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ABSTRACT
The debate about the effect of corruption on income distribution suffers from a number of problems. The main issues are the use of perception-based measures of corruption, which implicitly favours one side of the debate, and a too narrow conception of agency involved in corruption. By relying on direct and grained evidence of bribery in 106 industrialised and industrialising states, and by appreciating the role of agency on the part of bribers, this article finds support for an emerging view that the effect of corruption on inequality is conditional. Under poor institutional conditions, entrepreneurial-related bribery is associated with an increase in the relative income share of the poorest 40%, mitigating disposable income inequality. The results are robust to the use of different income-distribution measures and data sources, as well as different specifications. While wide-spread bribery and corruption in general may be detrimental to longer term socio-economic progress, it is important not to ignore the incentives and constraints that lead people to use bribery as a means of survival.

1. Introduction

The view that corruption inevitably worsens the potential for development, although still widely popular in the discourse of good governance, does not stand up to scrutiny. Important recent contributions underline the multidimensionality of corruption (Johnston 2005; Nyblade and Reed 2008) and its varied, context-dependent effects (Dobson and Ramlogan-Dobson 2010; Khan 1996; Uberti 2016; Wong 2017). These context-sensitive findings echo an older literature on corruption and development that sees corruption both as a function

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of and as a contributing factor to particular trajectories of development, rather than as an unmitigated obstacle to poverty mitigation.[1]

This article adds credibility to the conditional understanding of corruption. It focuses particularly on the debate about the effects of corruption on income inequality, a debate that has produced divergent conclusions. The dominant view is that corruption, *tout court*, worsens income inequality by reducing the relative share of low income earners (Ades and Di Tella 1997; Chong and Gradstein 2007a,b; Gupta, Davoodi and Alonso-Terme 2002; Gyimah-Brempong 2002; Gyimah-Brempong and Munoz de Camacho 2006; Justensen and Bjornskov 2014; Li, Xu and Zou 2000; Pedauga, Peduaga and Delgado-Márquez 2017; Spinesi 2009; Uslaner, 2007, 2008) Mechanisms include the diversion of resources into rent seeking, the subversion of political processes by the powerful, the generation of poverty traps, the imposition of higher marginal costs on the poor than the rich, the reduction of effective tax collection, and poor targeting of social assistance.

An alternative, minority, view is that the effect of corruption on income distribution is conditional, and that much depends on the type of corruption that is being discussed. Chong and Calderon (2000), for instance, point out that the data reveal an inverted U-effect of corruption on income inequality, and conclude that contextual factors have to be considered as explanations for this non-linear effect. They propose that it is an institutional factor, reflected in the size of the informal economy in poorer countries, that explains why corruption in states with lower GDP per capita levels is associated with lower levels of inequality. Following this suggestion, Dobson and Ramlogan-Dobson (2010) and Andres and Ramlogan-Dobson (2011) find corroboration of this in Latin America, and Kar and Shrabani (2012) do the same for South Asia. These studies suggest that the mechanism through which corruption reduces inequality is by enabling entrepreneurs to overcome institutional obstacles to start and run businesses, especially in the informal sector.

These contextual/conditional views share a problem with the literature against which it reacts, though. Like its antagonist, it also relies on perceptions as its only source of information on corruption. Perception-based data may have some use, but they are obscuring more than they reveal in the study of the micro dynamics of corruption. In particular, perceptual data do not distinguish between grand corruption, the large-scale looting of public finances by "stationary bandits" (Olson 1993), and the day-to-day petty practise of paying a bribe to get access to a public service or a utility. Implicit in the conditional approach taken by Chong and Calderon (2000), Dobson and Ramlogan-Dobson (2012), Wong (2017) and others, is the need to identify data sources that will help us understand the particular logic of different types of corruption. Not all forms of corruption have the same effects.

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[1] See Leff 1964; Leys 1965; Bayley 1966; Greenstone 1966; Nye 1967; Huntington 1968; and Scott 1969.

This article takes up the challenge of distinguishing between different forms of corruption. It focuses explicitly on the phenomenon of bribery, and identifies its potential effect of this micro-form of corruption on income distribution. Bribery, defined as an inducement by means of improper considerations to commit a violation of duty, is relatively under-appreciated, in corruption studies, given the headline-grabbing forms of grand corruption that allowed Mohammed Suharto, Ferdinand Marcos and Mobutu Sese Seko to appropriate up to US$50bn (£28bn) from the impoverished people of Indonesia, the Philippines and Zaire (*The Guardian* 26 March 2004). For many in the world, especially the relatively poor, bribery is a daily, pervasive, and as we will argue, an unavoidable course of action, if they want to survive, that is (Justensen and Bjornskov 2014; Olken and Pande 2012). In some countries, as *The Economist* put it, bribery is "The only thing that works" (Special Report on Nigeria, 20 June 2015). Linking up with anthropological studies of bribery (Kasuga 2013; Peluso 2018; Tvedten and Picardo 2019; Ufere et al. 2012), I explore the possibility that bribery is not necessarily an unmitigated disaster for the poor (see also Meon and Weill 2010). Bribery is here seen as an instrument by means of which actors compensate for weak and inconsistent institutional contexts. By bribing, the poor reaffirm their agency (Leff 1964).

This article contributes to deepening our understanding of the contextual factors that help to shape the effects of corruption, and in particular bribery. As mentioned above, the size of the informal sector has been identified as a potential conditional factor in explaining why corruption could enhance the relative income share of the poor, thus mitigating inequality. Below, I argue that the size of the informal sector is itself a function of a broader institutional attribute, and that it is this attribute that explains when and why bribery reduces income inequality and where and when not. I refer to this attribute as the lack of regulatory quality, that is, the absence of robust regulations and enforcement mechanisms to promote entrepreneurship in competitive markets. Bribery is a response mechanism of actors whose subsistence depends on how they navigate the unpredictable waters muddied by poor regulatory quality.

Once we focus specifically on direct and finely grained evidence on one form of corruption, namely bribery, and we distinguish between types of bribery, it transpires that entrepreneurial-related bribes and bribes to avoid tax are associated with increases in the income share of the poor relative to other groups, suggesting a mitigation of income inequality. This article finds evidence of such an association in a pooled dataset of 106 OECD and non-OECD states, covering the period 2004–2015. The results are robust to the use of alternative sources on bribery and income distribution, and the use of alternative estimation techniques, including fixed effects.

