for. To make sure that corruption can robustly explain migration, the next section will present the results of extreme bounds analyses along the lines of Sala-i-Martin (1997).

	(1)	(2)	(3)
	net_migr	net_migr	net_migr
CPITI	0.955*** (4.58)	1.089*** (2.91)	0.323 (0.84)
GDPpc		0.108 (0.51)	
GDPgrowth		0.275** (2.11)	
Udur		-0.157 (-1.63)	
Self			-2.557*** (-3.80)
Self*CPITI			0.530*** (3.49)
Cons	-3.350** (-2.30)	-3.985 (-1.28)	1.754 (0.64)
<i>N</i>	418	140	201

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Basic regressions of net migration on *CPITI* and other variables

3.3 Extreme Bounds Analysis as a robustness check

In the equation

$$\Delta M_i = \alpha X_i + \beta C_i + \gamma Z_i + u_i \quad (2)$$

ΔM_i is some variable of interest (here: net migration) that one wishes to explain by the right-hand side variables, X_i is a vector of standard economic explanatory variables that have previously been found to affect the dependent variable, C_i is an explanatory variable whose robustness needs to be tested (here: corruption), and Z_i is a vector of potential additional explanatory variables. The extreme bound test as in Leamer (1983) for variable C says that if the lower extreme bound of β (the lowest value of β minus two standard deviations) is negative while the upper extreme bound for β (the highest value for β plus two standard deviations) is positive, the variable C is not robustly related to Y . In practice, one runs regressions with all possible combinations of explanatory variables to determine whether the coefficients change if the composition of explanatory variables changes.

As Sala-i-Martin (1997) argues, Leamer's criterion is very strong, and hardly any variable passes it because this is almost impossible. So instead, Sala-i-Martin proposes to analyse the entire distribution of the estimates of β . His criterion is that if the average 90% confidence interval of a regression interval of a regression coefficient does not include zero the variable is correlated with the dependent variable. This approach has more frequently been applied because it allows some variables to pass but is still restrictive enough to determine which variables are fragile. Sala-i-Martin (1997) applies his approach to a cross-sectional growth dataset, but his approach is also used by other authors for panel datasets and datasets not related to growth, for example Sturm and de Haan (2005), Sturm, Berger and de Haan (2005), and Gassebner, Lamla and Vreeland (2009).

This section applies Sala-i-Martin's approach to test whether corruption and migration are robustly related. Each regression contains up to three variables from a pool of explanatory variables, mainly macroeconomic variables such as GDP growth, per capita GDP, government spending as a share

of GDP, average incomes net of taxes, an openness index, the number of self-employed people in an economy, and the average unemployment duration. The dependent variable is a measure of migration; different measures of migration were used interchangeably as a robustness check, and the main results do not change. Different measures of corruption (*CPITI*, *KKZ*, *CorrHer*) are used in the explanatory variables, and the effect of them is similar. Using all combinations of explanatory variables for the regressions ensures that all possibilities are taken into account. If a variable passes the robustness criteria under these circumstances, it is certain that this variable is significant even in combination with other variables.

Variable	Min Beta	Max Beta	% sign.	CDF(0)	avg. Beta
GDPpc	-4.339	9.712	87.302	96.825	6.406
CorrHer	-0.002	1.612	68.182	95.455	0.709
GDPgrowth	-0.422	0.177	27.273	81.818	-0.089
Open	-0.039	0.039	27.273	77.273	-0.013
Gov	-0.648	0.699	22.727	63.636	0.145
Udur	-0.401	0.236	36.364	59.091	-0.083
Netinc	0.000	0.001	18.182	50.000	0.000
Self	-0.886	423.605	0.000	50.000	123.253

Table 6: Extreme bounds analysis for *CorrHer* and other explanatory variables

Table 6 shows an extreme bounds analysis for a set of explanatory variables and the variable *CorrHer*, where the dependent variable is the net migration rate⁶. In this EBA, combinations of up to three variables as explanatory variables are used in simple fixed-effects regressions. *GDPpc* is included in every regression because it is known to be one of the most important factors in explaining migration and not including it in some regressions would result in serious omitted variable bias. It can be easily seen that *GDPpc* can robustly explain net migration flows: all coefficients are posi-

⁶The variables are sorted in descending order of robustness,

tive, and zero is not part of the coefficient distribution. Furthermore, over 95 percent of the coefficients of GDP per capita are significantly different from zero. One may therefore conclude the GDP per capita can robustly explain the net migration rate. This is in line with the well-known neoclassical microeconomic theory of migration, which argues that differences in income cause migration. *CorrHer* is also robust, according to Sala-i-Martin's criterion: 95% of the coefficients have the expected sign. Generally, this supports the hypothesis that corruption discourages labour inflows and encourages labour outflows. In contrast, countries with high levels of corruption tend to experience lower levels of net migration on average. However, the coefficients of *CorrHer* are only significantly different from zero in 68% of the cases, and one should also note that in 5% of the regressions, the coefficient has the wrong sign. However, according to Sala-i-Martin's criterion, *CorrHer* can robustly explain migration.

The other variables tested do not pass the robustness test. GDP growth has some effect on the migration rate, but only 81% of the coefficients lie on one side of zero (namely, the left side). The average β is negative, which would imply that if the growth rate increases, then the net migration rate decreases, a finding that may not seem intuitive at first but is in line with convergence theory. Since the correlation between GDP per capita and the growth rate is negative and the effect of GDP on migration is positive it makes sense that the effect of growth on migration is negative (though not robust). *Gov*, *Udur*, *Netinc* and *Self* are not robustly related to migration. Self-employment in particular seems fully unrelated to migration.

4 Conclusion

This paper has investigated the question whether corruption affects the net migration rate in a sample of 38 European and OECD countries over a 16-year time period. The analysis has shown that corruption indeed has an adverse effect on net migration flows. In particular, countries with high corruption levels suffer from low net migration rates, while countries with low corruption

and a good business environment seem to attract labour. The macroeconomic factors that have been described as being the most important factors in explaining migration behaviour turn out to not be the only, most important explanations. Of course, the basic predictions made by the neoclassical micro and macro theories of international migration are supported by the empirics presented in this paper, but it becomes clear that the political economy factors do matter. Although these factors have been rarely discussed in the literature of voluntary migration, they have come up in the literature on involuntary, forced migration (see, for example, Neumayer (2005)). However, it appears that corruption is not only a push factor, as argued in the literature on forced migration, but also a pull factor in that it creates a business-friendly environment that individuals wish to work in.

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