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The influence of governance infrastructure and corporate governance on profit shifting

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Abstract
In this article we develop a conceptual model to examine the influence of quality of country-level governance infrastructure and corporate governance effectiveness on profit shifting. We empirically test propositions derived from the model with a unique firm-level data set and using multiple indicators of governance infrastructure quality and corporate governance mechanisms. We estimate that on average about 6% of total pre-tax income is shifted out of foreign-owned firms in India. We show that governance infrastructure that improves collective action and transparency in both the foreign- and host-country reduces shifting. On the other hand, secure property rights and efficient contracting in the foreign country increases shifting. We also find that monitoring by foreign institutional investors restricts shifting.
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INTRODUCTION

International tax differences create opportunities and incentives for multinational firms to shift earnings/profits across the globe. For multinational companies with operations spanning multiple tax jurisdictions, financial redistribution is a means to minimize aggregate global tax incidence and maximize the overall value of the firm. However, for the governments, tax avoidance imposes negative externalities in their countries – a shrunken tax base and higher costs of enforcing compliance (Sikes & Verrecchia, 2014). Consequently, public scrutiny of multinational financial practices in this regard has particularly increased post the financial crisis. Echoing this public outpouring, *The Economist* recently ran a cover story titled "Tax havens: The missing $20 trillion" (*Economist*, 2013) underscoring the scale and ubiquity of this practice. In addition, of relevance to International Business (IB) scholarship is the fact that profit shifting creates divergence of interests among different shareholder groups, a conflict extensively investigated in the corporate governance literature (Desai, Dyck, & Zingales, 2007).

In this article we examine how tax-motivated "profit shifting" is influenced by the quality of country-level governance infrastructure (Dixit, 2009; Globerman & Shapiro, 2003) and firm-level corporate governance effectiveness. Corporate governance and international

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business researchers have emphasized the role of national institutional arrangements in explaining cross-country diversity in comparative corporate governance practices. Studies have evolved from simply accepting the widely held understanding that "institutions matter," to addressing the more contentious question of "how" they matter for corporate governance (Aguilera & Jackson, 2010). We contribute to the discussion by elucidating the "mechanism" or "how" quality of country-level institutions and corporate governance influences tax-motivated international profit shifting.

Tax-motivated profit shifting is interlinked with the quality of institutions at the country level and corporate governance mechanisms at the firm level. See Devereux and Maffini (2007) for a review of work on tax-motivated profit shifting from the public economics literature and Graham (2003) for a survey of studies from corporate governance literature. However, the extant literature on corporate governance as well as public economics area had paid far less attention to the interlinked role of country-level institutions and corporate governance in influencing profit shifting (Desai et al., 2007).

In this article we attempt to address this lacuna by making two salient contributions. First, we examine the influence of the quality of country-level governance institutions and corporate governance effectiveness on profit shifting in an integrated framework. We show that there exists a threshold level of tax difference beyond which shifting becomes optimal for the foreign owners. We decompose this threshold into governance infrastructure cost and corporate governance cost and show that foreign- and host-country institutional quality influences profit shifting differently. Finally, we show that superior corporate governance achieved through monitoring by other vigilant principals influences profit shifting.

Second, we present a flexible approach to empirically test our propositions. Our rigorous econometric method draws upon Bertrand, Mehta, and Mullainathan (2002) and more recent work by Siegel and Choudhury (2012). The approach addresses endogeneity concerns by measuring the sensitivity of the focal firm's profits to an exogenous macro-level earnings shock. Additionally from publicly available data our approach allows for testing impacts of multiple indicators of governance infrastructure and corporate governance on tax-motivated profit shifting in an integrated framework. In particular our analysis of corporate governance focuses on how the underlying tension between the foreign owner and other "vigilant" principals such as foreign institutional investors influences the extent of profit shifting.

We test the propositions using a unique firm-level data set, in which we trace detailed information on foreign ownership of firms operating in India (host country) during the 2001–2010 period to 23 different countries. Our results indicate that, on average, the foreign owner in India shifts out around 5.7% of the total pre-tax firm earnings. We find that a 0.1 point improvement in the host country governance infrastructure score – that restricts negative externalities – reduces profit shifting by 11–26%, and a similar improvement in the foreign country score reduces profit shifting from 1.5 to 5.2%. On the other hand, we find that a 0.1 point improvement in the foreign country governance infrastructure score – that supports economic activities and transactions – increases profit shifting by 1.7–7.8%. Additionally, consistent with our proposition, we find that corporate governance achieved through vigilant monitoring (a 1% increase in institutional investor shareholding) reduces profit shifting (by around 2.2–2.8% on average). Given the quality of governance institutions and tax rates in the sample, our model predicts that if corporate tax rates were to be reduced to 25% in host-country India, the foreign owners' incentive to shift profits would become negligible.

THEORY AND PROPOSITIONS

We develop a conceptual model linking the quality of country-level institutions of economic governance to firm-level governance outcomes arising from profit shifting incentives for foreign-/MNE-owned companies/subsidiaries.[1] We argue that the quality of country-level economic governance institutions influences the focal firm's proclivity to redistribute/shift earnings in two opposing ways. First, we posit that institutions that facilitate collective action and foster information transparency (in both foreign- and host-country) would deter unilateral expropriation of firms' earnings by profit shifting. Second, we suggest that stronger foreign-country institutions that secure property rights enable greater private control and security over the shifted earnings, thus increasing shifting.

Further, we contend that the structure and functioning of internal governance mechanisms are linked to the external institutional context. Specifically, diverging shareholder interests – caused by unilateral earnings shifting – create conflicts among the multiple principals (owners) of the firm. Frequently termed as the principal–principal agency problem, this form of conflict is pertinent to an

emerging economy host country with relatively weaker institutions (Young, Peng, Ahlstrom, Bruton, & Jiang, 2008). Hence a vigilant and dominant other principal (e.g., FIIs) would restrict the unilateral redistributive tendencies of the foreign owner(s).

At the firm level, we suggest links between ownership structure and corporate governance largely informed by the principal–principal agency theory (Filatotchev & Wright, 2011). For country-level institutions, our analysis is informed primarily by the notion that institutions set the "rules of the game," which in turn determine the behavioral outcomes at the firm level (Dixit, 2009; North, 1990). Using these twin theoretical lenses of agency and institutions, we develop a conceptual framework and posit hypotheses on the influence of country-level intuitions and corporate governance in the presence of profit shifting. The framework is depicted in Figure 1.

Based on this conceptual framework, we develop a simple model of optimal shifting and derive formal propositions. We describe the model and salient intuition behind the propositions here, while detailed mathematical derivation and supporting arguments are explicated fully in Appendix. Following prior work by Desai et al. (2007) we define the value of firm to the foreign owner as:

$$
\begin{aligned}
&[\textit{Value of the firm to Foreign Owner}] \\
&= [\textit{Income from Ownership Stake}] \\
&+ [\textit{Shifted Profits}] \\
&- [\textit{Shifting Cost due to Governance Infrastructure}] \\
&- [\textit{Shifting Cost due to Corporate Governance}]
\end{aligned}
$$

or

$$V_f = (1-s)(1-t)\lambda + s(1-f)\rho - \frac{1}{2}\gamma s^2 - \frac{1}{2}\mu s^2(1-\lambda) \quad (1)$$

In this model (Eq. (1)), without loss of generality, the firm's true pre-tax profit is normalized to 1. The controlling inside shareholder – in our case the foreign stakeholder – owns a fraction λ of the company. We represent the fraction of profits shifted out by the foreign owner as s, $(0 \leqslant s < 1)$, such that the firm reports a pre-tax earnings of $(1-s)$. If t is the corporate income tax rate in the high-tax host country, the foreign stakeholder's post-tax income from ownership stake is $(1-s)(1-t)\lambda$. Since the shifted profits are taxed in the foreign country at a lower tax rate f (i.e., $f<t$), the foreign owner would receive a fraction $s(1-f)$ of the shifted profits s. Further we assume that only a fraction $\rho(0<\rho<1)$ of the post-tax

