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An Offer You Can't Refuse: Murdering journalists as an enforcement mechanism of corrupt deals

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Abstract: Anecdotal evidence suggests that journalists and bureaucrats in some countries are killed when they try to blow the whistle on corruption. We demonstrate in a simple game-theoretical model how murders can serve as an enforcement mechanism of corrupt deals under certain regime assumptions. Testing the main implications in an unbalanced panel of 179 countries observed through three periods, we find that corruption is strongly related to the incidence of murders on journalists in countries with almost full press freedom. While our results provide evidence that journalists are killed for corrupt reasons, they also suggest that some countries may have to go through violent periods when seeking to secure full freedom for the press.

Keywords: Corruption, rent-seeking, murder

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1. Introduction

The year 2009 was another sad record year with respect to the number of journalist murders. Around 70 journalists were murdered while they were on duty (Committee to Protect Journalists, 2010) and the average degree of freedom of the press has further deteriorated in the year 2009 (Reporters without Borders, 2010). Most restrictions of press freedom and a huge share of violence against journalists are related to corruption in the respective countries. The murder of Brazilian journalist Jose Candido Amorim Pinto is a representative example of many corruption-related murders. Amorim Pinto, who had for half a year prior to his death received multiple threats and had two months prior been hit in a motorcycle drive-by shooting, was in 2005 killed in the street by assassins with no less than 20 shots. Pinto's transgression was that he had reported extensively on corruption. However, the practice of killing journalists is not restricted to developing and middle-income countries. In developed countries, both the 1992 shooting of Italian journalist Guiseppe Alfano and the 1996 murder in Dublin, Ireland, of Veronica Guerin – shot three times in the heart and once in the neck, as retaliation for her stories about the Irish underground – provide telling examples. Table 1 shows more examples of journalist murders.

Corruption constitutes an important economic, political and social problem in most poor and middle-income countries, and remains a problem in some rich countries. In recent years, much research has therefore been devoted to identifying the specific problems associated with it, as well as why some countries are evidently more corrupt than others (Aidt, 2003; Treisman, 2007; Dreher et al., 2007; Bjørnskov, 2011). Corruption is normally defined as a principal agent problem where the agent either pays

or receives a bribe without knowledge and consent of the principal. We follow this definition.

Corrupt deals are enforced by the mutual, particularized trust that can develop between parties in repeated interactions (Lambsdorff, 2002). However, these deals have to be kept secret to most other people, and in particular to the relevant authorities. This is usually done with the help of monetary rewards. The briber, e.g., a firm representative, offers a side payment to, e.g., a bureaucrat or an employer of a customer firm, who then is unable to blow the whistle since he is part of a criminal deal[1]. Sometimes, however, this mechanism does not work, and individuals reject the bribe. For such a case a more sinister mechanism exists, which to our knowledge has not been explored in empirical research so far. Instead of accepting a rejection and thereby risking that the bureaucrat blows the whistle, firms may prefer that the bureaucrat is incapable of telling anyone about the corrupt offer. This can only be ensured if the firm permanently takes out the bureaucrat, i.e., kills him. On the one hand, the credible threat of doing so may, in turn, lead bureaucrats to accept more bribes as well as accepting relatively smaller bribes. On the other hand, whether a killing is incentive compatible or not for the firm depends three factors: the likelihood of getting caught, the probable punishment when being convicted of murder instead of simple corruption, and the likelihood that the bureaucrat is actually heard.

We model these problems in a standard game-theoretical framework in which bureaucrat-journalists decide to either accept a bribe, reject a bribe and keep quiet, or reject a bribe and blow the whistle by trying to report it in the press. For simplicity, we collapse the role of the journalist and the bureaucrat. This is a strong simplification of

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[1] In the remainder of the paper the briber will always be called firm neglecting internal principal agent problems in firms, and the recipient will always be called bureaucrat.

the model, which we believe can be justified on two grounds other than mere simplicity. First, it can be interpreted as entailing the implicit assumption that the bureaucrat internalizes a sufficient degree of the risk that he imposes on the journalist. Second, one can alternatively assume that the firm, when facing a whistle blower, has to kill both the journalist and her source – the whistle blower – in order to eliminate the threat.[2] The model shows that whenever murder is a credible threat, firms in our model have an incentive to kill bureaucrat-journalists with a positive probability, given that they are actually free to report on corruption in the media. We therefore expect, based on game-theoretical considerations, that killings would be associated with corruption, but only when the media are sufficiently free.

Our model also leads us to expect that journalist murders will not take place above some level of press freedom, as it is associated with degrees of legal quality that make murder a non-credible threat. At low levels of press freedom, we expect no killings as reporting corruption is not a credible threat to firms. The model receives clear support in tests on a panel of 179 countries observed in three periods since 1990. We find that a simple count of how many journalists were killed over a prolonged period of time is strongly associated with corruption. This effect nonetheless only occurs in the quintile of countries with an almost free press.

The rest of the paper is structured as follows. Section two outlines our theoretical considerations in a relatively simple game-theoretical set-up. Section three describes the data that we use in section four, which describes the empirical results. Section five discusses the results and concludes.

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[2] A third reason can be seen in the fact that according to Orme Jr. (1998), official investigations of journalist murders tend to be slow and ineffective.

