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A Contribution to the Empirics of Press Freedom and Corruption

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Abstract

We test the relationship between aggregate press freedom and corruption performing a modified extreme bounds analysis for a 10-year panel. We also test the relation among different forms of restrictions to press freedom and corruption using the previously unexplored disaggregated data. Our results support the theoretical view that restrictions in press freedom lead to higher corruption levels. Furthermore, we obtain that both political and economic influences on the media are strongly and robustly related to corruption, while detrimental laws and regulations influencing the media are not strongly associated to higher corruption. In all cases, there is indicative, albeit not conclusive, evidence that the direction of causation runs from a freer press to lower corruption.

Outline

Non-Technical Summary

A commonly held belief is that a free and independent press can, along with other agencies, form an important part of the detection process and therefore act as deterrent. This view has found support in a few recent papers that consider the relationship between aggregate press freedom and corruption. While most accept that the press plays a role in detecting corruption, there is reason to suggest that its effectiveness may be overstated however. For example, press freedom carries both benefits and costs and the common belief that the net effect is positive does not survive deeper analysis. Or, the media may orchestrate and release false campaigns and accusations against the government if these stories are likely to capture public attention and increase sales. Or as importantly, journalists and the press may themselves be corrupted and choose not to report their evidence.

Alternatively it is also likely that the effect of press freedom on corruption simply picks up wealth effects and the institutional environment more generally. Rich countries can afford a free press and are likely to be liberal across a wide range of activities, not just media activities. Finally, there are also significant differences in the way in which the media are controlled across countries and which may lead to very different outcomes for corruption. Restrictive legislation, threats, verbal abuse, financial extortion, censorship, media concentration, intimidation, high entry costs and access restrictions to the media market are some of the most common restrictions to press freedom. Yet there is nothing to suggest that the effect of these restrictions is homogenous, or that the effect of any one restriction would be equal in all situations. In a similar vein, whilst it is generally true that these measures of economic, political and legal control over the media are reasonably highly correlated there are exceptions to this. For example, a very restrictive regulatory environment exists alongside relatively mild economic and political control of the media in Indonesia and Malaysia, while the opposite is true in Colombia, Russia, and the Ukraine. Or in Italy the economic and political control over the media is high compared to other developed countries, but compared to this the legal and regulatory environment is less restrictive.

In this paper we take seriously the issues raised above to provide a rigorous examination of the correlation between press freedom and corruption. Our approach has several parts. *First*, we consider the robustness of the effect of press freedom to the use of extreme bounds analysis (EBA). As highlighted above, press freedom might be highly correlated with other aspects of the institutional environment and development. The use of error bounds analysis allows us to consider whether press freedom has a robust independent effect on corruption or not. *Second*, we use new data on the relation between different forms of restrictions to press freedom. This disaggregated measure considers economic, political and legal restrictions on the media separately. *Third*, in order to avoid some well-known criticisms of standard EBA, we carefully screen the regression models that may help to explain why a variable is not robust. *Fourth*, we attempt to control for problems of endogeneity. *Finally*, we consider different data on corruption to see whether the results are robust to using data from different sources. This set of strong tests for the robustness of the effect of press freedom on corruption differs significantly from that found in the current literature and adds detail, as well as information on robustness and causation to that literature.

Our results support the theoretical view that restrictions in press freedom lead to higher corruption levels. Furthermore, we obtain that both political and economic influences on the media are strongly and robustly related to corruption, while detrimental laws and regulations influencing the media are not strongly associated to higher corruption. In all cases, there is indicative, albeit not conclusive, evidence that the direction of causation runs from a freer press to lower corruption.

"Were it left to me to decide whether we should have a government without newspapers, or newspapers without a government, I should not hesitate a moment to prefer the latter."

Thomas Jefferson

1. Introduction

The decision to participate in corruption, like any crime, depends upon a combination of the size of the payoff received, the probability of detection and the size of any punishment upon being caught. A commonly held belief is that a free and independent press can, along with other agencies, form an important part of the detection process and therefore act as deterrent. This view has found support in a few recent papers that consider the relationship between aggregate press freedom and corruption: Ahrend (2002), Stapenhurst (2000) and the Global Corruption Report (2003) all discuss the essential role of the (free) press in monitoring, reporting and denouncing official abuses for example. While using regression analysis Ahrend (2002), Brunetti and Weder (2003) and Chowdhury (2004) find that low levels of freedom of the press are associated with high levels of corruption, even when controlling for other important determinants of corruption.

While most accept that the press plays a role in detecting corruption, there is reason to suggest that its effectiveness may be overstated however. Graber (1986) for example, notes that press freedom carries both benefits and costs and the common belief that the net effect is positive does not survive deeper analysis. As she writes "close examination of several recent instances of press sleuthing with widely heralded payoffs indicates that the media often deserve less credit than previously believed for detecting public wrongdoing and fostering correction" (Graber, 1986).[1] Similar concerns can be found in Pharr and Putnam (2000) regarding the ephemeral nature of public reaction to reports of corruption. Or, using a game theoretic approach to allow for collusion between the press and government Vaydia (2001) finds that the potential beneficial effects of press freedom on corruption are reduced. This may be because the media may orchestrate and release false campaigns and accusations against the government if these stories are likely to capture public attention and increase sales. Or as importantly, journalists and the press may themselves be corrupted and choose not to report their evidence.[2]

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[1] Watergate is cited as an example of the passive role of the press in this study.

[2] The Global Corruption Report (2003) offers an accurate description of this problem: Corruption also exists within the structure of media organizations and in the way journalist carry out their reporting tasks. Many engage in a host of corrupt practices, ranging from 'chequebook journalism' to news tailored to suit advertising or commercial needs. (Global Corruption Report, 2003)

Alternatively it is also likely that the effect of press freedom on corruption simply picks up wealth effects and the institutional environment more generally. Rich countries can afford a free press and are likely to be liberal across a wide range of activities not just media activities. Similarly, the detection of corrupt activities is likely to be a function of monitoring spending by the government, quality of governance, greater competition, the salaries paid to bureaucrats, the quality of the legal system, and democracy, all of which are directly or indirectly related to the level of development.

Finally, there are also significant differences in the way in which the media are controlled across countries and which may lead to very different outcomes for corruption. Restrictive legislation, threats, physical harassment, verbal abuse, financial extortion, censorship, media concentration, intimidation, violent assaults, high entry costs and access restrictions to the media market are some of the most common restrictions to press freedom. Yet there is nothing to suggest that the effect of these restrictions is homogenous, or that the effect of any one restriction would be equal in all situations.[3] In a similar vein, whilst it is generally true that these measures of economic, political and legal control over the media are reasonably highly correlated across countries there are exceptions to this. For example, a very restrictive regulatory environment exists alongside relatively mild economic and political control of the media in Indonesia and Malaysia, while the opposite is true in Colombia, Russia, and the Ukraine.[4] Or in Italy the economic and political control over the media is high compared to other developed countries, but compared to this the legal and regulatory environment is less restrictive.

In this paper we take seriously the issues raised above to provide a rigorous examination of the correlation between press freedom and corruption. Our approach has several parts. *First*, we consider the robustness of the effect of press freedom on corruption to changes in the conditioning set of variables using a modified form of extreme bounds analysis (EBA) (see Leamer, 1983, 1985; Levine and Renelt, 1992). As highlighted above, press freedom might be highly correlated with other aspects of the institutional environment and development. The use of error bounds analysis allows us to consider whether the effect of press freedom has a robust independent effect on corruption or not. *Second*, in addition to testing for the relationship between the aggregate indicator of press freedom and corruption used in previous studies we use new data on the relation between different forms of

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[3] See some notable examples can be found in "Diario La Nacion", Online Edition (Archive, 26th January of 1997 at www.lanacion.com.ar/archivo/Nota.asp?nota_id=62655).

restrictions to press freedom. This disaggregated measure considers economic, political and legal restrictions on the media separately. *Third*, in order to avoid some well-known criticisms of standard EBA being too restrictive for a potentially important variable to pass as robust (Sala-i-Martin, 1997; Temple, 2000), we carefully screen the regression models for potential problems of similarity, collinearity and fit that may help to explain why a variable is not robust. *Fourth*, out of concern with potential problems of endogeneity we use a GMM approach in combination with EBA. *Finally*, we consider different data on corruption to see whether the results are robust to using data from different sources. This set of strong tests for the robustness of the effect of press freedom on corruption differs significantly from that found in the current literature and adds detail, as well as information on robustness and causation to that literature.

Our results support the theoretical view that restrictions in press freedom lead to higher corruption levels. Furthermore, we obtain that both political and economic influences on the media are strongly and robustly related to corruption, while detrimental laws and regulations influencing the media are not strongly associated to higher corruption. In all cases, there is indicative, albeit not conclusive, evidence that the direction of causation runs from a freer press to lower corruption.

The paper is structured as follows. The next section reviews the existing literature. In section 3, we describe the data, econometric methodology and the proposed robustness checks. Section 4 shows the main set of results using the panel data evidence, while Section 5 explores the endogeneity problem. Section 6 deals with the use of alternative measures and the sensitivity of the results to changes in data sources and econometric method. Section 7 concludes.

