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Sorting through global corruption determinants: Institutions and education matter – Not culture

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ABSTRACT

Identifying the robust determinants of corruption among cultural, economic, institutional, and geographical factors has proven difficult. From a policy perspective, it is important to know whether inherent, largely unchangeable attributes are responsible or if institutional and economic attributes are at work. Accounting for model uncertainty, we use Bayesian Model Averaging (*BMA*) to analyze a comprehensive list of 36 potential corruption determinants across 123 countries (covering 87 percent of the world population). The *BMA* methodology sorts through all 68,719,476,736 possible model combinations (2^{36}) in order to carve out the robust correlates. We then take a step toward alleviating endogeneity concerns in an Instrumental Variable *BMA* framework. Our results indicate that cultural factors are largely irrelevant, whereas particular economic and institutional characteristics matter. The rule of law emerges as the most persistent predictor with a posterior inclusion probability (PIP) in the true model of 1.00, whereas we find strong evidence for government effectiveness (PIP of 0.88), urbanization (0.85), and the share of women in parliament (0.80) as meaningful determinants of lower corruption levels. In developing countries, the extent of primary schooling enters as a powerful factor with a PIP of 1.00.

1. Introduction

Scandinavian countries, Canada, and Singapore are some of the least corrupt societies on earth, whereas Paraguay, Papua New Guinea, and Venezuela suffer from rampant corruption. But why exactly is that? Corruption is estimated to cost us at least five percent of global GDP, equivalent to US$2.6 trillion per year (World Economic Forum, OECD, 2013). However, it remains difficult to pin down the exact conditions under which corruption emerges in some countries but not in others. Are inherent cultural, historical, or even geographical factors deeming some countries to be more corrupt than others or do political institutions and economic parameters matter?

This uncertainty is reflected in broad (rather than specific) anti-corruption mission statements of countries and organizations, usually calling for transparency, public condemnation of, and stricter laws against corruption.[1] Recent experimental studies have broadly suggested cultural origin, as well as economic and institutional characteristics to matter (e.g., Fisman & Miguel, 2007; Barr & Serra, 2010; Brosig-Koch, Helbach, Ockenfels, & Weimann, 2011). However, from a policymaker's perspective it is important to understand whether corruption is influenced by factors that can be changed within a society, or whether deeply rooted and largely unchangeable characteristics are at work. The following pages propose to take a decisive step to enrich our understanding in that regard. In particular, we aim to provide a comprehensive analysis to check *which* cultural, economic, or institutional characteristics are driving corruption or the absence thereof.

Unfortunately, the empirical literature has found it difficult to establish a shortlist of robust corruption determinants, mainly because of three fundamental empirical problems. First, country-level data on corruption has only become available for a large number of countries since the late 1990s. To make matters worse,

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[1] For instance, consider the mission statement by Transparency International that urges people and governments to promote transparency:http://www.transparency.org/whoweare/organisation/mission_vision_and_values.

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annual data points can suffer from measurement error as nobody willingly reports corrupt acts.[2] Second, no comprehensive theoretical framework exists that is capable of uniting cultural, economic, and institutional factors in explaining corruption. Consequently, the empirical literature has produced an openene third and final major empirical obstacle impeding our understanding of corruption: reverse causality. Not only are richer countries usually less corrupt, but corruption may in turn decrease income levels (e.g., see Mauro, 1995). In summary, limited data availability, a long list of potential determinants, and endogeneity concerns plague our understanding of why some countries are more corrupt than others.

This paper proposes a systematic step toward solving these problems. First, to address model uncertainty, we use a Bayesian Model Averaging (*BMA*) approach and analyze a comprehensive set of 36 potential corruption determinants including 2^{36} (68,719,476,736) possible models. Previously, the use of *BMA* has allowed economists to make substantial contributions to explaining country-level differences in economic growth (Fernandez, Ley, & Steel, 2001; Doppelhofer et al., 2004; Masanjala & Papageorgiou, 2008; Durlauf, Kourtellos, & Tan, 2012; Moral-Benito, 2012). Much like the corruption literature, the search for robust explanations of income levels has been plagued by an openendedness of potential determinants (Brock & Durlauf, 2001; Durlauf, Johnson, & Temple, 2005). Further, averaging variables over ten years alleviates concerns about measurement error. Our sample includes 123 countries, covering 87 percent of the world population and thereby producing a globally representative sample.

Second, we take a step toward alleviating reverse causality concerns related to potentially endogenous regressors by employing a recently developed Instrumental Variable *BMA* technique (Karl & Lenkoski, 2012; Koop, Leon-Gonzalez, & Strachan, 2012). Naturally, since the idea of a *BMA* analysis is precisely to consider *all* potential corruption determinants, finding suitable instruments represents a particularly challenging task. For example, colonial status or geographical aspects have formed attractive instruments in other areas of research, but these characteristics have themselves been proposed as corruption determinants, thereby violating the exclusion restriction in the corruption setting.