2. A simple model with murder

We follow a basic game-theoretic approach similar to that used in much of the recent literature (e.g., Yavas, 2007; Frey and Torgler, 2008; Dreher et al., 2009; Bjørnskov, 2011). We primarily use this model as a background of our empirics and to derive conditions under which we would expect to see a clear connection between corruption and the murder of journalists. The model consists of a firm with profits π associated with operating in a market, and a bureaucrat handling the approval of the paperwork necessary to produce legally in the sector. We assume that all production is handled legally.[3] The approval comes with some cost S, which can be thought of as either a simple handling fee, costs associated with abiding by regulations, or some costs of documenting that production is legal. Alternatively, a bribe B can be paid to a potentially corrupt bureaucrat handling the regulation. The firm has to compare the bureaucratic cost S to B and the cost of being caught F multiplied with the likelihood of getting caught, λ.

The probability that the bureaucrat accepts a bribe depends on his wage, w, the value of his outside option if getting convicted, w_{out}, the likelihood of getting caught, λ, and a moral cost of being involved in an illegal transaction, N, following Bjørnskov (2010). As such, the model allows for the influence of both formal and informal institutions. The game tree with the resulting payoffs is depicted in the upper half of Figure 1. The 'non-killing' part of the game in the upper half is standard, illustrating the trade-off between costs and benefits of accepting bribes versus receiving an 'honest'

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[3] We realize that this assumption, standard as it is, is unrealistic since virtually all countries have some part of their economy that goes unregistered. For analyses relaxing this assumption and thereby allowing for an unofficial economy; see Dreher et al. (2009), Bjørnskov (2011).

wage. Solving this isolated part of the game backwards shows that it results in a corrupt deal if the partners can agree on a viable bribe B, given by (1).

$$\frac{\lambda}{1-\lambda}\left(w - w_{out}\right) + \frac{N}{1-\lambda} < B < S - \lambda F \tag{1}$$

As in previous studies, this simple structure illustrates how increasing legal quality, captured in the likelihood of getting caught λ, squeezes the viable interval of the bribe from both sides, moral costs N associated with accepting a bribe decrease the likelihood of bribes since they increase bureaucrats' minimum acceptable bribe, and regulatory costs, S, increase the likelihood. However, this rests on the assumption that it is costless for the bureaucrat to reject a bribe offer. In the following, we provide two such costs: 1) a moral cost M of keeping quiet with an illegal offer that the bureaucrat nonetheless rejected, i.e., a moral *complacency* cost; and 2) a cost in the form of a positive probability that whomever reports that a corrupt offer was extended to the bureaucrat, who rejected it, runs the risk of being killed as a direct cause of reporting it.

The complacency cost M thus has to be compared to the moral cost N of accepting a bribe, which we will refer to as a *conspiracy* cost. In order to capture the potential effects of press freedom in the conspiracy costs and the complacency costs, we make the assumption that both N and M depend on the availability of journalists that are free to write about corruption, θ. As for conspiracy costs N, the moral costs of being actively involved in bribery increase with the freedom of press such that the derivative N_θ is positive.[4] It then becomes more likely that journalists may detect this behavior and

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[4] The role of press freedom has been extensively discussed in the literature, but in other circumstances. See e.g. Besley and Prat (2006) for an analysis of media capture in democracies, Gentzkov and Shapiro (2008) for a discussion of competition in the media, and Djankov et al. (2003) for a discussion of the role of media ownership. Most directly related to our paper is Frey and Torgler (2008) who explore the determinants of the murder of politicians.

spread the information of it, thereby increasing the public shame associated with corruption. The argument with respect to M is similar such that M_θ is positive. As such, the complacency cost M would be very small in countries with limited press freedom, and large in countries with full press freedom, since complacency would be voluntary in the latter case, but forced by political circumstances in the former. M in other words depends on how much a bureaucrat can 'blame himself' for being complacent.

The analytical effect of allowing for murder may under particular circumstances change the outcome of the game. First, murder as an enforcement mechanism is a real option, and thereby a credible threat, if the chances of getting away are smaller than the relative cost of making a kill – the legal punishment F minus the cost of hiring a hit man H. Assuming for simplicity that the likelihood of being caught and convicted is a multiple of the legal quality in the other part of the game, $\mu = a\lambda$, this reduces to (2).

$$\mu < \frac{F - H}{D} \Leftrightarrow \lambda < \frac{F - H}{aD} \quad , \tag{2}$$

where D is the cost of being caught after the murder. With each killing considered a separate event, equation 2 holds. However, when we allow for probabilistic murder – i.e. when we allow firms to play a mixed enforcement strategy – murder is formally a credible threat when the probability of getting killed $k > M / w$ and

$k < \dfrac{F}{\mu D + (1 - \mu)F + H}$ where H is the cost of hiring a hitman (we expect any firm to outsource such activities). That means that an equilibrium with non-zero killings exists iff:

$$\frac{M}{w} < k < \frac{F}{\mu D + (1 - \mu)F + H} \Leftrightarrow$$

$$\mu < \frac{Fw}{M(D - F)} - \frac{F + H}{D - F} \Leftrightarrow$$

$$\lambda < \frac{Fw}{aM(D - F)} - \frac{F + H}{a(D - F)} \qquad . \tag{3}$$

Our simple model framework thus predicts that one should not observe journalist killings above some threshold of legal quality. However, we note that there is no reason to suspect that optimal behavior on behalf of the corrupt firm is to kill all actual or potential whistle blowers. Defining k as the probability that our bureaucrat-journalist will be killed if he blows the whistle, he will keep quiet if $k > M / w$. As such, the incentive compatible murder risk may be substantially smaller than 1, and decreasing in average or 'normal' bureaucratic income.

In other words, murder will be less likely to be credible when a country develops institutionally, but the necessary share of potential whistleblowers that have to be killed to keep the threat credible is also decreasing in overall development. We nevertheless note one possible complication that we refrain from modeling. We assume that murders are a private activity in the sense that the murders of one firm do not impose any externality on other firms' potentially corrupt deals. One can easily argue that a more realistic situation entails externalities, as one firms' murders may positively affect other firms' ability to enforce corrupt deals. As such, murders take on the characteristic of a public good. Given that firms do not take this into account, murders will be overproduced. However, if firms do treat murders as a public good, they will tend to underproduce them. Since we have no way of knowing which is the more realistic situation, we simply ignore this aspect for the rest of the paper.