2. Literature Review

Interest from academic economists in investigating the causes of corruption has followed largely from the influential work of Mauro (1995). There, Mauro presents evidence regarding the negative effects of corruption on economic performance. While numerous cross-country comparative empirical studies have followed from this, there would appear to be no consensus on the effect of any variable on corruption outside of economic development. To give an example: the variables that have received most attention as determinants of corruption in the literature are British colonial heritage, uninterrupted

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[4] Source: Freedom House, *Freedom of the Press* (2004) and other years.

democracy, protestant religion, electoral rule, and fiscal decentralization (see for example, Ades and di Tella, 1999; La Porta et al., 1997, 1999; Treisman, 2000; Persson et al., 2003; Adserá, Boix and Payne, 2003; Serra, 2004). Yet, these studies have sometimes drawn completely opposite conclusions on the same explanatory variables, due possibly to different corruption indicators, different samples of countries, and perhaps most importantly the use of a diverse set of conditioning variables within their empirical specifications. Despite this sensitivity of the results there remains within the literature little systematic research on the robustness analysis of the determinants of corruption. Two recent exceptions are the global sensitivity analyses by Serra (2004) and Seldadyo and de Hann (2005). The former has used "Extreme Bounds Analysis (EBA) as modified by Levine and Renelt (1992), while the latter has used EBA analysis of both Levine and Renelt (1992) and Sala-i-Martin (1997). These studies are revealing about the robustness of previous cross-country empirical evidence, although is limited to one data point per country. Our study focuses on a variable used in those papers, press freedom, extends the data to time series – cross section data and suggests some modifications to EBA.

The study of press freedom as a determinant of corruption has, compared to the prominent variables mentioned so far, been largely absent in the literature.[5] Attempts to introduce the topic have come from three papers whose main focus has been placed exclusively on press freedom, rather seeing this as one determinant of corruption amongst many others. The first, Brunetti and Weder (2003) test the hypothesis that a free press should *a priori* be associated to lower corruption. Using alternative measures for both press freedom and corruption and performing several robustness checks, they conclude that the empirical evidence suggests a strong negative relation. They conclude that in countries where the media is reasonably free from *any* kind of restriction on their activities corruption levels are likely to be low. Ahrend (2002) in contrast, examines the relationship between the variables from a wider perspective. His objective is to study the relationship between human capital, press freedom and corruption. He notes that a high degree of press freedom acts as a channel through which education decreases corruption. Additionally, the author finds evidence suggesting that high corruption levels are associated with low levels of press

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[5] Adsera, Boix and Payne (2003) used a proxy for the diffusion of newspapers and found a significant and large coefficient. This proxy, however, does not appropriately reflect the freedom that journalists and reporters enjoy. As noted by Besley, Burgess and Prat (2001), media diffusion measures overlook the fact that economic and political pressures influence the content that is released.

freedom. The causal direction, according to his work, runs from a freer press to lower corruption.

Finally, Chowhdury (2004) presents a concise treatment of the topic. The objective is akin to Brunetti and Weder (2003) but also incorporates the effects of democracy on corruption. In his view, the media's role as an informative device and the standing of democracy as a punishing mechanism should both help towards limiting corruption. The empirical findings of the paper support this conclusion. Both press freedom and democracy are powerful and significant controls on corruption and this result is robust to different settings. Finally, he remains cautious regarding the direction of causality.

While all these studies reach the same conclusion that press freedom is bad for corruption, all use an aggregate measure of press freedom and do relatively little to tests for sensitivity to changes in the set of conditioning variables. In this paper, in addition to testing for the robust relationship between the aggregate press freedom and corruption, we use previously unexplored data on different forms of restrictions on press freedom and to test the robustness of their individual relationships with corruption.

Further, from a broader perspective, our paper may be seen as an extension of the literature on Extreme Bounds Analysis (EBA) that has been originally proposed by Leamer (1983, 1985) and made popular by Levine and Renelt (1992) in the context of cross-country growth regressions. In order to avoid some well-known criticisms of standard EBA being too restrictive for a potentially important variable to pass as robust (Sala-i-Martin, 1997; Temple, 2000), we carefully screen the regression models for potential problems of similarity, collinearity and fit that may help to explain why a variable is not robust. We describe these modifications further below.

3. Data and Methodology

This section describes the data on corruption and press freedom along with the other control variables used in the empirical analysis, and explains the econometric methodology used.

3.1. Corruption and Press freedom indicators

We measure corruption by Transparency International's Corruption Perception Index (CPI).[6] The CPI is available annually from 1995 for a varying sample of countries.

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[6] See Lambsdorff (2002) for an in-depth treatment of the data, methodology and procedures used in the construction of the CPI.

Countries are ranked in a 0 – 10 scale where low scores represent high and pervasive (perceived) corruption and high scores indicate low levels of corruption.

We use the Press Freedom Index as the main indicator of the degree of press freedom, which is compiled by Freedom House.[7] This index is available from 1994 to 2004, although Freedom House has been assessing the degree of press freedom across countries since 1980.[8] The index ranks countries according to their degree of press freedom in a scale ranging from 0 (total freedom) to 100 (lack of freedom). To provide some assessment of various values of the index within this range Freedom House describe countries scoring from 0 to 30 as of having *'free'* media, while countries with scores from 31 to 60 and from 61 to 100 are regarded as *'partly free'* and *'not free'* respectively.

In order to assemble the aggregate measure, Freedom House evaluates and rates three aspects of press freedom violations.[9] These are the legal, political and economic environments. The *legal environment* subdivision encompasses "both and examination of the laws and regulations that could influence media content as well as the government's inclination to use these laws and legal institutions in order to restrict the media's ability to operate" (Freedom House, 2004). In this category Freedom House assesses several issues such as legal and constitutional guarantees of press freedom, penalties for libel and defamation as well as penal codes, the independence of the judiciary and others. The *political environment* chapter, on the other hand, evaluates "the degree of political control over the content of news media" (Freedom House, 2004). Among the most relevant aspects examined here are the editorial independence of the media, intimidation and threats to journalists, the access to informational sources, and also repressive actions such as arrests, imprisonment, physical violence and assassinations. Finally, under the *economic environment* category, the characteristics examined are related to "the economic considerations that can influence the media's activities". The relevant factors to consider within this category are the existence of competitive pressures leading to biased press reports and investigations, the extent of sponsoring, subsidisation and advertisement and its effect on press coverage and content, the impact of bribery by several self-interested actors on what is published and the structure and concentration of media ownership. Both the

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[7] The index is constructed from several different sources including press organisations; official reports on the state of the media, country-based correspondents, expert opinions and local and international news services.
[8] The data for the early years are not available as a numerical index but instead in the form of categorical divisions.

'legal' and 'economic' categories vary from 0 (complete freedom) to 30 (lack of freedom) while the 'political' sub-index ranges from 0 to 40. A country's overall press freedom score is simply the sum of the scores in each of the sub-categories. [10]

Table 1 about here

Although each of the sub-indexes measure different aspects of press freedom it is likely that they are correlated with each other. Table 1 shows the correlation matrix for the aggregate index and the sub-indexes along with their standard summary statistics. All the correlations are significant at the 5% level and it can be observed that each of the sub-indexes correlates very highly with the aggregate index. Furthermore, the different sub-indexes are also highly correlated among themselves, suggesting that in general different forms of restrictions to press freedom move together and in the same direction. The correlation between the political influences and economic influences is the highest at 0.769 and that between the laws and regulations and the economic influences the lowest at 0.637. This might be because the most common restrictive laws and regulations are libel, defamation and slander laws which are in general less related to economic-type pressures than to political influences on the media such as civil and criminal charges, prosecution and threats.

As suggested by this correlation there exist in the data a number of examples where countries score highly on one part of the press freedom index but not on the other. For example, in Russia there are strong political influences over the media but milder economic and legal pressures. Or in Jordan and Turkey the economic environment is less restrictive over the media (economic influences are minor in Turkey and average in Jordan) yet the legal environment is highly restrictive. Finally, in Italy the economic and political influences over the media are high compared to other developed countries, but the legal and regulatory environment is similar. Other examples exist and can be found in Tables A.1 to A.3 in Appendix where we cross-tabulate the different sub-indices.

Figure 1 provides a scatter plot of press freedom and the corruption index for the 51 countries for which the corruption index is available, while summary statistics and basic

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[9] From 1994 to 2001 the press index is compiled evaluating and rating over 4 separate aspects. From 2002, Freedom House only uses three categories (two of the former has been grouped into one), which we will be analyzing over the present article.

[10] Freedom House introduced some alterations to the weights for the different categories and to the value range of the index from 1997. In order to work with homogeneous series for the separate categories, we rescaled the original index for 1995 and 1996. These changes introduced no alterations in the orderings of the rankings but did change the scores for that year. To check for robustness we performed EBA on a reduced panel using only the original (unchanged) data and the results obtained are the same. These are available upon request.

correlations can be found in Table 1. The high correlation between the aggregate index of press freedom and its sub-components means that this graph is similar to that for the sub indices, although the corresponding correlations are lower than that for the overall index.