The article proceeds as follows. 2 explores the importance of distinguishing between types of corruption and augmenting our existing understanding

of agency in corruption, and specifically in bribery. It also highlights the various mechanisms through which bribery could be associated with an increase/decline in income inequality. This is followed in 3 by a discussion of the date sources and the estimation strategies used. A penultimate section (4) reports the results achieved, while a final section (5) concludes. Details about the variables used, their sources and measurement, their correlations, and relevant data for the countries covered are provided in three appendices (Supporting Information).

2. Bribery, agency, and regulatory quality

Thanks to the path-breaking work of Johnston (2005) and Nyblade and Reed (2008) and others, we appreciate that corruption practices and experiences differ within countries but also between different parts of the world. Johnson suggests that these differences may form country- or culture-specific "syndromes of corruption". Khan (1996) and Uberti (2016) distinguish between centralised and decentralised forms of corruption, showing that the former leads to better economic growth outcomes than the latter. There thus seems to be important reasons to distinguish between types of corruption. Recent attempts to distinguish between "looting" and "cheating" (Nyblade and Reed 2008; Wong 2017) are inspired by the search for more finely-grained data and are to be welcomed

Wong's study of the contrasting inequality patterns in two regions (Asia and Latin America) that both have relatively high corruption levels, underlines the importance of a contextual understanding of corruption. In explaining the divergent income distribution patterns in these two regions, he argues that the effect that government spending has on inequality depends on the type of corruption that prevails in each region. Whether it is "looting" (larceny of state funds) or cheating (vote-buying and pork-barrel spending) that prevails is a function of the conditional effect of political contestation, which shapes the incentives faced by politicians (Wong 2017).

Important as these contributions are, they do not tell us much about the effect of bribery as such. This is an unfortunate oversight, as bribery is a very pervasive form of corruption that affects the lives of millions on a daily basis. According to a recent survey of 28 SSA states, as many as 75 million inhabitants of the region could have been subjected to bribery at least once during the period 2014-15 (Transparency International and Afrobarometer 2015). Anthropological studies reveal that habitual bribe-paying and bribe-taking involving the day-to-day administration of regulations, service delivery and tax collection serve a variety of social functions and moral logics that are related to cultural patterns of gift-giving and gift-acceptance (Oliver de Sardan 1999; Tvedten and Picardo 2019). Bribery affects as many as one in every four persons surveyed by Transparency International's Global Corruption Barometer in 2012. In contrast

to the moral opprobrium that attaches to grand scale larceny, in many societies bribery has become normalised as a form of building capital, social and financial (Lourenço-Lindell 2002; Nkuku and Titeca 2018; Peluso 2018; Titeca and Flynn 2014). People complain bitterly about bribery, but they largely accept it, and value it, as part of the unavoidable fabric of everyday existence. In addition, some governments tolerate widespread bribery as it provides public goods on whose existence the government's authority depend (Dutta, Kar and Roy 2011).

Conceptual space for considering the potential inequality-mitigating effect of bribery opens up when we appreciate that agency could be more dispersed in some forms of corruption than in others. Nye's classic definition of corruption places agency on the side of those entrusted with formal duties and public roles. For Nye, corruption involves "behaviour which deviates from the formal duties of a public role because of private-regarding pecuniary or status gains; or violates rules against the exercise of certain types of private-regarding influence" (Nye 1967: 419). Definitions favoured by the World Bank and other monitoring agencies such as Transparency International follow suit. Applied to bribery, agency is assumed to rest with the bribe-taker, the person who abuses entrusted power to extract from a bribe-payer an undue payment for a service of one sort or another. This sense of bribery is the oldest and most dominant in the English language, etymologically related to the old French word "*briberie*" that relates to the practice of mendicancy (Oxford English Dictionary). From the 16th century onwards, though, bribery also comes to include the act of giving/paying a sum of money or of a "gift" *for the sake of influencing the judgement or action of others*. In this meaning, agency shifts to the *briber*, the person who "corrupts," while it is the *bribee* (the bribe taker) who is being corrupted. As Chinua Achebe's tale of the corrupting of Obi Okonkwo reminds us, the bribee (the bribe taker) is not the sole source of agency (Achebe 1994).

Here, bribery is defined *as an inducement by means of improper considerations to commit a violation of duty* (drawing on Bayley 1966: 720; and Anderson and Heywood 2009: 753). The attribution of agency in bribery is important as it often assumed that petty corruption targets the helpless and the poor (Justensen and Bjornskov 2014; Peiffer and Rose 2018). Instead, it might well be that some forms of bribery are the results of initiatives taken by streetwise individuals and firms who use it as a deliberate instrument to pry open doors that would otherwise remain closed, and to avoid paying taxes. Bribes to avoid taxation obviously augment the income of the obligated tax payer, as long as the marginal bribe rate is lower than the marginal tax rate (Olken and Pande 2012). But bribe paying can also facilitate entrepreneurship (Fisman and Svensson 2007; Kasuga 2013; Shleifer 2004), specifically when institutional quality is weak (Lavallée and Roubaud 2019). Under such circumstances "harrassment bribes", that is, bribes paid to gain access to what the bribe payer is entitled to, become common (Basu 2011). But entrepreneurial agency also extends beyond just responding to harassment by officials. A study by Ufere *et al.* of the behaviour

of entrepreneurs in Nigeria, for instance, find that these entrepreneurs are not victims, but "are themselves active perpetrators of bribery, adopting a set of 'bribery best practices' governed by a well-embedded set of social norms, rules, routines, and power relations . . . " (2012: 2440). Peluso, in her ethnographic study of how informal traders in Amazonia use bribes as a means of acquiring required documentation, *and in the process reaffirm their agency vis à vis the state*, points out that bribes are paid directly or can go through a bribe-broker:

> "For all these reasons, indigenous Amazonians often find it practical to 'to pay the man who wheels the cart' (*pagar el carrito*), or pay a *coima* to a broker, to gather the necessary documentation, since formal bureaucratic procedures are costly, time-consuming and disruptive requiring applicants to reside in town for long periods of time." (Peluso 2018: 406)

Potentially most useful are bribes to gain a permit to run a business despite not meeting the often idiosyncratic labour, health and safety, and environmental standards, both in the formal and informal sector. Another would be bribes to get access to utilities such as water and electricity, or to be allowed to transport goods from one point to another, sometimes across national borders which is closely monitored by rent-seeking officials. These bribes *compensate* for general institutional shortcomings and have an income-enhancing effect for those who would otherwise not be in business at all. I capture these mediating institutional characteristics with the notion of "regulatory quality". This refers to the capacity of authorities to formulate, apply, and enforce regulations that facilitate market opportunities and maintain competitive conditions. When such regulatory quality is weak, bribery is one mechanism used by entrepreneurs to lubricate the gears of business (Chong and Calderon 2000; Meon and Weill 2010).