Given that murder is a credible threat, the minimum bribe becomes smaller since the relevant choice for the bureaucrat-journalist now is not whether to bear the moral cost, but *which* moral cost to bear – conspiracy or complacency.

$$B > \frac{\lambda}{1-\lambda}(w - w_{out}) + \frac{N-M}{1-\lambda} \tag{4}$$

Our model thus shows that given the existence of a credible murder threat, the optimal share of whistleblowers that are killed is $k* = M / w$. The optimal number of murders therefore becomes:

$$K* = prob\left\{ B < \frac{\lambda}{1-\lambda(w-w_{out})} + \frac{N-M}{1-\lambda} \right\} k* \tag{5}$$

This result provides us with three testable implications:

Proposition 1: The number of killings will decrease or increase with the quality of institutions combating corruption, depending on costs' sensitivity to press freedom. This result follows from differentiating (4) by legal quality and noting that N and M both depend positively on the degree of press freedom, which can be described as $(N-M)\sim\theta$:

$$\frac{dK*}{d\lambda} = f(\bullet)\frac{w - w_{out} - N + M}{(1-\lambda)^2}k* .$$

Proposition 2: The number of killings will decrease or increase with press freedom, depending on costs' sensitivity to press freedom and existing levels of corruption. This result follows from differentiating (4) by θ and noting that the derivates N_θ and M_θ both are positive. $\frac{dK*}{d\theta} = f(\bullet)\frac{N'-M'}{(1-\lambda)}k* + K*\frac{1}{k*w} .$[5]

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[5] We assume that θ is independent. Endogenizing θ to depend on k would arguably bring the model closer to reality. However, assuming that θ is decreasing in k without implying full convergence to equilibria with either $\theta=0$ or $k=0$ (which would imply $\theta=0$) does not, in the absence of absurd (death-wish-like)

Proposition 3: The number of killings depends ambiguously on bureaucrats'

wages. This result follows directly from differentiating (4) by *w*.

$$\frac{dK^*}{dw} = f(\bullet)\frac{\lambda}{(1-\lambda)}k^* - K^*\frac{k^*}{w}$$

3. Data

In the following, we outline the data used to test the three straightforward implications

of our simple model above. If not stated otherwise, all variables are included as

averages across each of the three periods 1990-1995, 1996-2000 and 2001-2006. All

data are described in Table 2.

Our dependent variable is the number of journalists who have been killed within a

period. The data that we use are from the online Newseum, maintained by the

Committee to Protect Journalists (2010). We explicitly hand-coded each murder to

ensure that we exclude casualties of war and random accidents. We also coded the

number of murders within each country that either the media or the legal authorities

could firmly connect to religious groups. These murders were therefore not likely to be

associated with economic activity and are only indirectly related to the motivation of the

paper. We nevertheless keep the number of religiously motivated murders in our

specification as a control variable, as it proxies for overall violence in the country. Both

these measures as well as other central factors are expressed in logarithms, such that our

estimates are readily interpretable as elasticities, evaluated at the sample or subsample

mean.

To measure our other main variable – corruption – we follow a substantial part of

the literature in employing the Corruption Perceptions Index (CPI), published by the

behavioral assumptions, yield qualitatively different theoretical implications. We have therefore kept the

model simple by assuming independence.

German NGO Transparency International (2009). The index is restricted between zero and ten, with ten showing an ideally uncorrupt country, i.e., the lower the index, the higher is corruption. Although Transparency International warns that the corruption scores are not ideally comparable across periods, we treat them as if they were. The reason is that we do not detect any clear signs of scale instability in the index, which would be the feature that could invalidate their cross-period comparability.[6]

As our measure of press freedom, we use a proxy constructed from Freedom House (2009). The original Freedom House index of press freedom measures the restrictions on what journalists and editors are allowed to write in whatever newspapers are published. We break this index down into two components – legal restrictions and economic restrictions on freedom – and use those to compute a comparable index for each of the three periods. The reason for using a break-down of these data is that the full index also contains violence against journalists, which would partially measure our

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[6] The corruption scale might be instable in two different ways. First, if the mid-point of the scale slides over time, in which case the inclusion of period dummies would take care of any spurious effects. We include such period dummies even while noting that it is not likely that the scale of the CPI slides over time, since it is bounded between one and ten. Second, if the scale stretches or contracts over time, our estimates would be biased since scores would not be comparable across periods. However, we note that countries at either end of the scale, which we would strongly expect to have stable scores, do stay stable over time. At the high end of the scale, for example, neither Denmark nor Finland has had any corruption cases brought to court during this period. These 'super clean' countries therefore anchor the scale at the high end. At the low end, a country like Kenya, which is known to have had very stable (bad) institutions throughout the period, has had a stable corruption score as well. Even though it may constitute a minor problem that a larger number of poor and highly corrupt countries were gradually included in the CPI since 1995, we take this to mean that countries such as Kenya have approximately constituted an anchor at the low level of the index. We take this as evidence that the 'length' of the CPI scale has not fluctuated or changed substantially.

dependent variable. In addition, we note that the way Freedom House has included violence against journalists has changed over the years while the measures of legal and economic restrictions are readily comparable across all published reports. Due to the structure of our theoretical implications, which suggests that the effects of corruption may depend on press freedom in a non-linear way, we use our measure to break down countries in five quintiles in each of the three periods, where the first quintile consists of the countries with virtually full press freedom, the second quintile of those with few restrictions and thus almost full press freedom, and so on.