As is made clear from the Figure the correlation between the variables is strong and negative. Developed countries have both high levels of press freedom and good governance while developing countries are mostly situated on the bottom right corner of the graph with high corruption and low press freedom. There are some exceptions to this general rule. The data reveal that there are countries such as Hungary and Italy with a favourable legal and regulatory framework yet with substantial corruption levels, whereas other countries like India, Mexico, Philippines, Russia and some Latin American democracies have a high incidence of corruption despite having a mostly press-friendly legal environment. At the other end countries such as Jordan and Malaysia with a very restrictive legal and regulatory environment do not appear to be affected by widespread corruption. Overall, the correlation between these variables is correspondingly high at –0.79, although this falls when we control for the effect of GDP per capita. The correlation is then becomes –0.35. This is significant at the 1% level.

Figure 1

3.2. Control variables

In addition to our main variables described above we use a wide set of variables to serve as control variables in the regressions. Following previous empirical work we consider economic, political, cultural, institutional and historical factors among those likely to affect corruption. Due to our specific econometric technique we arrange these variables into two groups. The first is a subset of three control variables to be included in all the specifications, formed by those variables found consistently related to corruption by previous empirical studies (Treisman, 2000; Serra, 2004). In our study, these are a measure for *economic development*, an *index of political rights*, and a dummy for the *persistence of democracy*. In the second group are all of the other variables. A full description of the data and the description of the variables are given in the Appendix B.

3.3. Econometric methodology

Careful model building requires that the empirical relationships on which any theoretical model is based are robust. In this paper we adopt Leamer's (1978; 1985) *extreme bound analysis* (EBA) as modified by Levine and Renelt (1992) to provide a strict test of the

robustness of the relationship between press freedom and corruption. The basic idea of this approach is to understand whether the relationship between the variable of interest and the left hand side variable is specific to certain specifications of the regression equation or holds more generally.

The general specification of the EBA is given below:

(1) $y = \beta_1 I + \beta_m M + \beta_z Z + u$

Where y is the dependent variable (corruption), I is a set of (fixed) variables included in all the specifications, M is the variable of interest (press freedom) and Z is the subset of (changing) variables taken from a pool of additional covariates. I-variables and the M–variable remain unchanged throughout the entire analysis. The EBA procedure involves changing the variables included in Z in each regression (in combinations of three) until every possible combination of the pool of candidate Z variables is used. Once all the possible regressions have been performed we will have as many β's as specifications tested. The variable M will be considered to be robust if the extreme upper bound and the extreme lower bound estimates are statistically significant at the conventional level and does not pass through zero. The extreme bounds are defined as the estimated coefficients corresponding to the highest (lowest) value of β plus (minus) twice its standard error[11]. The variable is considered fragile otherwise.

Despite its potential benefits in terms of model selection, the EBA has been strongly criticised for being very difficult for any variable to pass as robust (Sala-i-Martin, 1997). [12] These criticisms relate to absence of diagnostic tests when reporting the outcome, a problem of collinearity, omitted variable bias and that simply labelling a variable as *robust* or *fragile* overlooks other useful characteristics of the data. Following these criticisms we make several modifications to the general EBA approach, to the manner by which the results are reported and their discussion.

Firstly, we might be concerned that the results are driven by an omitted variable bias. To control for this we use a large number of potential covariates in the Z-matrix (we use twenty-two additional variables). Secondly, we might conclude that a variable is non-robust because it has been included with a variable that captures similar variation in the data. As

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[11] It is important to note that performing an EBA involves examining how the coefficient on the variable of interest responds to changes in the specification and in this sense the analysis is useful to determine whether the coefficient of the variable of interest remains relatively stable throughout alterations in the information set.

such robustness in traditional EBA analysis is likely to be conditional on their being no collinear counterpart in the dataset. To know whether this is a problem in our dataset we use only a subset of the potential pool of *Z*-variables in any one regression (a set of three rotating *Z*-variables), identify those Z variables that are likely to measure similar aspects of corruption to press freedom and identify specifications with high variance inflation factors (VIF). To provide further insight we also consider carefully the regressions where insignificant coefficients on the variable of interest are found to search for potential patterns. Finally, as in Seldadyo and de Hann (2005), in order to identify variables that are highly correlated with press freedom as an initial step we analyse the pairwise correlations among all the variables. Amongst these we identified one variable that was highly correlated with press freedom, an index of democracy, where the correlation was 0.82. Given the high correlation of this variable with press freedom but also with the other measure of political rights used in the list of I-variables (labelled *pri*), the correlation here is 0.92, the decision was made to omit this variable. The correlation of this latter political rights indicator with press freedom was 0.65. To provide a cautious interpretation of the findings of the paper we recognise that our measure of press freedom may capture aspects of the political environment more generally and we condition the conclusions on this possibility.

A third criticism of traditional EBA analysis is that robustness is measured against both well-specified and poorly specified models so that the bounds may come from flawed models. We make two adjustments. Firstly, in order to concentrate only on well-specified models we adapt the suggestion of Granger and Uhlig (1990) and reject all the specifications with adjusted R^2 lower than that of the base specification[13]. The base specification consists of only four variables, the three I-variables (always included) and the variable of interest (M), press freedom. Secondly, we consider the robustness of our results to problems of endogeneity, which we discuss further below.

The regression equation actually estimated is therefore of the following form:

(3) $\quad y_{it} = \beta_1 * press_{it} + \beta_2 * gdp_{it} + \beta_3 * d50_{it} + \beta_4 * pri_{it} + \beta_5 * Z_{1it} + \beta_6 * Z_{2it} + \beta_7 * Z_{3it} + u_{it}$

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[12] See Temple (2000) for a summary of the critics and objections to the EBA.

[13] As noted by Granger and Uhlig (1990), the adjusted R^2 may not be an ideal measure of the quality of the model, but can still serve as a useful statistic to provide some insights about the specified model.

where y_t is the corruption indicator given by the Corruption Perception Index; *press* is the variable of interest, measured by the Press Freedom Survey; *gdp* is the logarithm of GDP per capita; *d50* is a dummy measuring the existence of uninterrupted democracy over the last 50 years; *pri* is an index measuring the extent of political rights in a society; and Z_1, Z_2 and Z_3 are the three additional covariates included until all combinations are exhausted.

The log of GDP per capita, the measure of uninterrupted democracy and the measure of political rights are included as the I variable (the non-rotating control variables). These have previously been found to be robustly correlated with press freedom by Treisman (2000) and Serra (2004) the latter using Error Bounds Analysis. We run the regressions by pooled OLS using robust standard errors. [14]

4. Analysis of results

We perform EBA on unbalanced panel of 51 countries over the period 1995 to 2004. The EBA results without controlling for endogeneity are given in Table 2. Column (1) shows the EBA results for the aggregate press freedom index, while columns (2), (3) and (4) contain the results for each of the subcategories. The table reports the estimated values of the upper and lower bounds for press freedom as well as the base; the z-variables included in the regressions generating these bounds, the adjusted R^2; the number of observations and the total regressions estimated and identified based on the pre-determined selection criterion.

It is worth noting to begin with that the base regression (including the three I-variables and the press freedom variable) fit the data very well, suggesting little room for important omitted variables. The regressions explain around 70 to 80 per cent of the variation in corruption across countries.

Dealing next with the final part of the Table 2: of the 4560 (1140*4) regressions estimated in the production of Table some 273 are identified as failing to pass the pre-selection criterion outlined in Section 3. This would appear due primarily to the ability of the additional regression to fit the data compared to the base regression, although there is some evidence of collinearity problems also. Comparing across the different measures of press

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[14] Neither of the two main methods for analysing panel data was considered appropriate for our analysis. It is clear that the use of *fixed effects* is not a valid alternative since we include both time-variant and time-invariant controls in our regressions and the inclusion of the latter rules out the fixed effects method. The use of *random effects,* on the other hand, was strongly rejected on the basis of the Hausman test. We do however test the robustness of the results to the use of fixed effects below.

freedom these problems are more severe for the components of the main index than the aggregate index itself and for the law and regulation part of this index in particular. Upon investigation it would appear that the failure to pass the VIF test occurs when two of the measures of openness to international trade, specifically *tra* (the ratio of exports and imports to GDP) and *imp* (the ratio of imports to GDP) are included in the Z-matrix at the same time. That is, there is a problem of collinearity amongst the z-variables rather than being a problem with press freedom. Including these regressions in fact has no impact on the results for press freedom found in the paper.

The failure to pass the adjusted R^2 criteria occurs when a number of variables are included, but across the four sets of regressions most commonly when the measure of fiscal decentralisation is used, *exp*. For example, of the 133 regressions excluded using the laws and regulations sub-index 81 include fiscal decentralisation. To put that in context the next most common variables are majoritarian electoral systems (*Maj* appeared in *43* of the excluded regressions); exports (*Fue* appeared in *33*); socialist legal system *(Soc* appeared in *30*); German legal roots (*Ger* appeared in *29*); former French colony (*Ffc* appeared in 28); electoral district magnitude (*Mag* appeared in *28*); military expenditure (*Def* appeared in 26); and party list system (*Plist* appeared in *26*). Fiscal decentralisation plays a similarly important role for the exclusion of regressions when using the other measures of press freedom. We do not have a good explanation for this finding. Instead we considered the robustness of our conclusions to the inclusion of these regressions *i.e.* we consider the EBA without the removal of the regressions due to the adjusted R^2 criteria, the results are robust, and to a separate test for the robustness of fiscal decentralisation using EBA. We find from this that of the 969 regressions estimated the coefficient on *exp* is insignificant in 856 of them.[15] Overall we are satisfied that whatever the problems with the fiscal decentralisation variables it does not affect the conclusions we reach about press freedom.