Following recent developments in closely related branches of research, we employ lagged values of the endogenous variables. Here as well, the growth literature has pioneered the consequent acknowledgement of endogeneity concerns (Horváth, 2013; Eicher & Kuenzel, 2014; Eicher, 2016) and the use of lagged values as instruments (Temple, 1999; Schularick & Steger, 2010; Mirestean & Tsangarides, 2016). Indeed, recently, the cross-country literature on corruption has also begun to use lagged values of endogenous variables as instruments. For instance, Bhattacharyya and Hodler (2010) instrument democracy with its lagged value to estimate its effect on corruption and Arezki and Brückner (2011) employ lagged corruption values as an instrument for corruption today to isolate effects on oil production.

Both the *BMA* and *IVBMA* results emphasize the role of institutional characteristics in driving corruption, whereas cultural attributes remain virtually (statistically) meaningless. First, the rule of law emerges as a dominant factor with a posterior inclusion probability (PIP) of 1.00 in both frameworks.[3] Closely related to law and order, the *BMA* analysis suggests property rights (PIP of 90 percent) and the absence of political rights (PIP of 85 percent) matter. Once endogeneity is taken into account via our IVBMA approach, government effectiveness gains importance (PIP of 0.88), whereas property rights and the absence of political rights become less relevant (PIPs of 0.01 and 0.68).

Second, the participation of women in politics and the urbanization rate both show relevance in the *BMA* results with PIPs of 97 and 92 percent, but their importance diminishes in the *IVBMA* framework (PIPs of 80 and 85 percent, respectively). The extent of primary schooling (PIP of 75 percent) also emerges as an important factor in our *IVBMA* study – a somewhat surprising result, as few papers have focused on education as a driving force behind the fight against corruption (Glaeser & Saks, 2006, is a notable exception). As noted by Glaeser and Saks (2006), p.1056, basic education can facilitate learning about politics and understanding the implications of corruption. This finding, in particular, can offer useful avenues for policymakers.

Third, neither the *BMA* nor the *IVBMA* analysis provide evidence of income levels diminishing corruption (PIP of 4 and 38 percent, respectively). While this result is at odds with some of the extant empirical literature, the fact that we are the first study to systematically account for model uncertainty is suggestive of a deeper focus on the likely determinants of corruption. For example, in Table 1, of the papers that do provide evidence of the impact of income levels on corruption, nearly all of them employ OLS using a variety of control variables, thereby ignoring endogeneity and model uncertainty. Thus, GDP per capita may be proxying for other, omitted variables in such studies, and once these are captured, income levels on their own carry little effect on corruption. Nevertheless, our result of GDP per capita being largely irrelevant when predicting corruption is consistent with some previous papers.[4]

Fourth and final, we then analyze a subsample of developing countries (broadly defined as non-OECD members), since corruption remains particularly troubling in poorer nations. The corresponding results again highlight the importance of the rule of law (PIP of 1.00), but also produce firm evidence for the extent of primary education (PIP of 1.00) as an important ingredient in fighting corruption. In addition, urbanization rates and government effectiveness are highly predictive of corruption in developing nations with PIPs of 95 and 78 percent.

What is consistent throughout our analyses is the finding that inherent and unchangeable country-specific factors are notably irrelevant in their relationship to corruption. It is remarkable that this result emerges with such continuity in a pure cross-country approach, taking into account how different each country remains in its history, culture, and geography. What seems to drive corruption are particular institutional aspects (e.g., the rule of law and government effectiveness) and comprehensive basic education levels.

The remainder of the paper is structured as follows. Section 2 provides an overview of the existing literature and the variables included in our analysis. Section 3 highlights problems plaguing our understanding of corruption determinants. Section 4 is dedicated to the methodological foundations of our study, whereas Section 5 describes our findings. Finally, Section 6 concludes.

2. Corruption and its potential determinants

The evaluation of corruption determinants has mostly been approached from an empirical perspective, with few exceptions

[2] Further problems leading to measurement error could be associated with different data collection techniques across countries and over time, as well as less precise measurements in countries where data collection is particularly difficult or imprecise because of fewer resources.

[3] Following Kass and Raftery (1995) and Eicher, Henn, and Papageorgiou (2012), PIPs are usually categorized as: $PIP > 0.99$ indicates decisive evidence, $0.95 < PIP < 0.99$ strong evidence, $0.75 < PIP < 0.95$ positive evidence, and $0.50 < PIP < 0.75$ suggests weak evidence.

[4] For example, Glaeser and Saks (2006) find little to no statistical relationship between state-level GDP in the US on respective corruption levels. Fisman and Miguel (2007) find that country-level income is not able to predict parking ticket violations of UN diplomats. Among cross-country level studies, Brunetti and Weder (2003) and Dreher, Kotsogiannis, and McCorriston (2009) find little support for income levels as a strong predictor of corruption.