Some authors believe that it is the informal economy as such that plays this conditional role (Andres and Ramlogan-Dobson 2011; Dobson and Ramlogan-Dobson 2010, 2012; Kar and Shrabani 2012). This is disputed, though, by Pedauga, Pedauga and Delgado-Márquez (2017). Be that as it may, the important point is that the presence of an informal sector is itself a function of broader institutional factors, as Dobson and Ramlogan-Dobson explicitly acknowledge (2012: 1536). The growth of the informal economy is itself a function of poor institutional quality (Chong and Gradstein 2007b; Dreher, Kotsogiannis, McCorriston 2007) and its potential influence on inequality (and on corruption) is thus derived rather than primary. Yes, the informal sector is important. There is evidence that Indian informal vendors who are prepared to pay bribes have a significant higher level of income compared to traders who do not bribe (Dutta, Kar and Roy 2011). But there is no reason to believe that only entrepreneurs in the informal sector would be able to exploit poor institutional quality for their own purposes (Krakowski 2005). In many developing and transition economies it is in any case not at all easy to distinguish between formality and informality, and entrepreneurs and workers oscillate between the

two (Neuwirth 2011). The regulatory regimes in societies with large informal sectors are hybridic, mixing the official and the unofficial, as important ethnographic studies show (Lourenço-Lindell 2002; Nkuku and Titeca 2018; Oliver de Sardan 1999; Titeca and Flynn 2014).

Other groups than the formal and informal entrepreneurs mentioned above may also benefit from widespread bribery under conditions of sub-optimal institutional conditions. Those who are already employed, say as officials of local or central authority, do supplement their wages by individually, or as part of larger rent-seeking networks, demanding bribes in return for favours that "ease" the lives of others. In India, for instance, public officials are said to have bagged as much as 1.26% of GDP per year through corruption (Debroy and Bhandari 2011). To the extent that these "officials" are located in the lower income echelons, their income gains will be part of the relative gains that we want to explore here. It is highly unlikely, though, that the relative income gain of the lowest 40% would be due *solely* to everyday bribe-taking rent seekers.

Declining income inequality may also be the result of a relative loss on the part of the rich under conditions of poor regulatory quality. It is commonly assumed that the rich gain disproportionally from corruption, but this may not be the case always. It is possible that the bribes demanded of the rich are much larger than those routinely paid by the poor, and it has been found that the rich bribe more often than the poor, at least in certain countries (Hunt and Laszlo 2012). Asset-holder bribees are willing to pay large sums of money to secure and maintain property rights over assets with large returns. Corruption in the land sector in Bangladesh, for instance, serves as a tax on the wealthy, and although it enhances the asset position of the rich, it might be one of the reasons why bribery/corruption does not worsen income inequality in Bangladesh (Islam and Lee 2016).

3. Data and methods

As Wong correctly points out (2017: 299), one reason for the unsatisfactory state of the debate on the effect of corruption on inequality is the absence of quality, finely grained data on corruption and its many dimensions. To date, both sides in the debate rely on broad-based subjective perceptions of corruption as the predictor variable. This is understandable, given the paucity of alternative sources, until recently that is. In his own study, Wong tries to overcome this by relying on the conditioning effect of a macro-political factor to differentiate between two forms of corruption, namely looting and cheating (a distinction originally drawn by Nyblade and Reed 2008). This takes us only part of the way, though, and Wong, as many other researchers in the field, is compelled to rely on data on subjective perceptions of corruption as his primary data source on corruption. As indicated above, this is also the case in the work of other authors who propose more conditional view of the effect of corruption

(Andres and Ramlogan-Dobson, 2011; Dobson and Ramlogan-Dobson 2012). In contrast, this article focuses explicitly on evidence of bribery as gleaned from survey responses of experience with bribery.

The problems associated with treating perceptions of corruption as reliable indicators of actual corruption have been extensively discussed (Aidt 2009; Anderson and Heywood, 2009; Olken 2009; Olken and Pande 2012; and see Charron 2016; Uslaner 2008 for counter arguments). In the case of inequality studies, though, we have to be very careful. A case can be made that perception-based measures load the dice in favour of the conclusion that corruption worsens income inequality. It is is exactly this developmental outcome, high inequality, and its associated and perceived socio-economic ills, that stimulate perceptions of pervasive corruption in the first place. To overcome this, we need more *direct* evidence of the extent of actual corruption (Aidt 2009), even though it might be impossible to completely exclude subjective evaluative factors in the process. Multi-country sources that meet the directness requirement are the survey-generated reports of experiences that citizens have as far as the act and purpose of paying bribes are concerned. Such data are generated by the Global Corruption Barometer (GCB) project (in conjunction with Afrobarometer in Africa).[2] The bribery data used here are derived from responses generated by Global Corruption Barometer (GCB) surveys in which respondents are asked whether they have encountered bribery over a 12-month period preceding the survey in one of seven different contexts. This evidence is "direct" as it reflects respondents' personal experiences, and focuses exclusively on bribes. The GCB also makes it possible to distinguish between different types of bribes, as its survey questions discriminate between (i) bribes paid to secure access to utilities and to influence the administration of permits and regulations (hereafter "business bribes"); (ii) bribes paid to avoid taxes ("tax bribes"); (iii) bribes to gain access to health services and educational opportunities; and (iv) bribes paid in the fields of law enforcement, namely the police and judiciary.[3] In view of the arguments developed in 2 above, I focus on business bribes plus tax bribes. The relevant data from the GCB are available only since the early-to-mid 2000s, and there is more than one observation for only 68 countries. To maximise observations, I divide observations into two periods (2004 to 2009, and 2010 to 2015) and calculate the country means for each state for each period. These means (plus similar means on other variables of interest) are pooled to create a cross-sectional dataset of 170 observations covering 106 states (see Supporting Information Appendix B). Not all states have observations for both periods, forming an unbalanced panel dataset. I

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[2] The World Bank's Enterprise Surveys (ES) are also a useful source on corruption experiences, and are available for a range of countries, unfortunately only from the early 2000s, and only for non-OECD states, though.