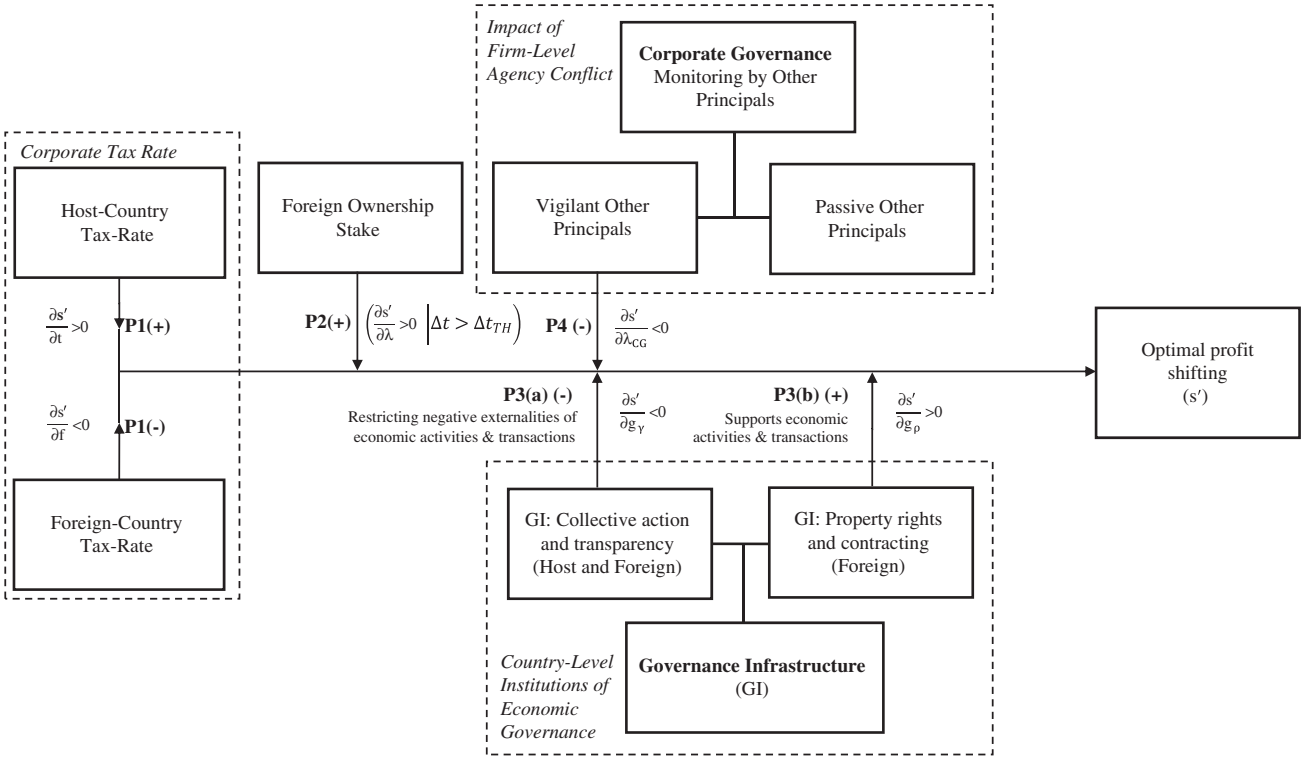


Figure 1 Conceptual framing of the propositions on influence of country governance infrastructure and corporate governance on tax-motivated profit shifting.

shifted profits $s(1-f)\rho$ is available to the foreign owner. We assume that costs of shifting are quadratic to quantum of shifting, where γ is the coefficient representing the quality of governance infrastructure in the foreign as well as host country. The coefficient μ represents the quality of corporate governance due to monitoring by minority shareholders, such that for a wholly owned firm, when $\lambda \to 1$, the cost due to monitoring by other principals vanishes.

We assume that the foreign owner would shift profits to maximize the total value V_f. From the first order condition ($\partial V_f / \partial s = 0$), we obtain this optimal level of shifting s':

$$s' = \frac{(1-f)\rho - (1-t)\lambda}{\gamma + (1-\lambda)\mu} \quad (2)$$

In the following sections, use this model of optimal shifting (in Eq. (2)) to derive results on the impact of corporate tax rates, quality of governance infrastructure and shareholder monitoring (corporate governance) on profit shifting.

Tax Differences and Profit Shifting

The MNEs extract benefits of multinational presence through: (a) multi-country coordination of markets and production activities (Dunning, 1980), (b) intra-firm transfer of technology and knowledge assets (Kogut & Zander, 1993), and (c) optimization of worldwide taxes and tariffs (Horst, 1971). We argue that the firm, as a rational actor, employs coordinated resource redistribution across multiple geographies to maximize its overall profits.

In particular, for MNEs with diverse geographical presence facing multiple tax jurisdictions, differences in inter-country taxes create opportunities and incentives for international earnings redistribution. We expect that a subsidiary in a high-tax host country, with the foreign owner located in a low-tax foreign country, would be incentivized to shift profits out of the high-tax country. Especially in an emerging economy host country with relatively high statutory corporate tax rates, such as India,[2] tax optimization would be a key driver for profit shifting. Therefore we propose the following:

Proposition 1: For a firm with controlling foreign ownership stake (λ) in a relatively high-tax host country, increase in host-country corporate tax rate (t) increases outward profit shifting, and increase in foreign country (f) tax rate decreases outward profit shifting (s'), *ceteris paribus*.

Proof: (The details of the proof are provided in Appendix)

Differentiating s' with respect to t and f we obtain:

$$\frac{\partial s'}{\partial t} > 0 \text{ and } \frac{\partial s'}{\partial f} < 0$$

□

Therefore the optimal outward shifting s' increases with higher host-country tax rate t and decreases with higher home-country (foreign country) tax rate f. The results intuitively suggest that the incentive to shift profits is arising from higher host-country and lower foreign-country tax rates.

The result is supported by several extant empirical studies using both aggregate country-level as well as micro firm-level data. Aggregate empirical analysis at the country level (Grubert & Mutti, 1991) and industry level (Bartelsman & Beetsma, 2003) find a significant negative influence of host-country tax on earnings and value added. Firm-level investigations, for instance Demirgüç-Kunt & Huizinga, 2001; Huizinga & Laeven, 2008 also reveal a significant negative correlation between host-country statutory tax rates and different measures of earnings. Our results make predictions on the incentives to shift profits arising from both host- and foreign-country tax rates, thus broadening its empirical applicability. In the next section, we show that such incentives are increasing with higher ownership only when the tax rate differences exceed a certain threshold.

Foreign/MNE Ownership and Earnings Redistribution

Both the definitions of ownership – residual rights to control (Grossman & Hart, 1986; Hart & Moore, 1990); residual claim on rents (Alchian & Demsetz, 1972) – suggest that a higher degree of ownership leads to better control rights, and in turn, better extraction of "private benefits of control" (Dyck & Zingales, 2004). In the case of profit shifting, the ability of foreign insider owners to shift profits, which is beneficial to their unilateral interests, constitutes the "private benefits of control."

We anticipate that if there is a sufficiently large host-to-foreign country tax rate difference, there are incentives for the foreign owner to engage in profit shifting activities. Thus increasing ownership stake to increase control and shifting a higher fraction of profits, could be an optimal response. Hence we have:

Proposition 2: For firms with controlling foreign ownership stake (λ) in a relatively high-tax (t) host country, higher foreign ownership increases outward profit shifting (s'), when the host-to-foreign

country tax difference (Δt) is greater than a threshold (Δt_{TH}).