According to the results presented in Table 2 there are no insignificant regressions for the aggregate press freedom index as well as two of its components, political and economic influences on the press. Comparisons of the upper and lower bound shows that the coefficients do not pass through zero for these three measures also. In EBA terminology, aggregate press freedom and the political and economic influences on this, are therefore robust to changes in the information set. The final component of the index, that on laws and

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[15] These results are similar if other measures of sub-national government (such as subnational revenues/GDP; subnational revenues/total government revenue) are used.

regulations, whilst the coefficient never passes through zero, is insignificant in 14 per cent of the regressions that pass the pre-selection criterion. We return to this result below.

Press freedom has therefore, the expected relationship with corruption. Higher levels of press freedom are associated with lower levels of corruption. Using the upper and lower bound on the coefficients as a guide then a one standard deviation increase in the overall level of press freedom is associated with a reduction in corruption of between 0.9 and 1.8 points. For countries like Brazil, Turkey and South Korea with high levels of corruption this would result in a reduction towards the mean corruption score in our data. To put this number in perspective the effect of a one standard deviation increase in GDP per capita (using the coefficient from the base regression) would be similar at 1.5 points. For the economic and political components of the main index the effect of a one standard deviation increase in press freedom would be associated with a decline of corruption between 0.6 to 1.7 for economic influences and 0.7 to 1.4 for political influences.

Overall the results presented in Table 2 evidence a close relationship between press freedom and bureaucratic corruption, thus confirming the findings of earlier research. Moreover, we go further and find evidence suggesting that certain forms of restrictions to press freedom are more strongly associated to higher corruption than others. Specifically, while laws and regulations that influence the media fail to qualify as robust, both political and economic pressures on the press are robust to changes in the specification throughout the whole EBA. This might help to explain why Italy, which scores poorly on these components of the index, has high corruption levels compared to other developed countries.

This raises the question of why is the laws and regulations index non-robust whereas the other components of press freedom manage to pass the EBA test. Unfortunately, examination of which Z-variables leads to insignificance of the laws and regulations index yields little that is obvious in terms of providing an explanation of this finding. The Z-variables that appear most commonly in the regressions in which laws and regulations is insignificant are a Dummy for Scandinavian legal system (appears on *73* occasions); a dummy for Protestantism (appears on *73* occasions); and a dummy for party list political system (appears on *35* occasions). The correlation between the two dummy variables Scandinavian and Protestantism is equal to one, which is why they appear exactly the same number of times in the insignificant regressions. Of the regressions in which laws and regulations is insignificant the Z-matrix includes neither of these variables on only 5 occasions. They would appear therefore, to be the primary reason why the laws and

regulations index is insignificant. What is particular to Scandinavian countries and their control of press freedom through laws and regulations is not immediately obvious, although perhaps worthy of further investigation.

Interestingly, the inclusion of these same variables in the Z-matrix produces coefficients that are smaller than the average for the other parts of the press freedom index also, and for the economic influences sub-index they are the smallest in size. Unlike the laws and regulations index, for these other parts the press freedom remains significant however, despite the reduction in the size of the coefficient. Finally, the fragility of the laws and regulations index would also not appear to be due to the use of dummy variables to measure the extent of the Protestant following in a country. If the proportion of Protestants is used instead the laws and regulations subindex is even less 'robust': it is insignificant in some 213 out of 1004 regressions (and changes sign in some of these). Again the primary reason for the loss of significance of the laws and regulations index is Proportion of Protestants (141 occasions); a dummy for Scandinavian legal system (82 occasions); a dummy for party list system (36 occasions).

5. Endogeneity

So far, our results indicate the existence of a close negative relation between press freedom and bureaucratic corruption. Can we argue that the evidence suggests that eliminating restrictions on the media and promoting a freer press is a means of reducing corruption? The answer is no: there are theoretical as well as empirical reasons to suspect that press freedom may be determined endogenously with corruption. Potential endogeneity could bias the estimates and lead to erroneous conclusions. In order to tackle the issue of endogeneity, we run the EBA with instrumental variables estimation performed using *generalised method of moments* (GMM). The justification to use this method is that in the presence of arbitrary heteroskedasticity in the sample, the use of this methodology is preferable to traditional IV estimation procedure [Baum, Schafer and Stillman (2003)]. The choice of instrumental variables through GMM was also justified and supported by diagnostic tests of heteroskedasticity, particularly the Pagan-Hall test of heteroskedasticity for IV[16].

Our choice of instrumental variable is somewhat limited since several potential candidates are already being used as Z-variables. We therefore follow Brunetti and Weder (2003) and

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[16] For an in-depth treatment of GMM estimation and diagnostic tests see Baum, Schafer and Sillman (2003).

Chowdhury (2004) we select the *ethno-linguistic fractionalisation index (ELF)* as our instrument. [17] Table 3 presents the results of EBA estimated with IV and using GMM. The table has the same structure as Table 2 although in addition we provide the coefficients resulting from running the EBA by GMM on the specifications generating the extreme bounds in the OLS case. These are denoted as Upper/Lower Bound$_{OLS}$. We also add certain diagnostic tests for both the base regression and the bounds. [18]

The explanatory power of the base regression remains around 0.80. The Pagan-Hall statistic rejects the null of homoskedasticity for both the upper and lower bound's regressions and for the base regression as well. Regarding the Hansen test for the overidentifying restrictions (also known as the J-Test), the null hypothesis (joint hypotheses of correct model specification and orthogonality conditions) cannot be rejected for the base and upper bound specifications and this supports the validity of the instrument chosen. It should be noted, however, that it is difficult to evaluate on the validity of the instruments since we have a large number of specifications, each yielding a different value of the J-test. According to the J-test, the instrument is valid in more than half of the total number of models.

The most striking feature of the results in this table is however their similarity to those estimated using OLS. Whatever may be the explanation for the robustness or lack of the correlation between press freedom and corruption it is not driven by its reverse causation. The coefficient for press freedom is statistically significant across all the specifications for the aggregate index and the political and economic influences but not for laws and regulations.

Tables 2-3 about here

6. Further Robustness Check

6.1. Alternative Measure of Corruption[19]

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[17] Although some authors have proposed and used this index as an instrument for corruption, the empirical literature on the determinants of corruption has rarely found evidence of a statistically important relation between ethno-linguistic fractionalisation and corruption.

[18] The test has been calculated for each regression of the EBA, although the statistic is only supplied for the base and extreme bounds regressions. Detailed results are available upon request.

[19] Originally, we also included an alternative indicator of press freedom, the index elaborated by Reporters Sans Frontieres (RFS). This data had limited time coverage and is not available as a disaggregated series and was therefore not pursued. Nevertheless, we estimated a regression using this series and the results for the overall press freedom index were very similar to those found here.

Having checked our results for robustness to changes in specification and methodologies, we perform the same analysis but this time using an alternative measure of corruption. For this purpose, we use the corruption index elaborated by Political Risk Services (PRS) Group and included as a chapter of the International Country Risk Guide (ICRG). The index ranks more than 140 countries from 0 (high corruption) to 6 (low corruption) and is also based on perceptions of different individuals[20].

The ICRG indicator is similar to CPI in many respects although it is not a composite index. Table 4 replicates the IV estimation with GMM using the ICRG index and the qualitative results are very similar to those obtained before. There are some quantitative differences. Firstly, the coefficient for the *laws and regulation sub-index* is not only insignificant in most of the models but also changes its sign in several specifications. Secondly, the coefficients are lower than those given in Table 3 with the CPI index (the z-statistics are lower than in the CPI case as well) and the variability of their size is smaller than with the CPI. Thirdly, the adjusted R^2 are, notably, much lower than in the CPI regressions. This might be due to the increased variability across the countries given by the increase in the sample size. Finally, the Pagan-Hall test for heteroskedasticity always rejects the null and our instrument fares better in this case in terms of exogeneity and relevance, since the null of valid instruments cannot be rejected in a larger proportion of specifications.

Tables 4-5 about here

6.2. Fixed Effects

Given the large number of time invariant control variables used as additional covariates the decision was made to perform the EBA analysis without country specific time invariant fixed effects. This has the advantage of allowing us to identify which of any economic, political and social determinants of corruption included in the Z-matrix press freedom was not robust to the inclusion of. It remains possible however, that we have excluded an important country-specific (time invariant) variable from our analysis. To consider this we estimate the base regression as a fixed effects regression for each of the different measures of press freedom. We exclude the dummy for persistent democracy, as this is time invariant and therefore collinear with the country fixed effects.

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[20] Lower scores of the index indicate that "high government officials are likely to demand special payments" and that "illegal payments are generally expected throughout lower levels of government" in the form of "bribes connected with import and export licenses, exchange controls, tax assessment, police protection or loans".

