Empirica (2024) 51:263–281
https://doi.org/10.1007/s10663-023-09600-0

ORIGINAL PAPER

# Corruption as a push and pull factor of migration flows: evidence from European countries

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Accepted: 16 November 2023 / Published online: 18 December 2023


## Abstract

Conclusive evidence on the relationship between corruption and migration has remained scant in the literature to date. Using 2008–2018 data on bilateral migration flows across EU28 and EFTA countries and four measures of corruption, we show that corruption acts as both push and pull factors on migration patterns. Based on a gravity model, a 1-unit increase in the corruption level in the origin country is associated with an 11% increase in out-migration. The same 1-unit increase in corruption in the destination country is associated with a 10% decline in in-migration.

**Keywords** Corruption · International migration · Regional migration · Gravity model

**JEL Classification** D73 · F22 · R23

Responsible Editor: Jesus Crespo Cuaresma.

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## 1 Introduction

Since the early 1990s, international migration has prompted major transformations in the European economic landscape. During this period, the volume of migration in the European Union (EU) has more than doubled, with the number of foreign-born residents in EU countries reaching 60 millions in 2019. This number represents 12% of the EU resident population and over 23% of the total stock of global migrants – despite the EU population only accounting for less than 7% of the total world population. Among the current stock of the foreign-born in the EU, more than 21 million individuals (or 35% of the total) are migrants from other EU member countries.[1]

What motivates migration decisions? One explanation is that individual, rational actors decide to migrate because a cost-benefit analysis of both monetary and non-monetary factors leads to the expectation of a positive net return from their movement (Sjaastad 1962; Schwartz 1973; Todaro and Maruszko 1987). In this micro-economic model of individual choice, where both push and pull constructs shape migration patterns, potential migrants move to areas where the expected discounted net returns are the greatest (Lee 1966; Borjas 1987).[2] Because corruption could lower prospective net returns through its large economic and social costs, it thus follows that corruption could be an important determinant affecting migration decisions. In particular, one should question whether a high level of corruption in a country promotes emigration and deters immigration. To make progress on this important question, in this paper, we use a gravity model specification to investigate whether corruption could be identified as a push factor and/or as a pull factor shaping migration patterns.

Using data on bilateral migration flows across EU28 and EFTA countries between 2008 and 2018, we show that four different measures of corruption are linked strongly with migration flows. Across all the specifications considered in this paper, we find that corruption acts as both a push and pull factor on migration decisions. Specifically, a 1-unit increase in the corruption level in the origin country is associated with an 11% increase in the outflow of migrants. Similarly, the same increase in corruption in the destination country is associated with a 10% decline in in-migration.

[1] Of these intra-EU migrants, 11 million (or 18%) come from the EU15: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom. Another 10 million (or 17%), up from 4 million in 2000, come from the NMS13 (the New Member States of the EU): Bulgaria, Croatia, Cyprus, Czechia, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, the Slovak Republic, and Slovenia. An additional 10 million (or 17%) are migrants from other non-EU countries in the western Balkans, Turkiye, Eastern Europe, and the European Free Trade Association (EFTA).

[2] Direct tests support this microeconomic model of individual choice in migratory responses. Graves and Waldman (1991) show that the elderly retire in localities where public goods are capitalized more into wages than into land prices. Kahn (2000) finds increased migration into counties with improving air quality. Similarly, Banzhaf and Walsh (2008) assess the impact of toxicity-weighted emissions and air quality on the composition of the population.

To date, comprehensive research on the nexus between corruption and migration is in its infancy, and conclusive evidence within the literature remains very scarce. This paper adds to this new body of research, which essentially comprises two distinct research areas. The first strand of literature is interested in the role of corruption as a factor explaining migration. It finds that corruption has both direct and indirect effects on migration patterns. A high level of corruption in a country, for example, significantly discourages immigration, as it is associated with weaker and more volatile economic conditions and increased job insecurity (Poprawe 2015). Increased corruption is also associated with higher emigration rates in sending countries, particularly among high-skill migrants (Morano Foadi 2006; Clausen et al. 2011; Ahmad and Arjumand 2015; Auer and Tjaden 2020). There are multiple explanatory factors behind this. One such factor is the negative impact of higher corruption levels on local institutions. The deterioration of local institutions leads to lower levels of trust from the public, weaker economic security, fewer job opportunities, and an overall lower quality of life. Corruption also erodes the meritocratic structure, reducing the returns to education and leading to a disproportionate impact on the levels of high-skilled migration (Ariu and Squicciarini 2013; Dimant et al. 2013; Cooray and Schneider 2015).[3]

The second strand of the available literature analyzes the impact of migrants on the corruption levels in both the home and destination country. It finds that migration lowers the overall level of corruption in the origin country by increasing the demand for political accountability and a higher quality of local institutions (Batista and Vicente 2011; Abdih et al. 2012). For example, students obtaining tertiary education abroad, especially in more democratic countries, can reduce corruption in their home country since their return usually demands a decrease in the risks that corruption poses to institutions, politics, and the economy (Spilimbergo 2009; Beine and Sekkat 2013; Ferreras 2013). In contrast with general migration, which, in destination countries with high economic freedom, tends to increase institutional quality and decrease corruption levels (Clark et al. 2015; Bologna Pavlik et al. 2019), immigration from corruption-ridden countries tends to have the opposite effect, boosting corruption levels (Dimant et al. 2015).