Our baseline specification is concluded by entering three variables from the Penn World Tables, Mark 6.3 (Heston et al., 2009). First, we include the logarithm to population size, which is necessary since we measure the absolute number of murders of journalists. While the inclusion of the size of the total population may seem intuitive, we note that we would ideally have included an exogenous measure of the size of the population of journalists. As there are no reliable numbers on the number of active journalists in most countries, the inclusion of population size is a second-best option. Second, we include the logarithm to GDP per capita, as it may both proxy for the acceptability of corruption as well as the average value of whatever corrupt deals that firms would want to keep hidden from public scrutiny. GDP also proxies for bureaucrats' and journalists' wages, i.e., we implicitly assume that they vary with the average income in society. Third, we include the size of government final consumption as a rough proxy for the influence of the government sector in the economy.

In a further set of regressions, we employ additional variables. We first introduce a set of interactions between four of the five quintiles of press freedom, leaving the first quintile as the comparison group. We note that such interactions have to be interpreted carefully and symmetrically, since full effects and standard errors depend on the

covariance of the estimates (Brambor et al., 2006). We next ensure that our findings are not spurious by including the general murder rate. As the World Bank (2010) World Development Indicators, from which we get these data, does not include numbers before 2000, we assume that the general murder rate is roughly stable over our full 17-year period, and place countries in five quintiles according to the average of all observations between 2000 and 2006.

Finally, we include democracy, as a number of studies have associated corruption with democratic institutions (Treisman, 2007). As such, the inclusion of democracy is an alternative way of capturing information freedom. We measure this by Vreeland's (2008) Xpolity index, which is a correction of the standard Polity IV index that takes out indicators of violence that are arguably not associated with political institutions. Xpolity applies a minimalist definition of democracy, including elements of contestability and constraints on the executive. While Xpolity may capture more relevant characteristics of political institutions, such as constraints on the executive as emphasized by Acemoglu and Robinson (2006), it is arguably a less problematic index as is the original Polity IV set (Vreeland, 2008; Cheibub et al., 2010). It also avoids problems associated with maximalist definitions of democracy that tend to include some form of absence of political corruption as the Freedom House (2009) indicator of political rights.

We perform a set of robustness tests in separate tables. First, we include country-level measures of newspaper readership as an alternative measure of effective press freedom. Due to severe data limitations, we observe actual newspaper readership in five quintiles. We separate countries into 'very limited', 'limited', 'median', 'high' and 'very high' newspaper density, based on all available information in the World Bank (2010) database on newspaper circulation. Second, we include a measure of legal

quality, λ, by the indicator provided by the Fraser Institute (Gwartney and Lawson, 2009). While the default estimator is pooled OLS with panel-corrected standard errors (PCSE; Beck and Katz, 1995), we also provide estimates of the central variables with two different choices of standard estimators: a random effects and a fixed effects GLS estimator.

4. Results

4.1. Baseline results

The simple baseline model in Table 3, column 1, shows that corruption is indeed negatively correlated with the numbers of journalist murders. When evaluated in the entire sample, i.e. assuming counter to the model that the effects of corruption are homogenous across levels of press freedom, the estimates suggest that a ten percent increase in corruption is associated with a 2.6% increase in journalist murders. Murders on journalists are also more likely in countries characterized by more religious violence: a ten percent increase in religious murders is associated with approximately a seven percent increase in the murders of journalists. Large countries are more likely to experience murders, although not proportionally so, as a ten percent larger population is only associated with 1.7% more murders. As such, this would be consistent with the fact that a single journalist can do damage regardless of how large the country is, which means that the number of journalists murdered is strongly associated with neither the size of the country, nor the number of active journalists. Conversely, the association with GDP per capita only becomes clearly significant when controlling for press freedom, the general murder rate and democracy – all factors that are themselves associated with GDP. However, this lack of a clear association is consistent with Proposition 3.

Adding four quintiles of press freedom in column 2 reveals another interesting result: we observe almost no murders in countries with the highest levels of freedom of press and in countries with virtually no press freedom, consistent with the simple picture in Figure 2.[7] In the second quintile, press freedom is significant, as it is in the third and fourth quintiles with increasing coefficients. Adding an interaction between corruption and the quintiles of press freedom in column 3 shows support for our theoretical prediction in Proposition 1: corruption is strongly associated with murders when the press is almost free, but not clearly so in any other regime. In other words, when journalists are a threat to corrupt deals and murder is incentive compatible, we observe a clear association between corruption and the journalist murder rate. Within this particular circumstance, the results suggest that the elasticity of murders with respect to the TI corruption index is approximately .6.

The results in column 4 provide a first, basic robustness test by including the general murder rate (in quintiles with the best quintile with the lowest rate as comparison group) and democracy (with the comparison being the lowest levels of democracy). While there are, unsurprisingly, more journalists murdered in countries with higher general murder rates and substantially less in the least democratic countries, the effects of corruption in the second press freedom quintile are unchanged.

We thus find that corruption is strongly associated with the likelihood that journalists are murdered. This association arises in conditions consistent with our

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[7] Indeed, murders that are potentially related to corruption are extremely rare in countries with full press freedom, and only two countries have non-trivial numbers. First, 11 journalists that may have investigated corruption were killed in India in the late 1990s. These killings could nonetheless also have been associated with sectarian violence in the state of Punjab. Second, five journalists were killed in the late 1990s on the US East Coast. All of these murders were connected with Haitian gangs and can therefore be interpreted as 'imported' murders.

theoretical implications. On the one hand, when journalists are either not free to write what they want or when they have full press freedom, we observe no effect. On the other hand, when journalists are sufficiently free to be a threat to corrupt deals, but not so free as to make murder prohibitively costly, we find a strongly positive association.