Comparing the results in Table 5 with Tables 2 – 3, it is clear that the effects of different forms of press freedom (both aggregate and disaggregate) identified earlier remain the same even after controlling for country fixed effect, where only *laws and regulations* is the only insignificant variable. There are two main quantitative differences. Firstly, although the overall press freedom index and the economic influences sub-index is significant ever after controlling for country fixed effects, the coefficient for political influences sub-index falls slightly short of significance at conventional level (t-ratio equals 1.89). Secondly, the coefficients are lower than those given in Table 2 – 3 with the CPI index (the t-ratios and the adjusted R^2 are lower as well).

7. Concluding remarks

The motivation of this paper was to investigate the empirical relationship between press freedom and corruption and in particular, to evaluate the impact of different types of restrictions to press freedom. We have provided empirical evidence that confirms previous findings. We also reinforce this evidence by applying a technique that allows us to incorporate not only a few but instead hundreds of alternative specifications so as to take into account the recent findings on the empirical determinants of corruption. We also noticed that restrictions to press freedom come in many guises and this may have different impacts on corruption. We cited anecdotal evidence referring to countries with similar corruption levels but different incidence of, say, political influences on the media. The econometric results suggest that not all the forms of restrictions to press freedom are strongly correlated with corruption. This is the case for example of the laws and regulations influencing the media. In contrast, economic and political restrictions are strongly associated with corruption. More specifically, it appears that it is political pressures, which have a slightly stronger effect on corruption. Our results are robust to a variety of control and tests and also to using different indicators for both press freedom and corruption.

There are straightforward policy implications from this. In our paper we found that changes (improvements) in certain categories of press freedom can have an important impact on corruption. Our analysis allows us to know a little bit more about how different attacks on press freedom translate into higher corruption. Therefore, reducing political influence on the media may be an important step towards reducing corruption levels. This could apply especially to countries like Pakistan and Colombia where political influences on the media are much more important than other types of restrictions. If these countries were to reduce some of these political influences, most notably the severe violence against journalists, to

the standards of their two other subcategories, they would be able to improve their corruption levels by an amount no lower than 1 point in the corruption scale. This means that these countries would be able to leave the unfriendly category of rampant corruption, as defined by Transparency International.

On the same level, improving the economic conditions for the press sector and contributing to a competitive environment would help to curb corruption. For instance, should a country like Italy improve its standard on political influences on the media to the levels of its fellows European countries as such as France, Spain and Portugal, it would be able to improve its corruption levels by a minimum of 1 and a maximum of 2.2 points on the 0-10 corruption scale. In other words, Italy would more resemble other developed countries in terms of its corruption levels were such a change made.

In relation to the legal environment it seems that either the direct effects on corruption are much lower than those of the other categories or it may be that many effects of improving the laws and regulations are passed onto corruption through economic development. For example, there are several countries where the legal and regulatory framework is very restrictive and the other types of pressures on the media are not so strong. This is the case of Malaysia, Jordan and Cameroon. According to our results, it would be more difficult for these countries to achieve improvements in their corruption levels by reducing the restrictions of the legal and regulatory framework. It would probably be more convenient to focus on trying to improve the other subcategories, which may have a larger positive impact on corruption levels.

Figure 1: Aggregate Press Freedom and Corruption

Freedom Index. Sample size: 51 countries. r=0.79 (significant at the 1% level)
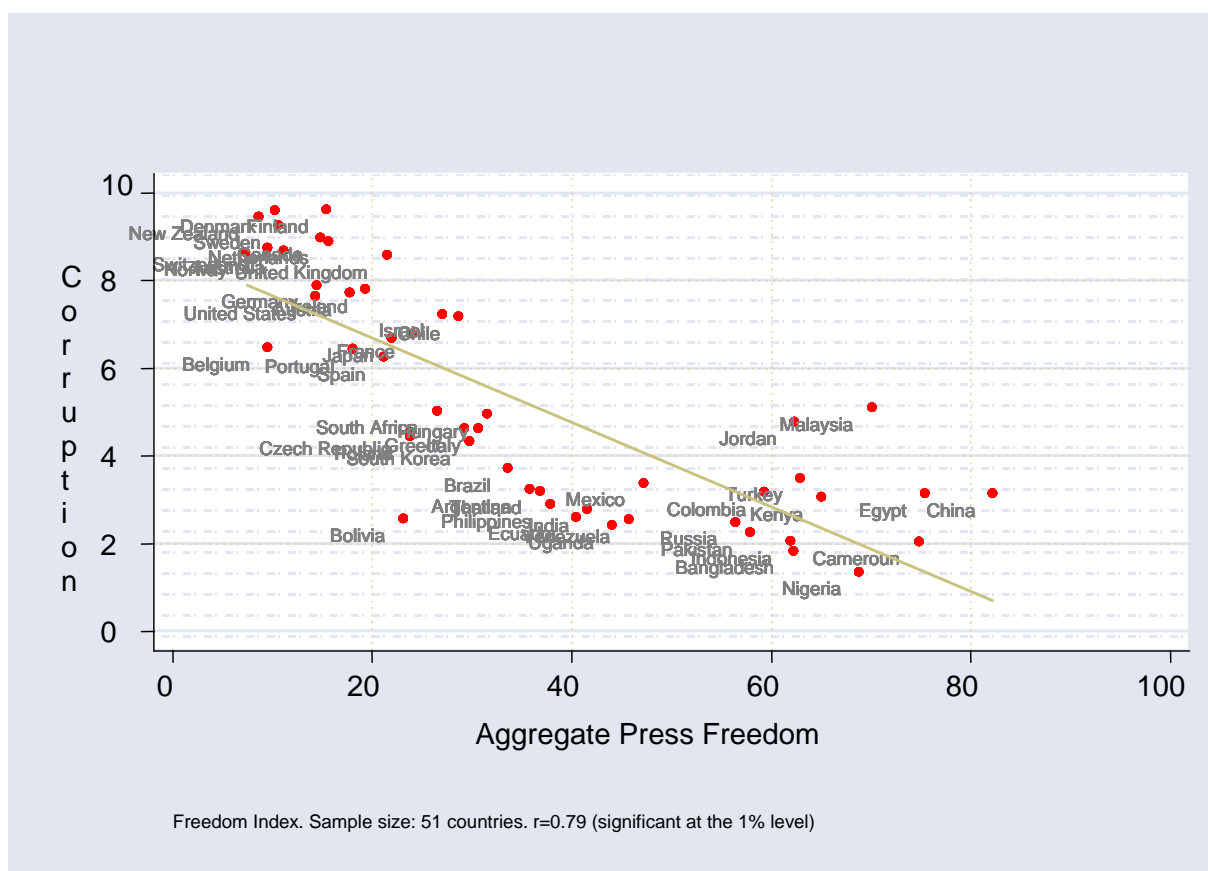
Note: Bureaucratic corruption is the 1995-2004 average of the CPI Index. Aggregate press freedom is the 1995-2004 average of the Press

Table 1: Correlation between aggregate press freedom and its components

Variable	Mean	Std. Dev.	Min	Max
Press Freedom	35.01	21.98	5	97
Laws & Regulations	10.17	7.74	0	30
Political Influences	15.36	10.73	0	40
Economic Influences	9.47	5.67	0	27

Correlations	Press Freedom	Laws & Regulations	Political Influences	Economic Influences	Corruption
Press Freedom	1				
Laws & Regulations	0.8879*	1			
Political Influences	0.9545*	0.7606*	1		
Economic Influences	0.8578*	0.6370*	0.7690*	1	
Corruption	-0.7503*	-0.6391*	-0.7429*	-0.6300*	1

Notes: *T*he Aggregate Press Freedom Index (From 0 to 100); *T*he Laws and Regulations Subindex (From 0 to 30); *T*he Political Influences Subindex (From 0 to 40); *T*he Economic Influences Subindex (From 0 to 30)
Source: Press Freedom Survey (various years) available from Freedom House (www.freedomhouse.org).

Table 2. EBA results for press freedom using OLS: Overall index and subcategories (CPI Index)

Results of press freedom index and subcomponents on corruption (CPI Index) - Data: 1995-2004

Method: Pooled OLS.	Overall Press Freedom (1)		Laws and Regulations (2)		Political Influences (3)		Economic Influences (4)	
Variable of interest (M)	**Beta**	**t**	**Beta**	**t**	**Beta**	**t**	**Beta**	**T**
Upper Bound	-0.0415	-6.56	-0.0053	-0.38	-0.0691	-7.71	-0.0684	-4.53
Base	-0.0609	-8.83	-0.0518	-3.28	-0.1002	-9.57	-0.0962	-5.37
Lower Bound	-0.0843	-7.25	-0.1049	-4.93	-0.1303	-7.22	-0.1755	-5.82
Z-variables (upper)	Eng, Ger, Pro_D		Fue, Pro_D, Plist		Ffc, Fbc, Pro_D		Soc, Fre, Pro_D	
Z-variables (base)	-		-		-		-	
Z-variables (lower)	Interv, Exp, Plist		Interv, Exp, Fre		Interv, Exp, Mag		Interv, Exp, Mag	
Adjusted R^2 (upper)	0.8145		0.7806		0.8286		0.8002	
Adjusted R^2 (base)	0.7704		0.7266		0.7705		0.7399	
Adjusted R^2 (lower)	0.7943		0.7640		0.7874		0.7680	
No. observations (upper)	487		458		477		487	
No. observations (base)	487		487		487		487	
No. observations (lower)	289		299		296		296	
Total number of regressions	1140		1140		1140		1140	
Regressions dropped due to R^2 criterion	24		133		85		25	
Regressions dropped due to multicollinearity	1		3		1		1	
Remaining regressions	1115		1004		1054		1114	
No. of insignificant regressions	0 / 1115		145 / 1004*		0 / 1054		0/114	

White-corrected standard errors. Base denotes the base specification including the *M*-variable and the always-included *I*-variables (loggdp, d50 and pri) and the base beta is the estimated coefficient from the base regression. Only coefficients for the *M*- variables are shown. Coefficients for the *I*-variables are significant throughout the whole analysis. These can be obtained from the author. The upper bound beta is the estimated coefficient corresponding to the regression that generates the extreme upper bound. The lower bound beta is the estimated coefficient corresponding to the regressions that generates the extreme lower bound. *Z*-variables are those included in the specifications that generate the bounds. No. insignificant denotes the number of specifications that produce a coefficient statistically insignificant (at the 0.05 level) and/or of a different sign.