To further investigate the role of corruption as both a pull and push factor of migration decisions, we use an array of subjective and objective corruption measures, combined with bilateral migration flow data exploiting both cross-sectional and time dimensions. Having access to a panel dataset on both bilateral migration flows and corruption levels is a contribution of this paper, and it improves on the most closely related studies exploring this topic. In particular, both Dimant et al. (2013) and Cooray and Schneider (2015) consider net migration rates without the ability to disentangle whether corruption should be interpreted as a push factor or as a pull factor. On the other hand, the bilateral migration data included in Poprawe (2015) lack the time dimension, with information on 230 countries, but only for the

[3] These channels are not limited to developing countries. For instance, Morano Foadi (2006) studies the role of corruption on migration flows in Italy.

year 2000.[4] Although our paper improves on the existing literature by having access to a panel dataset, it may potentially still suffer from reserve causality. Because of this, the analysis remains about correlation, and all the conclusions of this paper should not be interpreted as causal statements.

Lastly, by controlling for other non-corruption drivers of migration, this paper speaks to the large body of research interested in quantifying the role of the different determinants of migration flows. One such driver of migration found in the literature is the presence of networks of previous migrants of the same nationality in the destination country, with cultural distance affecting migration decisions (Clark et al. 2007; Falck et al. 2012; Bauernschuster et al. 2014; Falck et al. 2018; Krieger et al. 2018). This is found to be especially relevant for low-skill migration, with these diasporas explaining the majority of variation in migration flows (Beine et al. 2011). By sharing a common language and culture, the economic and psychological costs associated with migration are greatly reduced. Migrant networks also provide an essential service to newer waves of migrants during their job search, improving labor market outcomes in the destination country (Edin et al. 2003; Munshi 2003). From the perspective of the destination country, good education and health systems tend to attract migrants (Geis et al. 2013). This is in contrast with the significantly less clear role of social safety nets, which only seem to be salient for migrants from the least developed countries (Pedersen et al. 2008). From the perspective of sending regions, local amenities (e.g., security and public services) play an important role in shaping the intentions to emigrate (Dustmann and Okatenko 2014).

The remainder of the paper is organized as follows: Sect. 2 describes the dataset assembled for this study, Sect. 3 presents the empirical results, and Sect. 4 concludes.

## 2 Data

We have built a novel dataset on corruption levels and bilateral migration flows for EU28 and EFTA countries between 2008 and 2018. Exploiting both a cross-section and a time dimension is the main contribution of this study. First, bilateral migration flows (instead of net migration rates) allow us to disentangle the overall effect of corruption on migration into two distinct parts: push (encouraging emigration) and pull (discouraging immigration) factors. We also exploit the time dimension to include fixed effects absorbing the impact of unobserved and time-invariant factors.

### 2.1 Corruption

One definition of corruption could be "the abuse of entrusted authority for illicit gain" (Norwegian Agency for Development Cooperation 2008). This definition could then include both subjective and objective measures. For instance, corruption

[4] International bilateral migration stocks come from the World Bank Global Migration Database.

might range from bureaucratic corruption to a broader notion that also includes nepotism, patronage networks, fraud, conflict of interests, bribery, embezzlement, extortion, favoritism, and political corruption (Johnston 2005). Therefore, given the complexity of capturing this variable, there is a lot of debate on how to appropriately measure it.

In this paper, we try to capture the different elements of corruption by considering more than one measure. Specifically, we consider three subjective indicators of corruption: *i*) the Corruption Perception Index (CPI); *ii*) the Control of Corruption Governance Metric (WGI CC); and, *iii*) the Government Effectiveness Governance Metric (WGI GE). We also consider one objective measure of corruption: the International Country Risk Guide (ICRG). As shown in Hamilton and Hammer (2018), the survey-based indicators (in particular, the CPI and the WGI CC) are the most valid measures of overall corruption in the context of many countries. However, and in line with the existing literature on corruption, Hamilton and Hammer (2018) suggest cross-checking the results when using one measure of corruption alongside additional indicators, since significant differences exist in the construction of these measures.[5] So far, no consensus on the optimal measure of corruption exists.

The CPI, an annual index published by Transparency International since 1995, defines corruption as the misuse of "entrusted power for private benefit" (Transparency International, 2011). It ranks countries by the perceived levels of public sector corruption, as determined by expert assessments and opinion surveys.[6] In particular, the CPI is a composite index based on a combination of surveys and assessments from 13 different sources, with each individual indicator of corruption standardized to have the same weight in the aggregate score.[7] Because the CPI measures only public sector corruption, however, two additional subjective indicators are considered.

Compared to the CPI, the WGI CC, published by the World Bank Group, is a broader measure of public sector corruption. It measures both political and general bureaucratic corruption.[8] The WGI CC is updated annually, and its assessment score

[5] Besides ICRG, other measures of corruption exploit variations in conviction rates (Hill 2003; Fiorino et al. 2012) or press reports (Rehren 1996). However, these methods remain mostly unsystematic, thus leading to validity and reliability problems (Morris 2008, p. 390).

[6] As mentioned by Eurostat: "As there is no meaningful way to assess absolute levels of corruption in countries or territories on the basis of hard empirical data, capturing perceptions of corruption of those in a position to offer assessments of public sector corruption is so far the most reliable method of comparing relative corruption levels across countries."

[7] The main weakness of this measure is that the number of sources used to construct it varies over time, especially before 2012. However, because the CPI uses sources from the three years preceding each publication of the index, it is still possible to use the CPI to make comparisons over short periods of time (Persson and Tabellini 2003). There is a very strong significant correlation between the CPI and other proxies for corruption: black market activity and an overabundance of regulation (Wilhelm 2002), as well as business regulation and the public perceptions of corruption (Treisman 2007).

