A Clean and Discreet Service: The Role of Corruption and Secrecy in Profit Shifting by Multinational Firms

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Abstract: We investigate the importance of corruption in shaping the profit-shifting behaviour of multinational firms. Using country-level panel data, we find a significant and positive correlation between corruption and profit shifting. Our findings are consistent with several theoretical arguments predicting that corruption may both facilitate and provide an incentive to firm behaviour that deprives poorer countries of much needed tax revenues. Our findings are robust across a number of corruption and profit shifting measures, as well as to an instrumental variable approach that controls for the potential endogeneity between profit shifting and corruption. Our findings also indicate a negative and significant relationship between financial secrecy and outward profit shifting. We conclude that corruption and financial secrecy undermine global efforts to tackle profit shifting by multinational firms.

Keywords: taxation, profit shifting, corruption, secrecy, multinational corporations (MNCs) and enterprises (MNEs)

1. Introduction

International corporate tax avoidance has been prominent in public debate and has attracted increasing attention from policymakers and academics. Globalisation and business mobility have facilitated the growth of aggressive cross-border tax planning by multinational firms (Clausing, 2016). Multinational firms artificially shift their profits from high-tax countries to low-tax countries through transfer pricing (Clausing, 2003; Davies *et al*., 2018; De Simone *et al*., 2019), intra-firm debt (Desai *et al*., 2004; Mills and Newberry, 2004; Huizinga *et al*., 2008; Fuest *et al*., 2011; Büttner *et al*., 2012) and locating intellectual property assets in low-tax countries (Dischinger and Riedel, 2011; Karkinsky and Riedel, 2012; Griffith *et al*., 2014; Dudar and Voget, 2016). Despite extensive literature on profit shifting, its relationship with corruption is not well understood.

Corruption adversely affects economies, as it hinders growth and investment (Mauro, 1995; Johnson *et al*., 2011; Alm *et al*., 2016), undermines trust in governments (Seligson, 2002; Morris and Klesner, 2010), and increases poverty and inequality (Gupta, Davoodi *et al*., 2002; Apergis *et al*., 2010). Moreover, corruption facilitates tax evasion by allowing firms to exist in the shadows (Johnson *et al*., 1997; Dreher and Schneider, 2010; Goel and Saunoris, 2014). In the context of international business, corruption also has a negative impact on foreign direct investment (FDI) (Wei, 2000; Habib and Zurawicki, 2002; Egger and Winner, 2005; Cuervo-Cazurra, 2006; Hakkala *et al*., 2008; Cole *et al*., 2009; Morrissey and Udomkerdmongkol, 2012; Ledyaeva *et al*., 2013). We argue that the same fear of increased costs and uncertainty, which explains the observed negative impact of corruption on FDI, is a plausible mechanism that links corruption and profit shifting. Through this mechanism, we also argue that corruption could operate on both outward and inward profit shifting, encouraging the former and discouraging the latter.

Addressing corruption and profit shifting is vital for improving corporate tax revenue collections, especially in developing countries. It is estimated that OECD and G20 countries lost between 4%–10% of their corporate tax revenues to profit shifting in 2014, which corresponds to $100–$240 billion (Johansson *et al*., 2017). In addition, Torslov *et al*. (2018) estimate that 40% of the profits of multinational firms in OECD and main developing countries were artificially shifted to tax havens in 2015, which corresponds to $600 billion. Crivelli *et al*., (2015) estimate the annual global revenue losses of tax avoidance by multinational firms to be $650 billion, and Cobham and Janský (2018) estimate the losses to be in the region of $500 billion. Janský and Palanský (2019) estimate that $665 billion of corporate profits were shifted by multinational firms in 2016, which corresponds to $194 billion in revenue losses. Further, Damgaard *et al.* (2019) find that 40% of the global FDI is phantom—that is, investments in corporate shells that have no links to local economies where they are sited. In a review of US multinational firms Cobham and Janský (2019) find that the misalignment between the locations where profits are reported and the location of actual economic activities is estimated to be $660 billion in 2012. More recently, Garcia-Bernardo, and Janský (2021) estimate that multinational firms shifted $1 trillion of corporate profits to tax havens in 2016, which correspond to $200–300 billion in revenue losses. In 2016, the Official Development Assistance (ODA) flows to developing countries reached a peak of $142.6 billion (OECD, 2017), considerably less than revenue losses related to profit shifting. Addressing tax avoidance by multinationals is clearly important in terms of expanding a developing country's tax base and reducing aid dependency.

Using country-level panel data for the period 2009–2017, we find evidence consistent with the theory that corruption encourages and facilitates outward profit shifting by multinational firms. Our findings are robust to alternative measures of corruption and to an instrumental variable

approach that controls for the possible endogeneity between tax avoidance and corruption. For additional robustness checks, we test all the available country-level estimates of profit shifting in our base model. Our findings are robust to several methods of measuring these secretive behaviours and to differences in sample size and composition

A final contribution of this paper is its investigation of the relationship between financial secrecy and profit shifting. It is true that multinational firms shift their profits to tax havens because of favourable tax regimes (Dharmapala, 2008; Zucman, 2014; Cobham and Janský, 2019). However, the lack of transparency in tax havens is what makes the arrangements between them and multinational firms possible and sustainable (Cobham *et al*., 2015). This is evidenced by the Panama Papers and Luxleaks, which revealed almost zero tax secret agreements with large multinational firms. Previous studies utilised binary variables of haven and non-haven countries in their models to examine the behaviour of profit shifting. In this paper, we use a financial secrecy index developed by the Tax Justice Network (TJN). We find a negative correlation between the degree of secrecy and outward profit shifting. However, this correlation becomes insignificant in some of our robustness checks.

To the best of our knowledge, our paper is the first to address the relationship between corruption on one hand, and both outward and inward profit shifting on the other using country-level data. In other words, it examines the link between corruption and being a winner or loser country of profit shifting. Unlike previous studies, which focus on governance issues or provide a partial view for a few European countries (Marchini *et al*., 2019; Bilicka and Seidel, 2020, respectively), our approach is to explicitly consider the relationship between corruption and profit shifting across the globe. The utilisation of country-level data increases comparability across countries, including developing countries. This is key to estimating the association between corruption and profit shifting in developing and low-income countries, which have

received little attention. This could help in achieving one of the goals of the United Nations' (UN) 2030 Agenda for Sustainable Development: "Strengthen domestic resource mobilisation, including through international support to developing countries, to improve domestic capacity for tax and other revenue collection" (UN, 2015, p.26). Further, our paper is the first to use a financial secrecy index to study the behaviour of profit shifting and shift the focus from the tax rate aspect of tax havens to that of financial secrecy.

Our findings have several implications. First, governments may need to consider corruption among other factors that amplify profit shifting and foster an environment with low tax compliance. Tax policies, such as the current global race to the bottom, can generate little or no increase in tax revenues in the presence of poor governance. Second, ensuring the protection of multinational firms' profits can reduce the incentives of profit shifting and attract foreign profits and capital, consequently fostering growth in tax revenues. Third, international efforts aimed at curbing profit shifting, such as the OECD's Base Erosion and Profit Shifting plan (BEPS), should be accompanied with efforts to fight corruption to accomplish their goals. In addition, the lack of transparency in tax rulings related to tax preferential regimes could reduce the costs of profit shifting and raise concerns about tax avoidance. As a result, we believe that international cooperation in terms of information exchange with foreign tax authorities can support tax reforms to tackle profit shifting, and ensure fair international corporate taxation.

This paper is organized as follows: Section 2 reviews the background and related literature, Section 3 describes our data and approach, and Section 4 reports the results regarding the relationship between profit shifting and corruption, and the implications for those results when financial secrecy is added to our model. Lastly, Section 5 offers our conclusions and discuss the implications of our findings.