4.2. Ruling out alternative explanations

In principle, these findings could arise due to other factors correlated with press freedom and corruption, although necessarily in a particular pattern. We therefore have to discuss alternative explanations for the differences in the murder rate of journalists. Some of these are taken care of in Table 4, in which we show the main results of our robustness tests.

With our controls in Table 3, we tested for the general murder rate as well as religiously motivated journalist murders, showing that killings of journalists are related to both. However, neither religious nor 'normal' murder detracts from the effects of corruption on the frequency of journalist killings in a country. Our results are thus not likely to reflect the general level of violence in the country. On the same token, we can rule out that organized crime can account for the killings. If corruption and organized crime are related, the logic seems to point in the same direction: corruption drives organized crime as it drives journalist killings. In addition, although organized crime is by its very nature difficult to measure, it seems widespread in all societies, as the fields in which it can be found, are illegal but attract a lot of demand from ordinary citizens (prostitution, gambling). To maintain its businesses, organized crime in these areas can rarely afford much violence. Furthermore, we would expect organized crime to be much less prevalent in countries with better legal systems and more opportunity to hide such activities. Yet, neither including legal quality nor expanding the specification further

with quintiles for newspaper readership and regional dummies qualitatively affects our central estimates.

It also can be ruled out that institutions other than corruption drive the murder rate exclusively, i.e., that our results are due to a spurious correlation. While estimates in Table 4, column 1, indicate that a stronger legal system is negatively associated with the incidence of journalist murders, its inclusion does not change our main result. We thus also note that the corruption measure from Transparency International does, in fact, measure something else than merely overall institutional quality, as indicated by Knack and Langbein (2010).

Another potential problem occurs since corruption is decreasing in economic development, which might suggest that what we find is simply a reflection of increasing political violence in development (Muller and Weede, 1990). Our results do indeed suggest that economic development *per se*, apart from its beneficial effects on institutions, is associated with more violence. However, our estimates of the importance of corruption remain stable and large, regardless of whether we include or exclude measures of economic development.

Furthermore, we note that the results hold even if we change the estimator (using random or fixed effects), thereby obtaining a priori more conservative estimates. With regional controls, the estimates of the corruption elasticity in the second quintile of press freedom are slightly smaller but still significant at any conventional level. In columns 1, 3 and 4, the full interaction in the second quintile of press freedom remains of roughly the same size, indicating a corruption elasticity of about .5. This is pertinent since all of our estimates could also in principle reflect deeper cultural factors correlated with corruption (cf., Bjørnskov, 2011; Treisman, 2007). Such cultural characteristics are approximately time-invariant within a time horizon such as the one in our study. As

such, they are fully captured by country fixed effects, which we include in Table 4, column 4. Yet, we note that while a number of other estimates turn insignificant, our main result remains quantitatively unchanged and significant at conventional levels. We can therefore rule out the most immediate alternative explanations, which provides some confidence that a significant share of journalist murders in countries with almost full press freedom is due to corrupt deals.

A set of further exercises (not shown) supports that the findings are robust. For example, results remain unchanged when excluding the countries / observations with the highest numbers of murders. Likewise, excluding outliers identified by different procedures yield very similar, and in some cases stronger, results. Similar results are also obtained by excluding single countries (jackknife exercises) and single regions. Even when conditioning on whether or not there were any murders, the point estimate of the corruption elasticity in the second quintile of press freedom is -.435 (standard error .203), which remains significant at conventional levels.[8] Our conclusion from these exercises is that the overall results are as robust as one would like such results to be. Before we therefore proceed to discuss and conclude upon the results, we briefly outline an interpretation of the interaction effects.

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[8] Conditioning on actually observing murders or not amounts to performing a simple sort of Heckman two-stage estimate. We have attempted to estimate our model directly using this procedure, but experienced problems with the relatively small sample – in particular in the subsample that is selected in the first stage (killings or not). As the first-stage identification proved to be rather noisy, we therefore obtained somewhat inflated standard errors in second stage estimates although the point estimates were very similar to those obtained in Tables 3 and 4. The same is the case if we apply a Tobit estimator that explicitly takes care of the left-censoring of our dependent variable, which yields almost unchanged results.

4.3. Effects of changing corruption or changing press freedom?

As stressed by Brambor et al. (2006), interaction terms need to be interpreted symmetrically, at least when one has no clear reason to believe that one of the interacting variables is approximately time-invariant. In other words, we cannot know which is the moderating and which is the moderated variable. This means that one not only has to interpret the effects of corruption at given levels of press freedom, but also effects of press freedom at given levels of corruption. In other words, we next explore the effects of *changing* corruption at different levels of press freedom, and effects of changing press freedom at different levels of corruption.

Figure 3 first illustrates the interaction with press freedom as the mediating factor, i.e., the effect of changing corruption. The mid-point of each column represents the point estimate of the corruption elasticity of murders in a given quintile of press freedom (the x-axis) while the length of the columns are ±2 standard errors, i.e. the 95% confidence interval. As can clearly be seen, the elasticity of corruption at the second quintile of press freedom is about .5, and surrounded by a relatively narrow confidence interval. Hence, the estimates indicate that changes in corruption with almost full press freedom are strongly associated with changes in the incidence murders.

However, the estimates can also be read to reflect the opposite situation in which we assess the effect of changing press freedom. We first note that even though we report a set of static estimates, this exercise still makes sense, as the fixed effects estimates in Table 4 correspond to a dynamic assessment. It must also be stressed that one cannot directly interpret the interactions in the tables since the coefficients and standard errors of press freedom are relative to the best quintile and evaluated at a score on the TI corruption index of one (i.e. a logarithm of zero).