[8] Both WGI CC and WGI GE are part of a larger set of Worldwide Governance Indicators, which include: *i*) Voice and Accountability; *ii*) Political Stability and Absence of Violence / Terrorism; *iii*) Regulatory Quality; and, *iv*) Rule of Law.

ranges from −2.5 (most corrupt/least effective) to 2.5 (least corrupt/most effective). It is based on 30 individual data sources, selected to include the views of citizens, business owners, academics, and experts drawn from the public, private, and NGO sectors from across the globe. A third indicator, the WGI GE, measures non-elected public sector corruption. To the extent that bureaucrats behave independently from elected officials, the WGI GE captures corruption in the bureaucracy rather than political corruption.

Lastly, we consider one objective indicator of corruption: the index issued by ICRG. This index refers to the financial corruption associated with conducting business, including bribes and other forms of political corruption (e.g., excessive patronage, nepotism, and close ties between politics and business).

As these four indicators use different scales, we have re-scaled them to range from 0 (least corrupt) to 10 (most corrupt). Summary statistics are presented in Table 1.[9] As shown in Fig. 1, there is substantial variation in corruption levels across European countries. The southeastern region of the European continent is characterized by higher corruption levels (Bulgaria and Romania at 5.6, Greece at 5.4, and Italy at 5.1), especially when compared to the Nordic region (Finland at 0.7, Denmark at 0.8, and Sweden at 1.0).

### 2.2 Migration

We focus on bilateral migration flow data between 2008 and 2018 across EU28 and EFTA countries, obtained from Eurostat. Across the sample, countries differ both in terms of inflows and outflows of migrants, as shown in Fig. 2. Larger migration outflows are observed in eastern (Romania and Poland), central (Germany and France), and southern (Italy, Spain, and Portugal) European countries. The countries with the largest inflows are the UK, Spain, Italy, and Switzerland.[10]

### 2.3 Additional variables

The control variables that we use in the analysis are summarized in Table 1.

First, following the literature on gravity models, we measure the geographical distance between countries by including a dummy variable (equal to one) when countries share a common border. We also include indicators accounting for the difference in time zones, the distance (weighted by population), and the area of the country. To control for cultural and economic distance, we include variables measuring whether countries share a common language, a common religion, and a common currency. All these variables come from the CEPII Gravity Database.

Second, to control for differences in income levels, labor markets, and openness, we include GDP per capita levels, inflation rates, and the importance of agriculture

[9] There is substantial variation in corruption levels both cross-sectionally and over time for year fixed effects to be included in the gravity model.

[10] When looking at average migration inflows, a few large countries (including Germany, Greece, Poland, and Portugal) have missing data from Eurostat.

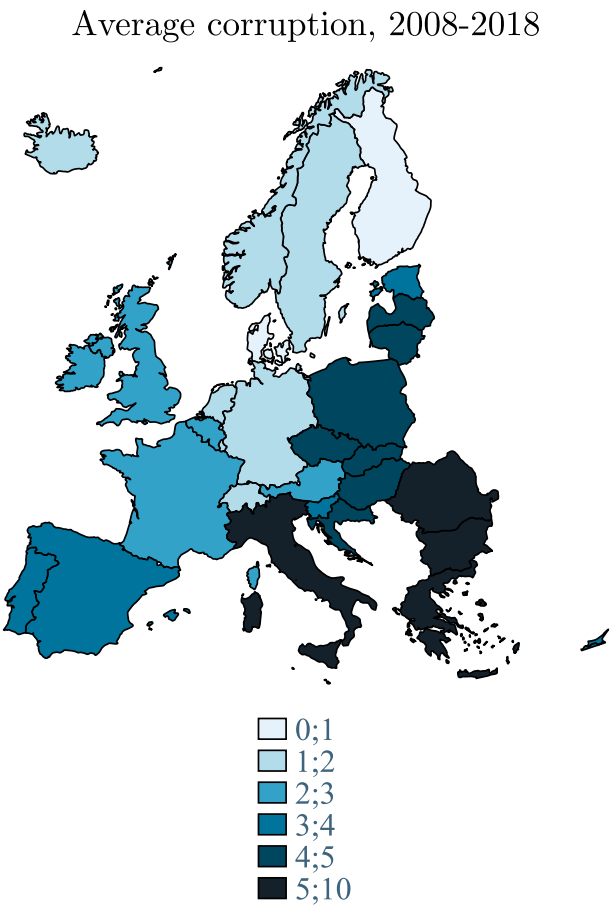


**Fig. 1** The map presents the average level of corruption across the four indicators of corruption considered in this paper, between 2008 and 2018. The indicators are the Corruption Perception Index—CPI, the Control of Corruption—WGI CC—Governance Metric, the Government Effectiveness—WGI GE—Governance Metric, and the International Country Risk Guide—ICRG. These four indicators have been re-scaled such that they range from 0 (least corrupt) to 10 (most corrupt). Therefore, an increase in these indices corresponds to a rise in corruption levels

and services in the local economy. These variables come from the World Bank World Development Indicators.