2. Background and related literature

Profit shifting disconnects the location of reported profits from the location of economic activities that generate those profits. Multinational firms artificially shift their profits from high-tax countries to low-tax countries through a number of channels. These multinational firms manipulate transfer prices for their intra-firm transactions (Clausing, 2003; Davies *et al*., 2018; De Simone *et al*., 2019). In particular, these firms reduce pre-tax profits in high-tax countries by overstating the prices of goods and services imported and understating the prices of goods and services exported. Some studies have reported that multinational firms may use thin capitalisation approaches applying intra-firm high-yielding subordinated debt to artificially reduce profits in high-tax countries. As a result, deductible quasi-interest payments will reduce the taxable income of a subsidiary, whereas the interest receipts by another subsidiary located in the low-tax country will be taxed at a low or zero tax rate (Desai *et al*., 2004; Mills and Newberry, 2004; Huizinga *et al*., 2008; Fuest *et al*., 2011; Büttner *et al*., 2012). Further, multinational firms may choose to locate intellectual property assets (e.g., patents, technical knowledge and know-how, licensing agreements, etc.) to low-tax countries. Studies by Dischinger and Riedel (2011), Karkinsky and Riedel (2012), Griffith *et al*. (2014) and Dudar and Voget (2016) have identified the extent to which subsidiaries in high-tax jurisdictions pay royalties, licence fees, and allocate management services costs to subsidiaries in countries where such income is taxed at a low tax or zero rate.

Despite the extent of the reported literature on profit shifting, little is known regarding its relationship with corruption. We use the World Bank's definition of corruption: "the abuse of public or corporate office for private gain" (Bhargava, 2005, p.1). There are only two recent studies in the literature that link corruption to profit shifting. The first is the work by Marchini *et al*. (2019), who find that tax-motivated inward profit-shifting from parent companies to

subsidiaries is significantly influenced by the level of corruption in the countries where the subsidiaries are located. They suggest that corruption at the country level can influence the opportunistic and unethical behaviour of managers. Consequently, managers in parent firms are reluctant to shift profits to corrupt countries. Second, Bilicka and Seidel (2020) find that tax-motivated outward profit shifting is significantly influenced by the level of corruption in host countries. They suggest that bribing a corrupt tax official reduces the high costs associated with auditing the complex structures of aggressive tax planning and therefore reduces the costs of profit shifting.

The empirical literature documents a negative relationship between corruption and FDI (Wei, 2000; Habib and Zurawicki, 2002; Egger and Winner, 2005; Cuervo-Cazurra, 2006; Hakkala *et al*.; Cole *et al*., 2009; Morrissey and Udomkerdmongkol, 2012; Ledyaeva *et al*., 2013). Specifically, corruption implies additional taxes in the firm of bribes (Cuervo-Cazurra, 2006; Fisman and Svensson, 2007; Hakkala *et al*., 2008), increases risks of expropriation (Fuest and Riedel, 2010; Kesternich and Schnitzer, 2010; Hebous and Lipatov, 2014) and reduces stability in the business environment (Marchini *et al*., 2019). Corruption is also problematic and difficult to manage, especially for investors from countries with less corruption (Habib and Zurawicki, 2002; Ledyaeva *et al*., 2013). Moreover, because corruption is a product of discretion, paying bribes does not insulate firms from future blackmailing (Wei, 2000; Hebous and Lipatov, 2014). Corrupt tax officials can also threaten firms to increase auditing costs if they do not cooperate with them (Bilicka and Seidel, 2020).

From the discussion above, we expect the demand for bribes to increase with an increase in firms' reported profits. Thus, multinational firms may conceal portions of profits generated in corrupt countries through legitimate profit shifting channels to avoid risks of bribes, uncertainties and blackmailing. A preferable destination for the shifted profits would be a

country with a low level of corruption. Unlike Marchini *et al*., (2019) and Bilicka and Seidel (2020), who focus on inward profit shifting and outward profit shifting, respectively, we argue that corruption could operate on both inward and outward profit shifting through this mechanism. That is, it discourages the former and encourages the latter. It is also worth noting that the studies by Marchini *et al*. (2019) and Bilicka and Seidel (2020) focus only on the activities of European multinational firms in European countries. As a result, their findings may not be applicable to other countries.

Our argument is supported by the study by Dharmapala and Hines (2009), who analyse tax havens characteristics. They find that tax havens score highly in governance quality measures. They explain that only countries with strong governance can commit to offering low tax rates to foreign investors and protecting them against expropriations. Although Dharmapala and Hines (2009) do not address profit shifting, they focus on tax havens, which are central to profit shifting activities. Similarly, Sugathan and George (2015) find that improving property rights protection and contract enforcement in foreign countries increases the opportunities for inward profit shifting from India using panel data on foreign multinational firms operating in India for the period from 2001 to 2010. These findings relate closely to our argument since corrupt countries are characterised by poor protection of foreign investments. However, they are based on the activities of foreign multinational firms operating in India, which could limit the generalisability of their findings to other contexts.

As with inward profit shifting, we expect corruption to operate on outward shifting. That is multinational firms that operate in corrupt countries are motivated to conceal portions of their profits and shift them to less corrupt countries. Using panel data on German multinational firms for the period from 1996 to 2008, Hebous and Lipatov (2014) find a positive correlation between operating in excessive corrupt countries and investments in tax havens. We expect

that profits can resemble investments in this context, as multinational firms are motivated to place them in countries with low levels of corruption but not necessarily only in tax havens. Johannesen *et al*., (2016) find that international tax differentials have a greater impact on reported profits by multinational firms in countries with low levels of economic and institutional development using global firm-level data for the period 2003–2012. These findings are also consistent with our argument, as corruption is more prevalent in less-developed countries.

Taken together, there is evidence to suggest that corruption provides an incentive for outward profit shifting to escape bribes, increased costs and uncertainties. However, the argument presented above suggests that strong governance at the country level attracts inward profit shifting. Building on these theoretical and empirical foundations, we contribute to the profit-shifting literature by utilising several country-level datasets to show that countries that perform better on anti-corruption metrics are the "winners" from multinational tax avoidance behaviours. While previous studies provide only a partial view of the impact of corruption on profit shifting for a limited number of countries, we show how corruption operates on both inward and outward profit shifting across the globe. We do not claim that country-level data are better than firm-level data in terms of profit shifting analysis. However, the former is more comprehensive in its coverage, as indicated by the OECD (2015), which helps us to understand a global issue such as profit shifting.

3. Data and estimation approach

3.1 Data

3.1.1 Measuring profit shifting

Our main source of country-level estimates of profit shifting comes from a database constructed by researchers at the International Monetary Fund (IMF), which estimates a country's exposure

to tax avoidance opportunities by channelling FDI through low-tax countries for the period 2009–2017 (Damgaard *et al*., 2019). This is the largest database that provides country-level estimates of exposure to tax avoidance by multinational firms. Damgaard *et al*. (2019) differentiate between real FDI in host economies and phantom FDI - investments in shell firms that have no actual links to host economies. The authors' definition of a phantom firm matches that of a special purpose vehicle (SPV) because of the lack of economic significance and links to local economies: "a registered legal entity subject to national law that satisfies several criteria: it has few or no employees; it has little or no production in the host economy; it has little or no physical presence; its ultimate owners are foreign residents; its assets and liabilities are mostly vis-à-vis non-residents; and its core business consists of group financing or holding activities" (Damgaard *et al*., 2019, p.6). The main data sources for this database are the IMF's Coordinated Direct Investment Survey (CDIS) and the OECD's FDI statistics.