Proof: (The details of the proof are provided in Appendix)Profit shifting increases with higher foreign ownership if:

$$\frac{\partial s'}{\partial \lambda} > 0$$

This derivative is positive only when the tax difference $\Delta t = (t - f)$ is greater than a threshold level $\Delta t > \frac{(1-f)(\gamma+\mu(1-\rho))}{\gamma+\mu} = \Delta t_{TH}$. □

Empirical studies find a positive association between ownership and control for foreign-owned companies/subsidiaries. For instance, in a study of US joint ventures over two decades, Desai, Foley, and Hines Jr. (2004) observed that a controlling ownership stake in its subsidiaries enhanced an MNE's coordination capabilities and tax planning. Similarly, Mudambi (1999) finds that stronger control of the subsidiary firms' resources is necessary for the efficient working of internal capital markets.

Our result suggests that once the incentive to shift profits exceeds a certain threshold, a higher ownership stake – in turn greater control – enables higher quantum of profit shifting. Therefore we expect to see a positive association of ownership stake and profit shifting whenever the tax rate difference exceeds a certain threshold level.

Alternatively for a given level of foreign tax rate, we can state that there is a maximum host-country tax rate $t_{\max}$ beyond which increasing foreign ownership ($\partial s'/\partial \lambda > 0$) increases shifting. We rewrite the threshold level of tax difference from Proposition 2 to obtain: (Please refer to Appendix for details)

$$t_{\max} = \begin{pmatrix} Governance \\ Infrastructure \\ Cost\ Fraction \end{pmatrix} + \begin{pmatrix} Corporate \\ Governance \\ Cost\ Fraction \end{pmatrix} \times foreign\ tax\ rate \quad (3)$$

where *Governance Infrastructure Cost Fraction* = $((\gamma+\mu(1-\rho))/(\gamma+\mu))$ and *Corporate Governance Cost Fraction* = $(\mu\rho/(\gamma+\mu))$. We graphically plot this relationship in Figure 2. The shaded portion in the figure shows the region of $\Delta t > \Delta t_{TH}$ where increasing foreign ownership ($\partial s'/\partial \lambda > 0$) is positively associated with shifting.

Figure 2 depicts an intuitive representation of Proposition 2, and for given host- and foreign-country tax rates it provides a useful device to check the extent of the proclivity of firms to shift profits. Illustrating an extreme case, in case of tax haven foreign countries (i.e., $f \to 0$) with a low risk of appropriation by external entities (i.e., $\rho \to 1$), the highest

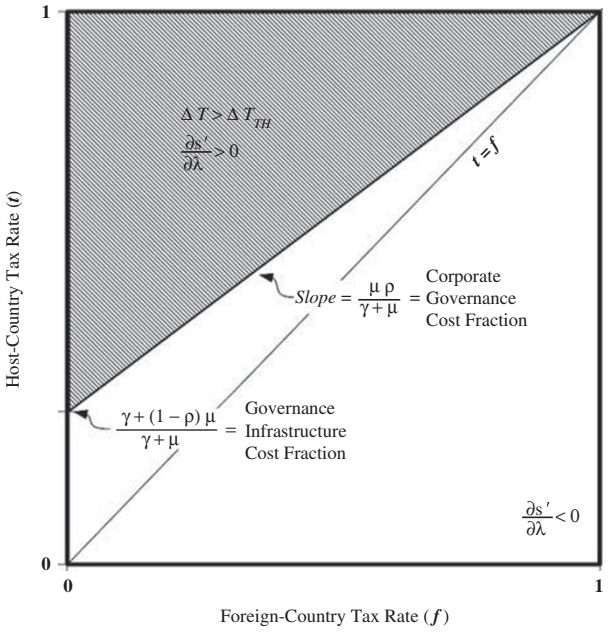


Figure 2 The region of host-to-foreign country tax difference where there are incentives for the foreign owner to shift profits (Eq. (3)).

tax rate that the host country may choose to levy beyond which profit shifting becomes optimal is:

$$t_{\max} < \begin{pmatrix} Governance \\ Infrastructure \\ Cost\ Fraction \end{pmatrix}$$

In other words, the quality of a country's governance infrastructure determines the upper limit on the host country's tax rate that can be enforced without incentivizing profit shifting. In the next section, we derive additional results of the direct impact of quality of country governance infrastructure on profit shifting.

Governance Infrastructure

We define governance infrastructure (GI) as the country's institutional fabric that supports the conduct of economic activities, facilitates efficient economic transactions and restricts negative externalities of such transactions. Globerman and Shapiro (2003: 19) suggest that these institutions include "legislation, regulation, and legal systems that condition freedom of transacting, security of property rights, and transparency of government and legal processes."

In contrast to the abstraction of institutional forces based on their characteristics – as regulative (laws, regulations and rules), normative (values

and norms), or cognitive (frames of conception of reality forces, Scott, 2001) – our conceptualization of the institutional environment is based on the function it serves to support economic activities. Specifically we conceptualize GI along Dixit's (2009) suggestion that GI provides three fundamental functions to support economic activities, and transactions: (a) it protects property rights, (b) enforces contracts, and (c) facilitates collective/common action. Analyzing the functions GI provides for economic activities, we conjecture how institutional forces would impact any particular economic transaction – in our case profit shifting by foreign-owned firms.

On one hand, by protecting private property and effective enforcement of contracts, GI supports economic activities and improves the efficiency of transactions, thus reducing costs of profit shifting. On the other hand, GI also restricts negative externalities thereby increasing costs of private shifting transactions – for instance by strong institutions of collective/common action. Consistent with North's (1990) conceptualization of institutions, the GI costs quantifies the extent of exogenous institutional uncertainty that firms face. We anticipate that the costs of conducting the economic activity, including extracting private benefits of control by profit shifting, are contingent on the quality of the institutional environment. We analyze the impact of GI on profit shifting by examining how this dual function of GI quality mitigates/aggravates costs of profit shifting transactions.

Governance infrastructure restricting negative externalities

Corporate profit shifting for tax avoidance results in negative externalities of different forms. We say that a negative externality occurs when the full cost to society of economic activity is not paid by the firm or individual engaging in that activity. Firms utilize different public capital assets of the country in which they operate. For instance they use the physical capital (infrastructure), institutional capital (functioning markets, legal systems, etc.), knowledge capital (publicly funded research and resulting intellectual property), and human capital (education and skills of employees acquired by public spending). Therefore when a firm engages in tax avoidance, it is free riding on this public capital and is externalizing its share of usage costs of these public assets on other tax-paying individuals and firms.

For example, Sikes and Verrecchia (2014) show that when a meaningful proportion of firms in an economy engage in tax avoidance strategies, the cost of capital for all firms in the economy increases. This is a particular case of how profit shifting by a few firms creates negative externality in the form of higher systematic risk for all the firms in the economy.

While the negative spillover of tax avoidance in likely to be higher in the host-country where the firm is operating, we also expect negative reputation consequences in the foreign country. For instance firms that operate from countries maintaining relatively low corporate tax rates – "tax haven" countries – are often subjected to enhanced scrutiny by tax enforcement agencies and international trading partners (Dharmapala & Hines Jr., 2009).

We anticipate that GI quality would play a role in restricting the negative spillover of profit shifting on the larger economy. In particular, prior studies demonstrate that institutions promoting greater transparency, freedom of expression, public accountability and moral values with reputational consequences[3] reduce opportunistic behavior. For instance, empirical research on freedom of the press (Djankov, McLiesh, Nenova, & Shleifer, 2001) showed that a free and diffused press curbs private opportunism. Ostrom (1990) and Coffee Jr. (2000) showed that policing through moral norms has a significant influence, outside of formal legal mechanisms. Therefore we expect that the cost of tax avoidance is also by strong socio-political institutions and transparency. Dyck and Zingales (2004) show evidence in support of this argument.