* None of these 145 insignificant regressions show a positive (wrong) sign.

Table 3. EBA results for press freedom using IV through GMM estimation: Overall index and subcategories (CPI Index) - 1995-2004
(Instrument: Ethnolinguistic Fractionalization)

Variable of interest (M)	Overall Press Freedom		Laws and Regulations		Political Influences		Economic Influences	
	Beta	z	Beta	z	Beta	z	Beta	z
Upper Bound $_{OLS}$	-0.0474	-6.77	-0.0176	-1.31	-0.0730	-7.49	-0.0811	-4.82
Upper Bound	-0.0449	-6.32	-0.0125	-0.95	-0.0730	-7.49	-0.0748	-4.26
Base	-0.0705	-9.54	-0.0608	-3.80	-0.1132	-10.29	-0.1165	-6.11
Lower Bound	-0.1008	-8.72	-0.1321	-5.15	-0.1566	-8.43	-0.2048	-6.79
Lower Bound $_{OLS}$	-0.1008	-8.72	-0.1136	-5.40	-0.1532	-8.88	-0.1946	-6.31
Z-variables (upper)	Maj, Fre, Pro_D		Fre, Pro_D, Plist		Ffc, Fbc, Pro_D		Parl, Eng, Fre	
Z-variables (base)	-		-		-		-	
Z-variables (lower)	Interv, Exp, Plist		Imp, Def, Exp		Inter, Exp, Plist		Exp, Eng, Plist	
Adjusted R2 (upper)	0.8148		0.7832		0.8335		0.7911	
Adjusted R^2 (base)	0.7702		0.7136		0.7676		0.7319	
Adjusted R^2 (lower)	0.7915		0.7149		0.7744		0.7328	
No. observations (upper)	416		429		439		429	
No. observations (base)	439		439		439		439	
No. observations (lower)	263		283		263		273	
Total number of regressions	1140		1140		1140		1140	
Regressions dropped due to R2 criterion	30		91		39		18	
Regressions dropped due to multicollinearity	0		0		0		0	
Remaining regressions	1110		1049		1101		1122	
No. of insignificant regressions	0 / 1110		85 / 1049		0 / 1101		0 / 1122	
J-Test (upper)	7.79 (0.01)		0.83 (0.36)		0.82 (0.36)		5.82 (0.02)	
J-Test (base)	0.80 (0.37)		0.65 (0.42)		0.18 (0.67)		0.41 (0.52	
J-Test (lower)	8.25 (0.00)		20.64 (0.00)		9.04 (0.00)		17.40 (0.00)	
Pagan-Hall Test (upper)	29.47 (0.00)		42.76 (0.00)		9.05 (0.34)		31.18 (0.00)	
Pagan-Hall Test (base)	14.40 (0.01)		30.35 (0.00)		12.13 (0.03)		22.60 (0.00)	

Pagan-Hall Test (lower)	20.97 (0.01)	37.72 (0.00)	29.71 (0.00)	16.14 (0.04)

Base denotes the base specification including the *M*-variable and the always-included *I*-variables (loggdp, d50 and pri) and the base beta is the estimated coefficient from the base regression. Only coefficients for the *M*- variables are shown. Coefficients for the *I*-variables are significant throughout the whole analysis. These can be obtained from the author. The upper bound beta is the estimated coefficient corresponding to the regression that generates the extreme upper bound. The lower bound beta is the estimated coefficient corresponding to the regressions that generates the extreme lower bound. *Z*-variables are those included in the specifications that generate the bounds. No. insignificant denotes the number of specifications that produce a coefficient statistically insignificant (at the 0.05 level) and/or of a different sign. J-Test gives the Hansen statistic for the overidentifying restrictions with P-values in parentheses). Pagan-Hall Test produces the statistic to test for heterogeneity with P-values in parentheses.

Table 4. EBA results for press freedom using IV through GMM estimation: Overall index and subcategories (ICRG Index) - 1995-2004

(Instrument: Ethnolinguistic Fractionalization)

Variable of interest (M)	Overall Press Freedom		Laws and Regulations		Political Influences		Economic Influences	
	Beta	**z**	**Beta**	**z**	**Beta**	**z**	**Beta**	**z**
Upper Bound $_{OLS}$	-0.0142	-3.59	0.0041	0.46	-0.0159	-2.70	-0.0464	-3.11
Upper Bound	-0.0127	-3.23	0.0049	0.59	-0.0159	-2.70	-0.0312	-2.89
Base	-0.0235	-5.81	-0.0119	-1.29	-0.0375	-5.97	-0.0457	-4.65
Lower Bound	-0.0440	-6.14	-0.0593	-4.03	-0.0768	-6.33	-0.0704	-3.90
Lower Bound $_{OLS}$	-0.0429	-6.25	-0.0517	-3.62	-0.0725	-6.30	-0.0577	-5.01
Z-variables (upper)	Ffc, Fre, Pro_D		Fbc, Ger, Pro_D		Ffc, Fsc, Pro_D		Maj, Fre, Mag	
Z-variables (base)	-		-		-		-	
Z-variables (lower)	Pres, Maj, Exp		Pres, Maj, Exp		Maj, Exp, Plist		Exp, Eng, Ger	
Adjusted R2 (upper)	0.5466		0.5364		0.5561		0.4695	
Adjusted R2 (base)	0.4708		0.4424		0.4696		0.4590	
Adjusted R2 (lower)	0.4957		0.4507		0.4948		0.4678	
No. observations (upper)	635		635		635		607	
No. observations (base)	635		635		635		635	
No. observations (lower)	337		337		327		338	
Total number of regressions	1140		1140		1140		1140	
Regressions dropped due to R2 criterion	107		178		111		239	
Regressions dropped due to multicollinearity	0		0		0		0	
Remaining regressions	1033		962		1029		901	
No. of insignificant regressions	0 /1003		718 / 962		0 / 1029		0 / 901	
J-Test (upper)	0.06 (0.81)		3.14 (0.07)		0.10 (0.75)		0.25 (0.61)	
J-Test (base)	0.08 (0.78)		0.10 (0.75)		0.02 (0.88)		0.00 (0.95)	
J-Test (lower)	15.60 (0.00)		17.05 (0.00)		10.71 (0.00)		10.52 (0.00)	
Pagan-Hall Test (upper)	48.09 (0.00)		36.12 (0.00)		42.95 (0.00)		48.77 (0.00)	
Pagan-Hall Test (base)	30.75 (0.00)		29.81 (0.00)		18.26 (0.00)		48.66 (0.00)	
Pagan-Hall Test (lower)	38.23 (0.00)		26.14 (0.00)		21.39 (0.00)		24.53 (0.00)	

Base denotes the base specification including the *M*-variable and the always-included *I*-variables (loggdp, d50 and pri) and the base beta is the estimated coefficient from the base regression. Only coefficients for the *M*- variables are shown. Coefficients for the *I*-variables are significant throughout the whole analysis. These can be obtained from the author. The upper bound beta is the estimated coefficient corresponding to the regression that generates the extreme upper bound. The lower bound beta is the estimated coefficient corresponding to the regressions that generates the extreme lower bound. *Z*-variables are those included in the specifications that generate the bounds. No. insignificant denotes the number of specifications that produce a coefficient statistically insignificant (at the 0.05 level) and/or of a different sign. J-Test gives the Hansen statistic for the overidentifying restrictions with P-values in parentheses). Pagan-Hall Test produces the statistic to test for heterogeneity with P-values in parentheses.