Damgaard *et al*. (2019) estimate the exposure to tax avoidance for countries that are the homes of ultimate investors of phantom FDIs—i.e., investments in foreign SPVs. In particular, they estimate the share of outward FDI where the recipient is a foreign phantom firm - i.e., a foreign SPV - in two steps. The first step is to decompose inward FDIs into real and phantom FDIs. To this end, they rely on the data of inward FDI into phantom firms that are reported by the country of destination. A number of countries report a breakdown of their inward FDI into SPVs (phantom) and non-SPVs (real). For these countries, the authors use this information directly. There is a significant and negative correlation within the subset of reporting host countries between the ratio of real to total FDI and the ratio of total FDI to GDP. For example, Sweden's total FDI accounts for only 0.7% of its GDP, and the ratio of its real FDI to total FDI is 95%. By contrast, Luxembourg's total FDI is 60 times its GDP, and the ratio of its real FDI to total FDI is less than 5% (Damgaard *et al*., 2019). The explanation for such a negative correlation,

as explained by Damgaard *et al*. (2019), is that there are no economic bounds on investments into shell firms that have no actual links to local economies. In contrast, the capacity for an economy to absorb real investments is limited. Thus, abnormal FDI positions relative to the sizes of host economies can indicate large shares of phantom FDI.

Damgaard *et al*. (2019) estimate the correlation between the ratio of real FDI to total FDI and the ratio of total FDI to GDP for the countries that report a breakdown of their inward FDI into phantom and real using the following model:

$$\log(\frac{Real\ FDI_{it}}{Total\ FDI_{it}}) = \alpha + \beta \log(\frac{Total\ FDI_{it}}{GDP_{it}}) + \epsilon_{it}$$

Where $Real\ FDI_{it}$ is inward FDI in non-SPVs in country *i* in year *t*, $Total\ FDI_{it}$ is all the inward FDI in country *i* in year *t*, GDP_{it} is the Gross Domestic Product in country i in year t and and ε_{it} is an error term of the standard type. The authors find that an increase in the ratio of *Total FDI* to *GDP* by 1% reduces the ratio of *Real FDI* to *Total FDI* by 5%. They then use the coefficient estimated from the model above to estimate the ratio of real FDI to total FDI for all the countries that do not report a breakdown of their inward FDI into phantom and real.

In the second step, Damgaard *et al*. (2019) estimate the share of outward FDI where the receipt is a foreign phantom firm using the estimates of inward FDI into phantom firms explained above. For that purpose, they assume that the share of inward FDI into phantom firms for a given country applies to all counterpart countries' outward FDI to that given country. For example, when Luxembourg reports that 95% of its inward FDI in 2019 is phantom FDI, this share applies to Canada's (and any other country's) outward FDI to Luxembourg in the same year. In this paper, we employ the exposure to tax avoidance through outward FDI using the

dependent variable *Phantom FDI*, which reflects the share of outward FDI where the recipient is a foreign phantom firm.

3.1.2 Measuring corruption

Our main measure of corruption is the Worldwide Governance Indicators (WGI)'s control of corruption variable (*Control of corruption*). *Control of corruption* ranges from -2.5 (very corrupt) to 2.5 (very clean). We also use Transparency International's (TI) Corruption Perception Index (*CPI*) as an alternative measure of corruption. *CPI* ranks countries by their perceived level of corruption using a scale from 0 (very corrupt) to 100 (very clean). As *CPI* is comparable only on a year-to-year basis after 2012, we have a smaller sample size available when using this metric of corruption.

A number of researchers, such as Svensson (2003), Reinikka and Svensson (2006), Treisman (2007), and Fan, Lin and Treisman (2009) argue that perceptions-based measures of corruption can suffer from perception biases. Razafindrakoto and Roubaud (2010) suggest that experts' evaluations of corruption in Sub-Saharan Africa are influenced by cultural and ideological biases. In contrast, experience-based measures of corruption are based on "hard evidence" (Svensson, 2005), and "place a greater emphasis on experience and less on perceptions" (Knack 2007, p. 257). However, unlike our perceptions-based measures, the countries covered by experience-based measures are very unevenly represented in the sample period, which results in very unbalanced panel data. Additionally, perceptions-based measures, especially the TI's CPI, are easier to access in a user-friendly way and receive a lot of media attention. Thus, they are more likely to be the data on corruption that influences the decisions of foreign investors (Gillanders and Parviainen, 2018).

3.1.3 Controls

We control for statutory tax rates (*Statutory tax rates*) as multinational firms shift profits across countries to exploit tax rate differences and minimise their overall tax bills. Profit shifting incentives are driven more by effective tax rates than by statutory tax rates because the former account for interest deductions, tax holidays, and any special investment allowances (Abbas and Klemm, 2013). However, the data on effective tax rates are not available on an annual basis for a large number of countries. Additionally, Dharmapala (2014) argues that effective tax rates can be endogenous to profit shifting choices, such as the use of intra-firm debt, as they reflect interest deductions. We use data on corporate statutory tax rates published by the accounting firms KPMG, Deloitte, and PwC. We also control for trade openness (*Openness*) because certain economies are more open than others, which makes it easier to shift profits. We construct the indicator of openness as the sum of exports and imports divided by GDP using data derived from the World Bank's development indicators.

Financial development plays a major role in profit shifting as sophisticated financial providers—including commercial and investment banks as well as insurance firms—design complex financial instruments that help multinational firms channel financial flows in the most tax-efficient manner (Volckaert, 2016). In addition, international financial flows through SPVs (which determine our main dependent variable) are highly influenced by financial development (Galstyan *et al*., 2019). We control for financial development (*Financial development*) using the IMF's financial development index. We control for the natural resource rent (*Natural resources*), as certain countries can appear to have excessive investments and profits that are not aligned with the related economic activities because foreign investments in natural resources tend to be profitable (Torslov *et al*., 2018; Cobham and Janský, 2019; Garcia-

Bernardo and Janský, 2021). For this purpose, we use World Bank's data for natural resource rent.

"Paper profits" that are shifted by multinational firms, as explained by Damgaard *et al*. (2019), have no substance or actual links to host economies and are less influenced by macro variables such as GDP. Additionally, GDP can be inherently distorted by profit shifting activities, which makes it difficult to treat it as an exogenous variable (OECD, 2015; Torslov, Wier, and Zucman, 2022). Moreover, GDP is used in constructing the main dependent variable, *Phantom FD,I* as explained in Section 3.1.1. However, for transparency and to disentangle the effect of corruption on profit shifting from that of the level of income and economic development, we include gross national income (GNI) per capita in our model using the World Bank's data. Including GNI per capita in the specifications where GDP or GNI is used to construct the dependent variables might result in a mechanical relationship, which can affect the accuracy of the findings. As a result, we also show the findings when GNI per capita is excluded from the regressions in Tables 2, 3 and 6 in which GDP or GNI is used to construct their dependent variables.

3.1.4 Summary statistics

Our sample yields an unbalanced panel data of all countries in the world that have FDI of over $100,000,000 for the period 2009–2017. Table 1 presents the summary statistics of the main variables of interest. The variation in our dependent variable, *Phantom FDI*, is large. On average, 24.27% of global outward FDI is phantom FDI. The Democratic Republic of the Congo had the largest share of phantom outward FDI, accounting for 97.01% of its total outward FDI in 2015. The Democratic Republic of the Congo scores below the sample average in both corruption measures (higher values indicate less corruption). Similarly, there is

considerable variation in perceived corruption across the countries in our sample. Denmark has the best *CC* score, with an average of 2.32 for the period 2009–2017. It also has the best *CPI* score, with an average of 90.33 for the period 2012–2017. By contrast, Equatorial Guinea has the worst *CC* score, with an average of -1.63 for the period 2009–2017.