Third, to measure differences between countries in legal barriers to mobility, employment legislation, and the generosity of the welfare system, we consider OECD measures on: *i*) employment protection legislation; *ii*) product market regulation; *iii*) social expenditure; and *iv*) the right to work.[11]

[11] The OECD employment protection legislation is a synthetic indicator of the strictness of regulation on the dismissal of workers on regular contracts and the hiring of workers on temporary contracts. It ranges from 0 to 6, where 6 represents the strictest regulations. Then, a larger number indicates more job security. The OECD product market regulation measures the degree to which policies promote or inhibit competition in markets. It ranges from 0 to 6, where 6 represents policies that most inhibit competition.

**Table 1** Summary statistics

| | N | Mean | St. Dev | Min | Max |
|---|---|---|---|---|---|
| *Migration* | | | | | |
| Bilateral migration | 6890 | 4.78 | 2.27 | 0.00 | 12.05 |
| *Corruption: overall variation* | | | | | |
| WGI CC | 10,912 | 2.73 | 1.63 | 0.11 | 5.53 |
| WGI GE | 10,912 | 2.59 | 1.16 | 0.50 | 5.72 |
| CPI | 10,571 | 3.43 | 1.65 | 0.60 | 6.70 |
| ICRG | 8649 | 3.63 | 1.95 | 0.00 | 6.67 |
| *Corruption: between variation* | | | | | |
| WGI CC | 992 | - | 1.61 | 0.38 | 5.43 |
| WGI GE | 992 | - | 1.14 | 0.87 | 5.43 |
| CPI | 961 | - | 1.61 | 0.88 | 6.05 |
| ICRG | 961 | - | 1.90 | 0.43 | 6.47 |
| *Corruption: within variation* | | | | | |
| WGI CC | 11 | - | 0.23 | 1.95 | 4.07 |
| WGI GE | 11 | - | 0.22 | 1.97 | 3.26 |
| CPI | 11 | - | 0.33 | 2.65 | 4.54 |
| ICRG | 9 | - | 0.45 | 1.95 | 5.66 |
| *Gravity* | | | | | |
| Common border | 9570 | 0.09 | 0.29 | 0.00 | 1.00 |
| Time zone difference | 9570 | 0.67 | 0.64 | 0.00 | 2.50 |
| Distance (*log*) | 9570 | 7.15 | 0.61 | 5.08 | 8.49 |
| Size of the country area (*log*) | 9570 | 11.22 | 1.56 | 5.76 | 13.21 |
| Common language | 9570 | 0.05 | 0.21 | 0.00 | 1.00 |
| Common religion | 9570 | 0.29 | 0.30 | 0.00 | 0.94 |
| Common currency | 9570 | 0.30 | 0.46 | 0.00 | 1.00 |
| *Additional controls* | | | | | |
| GDP per capita PPP (*log*) | 10,571 | 10.58 | 0.38 | 9.75 | 11.64 |
| Inflation (%) | 10,633 | 1.76 | 2.38 | −9.90 | 16.02 |
| Agriculture value added | 10,633 | 2.19 | 1.31 | 0.12 | 6.60 |
| Services value added | 10,633 | 63.40 | 6.69 | 43.15 | 79.33 |
| Right to work | 10,912 | 0.93 | 0.25 | 0.00 | 1.00 |
| Social protection exp. (% GDP) | 8866 | 22.46 | 4.68 | 13.02 | 32.21 |
| Product market regulation | 8184 | 1.64 | 0.49 | 0.54 | 3.12 |
| EPL: Individual dismissals | 8587 | 2.28 | 0.64 | 1.10 | 4.42 |
| EPL: Temporary contracts | 8587 | 1.70 | 0.84 | 0.38 | 3.75 |

WGI CC and WGI GE are the Worldwide Governance Indicators Control of Corruption and the Worldwide Governance Indicators Government Effectiveness, respectively. CPI is the Corruption Perception Index and ICRG is the International Country Risk Guide

Footnote 11 (Continued)

The OECD social expenditure indicator is presented as a share of GDP, and it includes social expenditure on old age, survivors, incapacity-related benefits, health, family, active labor market programs, unemployment, housing, and other social policy areas. When looking at 2010 data on migration policies from the immigration policies in comparison (IMPIC) database (Helbling et al. 2017), the previous indicators correlate in the expected direction. For example, social expenditure tends to be higher in countries with less restrictive labor migration policies (e.g., on work permit validity, labor market tests, loss of employment, or age limits).