Table 5

Results of press freedom index on corruption - Period: 1995-2004

Dependent Variable: Annual corruption index (CPI)

Method: Fixed-effects regressions

Variable of interest (M)	Beta	T-Stat	SE
Press freedom (overall)			
Pss	-0.012055	-2.9800	0.004
Gdp	-0.7196608	-1.5000	0.479
Pri	0.1084213	2.47	0.044
_cons	8.229553	4.28	1.921
R-squared (within)	0.0232		
No. observations	510		

F-test that all u_i=0 F(50, 456) = 63.16   Prob > F=0.0000

	Beta	T-Stat	SE
Laws and Regulations			
Pssa	-0.0087048	-0.9600	0.009
Gdp	-0.2344573	-0.5200	0.451
Pri	0.631215	1.52	0.042
_cons	6.103968	3.43	1.781
R-squared (within)	0.0062		
No. observations	510		

F-test that all u_i=0 F(50, 456) = 74.40   Prob > F=0.0000

	Beta	T-Stat	SE
Political Influences			
Pssb	-0.0112922	-1.8900	0.006
Gdp	-0.5554464	-1.1400	0.487
Pri	0.075427	1.81	0.042
_cons	7.416323	3.82	1.939
R-squared (within)	0.012		
No. observations	510		

F-test that all u_i=0 F(50, 456) = 63.26   Prob > F=0.0000

	Beta	T-Stat	SE
Economic Influences			
pssb	-0.0193999	-2.4300	0.008
gdp	-0.3206523	-0.7100	0.450
pri	0.0781102	1.9	0.041
_cons	6.501107	3.66	1.774
R-squared (within)	0.017		
No. observations	510		

F-test that all u_i=0 F(50, 456) = 70.40   Prob > F=0.0000

Appendix A

Table A.1

Political Influences and Laws and Regulations (CPI Index)

Laws and regulations Sub-index (Not free: 30 ; Free: 0)

		30-24	24-18	18-12	12-6	06-00
	40-32	China	-	-	-	-
	32-24	Cameroon Jordan	Egypt Indonesia Kenya Malaysia Nigeria Turkey	Bangladesh Colombia Pakistan	Russia	-
	24-16	-	-	Ecuador Uganda Venezuela	Argentina Brazil India Mexico Philippines	-
Political influences Subindex (Not free: 40 ; Free: 0)	**16-8**	-	-	Thailand	Bolivia Chile Czech Republic Greece Israel Poland South Africa South Korea	France Hungary Italy Japan Spain
	8-0	-	-	-	Austria Netherlands Portugal UK	Australia Belgium Canada Denmark Finland Germany Ireland New Zealand Norway Sweden Switzerland USA

For each subindex, the press freedom score for a country is a 10-year average of the annual measure compiled by Freedom House. The countries are divided in quintiles according to their score and those, which lie by more than one quintile away from the diagonal, are in bold. We list those countries included in the dataset containing the CPI index.

Table A.2

Economic Influences and Laws and Regulations (CPI Index)

Laws and regulations Subindex (Not free: 30 ; Free: 0)

		30-24	24-18	18-12	12-6	6-0
	30-24	-	-	-	-	-
	24-18	Cameroon China	Egypt Nigeria	Bangladesh	-	-
Economic Influences Subindex (Not Free: 30 ; Free: 0)	**18-12**	Jordan	Indonesia Kenya Malaysia	Colombia Pakistan	India Mexico Philippines Russia	Italy
	12-6	-	Turkey	Ecuador Thailand Uganda Venezuela	Argentina Brazil Chile Czech Republic Greece South Africa South Korea UK	Australia Denmark Finland France Hungary Ireland Japan Spain USA
	6-0	-	-	-	Austria Bolivia Israel Netherlands Poland Portugal	Belgium Canada Germany New Zealand Norway Sweden Switzerland

For each subindex, the press freedom score for a country is a 10-year average of the annual measure compiled by Freedom House. The countries are divided in quintiles according to their score and those which lie by more than one quintile away from the diagonal are in bold. We list those countries included in the dataset containing the CPI index.

Table A.3

Economic Influences and Political Influences (CPI Index)

Political influences Subindex (Not free: 40 ; Free: 0)

Economic Influences Index (Not Free: 30 ; Free: 0)		40-32	32-24	24-16	16-8	8-0
	30-24					
	24-18	China	Bangladesh Cameroon Egypt Nigeria	-	-	-
	18-12	-	Colombia Indonesia Jordan Kenya Malaysia Pakistan Russia	India Mexico Philippines	Italy	-
	12-6	-	Turkey	Argentina Brazil Ecuador Uganda Venezuela	Chile Czech Republic France Greece Hungary Japan South Africa South Korea Spain Thailand	Australia Denmark Finland Ireland UK USA
	6-0	-	-	-	Bolivia Israel Poland	Austria Belgium Canada Germany Netherlands New Zealand Norway Portugal Sweden Switzerland

For each subindex, the press freedom score for a country is a 10-year average of the annual measure compiled by Freedom House. The countries are divided in quintiles according to their score and those which lie by more than one quintile away from the diagonal are in bold. We list those countries included in the dataset containing the CPI index.

Appendix B

Data Appendix

cpi	Corruption Perception Index published by Transparency International. This measure provides (subjective) perceptions of the bureaucratic. Scores range from 0 (most corrupt) to 10 (least corrupt). From 1995 to 2003. (Available at www.transparency.org)
loggdp	The logarithm of real GDP per capita PPP was taken from the 2003 World Bank Indicators CD-Rom. From 1993 to 2001.
d50	Proxy for stability of democracy in a country. It measures the extent to which a country has been a democracy over the last 50 years (dummy equals 1) or not (dummy equals 0).,From 1995 to 2003.
pri	Index of political rights. Source: Freedom House.
tra	the sum of imports and exports in goods and services divided by GDP captures the degree of openness to foreign competition. Taken from the 2003 World Development Indicators CD-Rom. From 1993 to 2001.
imp	Capture the extent of openness to foreign competition. Measured as the share of imports of goods and services in GDP. Taken from the 2003 World Development Indicators CD-Rom. From 1994 to 2002.
fuel	Proportion of fuel and mineral exports in merchandise exports, as a measure of the level of potential rents and quasi-rents. Source: 2003 World Development Indicators CD-Rom. From 1993 to 2001.
interv	Index of government intervention. Countries with low government intervention have low values on the index. Source: Heritage Foundation ( ). From 1995 to 2003.
def	Military expenditure as a percentage of GDP taken from Stockholm International Peace Research Institute (SIPRI). Available at . From 1994 to 2002.
maj	Dummy for a plurality (majority) electoral system. Source: Database of Political Institutions, World Bank, 2001 ( ). From 1993 to 2001.
pres	Dummy variable assigning ones to countries which have presidential executive systems. Source: Database of Political Institutions, World Bank, 2001 ( ). From 1992 to 2000.
parl	Dummy assigning ones to countries which have parliamentary systems to elect the chief executive. Source: Database of Political Institutions, World Bank, 2001 ( ). From 1992 to 2000.
fbc	(*former British colony)* Dummy variable taking value 1 if country has a British colonial legacy, 0 otherwise. Source: Warcziag (1996), Grier (1997), and Treisman (2000).
ffc	(*former French colony*) Dummy variable taking value 1 if country has a French colonial legacy, 0 otherwise. Source: Warcziag (1996), Grier (1997), and Treisman (2000).
fsc	(*former Spanish colony*) Dummy variable taking value 1 if country has a Spanish colonial legacy, 0 otherwise. Source: Warcziag (1996), Grier (1997), and Treisman (2000).

ever	Dummy variable taking value if a country has ever been a colony since 1776, and 0 otherwise. Source: Persson, Tabellini and Trebbi (2003), based on Wacziarg (1996). From 1995 to 2003.
pss	Index of Press Freedom. Ranges from 0 to 100 with low scores indicating more press freedom and high values denoting less press freedom. Released by Freedom House ( )
pss_a	Subindex of *Laws and regulations that influence press freedom*. Ranges from 0 to 30 with low scores indicating more press freedom and high values denoting less press freedom. Released by Freedom House.
pss_b	Subindex of *Political influences on press freedom*. Ranges from 0 to 40 with low scores indicating more press freedom and high values denoting less press freedom. Released by Freedom House.
pss_c	Subindex of *Economic influences on press freedom*. Ranges from 0 to 30 with low scores indicating more press freedom and high values denoting less press freedom. Released by Freedom House.
free	Index of Economic Freedom. The index measures how well countries score on a list of 10 different areas of economic freedom. Ranges from 1 (complete freedom) to 5 (lack of freedom). Source: The Heritage Foundation ( ). From 1995 to 2003.
eng	Dummy for the origin of the legal system, taking value 1 if the country has English legal roots and 0 otherwise. Source: La Porta et al. (1999). From 1995 to 2003.
soc	Dummy for the origin of the legal system, taking value 1 if the country has Socialist legal roots and 0 otherwise. Source: La Porta et al. (1999). From 1995 to 2003.
fre	Dummy for the origin of the legal system, taking value 1 if the country has French legal roots and 0 otherwise. Source: La Porta et al. (1999). From 1995 to 2003.
ger	Dummy for the origin of the legal system, taking value 1 if the country has German legal roots and 0 otherwise. Source: La Porta et al. (1999). From 1995 to 2003.
sca	Dummy for the origin of the legal system, taking value 1 if the country has German legal roots and 0 otherwise. Source: La Porta et al. (1999). From 1995 to 2003.
pro_d	Dummy for Protestantism as a dominant religion in a country, taking value 1 if 2/3 or more of the population belong to the Protestant religion. Source: own elaboration drawing from La Porta et al. (1999). From 1995 to 2003.
cat_d	Dummy for Catholicism as a dominant religion in a country, taking value 1 if 2/3 or more of the population belong to the Catholic religion. Source: own elaboration drawing from La Porta et al. (1999). From 1995 to 2003.
elf	Index of ethnolinguistic fractionalization measuring the probability that two randomly selected persons from a given country will not belong to the same ethnolinguistic group. Source: La Porta et al. (1999). From 1995 to 2003.
exp	Proportion of total government spending accounted for by subnational governments. Source: World Bank Dataset based on the Government Finance Statistics, IMF. From 1987 to 1998.