("Table 1 goes about here")

3.2 Approach

We investigate the relationship between corruption and the estimated exposure to tax avoidance by multinational firms using the following pooled OLS model with regional and time-fixed effects:

$$Phantom\ FDI_{it} = \beta_0 + \beta_1 Corruption_{it} + \beta x_{it} + \varepsilon_{it}$$

where $Phantom\ FDI_{it}$ is the share of outward FDI that is received by foreign phantom firms in country *i* and time *t*. β_0 is the intercept term, $Corruption_{it}$ is an indicator of perceived corruption, x_{it} is a vector of controls, and ε_{it} is an error term of the standard type. The time invariance of corruption over the short time dimension available to us leaves little variation to be explored if we employ country fixed effects. We therefore follow Janský and Palanský (2019) and include regional fixed effects, as some regions share common histories and cultural characteristics that may significantly influence both our dependent and explanatory variables. The regional fixed effects are based on the World Bank's classification.

It is plausible that being exposed to profit shifting may increase the level of corruption and secrecy, not the other way around. Governments that are constrained by weak revenue mobilisation lack the capability to have effective resources to combat corruption and monitor

public officials. To address this issue, we employ an instrumental variable (IV) approach. Following seminal studies such as Hall and Jones (1999), Acemoglu *et al*. (2001), and Rodrik *et al*. (2004), we use distance from the equator (*Latitude*) as an instrument for governance quality. The idea is that in tropical areas, the extent to which extractive colonial institutions developed, and persisted is influenced by the disease burden. The identification assumption is that distance from the equator does not have a direct impact on our dependent variable, and it is only related to the outcome through its impact on corruption. However, this instrument appears to be weak in certain smaller datasets with narrower geographical coverage that are used subsequently for robustness checks, as it is not significantly correlated with corruption, or the first-stage F-statistic for the excluded instrument is less than 10. Consequently, we use press freedom (*Press*) as an alternative instrument. There is a strong and negative relationship between press freedom and corruption (Adsera *et al*., 2003; Brunetti and Weder, 2003). Although the press may play a role in exposing misconduct on the part of firms, the main modality of this misconduct in the context of tax avoidance will involve corruption. For our measure of press freedom, we relied on Freedom House's index of press freedom.

4. Results

4.1 Main results

Our main results are presented in Table 2. Columns (1) and (2) report OLS estimates for our dependent variable of interest, *Phantom FDI*—the outward FDI to phantom firms. Column (1) reports estimates of the effect of corruption using the WGI's *Control of corruption*. In accordance with theoretical predictions, we find a statistically significant correlation between corruption and outward phantom FDI (β = -3.537, p = 0.000). A one standard deviation improvement in *Control of corruption* (1.03) is associated with a reduction in *Phantom FDI* by

3.64% on average.

Column (2) repeats the specification in column (1), but substitutes *Control of corruption* with *CPI.* The number of observations decreases as the number of countries covered by *CPI* is less than that covered by *Control of corruption*. We find a statistically significant correlation between *CPI* and *Phantom FDI* (β = -0.120, p = 0.037). A one standard deviation improvement in *CPI* (19.78) is associated with a reduction in *Phantom FDI* by 2.37%, on average. We do not find a significant correlation between tax rates and Phantom FDI when all control variables are taken into account. This supports Habu's (2017) and Garcia-Bernardo and Janský's (2021) view that large multinational firms can incur fixed costs for profit shifting, and thus, their profits can be less responsive to changes in tax rates. Further, financial development is positively and statistically correlated with Phantom FDI. Sophisticated financial institutions have networks across countries that facilitate channelling cash flows in a tax-efficient manner. Columns (3) and (4) report the results of our IV analysis using distance from the equator as an instrument. *Control of corruption* and *CPI* are significant, and the values of their coefficients are substantially larger than was the case in our OLS model. Columns 5-8 report the results when GNI per capita is excluded from the specifications. These results are very similar to those reported in columns 1-4.

Overall, our findings suggest that corruption is significantly correlated with outward phantom FDI across the two measures of corruption. In line with the arguments made in Section 2 above, the more corrupt a country is, the more outward profit shifting it is exposed to.

("Table 2 goes about here")

4.2 Robustness

As a further robustness check of our results, we present estimates of our model using alternative measures of profit shifting by multinational firms. We utilise all the recent published datasets that consist of country-level estimates of the global scale of profit shifting (Cobham and Janský, 2018; Torslov *et al*., 2018; Cobham and Janský, 2019; Janský and Palanský, 2019; Garcia-Bernardo and Janský, 2021). The estimates included in these data sets are based on entirely different methodologies, different samples, and encompass different periods of time. In addition, each methodology produces a different estimate of profit shifting for a particular country. Some of these measures provide estimates of inward profit shifting, which helps identify the countries that can be winners of profit shifting by attracting paper multinational profits. As outlined previously, theoretical considerations suggest that corruption could operate on both outward and inward profit shifting.

4.2.1 Janský and Palanský (2019)

Janský and Palanský (2019) estimate the misalignment between the share of FDI from tax havens and the rate of return on it for 2016. They claim that inward foreign investments originating from tax havens are associated with low rates of return because multinational firms tend to artificially shift profits to these tax havens. We employ our baseline model, but our dependent variable now is artificially shifted profits as a percentage of total corporate profits—*Shifted profits*. We refrain from including regional dummies because they are already included in Janský and Palanský's (2019) model.

Columns (1) and (2) in Table 3 report our OLS estimates. The coefficient of *Control of corruption* is negative and significant (β = -0.053, p = 0.032). The coefficient of *CPI* is not

significant. Columns (3) and (4) report our IV estimates using press freedom as an instrument. The coefficients of *Control of corruption* and *CPI* are negative and significant, albeit at the 10% level. Columns (5) and (6) report the OLS estimates when GNI per capita is excluded from the specifications. *Control of corruption* and *CPI* are again statistically significant (β = -0.060, p = 0.006 and β = -0.002, p = 0.013, respectively). Columns (7) and (8) report the IV estimates when GNI per capita is excluded from the specifications. *Control of corruption* and *CPI* are significant at the 5% level.

Together, our findings suggest that there is a statistically significant correlation between corruption and profits shifted to tax havens across corruption measures and across OLS and IV analyses. The more corrupt a country is, the more profits are shifted out of it to tax havens.

("Table 3 goes about here")

4.2.2 Cobham and Janský (2019)

Cobham and Janský (2019) provide country-level estimates of the misalignment between the gross (taxable) profits of US multinational firms and the location of their economic activities for 2012. We employ our baseline model, but our dependent variable is now missing (excess) gross profits as a percentage of actual gross profits—*Missing (excess) profits*. Columns (1) and (2) in Table 4 report our estimates for *Missing (excess) profits* using *Control of corruption* and *CPI*, respectively. We do not find a significant correlation between *Control of corruption* and *CPI* on one hand and *Missing (excess) profits* on the other. Columns (3) and (4), however, report the results of our IV analysis using press freedom as an instrument, and show that

Control of corruption and *CPI* are significant, albeit at the 10% level. It is worth noting that these findings only pertain to the activities of US multinational firms.

Together, our OLS and IV analyses suggest that there is a correlation between corruption on one hand and the misalignment between the reported profits of US multinational firms and the location of their economic activities on the other. The more corrupt a country is, the more profits are shifted out of it. By contrast, the less corrupt a country is, the more profits are shifted into it.