[3] There are actually seven categories of bribes covered by the GCB data. I rearrange the seven into three categories.

rely predominantly on the full pooled dataset in the analysis below, but the time-series option provided by the panel-nature of the data is also exploited.

Income data and inequality measures are taken from two datasets that currently provide a comprehensive collection of comparable income-distribution data. The first is the Standardised World Income Inequality Dataset (SWIID) developed by Frederick Solt (2015, 2016), and widely used in the literature (Acemoglu et al. 2015; Wong 2017). The SWIID uses a range of estimation and smoothing techniques to generate a consistent cross-sectional dataset of comparable Gini measures of pre-tax and -transfer (market) income distribution, and net/disposable income distribution. I rely on the Gini of disposable income as one of the summary measures of relative income inequality.

The SWIID does not provide estimates of the income shares of the various deciles in a distribution. This information is important for us as we want to determine whether a change in income distribution is associated with a change in the relative income position of the poorest 40%. As is well-known, changes in the Gini can be due to changing income fortunes across the distribution. Hence, an income transfer from the richest 10% to the next 10% will be registered as a progressive transfer associated with a lower Gini score, although this transfer may have had no effect on the poor. We require information on the disposable income share of the different percentiles to locate and identify the direction of progressive (or regressive) transfers, and to determine whether the changes relate to disposable income or not. Available sources such as the Lakner-Milanovic (2013) World Panel Income Distribution WPID) dataset, and the UNU-WIDER's World Income Inequality Dataset (WIID) take us some distance, but the first does not extend beyond 2008, while the second also does not match the coverage of the summary measures in the SWIID.

Instead, I make use of the detailed income and consumption dataset estimated and verified by Lahoti, Jayadev and Reddy (2016), which is part of the Global Consumption and Income Programme (GCIP). I focus on consumption data, which come closest to capturing the SWIID's "net" income measure. The GCIP's Gini of consumption distribution has a close correlation (0.83) with the SWIID Gini of net income. The GCIP's data on the consumption of the poorest 40% also has a strong correlation of 0.81 with the high-to-medium quality net income data reported by the WIID. The GCIP has much broader coverage than the WIID, though, especially as far as industrialising countries are concerned. Regulatory quality is relatively poor, and inequality relatively high in these countries, and it is crucial to maximise the number of observations from this group of states. I rely on GCIP data on the relative consumption share of the poorest 40% (*Poor*). The detailed GCIP data also allow me to use a specific poor-sensitive summary measure of income distribution, such as Atkinson's normative measure (Atkinson 1970). This measure is derived from a social welfare function that favours transfers to the poor. Income inequality is measured by the social welfare gain that would result from the optimal redistribution of

income: the greater this potential social welfare gain, the more unequal income is distributed (Bosmans, Decancq and Ooghe, 2015) Lahoti, Jayadev and Reddy (2016) attribute a weight of two to the measure, making it particularly sensitive to changing patterns among the lowest income deciles.

The third variable of interest is an indicator of low regulatory quality (*RegQual*). In constructing the indicator, I rely on the World-Wide Governance Indicator measure, which measures perceptions from a range of expert sources of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Although these governance indicators are not without construction and validity issues (see Thomas 2010), the extensive range of sources used (30-plus), and their ability to capture expert and public perceptions world-wide, support their usefulness (see also Kaufmann, Kraay and Mastruzzi 2010). The business focus of the indicator of regulatory soundness is specifically relevant given the focus of this article. I reverse the scale of the indicator, so that a higher score indicates lower institutional quality. In most specifications, I use an indicator variable of poor institutional quality (*PoorRegQual*) that equals 1 if the *RegQual* score equals or is higher than the score of *RegQual* at the 75th percentile. This constitutes 44 of the observations, covering a quarter of the states in the sample (see Supporting Information Appendix C). 2 suggested that the effect of bribery on income inequality is conditional on regulatory quality. I therefore interact the indicator variable of *PoorRegQual*, alternatively the continuous variable *RegQual* with *Bribery*. This allows me to explore the effect of the practice of bribery in the presence and in the absence of poor regulatory quality.

The following equation aims at capturing the conditional effect of regulatory quality (*PoorRegQual*) on the association between entrepreneurially orientated bribes (*Bribery*) and income inequality (*Inequality*) in the *i-th* country at time period *t*. Idiosyncratic characteristics across countries in our pooled dataset are considered via fixed effects applications. Because observations come from two periods, time-specific fixed effects are also considered in order to cater for unobserved time-specific heterogeneity. The two time periods from which mean observations are used are 2004–2009 and 2010–2015:

$$Inequality_{it} = \beta_1 Bribery_{it} + \beta_2 PoorRegQual_{it} + \beta_3 Bribery_{it} * PoorRegQual_{it}$$
$$+ X'_{it} + u_i + \alpha_t + \epsilon'_{it} \tag{1}$$

X' is a vector of socio-economic features/controls, u_i ($i = 1 \dots .N$) is the intercept for each country, α_t ($t = 1, 2$) is the time-specific fixed effect, and ε is the error term. The arguments developed in 2 assumes β_1 to be > 0 if the dependent variable is a summary measure of income inequality. If the conditional effect of *PoorRegQual* is as predicted, β_3 will be < 0 in estimations using a summary inequality measure. The reverse will hold when the income share of the poor (*Poor*) is the dependent variable.

Covariates used in the estimation of Equation (1) are common to inequality estimations (see for instance Acemoglu et al. 2015; Pedauga, Pedauga and Delgado-Márquez 2017)), and detail is provided in Supporting Information Appendix B. I use the age dependency ratio, a measure of the distribution of educational opportunities, trade openness, stock of inward foreign direct investment, a measure of the egalitarian nature of the political regime, the log of real GDP per capita, and the rate of inflation. The correlations between the variables used are reported in Information Appendix A.