When assessing the changes, again using the delta method to get conditional standard errors, we find that evaluated at the average level of corruption, the estimates show that only a change into the best quintile of press freedom, i.e. regimes with full freedom, is associated with a significant decline in murders. This finding is robust to being evaluated at quintile specific means or medians. We moreover find no significant changes when moving between the fifth and second quintiles.

Yet, this does not imply that changes in press freedom are without significant before a country moves into the best category. The estimates suggest that when the TI index is above an approximate level of six – roughly the level of Malta or Estonia in the early 2000s – the decline resulting from increases in press freedom are more likely to occur when moving into the second category. In other words, the results indicate that the problem of journalist murders tends to fade away at slightly lower levels of press freedom in countries with less corruption problems. On the other hand, for highly corrupt countries, improving press freedom thus seems to have a non-linear effect, as the almost free status represents a 'hurdle' to overcome at which journalists become a real threat to corrupt deals. This result is in line with Muller and Weede (1990) and another line of literature documenting that countries' level of political violence tends to increase during the development process, although the richest countries tend to be the quite peaceful.

As such, what these relatively simple illustrations of the interaction terms suggest is that the main mechanism behind our findings is that of increases in corruption leading to more murders within the second quintile of press freedom while changes in press freedom seem to have more complex consequences. With these final insights, we turn to the conclusions.

5. Conclusions

This paper begins by providing entirely anecdotal evidence that a number of journalists in recent years have been murdered as they tried to report on corruption. This type of murderous behavior can easily be economically rationalized as a way to enforce corrupt deals. Put as simply as possible, corrupt firms and people give bureaucrats and journalists the colloquial 'offer you can't refuse': if you try to tell anyone about our deals, we will kill you.

In a relatively simple game-theoretical model, we sketch under which conditions such threats are credible and incentive compatible. While income and legal quality are ambiguous determinants, murders seem much more likely when there are a sufficient number of journalists available who are free (and willing) to write about corruption. In countries with full press freedom, legal quality will tend to drive the risk of getting caught to such levels that make murders incentive incompatible, and the general supply of journalists willing and able to write about corruption is so great that murder will be too costly – you simply can't kill them all. In countries with little press freedom, on the other hand, bureaucrats are not likely to be able to find a willing journalist and are therefore not likely to blow the whistle in the first place.

A set of panel data estimates shows substantial support for our simple theory. We find that corruption is strongly associated with how many journalists are murdered, but only in countries with almost full press freedom. Such countries both include, on the one hand, low-corruption countries such as Botswana and Chile in recent years, in which no journalists were murdered, as well as countries with severe corruption problems such as India and the Philippines on the other hand, in which life is rather dangerous for investigative journalists.

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While our results provide evidence that journalists are killed for corrupt reasons, they also hold more sinister implications in the medium term. Taking the findings at face value seems to suggest that some countries may have to go through violent periods when seeking to secure full freedom for the press. This result confirms earlier studies in the fields of political science and sociology suggesting that development is associated with increasing violence in general. In particular, expanding press freedom in relatively corrupt societies entails a substantial threat to those engaged in corrupt deals, which according to the present theory and empirical findings would tend to lead to escalating violence against journalists. Yet, the only clear example in our data is the Philippines, in which a move towards clearly improved press freedom in the early 1990s was accompanied by an increase in journalist murders from four in the first half of the decade to 14 in the last half and 26 in the first half of the 2000s. This implication, then, should not be exaggerated as very few examples exist, and the dynamics implied by our estimates are complex. Instead, one may want to think of our estimates as evidence of long-run equilibrium relations between corruption and murders that only react slowly when institutional characteristics related to press freedom change.

What we are left with is evidence of a consequence of corruption that has so far been ignored in the literature. However, freedom of the press and, at a broader level, freedom of information, is of potential importance for the quality of democracy. We end the paper by noting that if corrupt forces, merely by using brute force, can thwart such key features of political institutions, further study seems useful.

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Table 1. Examples of murders on journalist

Name	Country	Year	Media / interest	Method
Guiseppe Alfano	Italy	1993	Newspaper (La Sicilia), uncovering growing mafia influence	Shot by sniper in his car 100 yards from his home
Muhammad Sayuti Bochari	Indonesia	1997	Newspaper (Pos Makasar), government corruption and embezzlement	Found on the side of the road with severe wounds to the head and neck
Carlos Cardoso	Mozambique	2000	Fax newsletter (Metical), political corruption and organized crime	Two cars cut off Cardoso's car, sprayed it with AK-47 assault rifles
Zezinho Cazuza	Brazil	2000	Radio (Radio Xingo FM), accusing local mayor of corruption and malfeasance	Shotgunned after leaving party
Veronica Guerin	Ireland	1996	Newspaper (Sunday Independent), investigating growing power and corruption in Dublin's underground	Shot in her car by two motorcyclists at stoplight
Marlene Garcia Esperat	Philippines	2005	Newspaper (Midland Review), uncovering government corruption	Killer entered her home, said "Good evening, ma'am", and shot her
Igor Grushetsky	Ukraine	1996	Newspaper (Ukraine-Centre), had just testified in criminal case against son of a high-ranking police official	Found shot near his home
Raul Gibb Guerrero	Mexico	2005	Owner of regional daily, drug cartels and corruption networks	Shot in the street
Rohana Kumara	Sri Lanka	1999	Newspaper (Satana), running series on corruption among government officials, including a presidential adviser	Shot on road leading to his home
Jose Emeterio Rivas	Colombia	2003	Radio (Radio Calor Estero), accusing mayor of corruption and links to paramilitary organization	Found shot on the road