Summarizing we suggest that control of negative externalities achieved through both formal and informal governance institutions in both the host- and foreign-country would restrict profit shifting. Thus we propose:

Proposition 3(a): In firms with controlling foreign ownership (λ), higher costs of profit shifting due to the superior quality of governance infrastructure restricting negative externalities (γ), negatively moderates the extent of profit shifting (s') from the focal firm.

Proof: (The details of the proof are provided in Appendix)
If g_γ be a measure that is monotonically increasing with the quality of foreign country GI restricting negative externalities, then:

$$\frac{\partial s'}{\partial g_\gamma} < 0$$

□

Governance infrastructure supporting economic activities and transactions

Inside owners shift earnings using different market and non-market "tunneling" transactions involving multiple economic agents (Atanasov, Black, & Ciccotello, 2008). Efficient conduct of these transactions requires well-functioning institutions. We focus on the two fundamental functions of GI in the foreign country – contract enforcement and protection of property rights – ensuring that the shifted profits are safe and can be easily transacted with.

Efficient economic transactions require effective contract enforcement institutions. GI provides the function of contract enforcement through a combination of informal and formal mechanisms like social norms, bilateral self-enforcement, private third-party enforcement and legal structure. In the absence of effective contract enforcement, agents face problems of hold-up and opportunism increasing the transaction costs (Williamson, 1985). Therefore a foreign country where these institutions are well functioning is more likely to attract shifted profits.

Secure property rights[4] ensure that private capital is safe from predation by criminal entities or the government and its agents. Predation of private capital can happen through both organized and disorganized corruption. Governments can expropriate through discretionary regulation and taxation, or the outright nationalization of private property. In case of weak property rights – due to the presence of organized crime, government expropriation and discretionary regulations – firms either avoid such countries or they are forced into costly "underground" or "grey market" transactions. Friedman, Johnson, Kaufmann, and Zoido-Lobaton (2000) observe the firm behavior of this nature in an empirical study of 69 countries. Notably in a study of tax havens, Dharmapala and Hines Jr. (2009) showed that lower tax alone is not sufficient to make a country a tax haven. Instead, countries that are better governed and provide secure property rights along with low tax are more likely to become tax havens.

Therefore we anticipate that superior property rights and contracting institutions in the foreign country will mitigate the costs of shifting transactions, thereby facilitating profit shifting when ownership is based in those foreign countries. Hence we propose:

Proposition 3(b): In firms with controlling foreign ownership (λ), lower costs of profit shifting due to the superior quality of governance infrastructure (ρ), supporting economic activities and transactions in the foreign country, positively moderate the extent of profit shifting (s') from the focal firm.

Proof: (The details of the proof are provided in Appendix)
If g_ρ be a measure that is monotonically increasing with the quality of foreign country GI supporting economic activities and transactions, then:

$$\frac{\partial s'}{\partial g_\rho} > 0$$

□

Profit Shifting, Corporate Governance and Principal–Principal Agency

Profit shifting by foreign owners creates a divergence between multiple shareholder interests and incentives. We focus on this divergence of interest between different principals of the firm to understand the linkage between corporate governance and profit shifting. We argue that the controlling foreign owner is a beneficiary of earnings outflows from the firm. Gains to the foreign owner accrue through a reduction in the overall tax burden across multiple jurisdictions. However, for other (domestic minority) shareholders, this earnings outflow essentially leads to loss of income – income that was otherwise legitimately due to them proportionate to their shareholding. That is, in addition to the classical principal–agent (owner–manager) agency conflict (Laffont & Martimort, 2009), earnings redistribution creates a principal–principal agency conflict (Young et al., 2008).

Specifically in emerging economies with weak/non-existent external markets for corporate control, the conflicts among principals with divergent interests are crucial in driving firm-level governance. Prior studies on the principal–principal agency conflict in emerging economies (e.g., Young et al., 2008) attribute such conflicts to the inadequate institutional protection of minority shareholders.

We posit that a certain class of stakeholders would have a stronger influence in enforcing good corporate governance and by extension a reduction in unilateral profit shifting. We build upon the "governance through ownership" framework proposed by Connelly, Hoskisson, Tihanyi, and Certo (2010) to guide our arguments related to the differential influence of distinct types of owners on governance outcomes. First, we consider (simplistically) two distinct owner classes – the vigilant other principals (e.g., large blockholders and institutional investors); and the dispersed or passive principals (e.g., individual shareholders). Then, we use the twin foci of "alignment"

and "control" (Dalton, Daily, Johnson, & Ellstrand, 1999) to argue that while earnings redistribution creates a failure of alignment among the principals, the dominant other principals have superior monitoring control *vis-à-vis* the passive principals.

Thus we expect the stronger influence of the vigilant and dominant principals to result in effective monitoring of the foreign owner(s) – thereby reducing earnings outflow. In contrast, we expect that the diffused principals would lack sufficient monitoring capabilities and the influence necessary to impact shifting by the foreign owner(s). David, O'Brien, Yoshikawa, and Delios (2010) find that "transactional" owners with arms' length relationships with the firm (such as institutional investors) primarily appropriate rents in the form of financial profits. Therefore to maintain the profitability of their stake, we expect that such shareholders would be particularly vigilant in curbing profit shifting. Thus we hypothesize that:

Proposition 4: In firms with controlling foreign ownership (λ), better corporate governance achieved through monitoring by vigilant other principals (λ_{CG}) negatively moderates the extent of profit shifting (s').

Proof: (The details of the proof are provided in Appendix)
Let λ_{CG} be the share of vigilant other shareholders of the firm, then:

$$\frac{\partial s'}{\partial \lambda_{CG}} < 0$$

□

EMPIRICAL INVESTIGATION

Research Setting and Data Sources

We test the predictions of our model using a sample of firms operating in India during 2001–2010. This decade-long unbalanced panel consists of 23,217 firm-year observations of 3644 companies, including 921 observations corresponding to 167 firms with controlling foreign ownership. The data set has 22,296 observations of Indian firms – 8547 observations of business-group-affiliated firms and 13,749 of non-group-affiliated private firms (henceforth, we refer to these as "group firms" and "stand-alone firms," respectively). The sample represents 162 industries (four-digit NIC);[5] the foreign firms in the sample span 69 industries. The observations of Indian firms serve as the reference against which we estimate the foreign firms' sensitivity to macroeconomic earnings shock. The data set's constituents and the different sources from which they are aggregated are described below.

Ownership and financial data

Our primary source of ownership and financial data is PROWESS, a comprehensive database of annual financial and ownership information of Indian firms, which is widely used in academic research (Bertrand et al., 2002; Siegel & Choudhury, 2012). From PROWESS, we obtain information under four broad categories: (a) company financial data collated from annual reports; (b) business group affiliation; (c) primary economic activity and industry affiliation; and (d) ownership/shareholding pattern.[6] We collect the identities of the major shareholders/directors for all observations under controlling foreign ownership and trace each of them to their respective foreign countries. Multiple shareholders frequently exercise significant influence in a firm and a maze of cross-holdings by several related entities often exists. Thus to consistently trace the foreign countries of influential owners, we select the entity with the highest equity stake among all the stakeholders for a given observation year. Complementing the PROWESS information, we use extensive Internet searches[7] to trace owners to their respective foreign countries. Table 1 presents the sample distribution thus obtained amongst the 23 different owner foreign countries. Including the host-country India, there are ownership-based affiliations to 24 different countries in our data set. For these 24 countries in the 2001–2010 period we collect data pertaining to statutory corporate income tax rates from multiple sources.[8] The final cleaned sample[9] used in our study comprises 23,217 firm-year observations from 2001 to 2010.