("Table 4 goes about here")

4.2.3 Garcia-Bernardo and Janský (2021)

Garcia-Bernardo and Janský (2021) provide country-level estimates of profit shifting to tax havens for 2016. Similar to Cobham and Janský (2019), they estimate the misalignment between the taxable profits of multinational firms and the location of their activities. However, they use country-by-country reporting data that was recently published by the OECD in 2020. We employ our baseline model, but our dependent variable now is corporate tax revenue losses as a percentage of actual corporate tax revenues (*Revenue losses*).[1] Table 5 reports our results for 2016. Columns (1) and (2) report OLS estimates for *Revenue losses* using *Control of corruption* and *CPI*, respectively. The coefficient of *Control of corruption* is negative and significant, albeit at the 10% level, and the coefficient of *CPI* is negative and significant at the 5% level *(β*= -0.034, *p*= 0.027). Columns (3) and (4) report the results of our IV analysis using

[1] The data of the revenue losses are highly skewed. As a result, they are transformed into their natural logarithms.

Control of corruption and *CPI,* respectively, and using press freedom as an instrument. The coefficients of *Control of corruption* and *CPI* are negative and significant at the 5% level. Together, our findings suggest that there is a statistically significant correlation between corruption and profits shifted to tax havens across corruption measures and across OLS and IV analyses. The more corrupt a country is the more profits are shifted out of it to tax havens.

("Table 5 goes about here")

4.2.4 Cobham and Janský (2018)

Cobham and Janský (2018) estimate the impact of tax havens and their tax policies on the tax bases of non-haven countries for 2013. They estimate the tax revenues lost as a result of profit shifting by "turning off" the effect of tax havens on the tax bases of non-haven countries. Thereafter, the implied change in the tax base is calculated and multiplied by the applicable tax rate to arrive at an estimate of revenue loss (gain). We employ our baseline model, but our dependent variable now is corporate tax revenue losses (gains) as a percentage of actual tax revenues, *Revenue losses* (*gains*). Statutory tax rates and openness are already included in Cobham and Janský's (2018) model, and thus we refrain from including them in our model. We also do not control for natural resource rent, because Cobham and Janský (2018) exclude all resource-rich countries from their sample. Table 6 reports the results for 2013. Columns (1) and (2) report OLS estimates for *Revenue losses* (*gains*) using *Control of corruption* and *CPI*, respectively. Columns (3) and (4) report our IV estimates for *Revenue losses (gains)* using distance from the equator as an instrument. We do not find a significant correlation between corruption and *Revenue losses* (*gains*). We think this is because of mechanical nature of the estimate as GDP per capita is used in constructing the main dependent variable— *Revenue losses* (*gains*), as explained in Section 3.1.3.

Columns 5-8 report the estimates when GNI per capita is excluded from the specifications. The IV estimates show that *Control of corruption* and *CPI* are significant, albeit at the 10% level. Since the first-stage F-statistics when *Control of corruption* is used (9.90) falls somewhat short of the 10 threshold, we cannot discount the possibility of weak instruments.

("Table 6 goes about here")

4.2.5 Torslov, Wier, and Zucman (2018)

Torslov, Wier, and Zucman (2018) provide estimates for the scale of profit shifting by the OECD countries and some major emerging-market countries for 2015. They particularly track the cross-border "high-risk" flows to tax havens that are indicative of profit shifting using the bilateral balance of payments of tax havens. Examples of high-risk payments to tax havens are intra-firm interests and intellectual property royalties. We employ our baseline model, but our dependent variable now is high-risk payments to tax havens as a percentage of corporate profits—*High-risk payments*. We include only the OECD dummy variable, as the sample comprises OECD countries and a few additional countries. Table 7 reports the results. Columns (1) and (2) report the OLS estimates for *High-risk payments* using *Control of corruption* and *CPI*, respectively. Columns (3) and (4) report the results of our IV analysis using *Control of corruption* and *CPI*, respectively, and using press freedom as an instrument. We do not find a significant correlation between corruption and *High-risk payments* across all the specifications.

A possible explanation for these unexpected results could be the size and composition of the sample. It includes only 36 countries—the OECD countries and major emerging-market countries. All the countries are classified as high-income or upper-middle-income countries based on the World Bank's income classifications. Therefore, while the results do not support

our hypothesis, due to the narrow nature of the sample the findings may reflect the different mechanisms at play in the very richest economies.

("Table 7 goes about here")

4.3 Corruption, secrecy, and tax havens

Tax havens and secrecy jurisdictions have always been central in international tax avoidance debates, and it has been claimed that they have a significant role in reducing the corporate tax bases of other countries. Zero or low tax rates have been the most common feature of tax havens. It is true that a low tax rate is one of the most attractive attributes of tax havens; however, secrecy helps multinational firms conceal the fact that certain economic transactions take place in one particular country, but the related tax obligation arises in another lower-tax country (Murphy, 2009). In other words, low tax rates would be useless if multinational firms did not have the ability to avoid tax obligations in countries where their actual transactions were located (Murphy, 2009).

This argument is also supported by the OECD's key factors for identifying a tax haven: "No or nominal tax on the relevant income; lack of effective exchange of information; lack of transparency; no substantial activities" (OECD, 1998, p.23). Apart from tax rates, the other factors in this definition contribute to creating secrecy. Murphy (2009, p.5) identifies two characteristics that differentiate secrecy jurisdictions from other jurisdictions: "Firstly, the secrecy jurisdiction creates regulation that they know is primarily of benefit and use to those not resident in their geographical domain. Second, the creation of a deliberate, and legally

backed, veil of secrecy that ensures that those from outside the jurisdiction making use of its regulation cannot be identified to be doing so."

The Cayman Islands is a good example to illustrate the above argument. It is widely perceived to be a tax haven because of its zero corporate income tax. However, as explained by Cobham *et al*. (2015), Cayman Islands attracts paper profits that are generated from economic activities that take place somewhere else, and the secrecy feature enables them to hide such details from regulators in the home countries of multinational firms. Another example is the Luxembourg Leaks (Luxleaks), which revealed almost zero tax agreements between multinational firms and the Luxembourgish tax administration (Bowers, 2019). The true tax rates that were agreed upon were concealed, and it was not possible to assess these agreements using statutory tax rates or to construct effective tax rates from public data (Cobham *et al*., 2015).

We include the level of financial secrecy (*Secrecy*) in our base model to examine its correlation with profit shifting using the TJN's Financial Secrecy Index (FSI). The secrecy scores range from 0 (perfect transparency) to 100 (complete secrecy). The advantage of using this index is that it shifts the focus from the tax rate aspect of tax havens to that of financial secrecy and provides a scale where any country could fit rather than a binary distinction between haven and non-haven countries (Cobham *et al*., 2015). The FSI scores are constructed from four secrecy dimensions: knowledge of beneficial ownership, corporate transparency regulation, efficiency of tax and financial regulations, and international standards and cooperation.

Interestingly, numerous countries that are highly ranked in TJN's FSI for 2017 are ranked in the CPI's least corrupt quintile for the same year. However, we recognize that our measure of corruption does not reflect aspects associated with tax havens such as secrecy. Palan (2002) and Slemrod (2008) highlight tax havens as an example of commercialisation of state sovereignty. That is, some tax havens create "ring-fenced" tax regulations and deals paired

with confidentiality that are specially designed for foreign firms (Schjelderup, 2016). As explained by Slemrod and Wilson (2009), tax havens can sell "concealment services" for foreign firms and protection from national taxation. This secrecy aspect associated with tax havens can create a "supply side" for corruption that can harm countries, especially developing countries, by facilitating illicit financial flows (Hebous 2014; Christensen, 2012; Hebous and Lipatov 2014; Schjelderup, 2016). In fact, TI, which cooperated with constructing the FSI, recognizes that the CPI tells only one part of the corruption story. That is some countries, such as Switzerland and Singapore can highly rank in the CPI, while being deficient in terms of financial transparency (Christensen, 2012).