4. Results

To explore the data initially, Figure 1 relates country-mean data on *Bribery* to the Gini of disposable income. The resultant inversed-U relationship, captured in the dashed line, confirms previous findings of a concave non-linear relationship (Chong and Calderon 2000; Li, Xu and Zou, 2000). The explanation for this non-linear effect is suggested by the solid line, which results from regressing the inequality measure on a term interacting Bribery with our measure of regulatory quality (RegQual). It is the conditional effect of (poor) regulatory quality that accounts for the downward slope of the inverted U. Countries with very poor regulatory are marked by diamonds. Hence, once we cater for the conditional effect of regulatory quality, the need to include a squared version of Bribery in regression estimates disappears. This is confirmed by estimates that do enter both the singular and the squared versions of Bribery. The non-linear effect of *Bribery* disappears when the interactive term *Bribery*RegQual* is included (not shown).

The regression models reported in Table 1 explore the conditional influence of poor regulatory quality on the effects of bribery in more detail. Models 1.1–1.3 report the baseline models, using the three different measure of inequality as discussed above. Model 1.4 includes the controls and time- and country- fixed effects. The coefficients for the unit and time dummies used in 1.4 are not shown to keep the table within bounds. A first difference version of model 1.4 delivers results that are very similar to those established by including unit and time dummies (not shown). The signs of the main predictors, and their interactions, are as expected. As a rule, Bribery and Poor Regulatory Quality worsen income inequality, but it is only Bribery that crosses the significance threshold. When Bribery is interacted with the indicator variable of PoorRegQual, the coefficient of the interaction terms becomes consistently negative when summary inequality measures are used (Gini and Atkinson), and becomes significant at the 1% level (model 1.4). A version of 1.4, using the relative income share of the poor as dependent variable, produces a significant, but positive coefficient (not shown). The results are thus as predicted in the discussion of Equation (1).
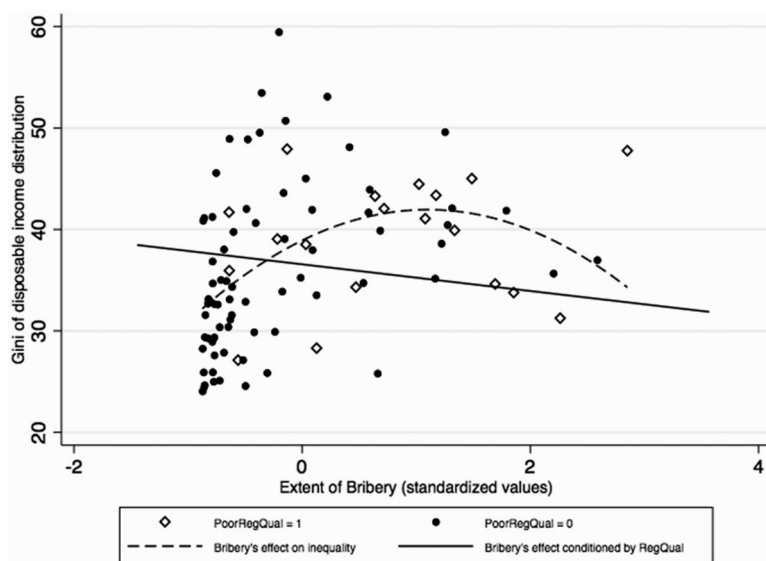
Figure 1. The effect of *Bribery* on income inequality (country means, 2004–2015). The solid line is based on regressing income inequality on the standardized values of the interaction term *RegQual*Bribery*. The scatterplot uses country-means of *Gini* and *Bribery*.

To explore the panel-data nature of the data, model 1.5 applies a fixed-effect panel-data regression as suggested by Allison (2009). The panel is unbalanced as there are less observations for the first time period (2004–2009) than for the second (2010–2015) The results of a Hausman test comparing a fixed-effects panel-data estimation with a random effects panel-data estimation indicated that the fixed effect model is more appropriate. The small number of time periods involved also rules out the Prais-Winsten correlated-panels-corrected-standard-errors approach as suggested by Beck and Katz (1995), which is suitable when there are more time periods involved. Model 1.5 in Table 1 reports the panel-data fixed effects results, and they are very similar similar to those achieved in the other models. The efficiency of model 1.5 is higher, though, reflected in smaller standard errors. Overall, all five models reported in Table 1, and an alternative, using the Gini for disposable income from the UNU-WIDER World Income Inequality dataset (not shown), confirm the expectations as discussed in 2 above.

The results imply that a country such as Bolivia (in 2010–2015) would have a Gini of four index points lower than Colombia (and would score 6% lower on the Atkinson measure) in the same period, despite the fact that both have similar bribery levels (around the mean for the non-OECD sub-sample). The difference between the two is that Bolivia qualifies for the dubious honour of falling in our category of very poor regulatory quality while Colombia does

Table 1. When bribes reduce income inequality.

	1.1 OLS	1.2 OLS	1.3 OLS	1.4 OLS	1.5 Panel-data estimation
	Gini	Atkinson	Poor	Gini	Atkinson
Bribery	3.919	0.019	−0.007	1.498	0.004
	(0.882)***	(0.010)*	(0.003)**	(1.118)	(0.007)
1.PoorRegQual	1.378	0.032	−0.010	−2.351	0.003
	(2.271)	(0.029)	(0.010)	(2.802)	(0.029)
1. PoorRegQual#c. Bribery	**−3.303**	**−0.040**	**0.013**	**−3.924**	**−0.040**
	(1.742)*	(0.018)**	(0.006)**	(1.298)***	(0.011)***
FDI				0.040	−0.000
				(0.036)	(0.000)*
Trade				−0.032	−0.000
				(0.041)	(0.000)
Educ				0.002	0.001
				(0.088)	(0.000)**
Age_Dep_Ratio				0.416	0.005
				(0.194)**	(0.001)***
Egaldem				−11.282	−0.194
				(13.332)	(0.086)**
GDP_pc_log				0.651	−0.004
				(2.149)	(0.014)
Inflation				0.029	0.001
				(0.153)	(0.001)
Fixed effects				Yes	Yes
_cons	37.301	0.339	0.182	17.485	0.109
	(0.912)***	(0.012)***	(0.004)***	(27.558)	(0.132)
Prob > chi2	0.0002	0.1242	0.1104	–	0.0000
R^2	0.13	0.04	0.04	0.99	0.48
Obs	151	170	170	137	154
N	98	106	106	89	96

Clustered standard errors in parentheses.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

not. The inequality-reducing, compensatory effect of bribery kicks in when a country crosses the threshold of poor regulatry quality.