Governance infrastructure data

As estimates of a country's governance infrastructure quality, like Globerman and Shapiro (2003) we also use the Worldwide Governance Indicators (WGI) – multidimensional governance scores compiled by the World Bank (Kaufmann, Kraay, & Mastruzzi, 2010). We prefer using the de facto perception-based WGI indices because they capture the factual perception of the institutional reality, as opposed to other *de jure* measures reflecting the state of institutions as enshrined in the code of law. Partly this is because there are considerable gaps between the de facto and the *de jure* measures of quality of institutions for India (Allen, Chakrabarti, De, Qian, & Qian, 2009). For instance, based on *de jure* considerations, India is

Table 1 Sample distribution of foreign countries of firms operating in India for the decade-long panel (Years: 2001–2010; $N = 23,217$).

Code[a]	Country	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	*N*
AUT	Austria	1	–	–	–	–	–	–	–	–	–	1
BEL	Belgium	–	–	1	1	–	–	–	1	1	1	5
CHE[b]	Switzerland [c]	3	4	5	6	8	6	6	7	7	2	54
DEU	Germany	16	15	14	13	15	15	14	15	14	7	138
DNK	Denmark	–	–	–	–	1	1	1	1	1	1	6
EGY	Egypt	1	1	1	1	–	–	–	–	–	–	4
ESP	Spain	–	–	–	–	–	–	–	1	1	–	2
FIN	Finland	1	1	1	1	1	1	–	–	–	–	6
FRA	France	5	4	5	5	5	5	4	4	4	4	45
GBR	United Kingdom	19	17	14	13	14	15	18	18	17	6	151
HKG[b]	Hong Kong[c]	–	–	–	2	2	1	1	2	2	1	11
IMY[b]	Isle of Man[c]	–	–	–	–	–	–	1	2	2	2	7
IRL[b]	Ireland[c]	1	1	1	1	1	1	1	1	1	1	10
JPN	Japan	7	8	11	11	10	11	9	8	8	9	92
KOR	Korea, Rep.(South)	–	–	–	1	1	1	1	1	–	–	5
MEX	Mexico	–	–	–	–	–	–	–	–	1	1	2
MUS[b]	Mauritius[c]	11	12	11	10	8	9	12	10	8	6	97
NLD	Netherlands	–	–	–	4	4	4	6	6	7	2	33
PAN[b]	Panama[c]	–	–	–	–	–	–	–	–	1	–	1
SGP[b]	Singapore[c]	3	6	6	5	4	5	5	4	4	2	44
SWE	Sweden	3	4	5	4	4	4	4	4	4	–	36
THA	Thailand	–	–	–	–	1	1	1	1	1	–	5
USA	United States	18	15	17	18	15	18	18	17	17	13	166
Total Foreign-Owned Firms		89	88	92	96	94	98	102	103	101	58	921
Indian Business Group Affiliated		831	868	862	864	851	862	880	870	849	810	8547
Indian Private Standalone Firms		1186	1292	1266	1241	1250	1440	1525	1582	1557	1410	13,749
Total Indian Firms		2017	2160	2128	2105	2101	2302	2405	2452	2406	2220	22,296
Total Firm-Year Observations		2106	2248	2220	2201	2195	2400	2507	2555	2507	2278	23,217

[a]Three-letter country code as per ISO 3166-1 alpha-3.
[b]Tax havens.
[c]From the list of tax haven countries compiled by Dharmapala and Hines (2009).

assigned a perfect score (4/4) on the Creditor Rights index by López-de-Silanes, La Porta, Shleifer, and Vishny (1998) and a high score (5/6) in the Anti-Director Rights Index by Djankov, La Porta, López-de-Silanes, and Shleifer (2008). In contrast, India is ranked a low 90/145 based on the de facto Corruption Perception Index from Transparency International in 2004.

As estimates of GI that restrict negative externalities in the foreign- and host-country, we use the Voice and Accountability (VA) and the Government Effectiveness (GE) indicators. For estimating the quality of GI in securing property rights and enforcing contracts in the foreign country, we use Government Effectiveness (GE) and Political Stability and Non-Violence (PSNV) indicators. It may be noted while Government Effectiveness would restrict negative externalities in the host country, the same GI function in necessary for secure property rights and contracting in the foreign country.

METHODOLOGY

The aim of our empirical investigation is to detect earnings redistribution by firms with controlling foreign ownership and to demonstrate the influence of institutional and corporate governance factors on the magnitude of such redistribution. For identification, our empirical design exploits two sources of variation: (a) cross-country variation in tax rates and institutional quality scores, and (b) temporal variation over the decade-long panel. The extant literature suggests that redistribution activities are reflected in the focal firm's decisions to manipulate reported accounting earnings. Therefore following Bertrand et al. (2002), we estimate profit shifting by comparing the variations in reported earnings of the firm to variations in expected/predicted earnings due to exogenous macro earnings shocks. Bertrand et al.'s (2002) method provides a rigorous technique to isolate channels that contribute to under-reporting of firm-level accounting profits. The method

isolates the channels by testing the impact of that channel on the sensitivity of profits to exogenous earnings shocks. These shocks could be due to factors that impact all firms in the industry and are beyond the control of any one firm – for instance global commodity prices, exchange rates, etc. – and reflect as industry-wide changes in profitability. Therefore a particular firm's sensitivity to the exogenous shock, if correlated with a channel of shifting, isolates that channel as an idiosyncratic source of shifting.

Since profit shifting is a channel of cash flow tunneling (Atanasov et al., 2008), we interpret that differential reaction of firm's earnings to macro shocks for different foreign owner classes, subgrouped by tax differences, is due to tax-motivated profit shifting. For instance in a recent work, Dharmapala and Riedel (2013) employ this method to investigate profit shifting in European multinational affiliates.

Following Bertrand et al. (2002), for the *i*th focal firm in the *j*th industry (four-digit NIC) for the time period *t*, we regress the reported earnings, $Earnings_{ijt}$, with the "predicted earnings" of the firm. We compute the "predicted earnings" regressand by first obtaining the asset-weighted average returns (return on assets, ROA) for the *j*th industry in period *t*: $Average\ Industry\ ROA_{jt} = \Sigma_i\ (ROA_{ijt} \times Assets_{ijt})/\Sigma_i\ (Assets_{ijt})$. The focal firm observation is dropped from this average computation to avoid potential mechanical correlations. Using this average return computed for the industry, we estimate the *i*th firm's "predicted earnings" in the absence of profit shifting as: $Predicted\ Earnings_{ijt} = (Assets_{ijt}) \times (Average\ Industry\ ROA_{jt})$. We then estimate a regression specification of the following general form:

$$\begin{aligned} Earnings_{ijt} = {} & \alpha + \beta_1 (Predicted\ Earnings_{ijt}) \\ & + \beta_2 [(Predicted\ Earnings_{ijt}) \\ & \quad \times (Ownership\ Dummy_{it})] \\ & + \beta_3 [(Predicted\ Earnings_{ijt}) \\ & \quad \times (Ownership\ Dummy_{it}) \\ & \quad \times (Other\ Interacting\ Factors_{it})] \\ & + \delta(Controls) + Firm\ Fixed\ Effects_i \\ & + Time\ Fixed\ Effects_t + e_{it} \end{aligned}$$

In this model, $Firm\ Fixed\ Effects_i$ and $Time\ Fixed\ Effects_t$ control for firm-specific unobserved heterogeneity and time-period-specific fixed effects, respectively. Controlling for unobserved firm-specific and time-period effects, we interpret coefficients β_1, β_2 and β_3 as follows. Coefficient β_1 is an estimate of the average sensitivity of firms to macro earnings shock. Thus depending on whether $\beta_1 < 1$ or $\beta_1 > 1$, we interpret that, on average, firms under-respond or over-respond, respectively, to exogenous shocks. Coefficient β_2 measures how affiliation to an ownership class moderates the firm's sensitivity to shocks. If $\beta_2 < 0$ ($\beta_2 > 0$) for a particular ownership class, it reflects deflated (inflated) reporting of earnings on average by the firms in that class. Coefficient β_3 is a measure of the extent of influence of the other factors of interest (e.g., tax rate, institutional quality) on the sensitivity to earnings shocks. If the factor positively moderates by increasing outflow shifting, we would expect $\beta_3 < 0$, and vice versa. It may be noted that a negative sign on β_3 reflects a positive moderating influence (i.e., increase in outflow).