Table 2. Descriptive statistics

Name	Mean	Standard deviation	No. observations
Log murders	.311	.658	533
Log religious murder	.036	.236	533
Log population size	8.779	1.843	537
Government size	19.947	10.851	534
Log GDP per capita	8.647	1.206	533
Log corruption	1.344	.518	336
Press freedom, second quintile	.210	.408	538
Press freedom, third quintile	.175	.380	538
Press freedom, fourth quintile	.208	.406	538
Press freedom, fifth quintile	.284	.452	538
First quintile murder	.224	.417	540
Second quintile murder	.194	.396	540
Third quintile murder	.206	.404	540
Fourth quintile murder	.194	.396	540
First quintile democracy	.211	.408	540
Second quintile democracy	.191	.393	540
Third quintile democracy	.179	.384	540
Fourth quintile democracy	.185	.389	540
Legal quality	5.843	1.806	378
First quintile readership	.169	.375	534
Second quintile readership	.157	.364	534
Third quintile readership	.179	.384	534
Fourth quintile readership	.179	.384	534

Table 3. Main results

	1	2	3	4
Log religious murder	.751***	.767***	.762***	.702***
	(.268)	(.270)	(.268)	(.260)
Log population size	.171***	.166***	.165***	.162***
	(.025)	(.024)	(.023)	(.022)
Government size	.006*	.005*	.005	.003
	(.003)	(.003)	(.003)	(.003)
Log GDP per capita	.043	.057	.074*	.129***
	(.041)	(.043)	(.044)	(.049)
Log corruption	-.264***	-.188**	-.039	-.025
	(.087)	(.095)	(.142)	(.170)
Press freedom, second quintile		.182**	1.084***	1.074***
		(.072)	(.371)	(.396)
Press freedom, third quintile		.268**	.365	.440
		(.111)	(.397)	(.438)
Press freedom, fourth quintile		.368***	.523	.631
		(.141)	(.364)	(.401)
Press freedom, fifth quintile		.034	.131	.449
		(.100)	(.346)	(.406)
Second quintile * log corruption			-.539***	-.548***
			(.189)	(.203)
Third quintile * log corruption			.041	-.034
			(.262)	(.276)
Fourth quintile * log corruption			.017	-.022
			(.253)	(.265)
Fifth quintile * log corruption			.057	.008
			(.201)	(.228)
First quintile murder				.390***
				(.096)
Second quintile murder				.212**
				(.097)
Third quintile murder				.269***
				(.078)
Fourth quintile murder				.097
				(.069)
First quintile democracy				.348**
				(.148)
Second quintile democracy				.407***
				(.149)
Third quintile democracy				.382***
				(.125)
Fourth quintile democracy				.234**
				(.095)
Observations	335	335	335	335
Countries	179	179	179	.179
R squared	.293	.323	.348	.411
Wald Chi Squared	94.59	104.52	112.90	135.42

Note: standard errors in parentheses; *** (**) [*] denotes significance at p<.01 (p<.05) [p<.10].

Table 4. Robustness tests

Estimator	1 PCSE	2 PCSE	3 RE	4 FE
		Full baseline included		
Log corruption	.243	.014	.014	.267
	(.242)	(.169)	(.196)	(.239)
Press freedom, second quintile	1.413***	.913**	.999**	1.173**
	(.504)	(.359)	(.420)	(.507)
Press freedom, third quintile	.530	.264	.503	.998*
	(.534)	(.413)	(.452)	(.572)
Press freedom, fourth quintile	1.033**	.598	.547	.563
	(.512)	(.381)	(.417)	(.502)
Press freedom, fifth quintile	.575	.435	.396	.756
	(.517)	(.395)	(.434)	(.594)
Second quintile * log corruption	-.723***	-.451**	-.511**	-.607**
	(.255)	(.189)	(.225)	(.268)
Third quintile * log corruption	-.037	.061	-.086	-.374
	(.321)	(.266)	(.281)	(.351)
Fourth quintile * log corruption	-.292	-.051	-.065	-.225
	(.316)	(.264)	(.258)	(.348)
Fifth quintile * log corruption	-.094	-.020	.030	-.235
	(.273)	(.242)	(.257)	(.400)
Legal quality	-.099**			
	(.041)			
Observations	335	333	335	335
Countries	179	177	179	.179
R squared	.472	465	.405	.180
Wald Chi Squared	152.27	189.07	146.90	1.05

Note: standard errors in parentheses; *** (**) [*] denotes significance at p<.01 (p<.05) [p<.10]. A Hausmann test for fixed effects versus random effects is insignificant; Chi squared (20) = 19.37; p<..498. Column 2 includes newspaper readership quintiles and regional dummies (Asia, Latin America and the Caribbean, the Middle East and North Africa, the postcommunist region, and Sub-Saharan Africa). PCSE refers to pooled OLS with panel-corrected standard errors; RE to random effects GLS; and FE to fixed effects GLS.