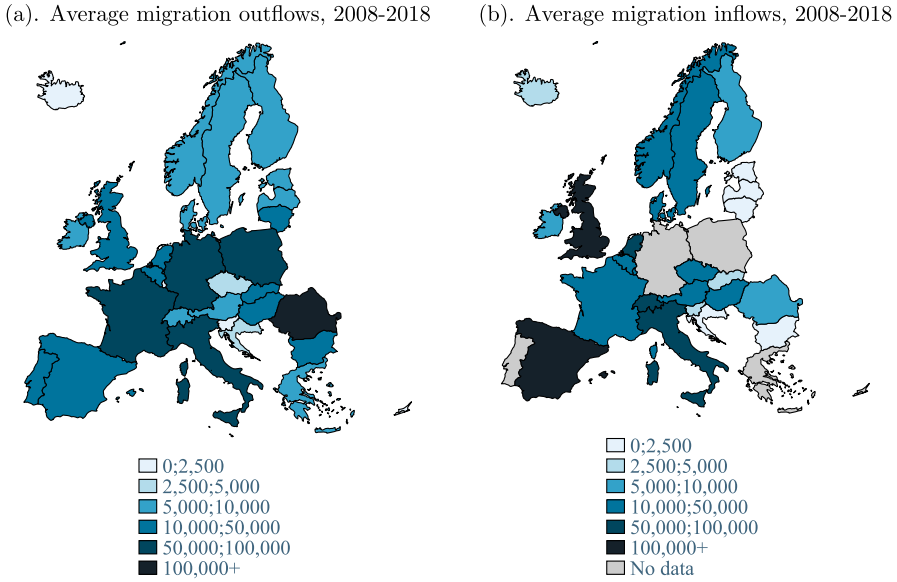


**Fig. 2** Panel (**a**) and Panel (**b**) present the average migration outflows and inflows between 2008 and 2018

## 3 Corruption levels and migration decisions

Using these variables, we develop a specification built around a gravity model (Anderson and Van Wincoop 2003; Poprawe 2015). As a starting point, we assess the relationship between each of the four different corruption indicators (the three subjective measures—CPI, WGI CC, and WGI GE—and the objective indicator—ICRG) and bilateral migration flows, with the inclusion of only year fixed effects. The specification is shown in Eq. 1, and the results are presented in Table 2.

$$\log(MigFlow_{o,d,t}) = \beta_0 + \beta_1 Corr_{o,t} + \beta_2 Corr_{d,t} + \alpha_t + \epsilon_{o,d,t} \quad (1)$$

Across all four columns of Table 2, the results remain statistically significant. As mentioned in Sect. 2.1, all four corruption indicators have been re-scaled on a 0-10 scale, with 10 indicating the most corrupt scenario. An increase in the corruption indicator by 1 unit in the sending country $o$ is associated with a rise in migration from $o$ to $d$ of between 9% and 29%. On the other hand, a higher level of corruption in the receiving country $d$ is associated with a fall in migration from $o$ to $d$ of between 34% and 44%. According to these preliminary results, corruption seems to act as both a push and pull factor in migration decisions, with the latter effect being twice as large. Migrants seem to respond more to the expected levels

**Table 2** Year fixed effects

| Dependent variable | Migration flows | | | |
|---|---|---|---|---|
| | WGI CC | WGI GE | CPI | ICRG |
| | (1) | (2) | (3) | (4) |
| WGI CC in *o* | 0.15*** | | | |
| | (0.02) | | | |
| WGI CC in *d* | – 0.34*** | | | |
| | (0.01) | | | |
| WGI GE in *o* | | 0.29*** | | |
| | | (0.02) | | |
| WGI GE in *d* | | – 0.44*** | | |
| | | (0.02) | | |
| CPI in *o* | | | 0.11*** | |
| | | | (0.02) | |
| CPI in *d* | | | – 0.39*** | |
| | | | (0.01) | |
| ICRG in *o* | | | | 0.09*** |
| | | | | (0.01) |
| ICRG in *d* | | | | – 0.36*** |
| | | | | (0.01) |
| Constant | 5.17*** | 5.06*** | 5.72*** | 5.83*** |
| | (0.11) | (0.13) | (0.11) | (0.12) |
| Year FE | Yes | Yes | Yes | Yes |
| Adj. R-Square | 0.09 | 0.09 | 0.11 | 0.13 |
| N | 6890 | 6890 | 6594 | 5248 |

Robust standard errors clustered by county in parenthesis. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively

of corruption in the destination country than to increased corruption levels in the sending country.

As geographical, cultural, and economic distances between countries might have an effect both on the decision to migrate and on the level of corruption across countries, we consider a follow-up specification that includes variables indicating whether countries *o* and *d* lie on a contiguous border and whether they share a common language, religion, and/or currency. Additionally, we include the area of the country, the difference in time zones, and the distance (weighted by population). This augments Eq. 1 with the inclusion of the vector $\mathbf{Gravity}_{o,d,t}$, as shown in Eq. 2.

$$\log(MigFlow_{o,d,t}) = \beta_0 + \beta_1 Corr_{o,t} + \beta_2 Corr_{d,t} + \mathbf{Gravity}_{o,d,t}\gamma_1 + \alpha_t + \epsilon_{o,d,t} \quad (2)$$

**Table 3** Geographical, cultural, and economic distance

| Dependent variable | Migration flows | | | |
|---|---|---|---|---|
| | WGI CC | WGI GE | CPI | ICRG |
| | (1) | (2) | (3) | (4) |
| WGI CC in *o* | 0.16*** | | | |
| | (0.01) | | | |
| WGI CC in *d* | – 0.47*** | | | |
| | (0.01) | | | |
| WGI GE in *o* | | 0.28*** | | |
| | | (0.02) | | |
| WGI GE in *d* | | – 0.66*** | | |
| | | (0.02) | | |
| CPI in *o* | | | 0.16*** | |
| | | | (0.01) | |
| CPI in *d* | | | – 0.45*** | |
| | | | (0.01) | |
| ICRG in *o* | | | | 0.13*** |
| | | | | (0.01) |
| ICRG in *d* | | | | – 0.38*** |
| | | | | (0.01) |
| Contiguous border | 0.29*** | 0.30*** | 0.29*** | 0.27*** |
| | (0.08) | (0.08) | (0.08) | (0.09) |
| Common language | 0.92*** | 1.04*** | 0.96*** | 0.92*** |
| | (0.09) | (0.09) | (0.09) | (0.10) |
| Distance (*log*) | – 0.95*** | – 0.87*** | – 0.93*** | – 0.97*** |
| | (0.04) | (0.04) | (0.04) | (0.05) |
| Common religion | 0.96*** | 0.96*** | 0.98*** | 0.96*** |
| | (0.07) | (0.08) | (0.08) | (0.09) |
| Common currency | 0.41*** | 0.43*** | 0.42*** | 0.40*** |
| | (0.05) | (0.05) | (0.05) | (0.05) |
| Time zone difference | – 0.21*** | – 0.23*** | – 0.23*** | – 0.20*** |
| | (0.04) | (0.04) | (0.04) | (0.05) |
| Size of *o* (*log*) | 0.65*** | 0.65*** | 0.66*** | 0.66*** |
| | (0.01) | (0.01) | (0.01) | (0.01) |
| Size of *d* (*log*) | 0.54*** | 0.51*** | 0.53*** | 0.50*** |
| | (0.02) | (0.02) | (0.02) | (0.02) |
| Constant | – 1.58*** | – 1.66*** | – 1.59*** | – 0.97** |
| | (0.34) | (0.35) | (0.35) | (0.39) |
| Year FE | Yes | Yes | Yes | Yes |
| Adj. R-Square | 0.55 | 0.54 | 0.54 | 0.54 |
| N | 6053 | 6053 | 6053 | 4813 |