We interpret β_2 and β_3 in relation to the model parameters to test the propositions. For example, consider Proposition 3(a): $\partial s'/\partial g_\gamma < 0$. Where g_γ is an estimate of GI quality in restricting negative externalities of economic activity and we can use the WGI indicators VA and GE in host country as estimates of g_γ. Then the regression coefficient β_3 of the interaction term with the WGI indicators measure how shifting is influenced by $g_\gamma = VA,\ GE\ scores$, such that $\partial s'/\partial g_\gamma = -\beta_3$. The negative sign on β_3 indicates an inverse relation of g_γ with profit shifting. We test for the other model propositions in a similar way.

Concerns about heteroskedasticity and serial autocorrelation issues were raised with the original application of this method to the PROWESS data set (Siegel & Choudhury, 2012). To address these issues, we compute heteroskedasticity and serial correlation-robust standard errors clustered at the firm level. Additionally, we control for standard strategy variables that might directly influence pre-tax earnings.

Variables

Dependent variables

Similar to Bertrand et al. (2002), Gopalan, Nanda, and Seru (2007), and Siegel and Choudhury (2012), we use earnings before interest, taxes, depreciation and amortization (EBITDA) as the dependent variable. We select EBITDA for three reasons. First, profit shifting through transfer pricing adjustments (or other methods that impact a firm's cash flows) directly influences the reported EBITDA/Assets (ROA) (Atanasov et al., 2008). Second, EBITDA is the most commonly used measure of firm performance, especially in the extant usage of Bertrand et al.'s (2002) methodology. Third, the EBITDA data is relatively less noisy, and thus, a more reliable measure of performance than the other

data variables provided by the CMIE database (Bertrand et al., 2002).

Independent variables

We select three categories of independent variables.

(1) Ownership group indicators

(1a) Foreign ownership stake: The total percentage of equity ownership of foreign owners, excluding institutional investors and venture capitalists.

(1b) Controlling foreign ownership dummy: A dummy variable defined by a foreign ownership threshold that is greater than or equal to 51% of the total equity. Rao and Dhar (2011) presented a detailed India-specific discussion on FDI caps, corporate control mechanisms used by MNEs, and the aptness of the 51% shareholding threshold. We use this in relation to local legal provisions. We also create dummies based on host-to-foreign tax differences subgrouped into top 50, 33 and 25 percentiles. We also create a dummy for tax haven countries based on the listing in Dharmapala and Hines Jr. (2009: 1067).

(1c) Business group affiliation dummy: The CMIE definition of business group affiliation based on multiple criteria such as equity cross-holdings, interlocking directorates and influential informal ties.

(2) Country-level indicators

(2a) Statutory corporate tax rates:[10] Aggregate country-level corporate tax rates manually collected from multiple sources.[11]

(2b) The estimates of the quality of governance infrastructure: We use the following World Bank WGI indicators (Kaufmann et al., 2010). The country-level Voice and Accountability (VA) defined as "capturing perceptions of the extent to which a country's citizens can participate in selecting their government, as well as freedom of expression, freedom of association, and a free media," Government Effectiveness (GE) defined as "capturing perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies," and Political Stability and Non-Violence (PSNV) defined as "capturing perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism" (Kaufmann et al., 2010:4).

(3) Other principals

(3a) Dominant principals: Large block-holders such as Domestic/Indian institutional investors, foreign institutional investors and Domestic/Indian owner/owner stake.

(3b) Passive principals: The extent of individual shareholding (public shareholding) as a measure of ownership by dispersed principals.

Control variables

We use a standard set of controls from the existing literature. Following Bertrand et al. (2002), the variables controlling for the firm's responsiveness to exogenous earnings shock are the size of the firm (Log(*Assets*), used as a measure of size) and the age of the firm (year of incorporation). Following Gopalan et al. (2007), the variables controlling for variation in the reported EBITDA are financial leverage (debt/asset ratio) and investments. Since the focal group of firms is foreign-controlled, we anticipate that they are endowed with possible earnings/performance advantages derived from their multinationality (Tallman & Li, 1996). Specifically, empirical observations (Grant, 1987; Kotabe, Srinivasan, & Aulakh, 2002) suggest that the R&D and marketing capabilities moderate the performance of multinational firms. Hence we include R&D intensity (R&D/sales) and marketing intensity (advertisement/sales) as additional strategy controls. There is a possibility that the country's tax policy is endogenous to its institutional quality, thus we introduce country dummies to control for the country's long-term institutional quality that does not change for duration of the sample period.[12]

RESULTS

The summary statistics and Pearson correlations for the full sample of 23,217 firm-year observations are reported in Table 2. In Table 3, we present the fixed-effects regression estimates for the sensitivity of firms to earnings shock (models 1 & 2), influence of foreign ownership (models 3 & 4) and the influence of tax differences (models 5–10). We interpret the coefficient of the *Earnings Shock* variable as an estimate of the average earnings response for all the firms in the sample. From model 1 ($\beta_1 = 0.53$, $p<0.01$), we estimate that firms gain about 53 cents

Table 2 Summary statistics and Pearson correlations[a]

Variable	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	
1. EBITDA[b]	296.57	766.84	1.00										
2. Predicted EBITDA[b]	315.93	972.58	0.67	1.00									
3. Business group affiliation dummy	0.37	0.48	0.25	0.22	1.00								
4. Foreign ownership dummy	0.04	0.20	0.10	0.05	−0.16	1.00							
5. Tax distance[c]	0.00	0.03	0.12	0.02	−0.12	0.80	1.00						
6. Tax haven dummy[d]	0.01	0.10	0.09	0.00	−0.08	0.49	0.79	1.00					
7. Voice and Accountability Score	0.43	0.18	0.11	0.08	−0.14	0.84	0.58	0.21	1.00				
8. Government Effectiveness	0.02	0.33	0.10	0.08	−0.15	0.94	0.75	0.40	0.87	1.00			
9. Political Stability and Non-Violence	−1.14	0.41	0.09	0.06	−0.14	0.91	0.77	0.51	0.75	0.87	1.00		
10. Foreign ownership share	0.04	0.15	0.09	0.04	−0.11	0.86	0.70	0.43	0.71	0.81	0.78	1.00	
Variable	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	
11. Domestic (Indian) owner share	0.43	0.22	−0.02	−0.02	0.13	−0.37	−0.30	−0.18	−0.28	−0.33	−0.35	−0.41	
12. Domestic institutional investor share	0.04	0.07	0.28	0.22	0.27	0.03	0.03	0.01	0.01	0.02	0.04	0.02	
13. Foreign institutional investor share	0.02	0.06	0.43	0.36	0.13	0.01	0.01	0.01	0.04	0.04	0.02	0.00	
14. Domestic individual (public) share	0.31	0.17	−0.27	−0.21	−0.19	−0.16	−0.14	−0.09	−0.15	−0.17	−0.14	−0.20	
15. Assets[b]	2,485.42	6,704.98	0.80	0.77	0.25	0.06	0.10	0.06	0.06	0.05	0.04	0.06	
16. Log(Assets)	6.40	1.67	0.61	0.52	0.44	0.13	0.12	0.08	0.12	0.14	0.11	0.14	
17. Year of incorporation	1,980.19	17.88	−0.15	−0.10	−0.26	−0.10	−0.07	−0.02	−0.09	−0.10	−0.10	−0.09	
18. Debt-to-asset ratio	0.43	0.35	0.00	0.02	0.07	−0.15	−0.12	−0.07	−0.12	−0.13	−0.15	−0.14	
19. Investments[b]	292.81	2,218.08	0.32	0.59	0.10	0.05	0.07	0.02	0.05	0.05	0.03	0.04	
20. R&D to sales intensity	0.01	0.43	0.00	0.36	0.00	0.04	0.04	0.00	0.04	0.04	0.03	0.03	
21. Advertisement to sales intensity	0.01	0.04	0.08	0.09	0.05	0.03	0.01	0.00	0.02	0.03	0.02	0.02	
Variable	Mean	s.d.	11	12	13	14	15	16	17	18	19	20	21
11. Domestic (Indian) owner share	0.43	0.22	1.00										
12. Domestic institutional investor share	0.04	0.07	−0.12	1.00									
13. Foreign institutional investor share	0.02	0.06	−0.06	0.16	1.00								
14. Domestic individual (public) share	0.31	0.17	−0.44	−0.26	−0.28	1.00							
15. Assets[b]	2,485.42	6,704.98	−0.02	0.25	0.39	−0.24	1.00						
16. Log(Assets)	6.40	1.67	0.05	0.36	0.41	−0.45	0.60	1.00					
17. Year of incorporation	1,980.19	17.88	−0.05	−0.25	0.00	0.16	−0.11	−0.24	1.00				
18. Debt-to-asset ratio	0.43	0.35	0.07	0.09	−0.02	−0.02	0.06	0.11	0.02	1.00			
19. Investments[b]	292.81	2,218.08	−0.01	0.10	0.20	−0.11	0.57	0.25	−0.02	−0.03	1.00		
20. R&D to sales intensity	0.01	0.43	−0.02	0.00	0.02	−0.01	0.24	0.03	0.01	−0.01	0.68	1.00	
21. Advertisement to sales intensity	0.01	0.04	0.01	0.01	0.07	−0.05	0.12	0.08	−0.01	0.00	0.07	0.05	1.00