The conditioning influence of poor regulatory quality is further illustrated in Figure 2. Figure 2 is based on estimation model 1.5 reported in Table 1. This traces the marginal effect of the categorcal distinction implied by *Poor-RegQual* on inequality, at different levels of *Bribery*. The solid line traces the effect of poor regulatory quality, that is when the relevant *RegQual* score is at or above the 75th percentile, the marginal effect is negative. As *Bribery* increases, when regulatory quality is very poor, income distribution improves. The dotted line applies to those countries with better regulatory quality, and in their cases increasing levels of Bribery are associated with increasing inequality. The Atkinson measure suggests that this effect is due to increases in the relative income shares of the poor. This is confirmed by a version of model 1.5, using the income share of the poor (*Poor*) as the dependent variable (not shown).

Tracing the marginal effect of Bribery at different levels of *RegQual* (not shown) illustrates that income inequality starts to improve when regulatory
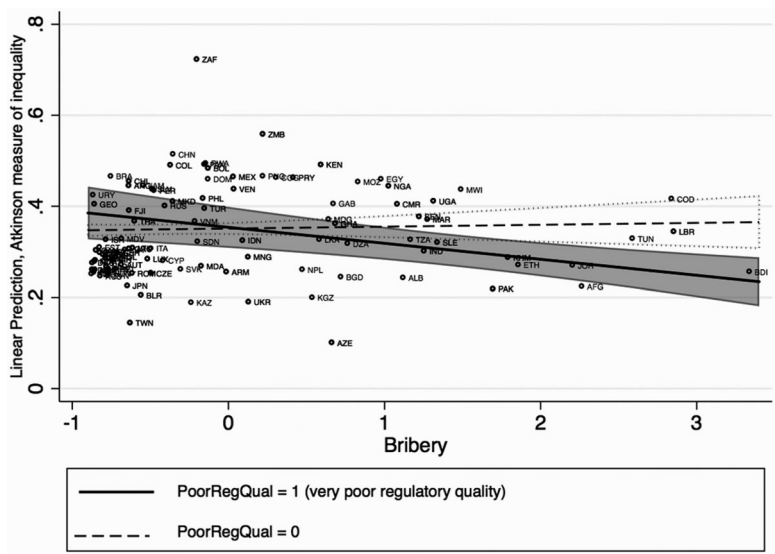
Figure 2. Predictive Margins of PoorRegQual with 95% confidence interval, at increasing levels of *Bribery*. The figure is based on the panel-data fixed effects estimation (model 1.4) as reported in Table 1. The scatterplot uses country-means.

quality declines to the low levels that it had in countries such as Armenia, Brazil, Ghana, Jamaica, and Thailand in 2010–2015. In a total of 59 countries in our sample (all non-OECD states) the marginal predictive effect of bribery as conditioned by regulatory quality is associated with a net decline in income inequality, that is, the point where bribery starts to compensate the poor for the lack of regulatory quality. However, it is only when regulatory quality declines to the 2010–2015 level of that of Russia (0.62), Tanzania (0.63), and Maldives (0.63), that the effect becomes significant at the 10% level. Thirty-seven of the states in our example fall within the group for which the association between bribery and declining income inequality, mediated by regulatory quality, is significant at this level.

We are particularly interested in the contrasting inequality levels of countries that fall inside and outside our category of having *very* poor regulatory quality, though. Twenty-four states fall in this category, and it is only in their cases that the marginal effect of bribery becomes significant at the 5% level. The contrasting net effect of bribery as mediated by regulatory quality is illustrated in the cases of Senegal and of Sierra Leone, two West African states. While the two states have comparable levels of *Bribery*, only Sierra Leone has very poor regulatory quality (PoorRegQual = 1). Income inequality is 5% lower in Sierra Leone, though. A similar size difference can be observed in the case of two other comparable states, Jordan and Afghanistan. They have similar levels of Bribery, but different regulatory qualities. The country with the poorest

regulatory quality of the two, Afghanistan, has the lower income inequality. Or contrast two East African countries with similar levels of Bribery: Kenya (higher inequality but better regulatory quality) vs Madagascar (poorer regulatory quality, but income inequality that is about 10% better than that of Kenya). In all of these examples we report net results, thus results achieved after controlling for the influence of relevant other factors, such as per capita income levels, levels of trade and foreign investment, the age dependency ratio, educational equality, the effect of democratic government redistributive policy, and inflation. The coefficients of these control variables used in the fixed-effects model (1.5) are as expected, but only in the cases of the age dependency ratio, educational equality, and the reditributive effect of democracy are the coefficients significant at the 5% level.

5. Concluding remarks

By addressing conceptual and data-related challenges, this article finds that one form of corruption, bribery – and particularly bribery related to starting and running a business – is associated in as much as 25% of the states in our sample with increases in the income share of the poorest 40%. A crucial mediating factor is the quality of market-promoting rules and regulations, and their implementation. In countries where the formal market institutions are very poorly developed, bribery plays a compensatory role, securing income for the poorest sectors of society. The results reported in Table 1 and visually explored in Figure 2, confirm the hypothesis developed in 2. These results are robust to the use of different income-distribution measures, taken from different sources, and the use of different specifications.

The results underline the importance of considering contextual factors in the relationship between corruption and inequality, and thus confirms the findings of Chong and Calderon (2000), Dobson and Ramlogan-Dobson (2012) and Wong (2017). In contrast to Dobson and Ramlogan-Dobson, though, there is no reason to believe that the diminishing effect on income inequality is restricted only to Latin American countries. By using direct evidence of bribery, rather than relying on broad perceptions, and by looking specifically at regulatory quality as the conditioning factor, I show that the effect is observable in a range of non-OECD states. This dynamic can easily be misjudged by observers from societies in which regulatory quality is high. The important point is that poor institutional quality provides incentives for entrepreneurs to engage in bribery, and underlines the fact that agency in the practice of bribery is much more dispersed than many assume.