Robust standard errors clustered by county in parenthesis. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively

The results are presented in Table 3. Reassuringly, all the estimates on the corruption indicators maintain their sign and significance.[12] An increase in the corruption indicator by 1 unit in the sending country *o* is now associated with a rise in migration from *o* to *d* of between 13% and 28%, while a higher level of corruption in the receiving country *d* is associated with a fall in migration from *o* to *d* of between 38% and 66%. While the coefficients for the push dimension of corruption are comparable to the ones estimated in Table 2, the upper bound of the pull dimension of corruption in this more demanding model is about three and a half times larger than the push factor. According to these results, corruption—and in particular the levels of corruption in the destination country—continues to act as an important determinant of migration flows.[13]

As omitted variable bias may be a cause for concern, we include additional factors that might have a simultaneous effect on both corruption levels and migration flows. These include GDP per capita, inflation rates, the importance of agriculture and services in the economy, and the right of citizens from country *o* to work in country *d*. Reassuringly, the sign and the significance of the estimated coefficients on the four corruption indicators remain unchanged. However, as shown in Table 4, both push and pull factors have smaller magnitudes following the inclusion of these additional controls: the former is estimated to be between 3% and 24%, while the latter is between 8% and 13%.[14] Averaging the results across the four columns, a 1-unit increase in the corruption level in the origin country is associated with an 11% increase in out-migration. The same 1-unit increase in the destination country is associated with a 10% decline in in-migration.[15] Once we include this larger set of controls that might simultaneously affect corruption levels and migration flows, migrants seem to respond more equally to the levels of corruption faced in the origin country and in the destination country. Push and pull factors have a much more similar role on migration decisions.

[12] The included gravity controls enter the equation with the expected sign. In particular, a common border, a common language, a common religion, and a common currency are all found to increase migration flows between *o* and *d*. On the other hand, as countries lie further apart and more time zones separate them (both are proxies for migration costs), migration flows are reduced. Lastly, larger countries are more likely to be positively associated with patterns of both emigration and immigration. As there might be interactions between the gravity control variables and the corruption indicators, in Table 8 we estimate a specification that explicitly includes the interaction between each control variable and the bilateral difference in the corruption indicator.

[13] Table 6 further includes country fixed effects in the specifications of Eq. 1 and Eq. 2. Results remain broadly unchanged. Table 7 estimates a specification using the bilateral difference (between *o* and *d*) in corruption levels. The coefficients show a positive relationship between the gap in corruption and the bilateral flow that occurs from *o* to *d*.

[14] Legal barriers to mobility also matter substantially in the migration decision: removing all work restrictions between two countries is associated with a 172% increase in bilateral migration flows. As the dependent variables are log-transformed, to obtain the exact impact on the right-to-work variable, the coefficient $\beta$ must also be transformed according to the formula: $e^{\beta} - 1$. Taking the average value (0.28) across columns (1) to (4), the coefficient is 1.72.

[15] These results are in line with the existing literature. For example, Poprawe (2015) finds that a 1-unit increase in the corruption level is associated with a 22% increase in out-migration and a 14% decline in in-migration.