[a]Unbalanced data panel for 2001–2012; $N = 23,217$. Correlation coefficients greater than 0.012 are significant at $p <= 0.05$.
[b]All monetary variables are expressed in million INR for the constant year 2001. Computed using the Consumer Price Index obtained from the Labour Bureau, Government of India (indexed at the year 2001 = 100).
[c]The difference in statutory corporate tax-rates between host and the foreign country is defined as the tax difference (= Host-Country Tax Rate – Home-Country Tax Rate). The mean tax-difference for the full sample is 0.004 or 0.4%, and for the subsample of foreign-owned firms the mean is 10.68%.
[d]The tax haven dummy marks seven countries as tax havens following Dharmapala and Hines Jr. (2009) listing.

Table 3 Influence of foreign ownership and corporate income tax rates [P1 and P2]

EBIDTA	1	2	3	4	5 P1	6 P2	7 P2	8 P2	9 P2	10 P2
Own Shock (Predicted EBIDTA)	0.53*** (0.05)	5.95** (2.60)	6.60** (2.79)	6.17** (2.83)	5.75* (2.95)	5.97** (2.89)	6.21** (2.87)	6.24** (2.85)	6.25** (2.87)	6.47** (2.86)
Own Shock Interactions										
× Foreign Owner Dummy			−0.22** (0.09)		−0.07 (0.10)	−0.07 (0.10)				
× Foreign Ownership Stake (%)				−0.28** (0.12)						
Influence of Tax Difference										
× Foreign Tax Rate					0.53* (0.29)					
× Host–Foreign Tax Difference						−0.53* (0.29)				
× Foreign Dummy Tax Haven							−0.27** (0.11)			
× Foreign Dummy No Tax Haven							−0.14 (0.09)			
× Foreign Dummy (Top 50 pc Tax Diff.)								−0.27*** (0.10)		
× Foreign Dummy (Bot. 50 pc Tax Diff.)								−0.14 (0.09)		
× Foreign Dummy (Top 33 pc Tax Diff.)									−0.27** (0.11)	
× Foreign Dummy (Bot. 66 pc Tax Diff.)									−0.15 (0.09)	
× Foreign Dummy (Top 25 pc Tax Diff.)										−0.24** (0.10)
× Foreign Dummy (Bot. 75 pc Tax Diff.)										−0.19** (0.09)
Controls										
Own Shock × Indian Group Dummy			−0.13* (0.07)	−0.11* (0.06)	−0.13* (0.07)	−0.13* (0.07)	−0.13* (0.07)	−0.13* (0.07)	−0.13* (0.07)	−0.13* (0.07)
Own Shock × Year of Incorporation		−0.00** (0.00)	−0.00** (0.00)	−0.00** (0.00)	−0.00** (0.00)	−0.00** (0.00)	−0.00** (0.00)	−0.00** (0.00)	−0.00** (0.00)	−0.00** (0.00)
Own Shock × Log(Total Assets)		0.02 (0.04)	0.04 (0.04)	0.04 (0.05)	0.04 (0.05)	0.04 (0.05)	0.04 (0.04)	0.04 (0.04)	0.04 (0.04)	0.04 (0.04)

Log(Total Assets)		62.12***	56.00***	56.89***	57.95***	57.95***	56.97***	56.98***	56.90***	56.34***
		(11.67)	(11.68)	(11.67)	(12.01)	(12.01)	(11.87)	(11.85)	(11.86)	(11.81)
Own Shock × RnD-to-Sales Intensity		0.02***	0.02***	0.02***	0.01***	0.01***	0.01***	0.01***	0.01***	0.01***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
RnD-to-Sales Intensity		−364.68**	−358.18**	−367.10**	−358.52**	−358.52**	−358.40**	−358.45**	−358.28**	−357.99**
		(174.43)	(170.71)	(172.13)	(170.28)	(170.28)	(170.81)	(170.84)	(170.77)	(170.60)
Own Shock × Advert.-to-Sales Intensity		0.12	0.14	0.13	0.12	0.12	0.13	0.13	0.13	0.13
		(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
Advert.-to-Sales Intensity		−690.73***	−732.96***	−716.77***	−697.00***	−697.00***	−714.87***	−714.69***	−716.59***	−727.24***
		(261.92)	(261.74)	(258.49)	(262.31)	(262.31)	(261.20)	(261.11)	(261.33)	(262.41)
Own Shock × Debt to Asset Ratio		−0.08	−0.11*	−0.10	−0.08	−0.08	−0.10	−0.10	−0.10	−0.11
		(0.07)	(0.07)	(0.06)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Debt to Asset Ratio		−70.38***	−66.95***	−68.48***	−72.90***	−72.90***	−70.22***	−70.23***	−69.92***	−68.06***
		(13.04)	(12.49)	(12.62)	(12.81)	(12.81)	(12.77)	(12.75)	(12.74)	(12.61)
Own Shock × Investments		−0.00***	−0.00***	−0.00***	−0.00***	−0.00***	−0.00***	−0.00***	−0.00***	−0.00***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Investments		0.12***	0.11***	0.11***	0.10***	0.10***	0.10***	0.10***	0.10***	0.11***
		(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Own Shock × Year Dummies	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observation	23,217	23,217	23,217	23,217	23,217	23,217	23,217	23,217	23,217	23,217
Adjusted *R*-Squared	0.412	0.484	0.488	0.488	0.489	0.489	0.488	0.488	0.488	0.488

*$p<0.10$; **$p<0.05$; ***$p<0.01$.
Robust standard errors clustered at the firm level are presented in parentheses.

on average for a 1-dollar exogenous earnings shock in the industry. In model 2, we introduce the standard set of control variables from the literature to control for the other factors influencing sensitivity to earnings shock. The interaction of the *Foreign Ownership* dummy with *Earnings Shock* in model 3 demonstrates how foreign ownership influences sensitivity to exogenous earnings shocks. A negative coefficient estimated for this term ($\beta_2 = -0.22$, $p<0.05$) indicates that foreign ownership is associated with about 22% under-response or under-reporting of earnings when compared with other standalone private Indian firms. Following Dharmapala and Riedel (2013), we interpret the foreign ownership-linked under-response to earnings shocks as an outcome of the firms' international profit shifting. It may be noted here that a negative sign on the interaction term's coefficient reflects an increase in earnings outflow (i.e., a positive influence on shifting), and vice versa.