Corruption, however, in our paper is defined as "the abuse of public or corporate office for private gain", as explained in Section 2. Thus, it is interpreted as poor public governance. That can explain the findings of Dharmapala and Hines (2009), discussed in Section 2, in which there is an association between good governance and being a tax haven. Similarly, Selmrod (2008), who investigated cross-country commercialisation of sovereignty, finds that good governance is associated with tax havens. The author claims that there is no evidence that bad governance is associated with international unlawfulness, such as money laundering. Moreover, Palan (2002) describes tax havens as having political and economic stability and low level of scandals and money laundering.

Table 8 presents the results of our OLS model when *Secrecy* is included.[2] The FSI scores are published only every other year, starting from 2009 to 2019. Consequently, we only test *secrecy* with three country-level estimates of profit shifting: Damgaard *et al*.'s (2019) estimate for the period 2009–2017; Cobham and Janský's (2018) estimate for 2013; and Torslov *et al*.'s (2018) estimate for 2015. Columns 1-4 report our estimates using Damgaard *et al*.'s (2019) *Phantom*

[2] We do not find a significant interaction effect of corruption and secrecy.

FDI as a dependent variable. Columns 5-8 report our estimates using Cobham and Janský's (2018) *Revenue losses (gains)* as a dependent variable. Columns (9) and (10) report our estimates using Torslov *et al*.'s (2018) *High-risk payments* as a dependent variable. Unfortunately, due to of the limited coverage of the FSI, the number of observations is significantly reduced compared to that of our main results.

Column (1) indicates that *Control of corruption* and *Secrecy* are statistically significant (β = -4.079, p = 0.015 and β = -0.333, p = 0.001, respectively). Column (2) indicates that *CPI* is not statistically significant, and *Secrecy* is statistically significant (β = -0.361, p = 0.012). This is perhaps due to the fact that *CPI* encompasses fewer countries compared to *Control of corruption*. These results hold in columns (3) and (4) when GNI per capita is excluded from the specifications. Turning to our alternative measures, Columns (5) and (6) indicate that corruption and secrecy are not significantly correlated with *Revenue losses (gains).* Corruption is only significantly associated with *Revenue losses (gains)* when we exclude GNI per capita in columns (7) and (8), as was the case with our OLS models in Table 6. Again, we note that GDP per capita is used in the construction of *Revenue losses (gains).* By contrast, *Secrecy* is not significant in both columns. Lastly, columns (9) and (10) indicate that *Control of corruption* and *CPI* are not significant, as in our main results, and *Secrecy* is not significant. Again, it is important to note that the sample sizes are much smaller for these other measures of profit shifting and these samples comprise richer economies.

Overall, we find that the association between corruption and profit shifting remains the same as in our previous results. The potential role of secrecy in shaping profit shifting is less clear than in the case of corruption. Increasing the coverage of the FSI is likely to provide more insights, which could be a direction for future research.

("Table 8 goes about here")

5. Conclusion

Tax avoidance by multinational firms through profit shifting is a serious problem that deprives countries of much needed tax revenues. Our review of the published literature in this field indicates that multinational firms respond to tax rate differentials by locating their profits in low-tax countries. The aspect that has received relatively little attention is the role of governance infrastructure on the intensity of profit shifting. The main goal of this paper is to investigate the role of corruption and secrecy in profit shifting by multinational firms and to understand why this problem is persistent despite recent pronounced global corporate tax rate cuts.

Using country-level panel data, we find a significant and positive correlation between corruption and profit shifting. This is consistent with the idea that firms strategically allocate their tax motivated intra-firm transactions among countries in a way to shelter from potential risks associated with corruption. This flight from corruption is also consistent with the finding of Fisman and Svensson (2007) that corruption is more harmful to firm growth than taxation. Our findings are robust across several corruption and profit shifting measures. In addition, our results are robust to an instrumental variable approach that controls for the potential endogeneity between profit shifting and corruption. We also find a negative and significant relationship between financial secrecy and outward profit shifting. However, this relationship becomes less evident with small samples because of the limitations of the financial secrecy index coverage.

This study contributes to the literature as it is the first to investigate the relationship between corruption on one hand, and both outward and inward profit shifting on the other using country-

level data. Previous studies provide a partial view of the correlation between governance issues and profit shifting for European countries, whereas this study explicitly considers the link between corruption and profit shifting across the globe. The utilisation of country-level data allows us to investigate the relationship between corruption and profit shifting across developing and low-income countries, where empirical evidence of this relationship is scarce. Further, our paper is the first to use a financial secrecy index to study the behaviour of profit shifting and shift the focus from the tax rate aspect of tax havens to that of financial secrecy.

The study is limited by the uncertainty associated with measuring profit shifting, since it is unobservable and can, at best, only be estimated. The estimation can be challenging, knowing that profit shifting is accomplished through complex intra-firm transactions that include multiple related parties. In addition, the coverage and comprehensiveness of the existing data vary significantly across countries, particularly between developed and developing countries. This may explain the small number of countries encompassed in certain estimates of profit shifting that we use for robustness checks. Country-by-country reporting by multinational firms and the availability of comprehensive data with greater comparability across countries will add to our understanding of the behaviour of multinational firms and the role of corruption and secrecy in profit shifting.

It is also important to note that our definition of corruption, the abuse of public power for private gain, and the way in which this concept is measured, does omit some behaviours and decisions that some would consider to be corrupt. In particular, the concept of the commercialisation of sovereignty discussed above encompasses what some would see as an inappropriate and harmful influence of international private sector actors on a states' financial regulation and taxation policymaking. Our results do not speak to the effect of these kinds of practices. In addition, we note that including national income in the model when using some

of our alternative measures of profit shifting led to corruption becoming insignificant in our models. Future work should further explore the nexus of national income, corruption, and secrecy.

Nonetheless, our findings have several implications that may be of interest to policymakers and other stakeholders. Corruption can increase the incentives for profit shifting and foster an environment of low tax compliance. Protection of the profits and investments of multinational firms can reduce the incentives of outward profit shifting, and consequently support tax revenue mobilisation. Tax reforms and international efforts aimed at curbing profit shifting, such as the OECD's BEPS plan aimed at increasing revenues, can be constrained by the presence of low-quality governance. As a result, they might need to be accompanied by efforts to curb corruption to reduce the incentives of profit shifting by multinational firms. Finally, international cooperation in terms of information exchange can help in tackling profit shifting, and ensure fair international corporate taxation.

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Table 1. Summary statistics

Variable	N	Mean	Min	Max	SD
Phantom FDI	1,058	24.27	0	97.01	18.48
Control of corruption	1,058	0.23	-1.83	2.45	1.03
CPI	674	48.58	14	92	19.78
Statutory tax rates	1,058	23.52	0	40.69	8.28
Openness	1,058	0.99	0.20	4.34	0.63
Financial development	1,058	0.41	0.03	0.96	0.23
Natural resources	1,058	6.01	0	62.21	10.03
GNI Per Capita (log)	1,058	5.71	0.00	7.27	2.02