Two qualifications have to be considered in reviewing these findings, though. First, the paper has modest aims in that it only suggests conditions under which and potential mechanisms through which bribery is associated with declining income inequality. As such the paper suggests, rather than

tests for, a causal relationship. To do the latter, consideration will have to be given to the considerable endogeneity issues involved in tracing the relationship between corruption and inequality, by exploring instrumental-variable and/or simultaneous-equation modeling.[4] So far, the literature has not been successful in identifying fully valid instruments for corruption that meet both the requirements of being associated with bribery/corruption, and of having an effect on the outcome (income distribution) solely through its relationship with bribery/corruption (Dobson and Ramlogan-Dobson 2012; La Porta et al. 1999; Treisman 2000; Wong 2017). In preparing this paper, I did test a number of potential instruments and all of them did turn out to confirm the results reported in Table 1. However, none of the available instruments can be regarded as fully valid, that is, meeting the criterion of excludability. Hence, in the absence of more conclusive evidence, this paper can claim only heuristic relevance in suggesting credible hypotheses for further research.

The second qualification that has to be kept in mind is that the paper does not condone or promote bribery/corruption in any form or manner. There is no denying the considerable body of evidence that shows that corruption undermines the conditions for long-term sustainable development (Aidt 2009). Countries, and their people, do better when institutional quality is high and public offices are used for the purpose of providing public goods, rather than private goods. This study was not undertaken to contribute explicitly to the policy discussion on the need for good governance, and these findings should not be interpreted as if to imply that I condone corruption in any form. I have not looked at the range of things that could potentially be corrupted by bribery.

Where this article does make a contribution, though, is in reminding us of a literature that appreciates that corruption acts as a form of compensation for major institutional and delivery shortfalls (Bayley 1966; Khan 1996; Leys 1964; Uberti 2016). This literature avoids moralistic shortcuts, and points out that corruption diminishes when socio-economic development reaches a certain level of maturity. The sequence is important. Bribery, and other forms of corruption, play a variety of roles on the way to that maturity. Many successful and today relatively corruption-free nations went through phases of quite significant and

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[4] Dealing effectively with endogeneity is a challenge, given the significant degree of mutual dependence in the data. High income inequality, while shaped by institutional quality (Chong & Gradstein 2007a) and corruption, in turn could influence institutional quality and encourage corruption. Inequality contributes to undermining trust in institutions that in turn stimulates more corruption. You and Khagram (2005) point out that income inequality reflects power differentials in a society, providing the wealthy with more motivation and opportunities to benefit from corrupting political decision making, especially if done by competitive elections. Inequality also undermines trust in norms and institutions, encouraging greater tolerance of deviant behaviour, including corruption. Uslaner (2008) also links inequality and corruption by showing how the former decreases general interpersonal trust and increases in-group trust, thus lowering the normative barriers of engagement in corruption. To complicate matters even further, weak institutions provide a fertile context for bribery/corruption to flourish, and the more widespread the latter becomes, the more institutional quality is undermined (Uslaner 2008).

widespread corruption. Who can deny the role that court patronage and corruption played in laying the foundations of state building in Stuart England (Levy Peck 1990)? What about the role of corruption in the gilded era of capitalist development in the USA (Cherny 1997)? Above all, the discussion above underlines the importance of trying to understand actors and their behaviour not according to how we wish they would act, but according to the institutional incentives and disincentives that they face. This is the only sound approach if we want to do something really constructive about corruption in today's world.

Disclosure statement

No potential conflict of interest was reported by the author.

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Notes

1. See Leff 1964; Leys 1965; Bayley 1966; Greenstone 1966; Nye 1967; Huntington 1968; and Scott 1969.
2. The World Bank's Enterprise Surveys (ES) are also a useful source on corruption experiences, and are available for a range of countries, unfortunately only from the early 2000s, and only for non-OECD states, though.
3. There are actually seven categories of bribes covered by the GCB data. I rearrange the seven into three categories.
4. Dealing effectively with endogeneity is a challenge, given the significant degree of mutual dependence in the data. High income inequality, while shaped by institutional quality (Chong & Gradstein 2007a) and corruption, in turn could influence institutional quality and encourage corruption. Inequality contributes to undermining trust in institutions that in turn stimulates more corruption. You and Khagram (2005) point out that income inequality reflects power differentials in a society, providing the wealthy with more motivation and opportunities to benefit from corrupting political decision making, especially if done by competitive elections. Inequality also undermines trust in norms and institutions, encouraging greater tolerance of deviant behaviour, including corruption. Uslaner (2008) also links inequality and corruption by showing how the former decreases general interpersonal trust and increases in-group trust, thus lowering the normative barriers of engagement in corruption. To complicate matters even further, weak institutions provide a fertile context for bribery/corruption to flourish, and the more widespread the latter becomes, the more institutional quality is undermined (Uslaner 2008).

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Appendix A

Table A1. Correlation coefficients.

	Atkinson	Gini	Poor	Bribery	PoorRegQual	FDI	Trade	Educ	Age_Dep_Ratio	Egaldem	GDP_pc_log	Inflation
Atkinson		0.87	−0.998	0.271	0.095	−0.112	−0.314	−0.525	0.459	−0.349	−0.427	0.272
Gini	0.851		−0.875	0.51	0.181	−0.191	−0.399	−0.683	0.509	−0.563	−0.648	0.427
Poor	−0.993	−0.847		−0.288	−0.101	0.117	0.314	0.541	−0.466	0.36	0.446	−0.282
Bribery	0.077	0.324	−0.08		0.394	−0.203	−0.172	−0.729	0.463	−0.707	−0.773	0.53
PoorRegQual	0.085	0.149	−0.082	0.491		−0.094	−0.066	−0.368	0.302	−0.477	−0.42	0.519
FDI	−0.036	−0.006	0.042	0.192	0.093		0.587	0.293	−0.295	0.248	0.237	−0.208
Trade	−0.232	−0.319	0.226	−0.11	−0.105	0.494		0.221	−0.369	0.14	0.178	−0.172
Educ	−0.355	−0.552	0.369	−0.638	−0.431	−0.051	0.174		−0.575	0.723	0.878	−0.561
Age_Dep_Ratio	0.369	0.416	−0.375	0.611	0.456	0.076	−0.266	−0.789		−0.317	−0.528	0.236
Egaldem	−0.289	−0.54	0.283	−0.582	−0.508	0.011	0.088	0.679	−0.422		0.781	−0.628
GDP_pc_log	−0.357	−0.56	0.364	−0.682	−0.474	−0.099	0.214	0.832	−0.7	0.734		−0.62
Inflation	0.13	0.198	−0.125	0.269	0.51	−0.04	−0.16	−0.326	0.257	−0.406	−0.364	

Lower-triangular cells report Pearson's correlation coefficients, upper-triangular cells are Spearman's rank correlation.