**Table 4** Controlling for additional factors

| Dependent variable | Migration flows | | | |
|---|---|---|---|---|
| | WGI CC | WGI GE | CPI | ICRG |
| | (1) | (2) | (3) | (4) |
| WGI CC in *o* | 0.09*** | | | |
| | (0.02) | | | |
| WGI CC in *d* | – 0.10*** | | | |
| | (0.02) | | | |
| WGI GE in *o* | | 0.24*** | | |
| | | (0.02) | | |
| WGI GE in *d* | | – 0.08*** | | |
| | | (0.02) | | |
| CPI in *o* | | | 0.08*** | |
| | | | (0.02) | |
| CPI in *d* | | | – 0.09*** | |
| | | | (0.02) | |
| ICRG in *o* | | | | 0.03* |
| | | | | (0.01) |
| ICRG in *d* | | | | – 0.13*** |
| | | | | (0.01) |
| GDP pc PPP (*log*) in *o* | – 1.26*** | – 1.06*** | – 1.32*** | – 1.49*** |
| | (0.08) | (0.08) | (0.08) | (0.09) |
| Inflation (%) in *o* | 0.04*** | 0.04*** | 0.03*** | 0.04*** |
| | (0.01) | (0.01) | (0.01) | (0.01) |
| Agriculture va in *o* | – 0.30*** | – 0.32*** | – 0.29*** | – 0.27*** |
| | (0.02) | (0.02) | (0.02) | (0.02) |
| Services va in *o* | 0.06*** | 0.06*** | 0.06*** | 0.06*** |
| | (0.00) | (0.00) | (0.00) | (0.00) |
| GDP pc PPP (*log*) in *d* | 0.76*** | 0.96*** | 0.81*** | 0.54*** |
| | (0.09) | (0.09) | (0.09) | (0.10) |
| Inflation (%) in *d* | – 0.03*** | – 0.03*** | – 0.03*** | – 0.04*** |
| | (0.01) | (0.01) | (0.01) | (0.01) |
| Agriculture va in *d* | – 0.33*** | – 0.32*** | – 0.32*** | – 0.34*** |
| | (0.02) | (0.02) | (0.02) | (0.02) |
| Services va in *d* | 0.09*** | 0.09*** | 0.09*** | 0.09*** |
| | (0.00) | (0.00) | (0.00) | (0.00) |
| Right to work | 0.25*** | 0.28*** | 0.25*** | 0.34*** |
| | (0.08) | (0.08) | (0.08) | (0.09) |
| Constant | – 7.71*** | – 12.32*** | – 7.57*** | – 2.76* |
| | (1.36) | (1.27) | (1.29) | (1.44) |
| Gravity controls | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes |
| Adj. R-Square | 0.70 | 0.70 | 0.70 | 0.70 |
| N | 6053 | 6053 | 6053 | 4813 |

The additional gravity controls are included. Robust standard errors clustered by county in parenthesis. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively

**Table 5** Legal regulations and the welfare state

| Dependent variable | Migration flows | | | |
|---|---|---|---|---|
| | WGI CC | WGI GE | CPI | ICRG |
| | (1) | (2) | (3) | (4) |
| WGI CC in *o* | 0.22*** | | | |
| | (0.01) | | | |
| WGI CC in *d* | – 0.34*** | | | |
| | (0.01) | | | |
| WGI GE in *o* | | 0.33*** | | |
| | | (0.02) | | |
| WGI GE in *d* | | – 0.53*** | | |
| | | (0.02) | | |
| CPI in *o* | | | 0.21*** | |
| | | | (0.02) | |
| CPI in *d* | | | – 0.33*** | |
| | | | (0.01) | |
| ICRG in *o* | | | | 0.18*** |
| | | | | (0.01) |
| ICRG in *d* | | | | – 0.27*** |
| | | | | (0.01) |
| Social protection exp. (% GDP) in *o* | – 0.01* | – 0.01 | – 0.01* | – 0.00 |
| | (0.01) | (0.01) | (0.01) | (0.01) |
| Social protection exp. (% GDP) in *d* | 0.01* | 0.01 | 0.01* | 0.01** |
| | (0.01) | (0.01) | (0.01) | (0.01) |
| Product market regulation in *o* | – 0.65*** | – 0.58*** | – 0.64*** | – 0.64*** |
| | (0.05) | (0.05) | (0.05) | (0.05) |
| Product market regulation in *d* | – 0.63*** | – 0.79*** | – 0.64*** | – 0.58*** |
| | (0.06) | (0.06) | (0.06) | (0.07) |
| EPL: Individual dismissals in *o* | – 0.06 | – 0.02 | – 0.06 | – 0.04 |
| | (0.04) | (0.04) | (0.04) | (0.04) |
| EPL: Individual dismissals in *d* | – 0.20*** | – 0.30*** | – 0.20*** | – 0.18*** |
| | (0.05) | (0.04) | (0.05) | (0.05) |
| EPL: Temporary contracts in *o* | – 0.02 | – 0.05* | – 0.03 | – 0.01 |
| | (0.03) | (0.03) | (0.03) | (0.03) |
| EPL: Temporary contracts in *d* | 0.15*** | 0.20*** | 0.18*** | 0.13*** |
| | (0.03) | (0.03) | (0.03) | (0.03) |
| Constant | 0.86** | 1.31*** | 0.82** | 0.80* |
| | (0.41) | (0.41) | (0.42) | (0.46) |
| Gravity controls | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes |
| Adj. R-Square | 0.58 | 0.59 | 0.58 | 0.57 |
| N | 4136 | 4136 | 4136 | 3328 |

The additional gravity controls are included. Robust standard errors clustered by county in parenthesis. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively

Lastly, to control for differences in legal frameworks and regulations between countries, we include indicators of employment legislation, product market regulation, and social expenditure. Results are presented in Table 5. All the estimates on the corruption indicators remain broadly unchanged: an increase in the corruption level in the origin country *o* (resp., the destination country *d*) is associated with a rise (resp., fall) in migration flows of between 18% and 33% (resp., 27% and 53%). Although the number of observations is reduced by the limited data that exist on the legal frameworks and on the regulations between countries, the coefficients estimated in this model confirm the important role of corruption on migration decisions.

## 4 Conclusions

Tackling corruption is globally recognized as an important goal, as corruption "threatens good governance, sustainable economic development, democratic process, and fair business practices" (OECD 2022). Corruption instigates lack of transparency and poor regulatory supervision. At the same time, policymakers have been looking at ways to encourage native citizens to stay, all while attracting foreign workers to the domestic labor market. Policies aiming to shape migration flows have become more important in a growing number of countries—especially those facing a brain drain. Then, lowering corruption by improving the institutional quality, the economic and political stability, and the regulatory environment could all influence the performance of workers and firms. Strong labor market outcomes in turn attract migrants and minimize brain drain. A country could then benefit from the rise in investment and economic growth that may result from a crackdown on corrupt practices.