Table 2. The impact of corruption on phantom FDI

	(1) Phantom FDI OLS	(2) Phantom FDI OLS	(3) Phantom FDI IV	(4) Phantom FDI IV	(5) Phantom FDI OLS	(6) Phantom FDI OLS	(7) Phantom FDI IV	(8) Phantom FDI IV
Control of corruption	-3.537***		-13.941**		-3.408***		-13.817**	
	(0.858)		(6.189)		(0.852)		(6.258)	
CPI		-0.120**		-1.059***		-0.119**		-1.024***
		(0.058)		(0.337)		(0.057)		(0.339)
Statutory tax rates	-0.039	0.012	-0.194	-0.300*	-0.029	0.026	-0.174	-0.274
	(0.080)	(0.118)	(0.120)	(0.170)	(0.080)	(0.116)	(0.117)	(0.169)
Openness	-0.140	-0.662	3.456	4.737**	-0.162	-0.747	3.466	4.450**
	(0.830)	(0.976)	(2.180)	(2.028)	(0.829)	(0.975)	(2.219)	(2.049)
Financial development	35.883***	33.058***	64.087***	79.428***	34.929***	31.522***	62.338***	76.084***
	(4.566)	(5.676)	(17.134)	(17.361)	(4.465)	(5.616)	(16.876)	(17.496)
Natural resources	0.068	0.135	-0.024	0.009	0.072	0.151*	-0.018	0.032
	(0.061)	(0.088)	(0.084)	(0.103)	(0.061)	(0.087)	(0.083)	(0.100)
GNI pc (log)	-0.308	-0.760*	-0.714*	-0.824				
	(0.315)	(0.443)	(0.395)	(0.519)				
OECD	-4.038**	-4.739**	3.035	9.195	-4.179**	-4.834**	2.828	8.587
	(1.643)	(2.131)	(4.611)	(5.663)	(1.646)	(2.135)	(4.628)	(5.699)
Latin America,	-3.752**	-5.075**	0.871	0.942	-3.698**	-5.106**	1.077	0.690
Caribbean	(1.614)	(2.135)	(3.204)	(3.276)	(1.613)	(2.142)	(3.330)	(3.323)
Sub-Saharan Africa	3.317	7.402**	7.517**	15.437***	3.038	6.821**	6.938**	14.517***
	(2.298)	(3.091)	(3.599)	(4.429)	(2.277)	(3.045)	(3.482)	(4.440)
Middle East, North	-5.695***	-4.038*	-4.224*	-1.377	-5.732***	-4.174*	-4.287*	-1.622
Africa	(1.941)	(2.315)	(2.282)	(2.915)	(1.950)	(2.350)	(2.305)	(2.942)
Constant	8.999***	26.960***	-0.138	49.819***	7.431***	22.944***	-3.963	39.586***
	(3.344)	(4.628)	(6.670)	(9.198)	(2.869)	(3.768)	(7.556)	(8.771)
Observations	1,058	674	1,058	674	1,058	674	1,058	674
R-squared	0.123	0.113			0.122	0.107		
First stage F statistic			15.69	17.75			16.16	17.76

Robust standard errors are given in parentheses

*** p < 0.01, ** p < 0.05, * p < 0.1

Table 3. The impact of corruption on profit shifting related to FDI (Jansky and Palansky, 2019)

	(1) Shifted profits OLS	(2) Shifted profits OLS	(3) Shifted profits IV	(4) Shifted profits IV	(5) Shifted profits OLS	(6) Shifted profits OLS	(7) Shifted profits IV	(8) Shifted profits IV
Control of corruption	-0.053**		-0.058*		-0.060***		-0.063**	
	(0.024)		(0.032)		(0.021)		(0.029)	
CPI		-0.002		-0.003*		-0.002**		-0.003**
		(0.001)		(0.002)		(0.001)		(0.001)
Statutory tax rates	0.002	0.002	0.003	0.003	0.002	0.002	0.003	0.003
	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)
Openness	0.126*	0.118*	0.124**	0.131**	0.126*	0.117*	0.122**	0.127**
	(0.064)	(0.059)	(0.056)	(0.058)	(0.064)	(0.061)	(0.056)	(0.058)
Financial development	0.322**	0.271*	0.284*	0.310**	0.264**	0.177	0.219	0.235*
	(0.155)	(0.149)	(0.146)	(0.150)	(0.130)	(0.118)	(0.136)	(0.141)
Natural resources	0.010	0.009	0.010*	0.010*	0.011	0.010	0.010*	0.010*
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.007)	(0.006)	(0.006)
GNI pc (log)	-0.016	-0.027	-0.015	-0.016				
	(0.023)	(0.023)	(0.024)	(0.024)				
Constant	-0.094	0.098	-0.117	0.025	-0.207	-0.066	-0.215*	-0.073
	(0.181)	(0.129)	(0.184)	(0.132)	(0.136)	(0.103)	(0.120)	(0.096)
Observations	64	62	63	62	64	62	63	62
R-squared	0.237	0.261			0.232	0.244		
First stage F statistic			23.87	41.48			18.10	25.64

Robust standard errors in parentheses
*** p < 0.01, ** p < 0.05, * p < 0.1

Table 4. Misalignment of US firms (Cobham and Janský, 2019)

	(1) Missing (excess) profits OLS	(2) Missing (excess) profits OLS	(3) Missing (excess) profits IV	(4) Missing (excess) profits IV
Control of corruption	-37.870		-71.590*	
	(28.018)		(38.090)	
CPI		-2.112		-3.830*
		(1.508)		(2.001)
Statutory tax rates	-6.323***	-6.477***	-5.996***	-6.304***
	(1.301)	(1.329)	(1.204)	(1.200)
Openness	-17.122	-17.559	-8.949	-10.448
	(20.355)	(20.594)	(22.496)	(22.662)
Financial development	102.116	105.079	140.630	142.676
	(153.779)	(152.399)	(151.311)	(150.074)
Natural resources	-11.678***	-11.742***	-11.677***	-11.794***
	(3.309)	(3.306)	(3.171)	(3.150)
GNI pc (log)	-51.731	-50.943	-33.168	-33.343
	(35.081)	(35.749)	(32.192)	(32.440)
OECD	93.903	91.211	108.024*	101.922*
	(56.489)	(55.931)	(61.142)	(59.255)
Latin America, Caribbean	40.081	36.573	42.000	35.473
	(53.408)	(54.233)	(50.149)	(49.962)
Sub-Saharan Africa	129.707***	128.091***	131.193***	128.135***
	(27.317)	(28.150)	(25.158)	(25.904)
Middle East and North Africa	-121.840***	-125.918***	-116.852***	-124.679***
	(26.159)	(26.654)	(26.579)	(25.504)
Constant	532.300**	621.203**	335.172	513.429**
	(261.973)	(248.398)	(250.827)	(222.462)
Observations	48	48	48	48
R-squared	0.414	0.421		
First stage F statistic			17.56	14.08

Robust standard errors in parentheses
*** p < 0.01, ** p < 0.05, * p < 0.1

Table 5. The impact of corruption on misalignment of multinational firms worldwide (Garcia-Bernardo and Janský, 2021)

	(1) Revenue losses OLS	(2) Revenue losses OLS	(3) Revenue losses IV	(4) Revenue losses IV
Control of corruption	-0.497*		-1.630**	
	(0.291)		(0.688)	
CPI		-0.034**		-0.087**
		(0.015)		(0.034)
Statutory tax rates	0.048*	0.053*	0.035	0.038
	(0.027)	(0.028)	(0.032)	(0.031)
Openness	-0.429*	-0.384	0.180	0.122
	(0.257)	(0.270)	(0.408)	(0.391)
Financial development	-1.300	-1.179	1.579	1.334
	(1.061)	(1.052)	(2.376)	(2.181)
Natural resources	0.015	0.015	0.003	0.002
	(0.036)	(0.035)	(0.037)	(0.035)
GNI pc (log)	-0.080	-0.095	-0.176**	-0.139*
	(0.062)	(0.074)	(0.075)	(0.082)
OECD	0.011	0.219	0.676	0.749
	(0.467)	(0.470)	(0.550)	(0.572)
Latin America, Caribbean	-0.170	-0.061	0.481	0.283
	(0.413)	(0.414)	(0.502)	(0.465)
Sub-Saharan Africa	0.058	0.046	0.528	0.364
	(0.494)	(0.514)	(0.587)	(0.559)
Middle East, North Africa	-1.036	-1.006	-0.803	-1.003
	(0.875)	(0.853)	(0.909)	(0.889)
Constant	2.676***	4.027***	1.656*	5.459***
	(0.656)	(0.792)	(0.991)	(1.072)
Observations	103	98	98	96
R-squared	0.337	0.367	0.240	0.275
First stage F statistic			13.44	15.03