Appendix B

Table B1. Variables used.

Variable	Description	Source
Age Dependency Ratio	The ratio of dependents (people younger than 15) to the working-age population ages (15-64)	World Development Indicators (WDI)
Atkinson	Atkinson's normative measure of consumption inequality. The value of alpha is 2.	Lahoti, Jayadev and Reddy 2016: The Global Consumption and Income Project (GCIP) http://gcip.info/media/overview paper2016March28.pdf
Bribery	Bribes paid to secure access to utilities and to influence the administration of permits and regulations, plus bribes paid to avoid taxes (standardized)	Global Corruption Barometer (GCB) surveys
Educ	Gross enrolment ratio, secondary education, both genders	UNESCO
EgalDem	Expert assessment of the extent the ideal of egalitarian democracy achieved	Varieties of Democracy Project, https://www.v-dem.net/en/data/data-version-8/
FDI	Stock of inward FDI	WDI
GDPpc	Real GDP per capita (log)	GLE
Gini	Gini of distribution of net income	SWIID (Solt 2016)
Gini (WIID)	Gini of distribution of disposable income	UNU-WIDER WIID
Latitude	Absolute distance from the equator	Dataset used by Quamral Ashraf & Oded Galor "The "Out of Africa" Hypothesis, Human Genetic Diversity, and Comparative Economic Development", Online appendix, *American Economic Review* 103(1) 2013:1-46
OECD	Indicator variable of being a member of the Organisation of Economic Cooperation and Development	OECD
PoorRegQual	Indicator variable that equals 1 if RegQual score is higher than the score at the 75th percentile	World-wide Governance Indicators
RegQual	Quality of regulations and policies promoting and protecting a market economy (reversed and standardised). Continuous variable.	World-wide Governance Indicators
Trade	Sum of imports and exports as % of GDP	WDI

Appendix C

Table C1. List of countries per *PoorRegQual*, with mean levels of Bribery and the *Atkinson* measure of consumption inequality (2004–2015)

State	PoorRegQual	Bribery	Atkinson measure of income inequality
Afghanistan	1	2.262	0.225
Algeria	1	0.761	0.319
Argentina	1	−0.640	0.446
Armenia	0	−0.015	0.257
Australia	0	−0.823	0.248
Austria	0	−0.688	0.273
Azerbaijan	0	0.661	0.102
Bangladesh	1	0.718	0.245
Belarus	1	−0.561	0.206
Belgium	0	−0.725	0.263
Bolivia	1	−0.132	0.484
Bosnia and Herzegovina	0	−0.741	0.283
Brazil	0	−0.756	0.467
Bulgaria	0	−0.768	0.287
Burundi	1	3.335	0.257
Cambodia	0	1.788	0.288
Cameroon	1	1.079	0.405
Canada	0	−0.850	0.304
Chile	0	−0.639	0.456
China	0	−0.357	0.515
Colombia	0	−0.374	0.491
Congo, Democratic Republic	1	2.837	0.417
Croatia	0	−0.771	0.263
Cyprus	0	−0.422	0.281
Czech Republic	0	−0.498	0.254
Denmark	0	−0.874	0.262
Egypt	1	0.976	0.461
El Salvador	0	−0.491	0.439
Estonia	0	−0.828	0.311
Ethiopia	1	1.855	0.272
Fiji	1	−0.638	0.392
Finland	0	−0.865	0.256
France	0	−0.827	0.299
Georgia	0	−0.860	0.406
Germany	0	−0.874	0.277
Ghana	0	0.682	0.363
Greece	0	−0.638	0.308
Hungary	0	−0.770	0.253
Iceland	0	−0.856	0.261
India	0	1.251	0.302
Indonesia	0	0.089	0.326
Ireland	0	−0.789	0.287
Israel	0	−0.787	0.328
Italy	0	−0.498	0.308
Jamaica	0	−0.548	0.446
Japan	0	−0.649	0.226
Jordan	0	2.202	0.271
Kazakhstan	0	−0.241	0.190
Kenya	0	0.591	0.492
Korea, South	0	−0.860	0.280
Kyrgyzstan	0	0.535	0.201

Table C1. Continued.

State	PoorRegQual	Bribery	Atkinson measure of income inequality
Latvia	0	−0.666	0.305
Liberia	1	2.850	0.345
Lithuania	0	−0.616	0.309
Luxembourg	0	−0.520	0.285
Macedonia	0	−0.358	0.412
Madagascar	1	0.639	0.372
Malawi	1	1.488	0.438
Malaysia	0	−0.789	0.293
Maldives	0	−0.687	0.330
Mexico	0	0.030	0.466
Moldova	0	−0.176	0.269
Mongolia	0	0.124	0.289
Morocco	0	1.273	0.372
Mozambique	0	0.828	0.455
Nepal	1	0.471	0.262
Netherlands	0	−0.785	0.269
Nigeria	1	1.024	0.445
Norway	0	−0.861	0.260
Pakistan	1	1.692	0.219
Papua New Guinea	1	0.218	0.467
Paraguay	0	0.413	0.464
Peru	0	−0.479	0.436
Philippines	0	−0.165	0.418
Poland	0	−0.724	0.290
Portugal	0	−0.786	0.300
Romania	0	−0.619	0.254
Russia	0	−0.410	0.402
Rwanda	0	−0.148	0.495
Senegal	0	1.220	0.378
Sierra Leone	1	1.336	0.321
Slovakia	0	−0.308	0.262
Slovenia	0	−0.776	0.248
South Africa	0	−0.205	0.724
Spain	0	−0.806	0.295
Sri Lanka	0	0.580	0.328
Sudan	1	−0.200	0.323
Switzerland	0	−0.855	0.282
Taiwan	0	−0.631	0.145
Tanzania	0	1.164	0.327
Thailand	0	−0.604	0.368
Tunisia	0	2.586	0.330
Turkey	0	−0.155	0.396
Uganda	0	1.312	0.412
Ukraine	1	0.127	0.191
United Kingdom	0	−0.713	0.299
Uruguay	0	−0.869	0.426
Venezuela	1	0.033	0.439
Vietnam	1	−0.217	0.368
Zambia	0	0.219	0.559