Table B.1: Summary Statistics for Dependent and Independent Variables

Table of Summary Statistics

Variable	Description	Observations	Mean	Std. Dev.	Minimum	Maximum
cpi	Corruption Perception Index	510	5.247196	2.589116	0.4	10
gdp	Log of GDP per capita	510	3.914747	0.4452102	2.892095	4.535547
pri	Index of Political Rights	510	2.370588	1.854723	1	7
d50	Persistence of Democracy over last 50 years	487	0.5174538	0.5002091	0	1
pss_all	Overall Press Freedom Index	510	35.01373	21.97574	5	97
pss_a	Category A: Laws and Regulations	510	10.17451	7.741333	0	30
pss_b	Category B: Political Influences	510	15.36471	10.72666	0	40
pss_c	Category C: Economic Influences	510	9.47451	5.670239	0	27
tra	Trade as % of GDP	510	63.50902	35.77081	10.9	229.6
imp	Imports of goods and services as % of GDP	510	32.65196	17.24001	6.9	104.8
fue	% of fuel and mineral exports in merchandise exports	486	11.10761	18.45124	0	99.6
interv	Index of Government Intervention	495	2.441414	0.767905	1	5
def	Military Expenditure as % of GDP	509	2.362279	1.683989	-2.2	12.4
ffc	Dummy for Former French Colony	500	0.02	0.1401402	0	1
fsc	Dummy for Former Spanish Colony	500	0.2	0.4004006	0	1
fbc	Dummy for Former British Colony	500	0.28	0.4494486	0	1
parl	Dummy for Parliamentary System	490	0.5755102	0.4947704	0	1
pres	Dummy for Presidential System	490	0.3591837	0.4802515	0	1
maj	Dummy for Majoritarian Electoral System	475	0.6168421	0.4866688	0	1
eng	Dummy for English Legal Tradition	510	0.3137255	0.4644618	0	1
soc	Dummy for Socialist Legal Tradition	510	0.0980392	0.2976596	0	1
fre	Dummy for French Legal Tradition	510	0.4117647	0.4926362	0	1
ger	Dummy for German Legal Tradition	510	0.0980392	0.2976596	0	1
sca	Dummy for Scandinavian Legal Tradition	510	0.0784314	0.2691132	0	1
elf	Ethnolinguistic Fractionalization Index	490	0.265102	0.2809275	0	0.8567
plist	Dummy for Party List System	500	0.5526	0.4504854	0	1
mag	Electoral District Magnitude	500	0.5531762	0.3740123	0	0.9916667
ever	Dummy for Ever a Colony	500	0.66	0.4741832	0	1
cat_d	Dummy for Catholicism as Dominant Religion	510	0.3333333	0.4718674	0	1
pro_d	Dummy for Protestantism as Dominant Religion	510	0.0784314	0.2691132	0	1
exp	Subnational Expenditure as % of Total Expenditure	321	27.34256	13.88995	3.471281	58.72989
elfalt	Ethnolinguistic Fractionalization Index (alt.)	440	36.36364	31.31157	0	90

	cpi	gdp	pri	d50	pss	pss_a	pss_b	pss_c	tra	imp	fue	int	def	ffc	fsc	fbc	parl	pres	maj	exp	eng	soc	fre	ger	sca	pro	cat	plist	mag	ever
cpi	1.00																													
gdp	0.83	1.00																												
pri	-0.65	-0.77	1.00																											
d50	0.65	0.64	-0.47	1.00																										
pss	-0.75	-0.78	0.89	-0.47	1.00																									
pss_a	-0.64	-0.72	0.86	-0.46	0.89	1.00																								
pss_b	-0.74	-0.74	0.81	-0.44	0.95	0.76	1.00																							
pss_c	-0.63	-0.63	0.73	-0.39	0.86	0.64	0.77	1.00																						
tra	0.22	0.19	-0.08	0.16	-0.09	0.02	-0.14	-0.10	1.00																					
imp	0.17	0.14	-0.06	0.09	-0.05	0.07	-0.10	-0.09	0.94	1.00																				
fue	-0.30	-0.27	0.29	-0.03	0.27	0.28	0.20	0.29	-0.07	-0.14	1.00																			
int	0.08	-0.04	0.14	0.07	0.09	0.12	0.06	0.07	0.01	0.03	-0.04	1.00																		
def	-0.02	-0.03	0.10	-0.02	0.16	0.21	0.16	0.03	0.05	0.14	-0.11	0.31	1.00																	
ffc	-0.18	-0.24	0.35	-0.15	0.28	0.32	0.20	0.25	-0.08	-0.09	0.18	0.02	-0.09	1.00																
fsc	-0.38	-0.03	0.13	-0.32	0.17	0.13	0.19	0.13	-0.21	-0.22	0.28	-0.26	-0.16	-0.07	1.00															
fbc	-0.13	-0.41	0.37	-0.03	0.32	0.30	0.29	0.27	0.11	0.14	0.01	0.13	0.05	-0.09	-0.31	1.00														
parl	0.58	0.56	-0.50	0.52	-0.48	-0.46	-0.44	-0.40	0.24	0.22	-0.38	0.09	-0.08	-0.17	-0.59	-0.02	1.00													
pres	-0.50	-0.50	0.40	-0.48	0.37	0.36	0.34	0.30	-0.21	-0.18	0.31	-0.08	0.11	0.19	0.57	-0.08	-0.87	1.00												
maj	-0.17	-0.25	0.19	-0.28	0.18	0.08	0.19	0.24	-0.15	-0.09	-0.24	-0.06	0.01	0.12	-0.12	0.28	-0.01	0.08	1.00											
exp	0.32	0.33	-0.21	0.36	-0.27	-0.33	-0.25	-0.13	-0.33	-0.40	0.08	0.25	-0.17	0.00	-0.13	0.13	0.13	-0.05	0.07	1.00										
eng	0.02	-0.20	0.08	0.16	0.06	0.05	0.06	0.05	0.05	0.07	-0.10	0.04	0.07	-0.10	-0.34	0.72	0.10	-0.10	0.25	0.02	1.00									
soc	-0.17	-0.05	0.08	-0.26	0.13	0.09	0.13	0.13	0.06	0.07	-0.02	0.14	0.00	-0.04	-0.15	-0.18	-0.08	0.09	0.07	-0.02	-0.22	1.00								
fre	-0.30	-0.12	0.12	-0.30	0.19	0.19	0.17	0.15	-0.09	-0.07	0.18	-0.23	0.07	0.17	0.59	-0.35	-0.34	0.30	-0.10	-0.33	-0.57	-0.28	1.00							
ger	0.23	0.30	-0.20	0.19	-0.24	-0.22	-0.21	-0.25	-0.05	-0.06	-0.18	-0.12	-1.56	-0.05	-0.17	-0.21	0.26	-0.22	0.08	0.26	-0.22	-0.11	-0.28	1.00						
sca	0.45	0.29	-0.22	0.29	-0.32	-0.28	-0.33	-0.23	0.07	-0.01	0.07	0.33	-0.08	-0.04	-0.15	-0.18	0.26	-0.22	-0.38	0.26	-0.20	-0.01	-0.24	-0.10	1.00					
pro	0.45	0.29	-0.22	0.29	-0.32	-0.28	-0.33	-0.23	0.07	-0.01	0.07	0.33	-0.08	-0.04	0.15	-0.18	0.26	-0.22	-0.38	0.26	-0.20	-0.10	-0.24	-0.10	1.00	1.00				
cat	-0.12	0.09	-0.22	-0.14	-0.15	-0.17	-0.11	-0.12	-0.04	-0.04	0.05	-0.29	-0.22	-0.10	0.59	-0.35	-0.24	0.35	-0.24	-0.26	-0.39	-0.09	0.59	-0.09	-0.21	-0.21	1.00			
plist	0.17	0.35	-0.24	0.17	-0.24	-0.15	-0.23	-0.30	-0.06	-0.11	0.09	0.12	-0.06	0.04	0.16	-0.62	0.08	-0.13	-0.64	0.00	-0.61	0.19	0.28	0.04	0.29	0.29	0.25	1.00		
mag	0.14	0.26	-0.22	0.04	-0.22	-0.07	-0.25	-0.29	0.13	0.12	0.11	0.10	0.04	0.05	0.20	-0.48	-0.05	-0.04	-0.65	-0.10	-0.55	0.12	0.30	0.01	0.28	0.28	0.24	0.82	1.00	
ever	-0.37	-0.48	0.34	-0.32	0.32	0.33	0.30	0.21	0.04	0.07	0.28	-0.05	0.06	0.10	0.36	0.45	-0.45	0.37	-0.02	-0.10	0.22	-0.10	-0.32	-0.32	-0.10	-0.10	0.07	-0.18	-0.04	1.00

Source: Based on several sources (see data appendix)

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