Robust standard errors in parentheses
*** p < 0.01, ** p < 0.05, * p < 0.1

Table 6. The impact of corruption on revenue losses from profit-shifting (Cobham and Janský, 2018)

	(1) Revenue losses (gains) OLS	(2) Revenue losses (gains) OLS	(3) Revenue losses (gains) IV	(4) Revenue losses (gains) IV	(5) Revenue losses (gains) OLS	(6) Revenue losses (gains) OLS	(7) Revenue losses (gains) IV	(8) Revenue losses (gains) IV
Control of corruption	0.012		-0.082		-0.013		-0.062*	
	(0.010)		(0.163)		(0.008)		(0.032)	
CPI		0.000		-0.004		-0.001**		-0.003*
		(0.001)		(0.007)		(0.000)		(0.001)
Financial development	0.054	0.054	0.058	0.034	-0.046	-0.036	0.061	0.045
	(0.047)	(0.050)	(0.071)	(0.075)	(0.039)	(0.043)	(0.084)	(0.076)
GNI pc (log)	-0.048***	-0.044***	0.017	0.011				
	(0.014)	(0.015)	(0.113)	(0.096)				
OECD	0.015	0.016	0.032	0.030	-0.011	-0.003	0.025	0.027
	(0.022)	(0.022)	(0.043)	(0.038)	(0.021)	(0.022)	(0.034)	(0.033)
Latin America, Caribbean	0.036	0.038	0.028	0.021	0.020	0.027	0.023	0.028
	(0.027)	(0.028)	(0.034)	(0.042)				
					(0.024)	(0.027)	(0.025)	(0.027)
Sub-Saharan Africa	-0.010	-0.006	0.067	0.055	0.028	0.035	0.037	0.044
	(0.029)	(0.029)	(0.138)	(0.111)				
					(0.025)	(0.030)	(0.029)	(0.031)
Middle East, North Africa	-0.007	-0.007	-0.004	-0.011	-0.006	-0.003	-0.014	-0.010
	(0.028)	(0.028)	(0.042)	(0.039)				
					(0.026)	(0.028)	(0.036)	(0.036)
Constant	0.432***	0.384***	-0.139	0.091	0.062**	0.091**	0.019	0.148***
	(0.118)	(0.102)	(0.994)	(0.521)	(0.024)	(0.036)	(0.039)	(0.052)
Observations	73	71	73	71	77	73	77	73
R-squared	0.408	0.407			0.317	0.330		
First stage F statistic			0.66	0.82			9.53	10.63

Robust standard errors are given in parentheses
*** p < 0.01, ** p < 0.05, * p < 0.1

Table 7. The impact of corruption on excessive high-risk payments (Torslov, Wier and Zucman, 2018)

	(1) High-risk payments OLS	(2) High-risk payments OLS	(3) High-risk payments IV	(4) High-risk payments IV
Control of corruption	0.011		0.017	
	(0.009)		(0.012)	
CPI		0.000		0.001
		(0.000)		(0.001)
Statutory tax rates	0.000	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)
Openness	0.032	0.031	0.032	0.030
	(0.024)	(0.025)	(0.020)	(0.021)
Financial development	0.091	0.089	0.092*	0.090*
	(0.075)	(0.077)	(0.051)	(0.052)
Natural resources	0.000	0.000	0.000	0.000
	(0.002)	(0.002)	(0.002)	(0.002)
GNI pc (log)	-0.002	0.001	-0.008	-0.008
	(0.012)	(0.013)	(0.018)	(0.018)
OECD	-0.001	-0.003	0.001	-0.001
	(0.012)	(0.012)	(0.019)	(0.019)
Constant	-0.013	-0.053	0.042	0.003
	(0.106)	(0.102)	(0.151)	(0.133)
Observations	36	36	36	36
R-squared	0.335	0.327		
First stage F statistic			33.39	31.16

Robust standard errors are given in parentheses
*** p < 0.01, ** p < 0.05, * p < 0.1

Table 8. Financial secrecy and profit shifting

	(1) Phantom FDI	(2) Phantom FDI	(3) Phantom FDI	(4) Phantom FDI	(5) Revenue losses (gains)	(6) Revenue losses (gains)	(7) Revenue losses (gains)	(8) Revenue losses (gains)	(9) High-risk payments	(10) High-risk payments
Control of corruption	-4.079**		-4.022**		0.010		-0.023**		0.010	
	(1.671)		(1.645)		(0.017)		(0.011)		(0.008)	
CPI		-0.156		-0.156		0.001		-0.001**		0.000
		(0.097)		(0.097)		(0.001)		(0.001)		(0.000)
Secrecy	-0.333***	-0.361**	-0.325***	-0.349**	0.001	0.001	0.000	0.001	-0.001	-0.001
	(0.104)	(0.142)	(0.099)	(0.140)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Statutory tax rates	-0.133	-0.063	-0.123	-0.059					0.001	0.001
	(0.147)	(0.220)	(0.144)	(0.217)					(0.001)	(0.001)
Openness	1.453	0.213	1.454	0.235					0.024	0.023
	(1.218)	(1.571)	(1.214)	(1.558)					(0.026)	(0.027)
Financial development	28.327***	21.401**	27.553***	20.663**	0.079	0.087	-0.038	-0.048	0.072	0.070
	(8.768)	(10.517)	(8.341)	(10.263)	(0.088)	(0.088)	(0.068)	(0.071)	(0.082)	(0.084)
Natural resources	0.190	0.415	0.177	0.407					0.000	0.000
	(0.185)	(0.263)	(0.184)	(0.261)					(0.002)	(0.002)
GNI pc (log)	-0.216	-0.525			-0.062**	-0.068***			0.002	0.005
	(0.531)	(0.703)			(0.030)	(0.024)			(0.015)	(0.016)
OECD	-7.164**	-11.111***	-7.224**	-11.086***	0.036	0.049	-0.001	0.004	-0.004	-0.006
	(3.397)	(3.992)	(3.375)	(3.977)	(0.040)	(0.036)	(0.048)	(0.045)	(0.014)	(0.014)
Latin America and the Caribbean	3.010	-1.051	3.125	-0.627	0.033	0.047	0.004	0.007		
	(3.713)	(5.117)	(3.756)	(5.205)	(0.046)	(0.045)	(0.049)	(0.047)		
Sub-Saharan Africa	-2.225	-3.209	-2.293	-2.856	-0.049	-0.052	-0.047	-0.047		
	(4.857)	(6.297)	(4.835)	(6.137)	(0.039)	(0.039)	(0.050)	(0.049)		
Middle East and North Africa	-6.531**	-11.250***	-6.650**	-11.422***	-0.002	-0.004	-0.027	-0.031		
	(3.265)	(3.366)	(3.275)	(3.367)	(0.022)	(0.021)	(0.020)	(0.021)		
Constant	42.549***	58.025***	40.762***	54.439***	0.523**	0.533***	0.046	0.102	0.003	-0.034
	(11.602)	(12.484)	(10.453)	(11.437)	(0.225)	(0.161)	(0.066)	(0.068)	(0.114)	(0.106)
Observations	257	169	257	169	37	36	38	37	35	35
R-squared	0.165	0.160	0.165	0.157	0.502	0.572	0.387	0.436	0.342	0.334

Robust standard errors are given in parentheses

*** p < 0.01, ** p < 0.05, * p < 0.1