Figure 1. The game tree

Π – S, w   *Don't offer*

Offer bribe

Reject bribe

Accept bribe

Keep quiet   *Blow whistle*

Get caught   *Get away*

Π, w - M

Π – F-B, w_{out} - N Π - B, w + B - N

Accept   *Kill*

Π – F, w

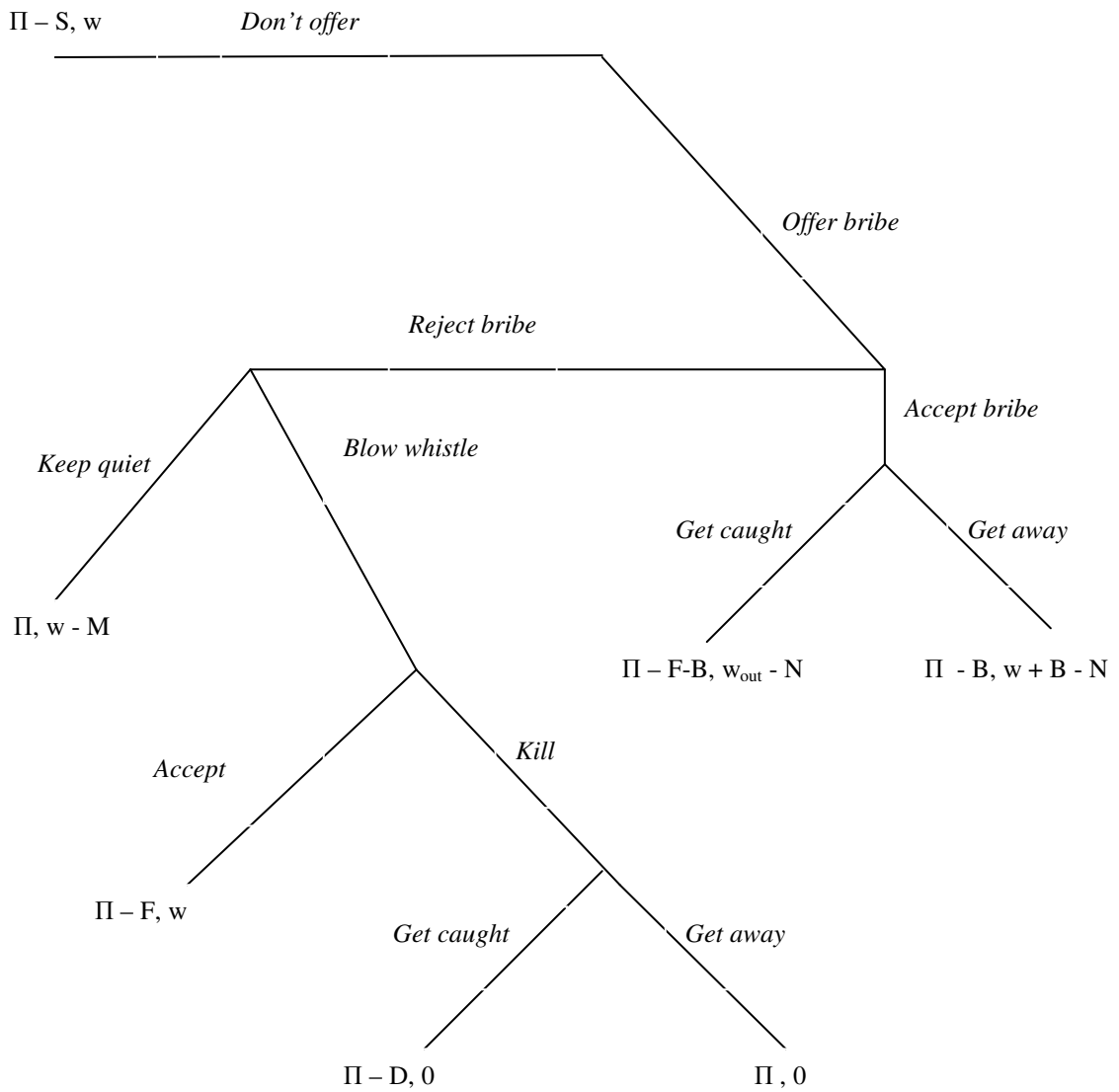*Get caught*   *Get away*

Π – D, 0 Π , 0

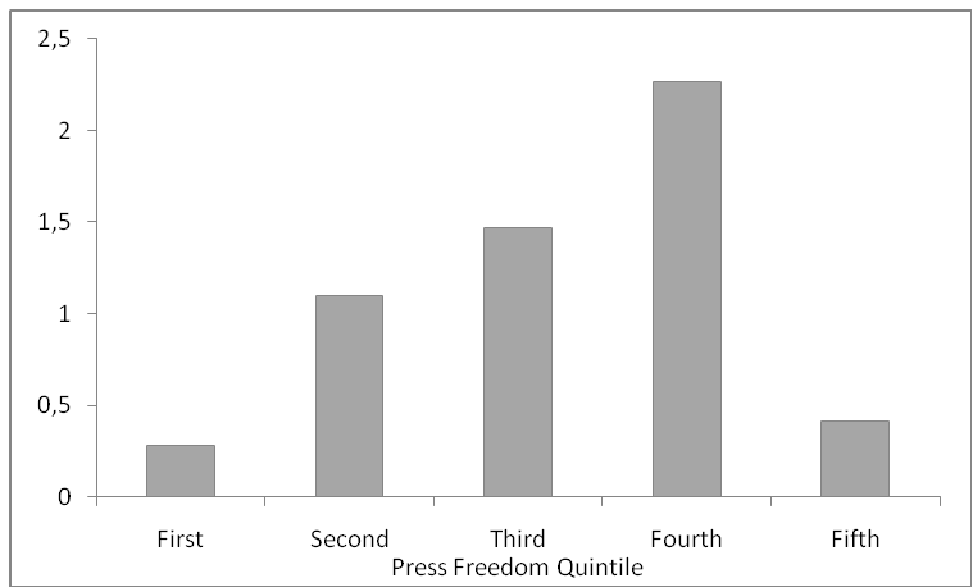Figure 2. Frequency of journalist murders, five press freedom quintiles

Figure 3. Corruption elasticity at five quintiles of press freedom