By looking at four separate measures of corruption, the findings in this paper suggest that corruption indeed acts as both push and pull factors in migration decisions. Based on a gravity model, a 1-unit increase in the corruption level in the origin country is associated with an 11% increase in out-migration. The same 1-unit increase in corruption in the destination country is associated with a 10% decline in in-migration. Therefore, tackling corruption may be a viable policy option for reducing outward migration flows and encouraging foreign immigration.

Our results open the door to several important questions. What are the most effective ways to design anti-corruption policies that can retain local workers and attract foreign workers? Is it corruption in general or a particular dimension of corruption mostly affecting migration flows? Does the effect on migration vary between different types of workers? All these questions offer room for the further expansion of studies on the relationship between corruption and migration.

## A Appendix: Additional material

**Table 6** Year and country fixed effects

| Dependent variable | Migration flows | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | WGI CC | | WGI GE | | CPI | | ICRG | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| WGI CC in *o* | 0.16*** | 0.14*** | | | | | | |
| | (0.01) | (0.01) | | | | | | |
| WGI CC in *d* | – 0.25*** | – 0.27*** | | | | | | |
| | (0.09) | (0.06) | | | | | | |
| WGI GE in *o* | | | 0.28*** | 0.23*** | | | | |
| | | | (0.02) | (0.01) | | | | |
| WGI GE in *d* | | | – 0.06 | – 0.15** | | | | |
| | | | (0.10) | (0.07) | | | | |
| CPI in *o* | | | | | 0.11*** | 0.14*** | | |
| | | | | | (0.01) | (0.01) | | |
| CPI in *d* | | | | | – 0.09 | – 0.09** | | |
| | | | | | (0.07) | (0.05) | | |
| ICRG in *o* | | | | | | | 0.09*** | 0.10*** |
| | | | | | | | (0.01) | (0.01) |
| ICRG in *d* | | | | | | | – 0.11* | – 0.07* |
| | | | | | | | (0.06) | (0.04) |
| Constant | 4.97*** | 5.29*** | 4.19*** | 4.87*** | 4.84*** | 4.90*** | 4.93*** | 4.61*** |
| | (0.23) | (0.32) | (0.27) | (0.33) | (0.22) | (0.32) | (0.20) | (0.35) |
| Gravity controls | No | Yes | No | Yes | No | Yes | No | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Country FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Adj. R-Square | 0.46 | 0.75 | 0.47 | 0.75 | 0.45 | 0.75 | 0.45 | 0.75 |
| N | 6890 | 6053 | 6890 | 6053 | 6594 | 6053 | 5248 | 4813 |

Robust standard errors clustered by county in parenthesis. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively

**Table 7** Bilateral difference in corruption

| Dependent variable | Migration flows | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | WGI CC | | WGI GE | | CPI | | ICRG | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Difference (*o-d*) in WGI CC | 0.25*** | 0.32*** | | | | | | |
| | (0.01) | (0.01) | | | | | | |
| Difference (*o-d*) in WGI GE | | | 0.37*** | 0.48*** | | | | |
| | | | (0.01) | (0.01) | | | | |
| Difference (*o-d*) in CPI | | | | | 0.26*** | 0.31*** | | |
| | | | | | (0.01) | (0.01) | | |
| Difference (*o-d*) in ICRG | | | | | | | 0.24*** | 0.26*** |
| | | | | | | | (0.01) | (0.01) |
| Constant | 4.72*** | – 2.94*** | 4.73*** | – 2.90*** | 4.87*** | – 2.97*** | 4.84*** | – 3.12*** |
| | (0.03) | (0.37) | (0.03) | (0.38) | (0.03) | (0.38) | (0.03) | (0.43) |
| Gravity controls | No | Yes | No | Yes | No | Yes | No | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Adj. R-Square | 0.08 | 0.53 | 0.08 | 0.52 | 0.09 | 0.52 | 0.10 | 0.51 |
| N | 6890 | 6053 | 6890 | 6053 | 6594 | 6053 | 5248 | 4813 |

Robust standard errors clustered by county in parenthesis. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively

**Table 8** Gravity controls interacted with corruption

| Dependent variable | Migration flows | | | |
|---|---|---|---|---|
| | WGI CC | WGI GE | CPI | ICRG |
| | (1) | (2) | (3) | (4) |
| Difference (*o* - *d*) in WGI CC | 1.88*** | | | |
| | (0.17) | | | |
| Difference (*o* - *d*) in WGI GE | | 2.81*** | | |
| | | (0.26) | | |
| Difference (*o* - *d*) in CPI | | | 1.91*** | |
| | | | (0.17) | |
| Difference (*o* - *d*) in ICRG | | | | 1.40*** |
| | | | | (0.16) |
| Constant | – 4.36*** | – 4.05*** | – 4.22*** | – 4.43*** |
| | (0.36) | (0.36) | (0.36) | (0.42) |
| Gravity controls | Yes | Yes | Yes | Yes |
| Gravity controls X Corruption | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes |
| Adj. R-Square | 0.57 | 0.57 | 0.56 | 0.55 |
| N | 6053 | 6053 | 6053 | 4813 |

Robust standard errors clustered by county in parenthesis. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively

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