Similar to Bertrand et al. (2002), we also estimate an under-response of 11–13% ($\beta_2 = -0.11$ to -0.13, $p<0.10$) associated with business group affiliation. Model 4 depicts that for every 1% stake increase by the foreign owner, there is an increase in shifting (outflow) of about 0.28% ($\beta_2 = -0.28$, $p<0.05$).

Models 5–10 test the influence of the differences in host- and foreign-country tax rates. From model 5, we observe that a 1% increase in foreign country tax rate (f) is associated with 0.53% reduction in earnings shock ($\beta_3 = 0.53$, $p<0.1$), here $\beta_3 > 0$ implies $\partial s'/\partial f<0$.This supports Proposition 1 and we estimate $\partial s'/\partial f = 0.53\%$. However, since we do not observe any significant variation in the host-country tax rate (t) during the sample period, we are not able to identify $\partial s'/\partial t$ separately. From model 6, we find that for a 1% increase in the host-country tax rate compared with that of the foreign country, there is a significant 0.53% increase in earnings outflow ($\beta_3 = -0.53$, $p<0.1$), here $\beta_3<0$ implies $\partial s'/\partial t > 0$.

Our estimate of the semi-elasticity ($= (\partial(Earnings))/((Earnings)\partial x(Tax\ Difference))$) of profit shifting to tax differences of –0.53 is comparable with other empirical estimates for other countries. Huizinga and Laeven (2008) estimated semi-elasticity in the range of –0.28 to –2.92 in the European context. In particular, we find that our estimate of –0.53 is very close to the headquarter-to-low-tax affiliate semi-elasticity estimated at –0.50 by Dischinger and Riedel (2010) for European MNEs. Given the mean tax difference of 10.68% for the foreign-owned firms in our sample, we estimate that about 5.7% ($= 10.68\times0.53$) of the pre-tax earnings is shifted away on average from foreign-owned firms from India.

Further, based on the estimates from models 5–10, we show that the negative response to earnings shock attributable to foreign ownership is explained by the difference in tax rates. This strengthens the proposition that the observed negative earnings response for foreign-owned firms is specifically associated with international profit shifting.

In model 7, the foreign ownership dummy is split into two groups corresponding to "tax haven" and "others"; the estimates show significant (–27%, $\beta_3 = -0.27$, $p<0.05$) negative earnings response for foreign-owned firms from a tax haven foreign country. To specifically estimate the threshold tax difference (Proposition 2), we further split foreign-ownership firms into groups of top-50%, top-33%, top-25%, and bottom-50%, bottom-66%, bottom-75% percentile tax-difference groups (models 8–10). We find that the observed negative earnings response is driven by firms representing higher host-to-foreign tax differences. We note that the bottom-75% tax-difference group is significant ($\beta_3 = -0.19$, $p<0.05$) while other bottom-groups are not significant. Here $\beta_3<0$ implies $\partial s')/(\partial\lambda) > 0$. The highest tax-difference in the bottom-75% group is about 17% and in the next lower group (bottom-66%) tax-difference is 14%. Therefore we estimate for our sample, the threshold tax difference ($\Delta t_{TH} = (1-f)(\gamma+\mu(1-\rho)))/(\gamma+\mu)$) is in the range $14\% \leqslant \Delta t_{TH} \leqslant 17\%$. Conservatively we estimate that for the given institutional quality, corporate governance and tax rates in India, the incentives for the foreign owner to increase shifting with higher ownership (i.e., $\partial s'/\partial\lambda > 0$) arises if host-foreign country tax difference is greater than 17% ($\Delta t_{TH} \approx 17\%$). These tests from models 5 to 10, specifically lend support to propositions 1 and 2.

The average foreign country tax rate (f) in the sample is 31.32%. Plugging the average f in our estimated threshold equation we obtain: $\Delta t_{TH} = ((1-0.3132)(\gamma+\mu(1-\rho)))/(\gamma+\mu) = 17\%$. From this relation we estimate the "Governance Infrastructure cost fraction" (in Eq. (3), see Appendix for additional details): $((\gamma+\mu(1-\rho)))/(\gamma+\mu) = 0.17/(1-0.3132) = 0.25$. The corresponding "Corporate governance cost fraction" is 0.75 ($= 1-0.25$). Substituting these values, we have the following estimate of Eq. (3):

$$t_{\max} = \underbrace{(0.25)}_{\substack{Governance\\ Infrastructure\\ Cost\ Fraction}} + \underbrace{(0.75)\,f}_{\substack{Corporate\\ Governace\\ Cost\ Fraction}}$$

This equation provides a convenient way to estimate the maximum tax rate that may be levied in the host-country India, beyond which there is increasing incentives for the foreign owner from a lower tax rate country to shift profits. To illustrate consider the example of Mauritius, a tax haven, where the lowest tax rate was 12.5% during the sample period. The corresponding t_{max} for the host India would be about 34.4% (=0.25+0.125*0.75). The equation also implies that for the given quality of GI and corporate governance represented by the sample of firms, if corporate income tax rates in India were to drop below 25%, the incentives to shift profits out of India would vanish.

We test the influence of foreign-country-level and host-country-level GI quality that restricts negative externalities [Proposition 3(a)] in models 11–18 (Table 4) and models 19–22 (Table 5). We test for foreign-country GI that support economic activity and transactions [Proposition 3(b)] in models 23–30 (Table 5).

A negative response to shock indicates reporting of lower profits, which we associate with profit shifting. Therefore it may be noted that a negative regression coefficient β_3 indicates higher profit shifting and vice versa. In the host country (Table 4) we observe that the WGI scores of Voice and Accountability (VA) and Government Effectiveness (GE) are negatively correlated with earnings shock. That is in the host country we see that $\partial s'/\partial g_\gamma<0$ for $g_\gamma=$(GE and VA scores). We see from model 11 that $\partial s'/\partial(g_\gamma=\text{VA})=-2.59$ ($\beta_3=2.59$, $p<0.10$) and from model 15, $\partial s'/\partial(g_\gamma=\text{GE})=-1.07$ ($\beta_3=1.07$, $p<0.05$). Here $\beta_3>0$ implies $\partial s'/\partial g_\gamma<0$ and vice versa. So we conclude that the GE and VA scores estimate GI quality in the host country that provides the function of restricting negative externalities. We note that the effect of these indicators is not significant in the case where the foreign country has higher tax-differences (models 12–14 and 16–18). We interpret this result as the increasingly weaker influence of GI indicators on profit shifting, as the incentives to shift gets stronger with higher tax differences. This is consistent with Proposition 2, that the given quality of GI and corporate governance determines a tax threshold beyond which shifting is an optimal response for the foreign owner, such that at higher tax differences there exist stronger incentives to shift profits.

For the foreign country (Table 5) we observe that the WGI score of Voice and Accountability (VA) is negatively correlated with earnings shock. That is in the foreign country we see that $\partial s'/\partial g_\gamma<0$ for $g_\gamma=$(VA score). We see that $\partial s'/\partial(g_\gamma=\text{VA})=-0.32$ ($\beta_3=0.32=-4.28+4.50$, $p<0.01$) for all foreign-owned firms (model 19), $\partial s'/\partial(g_\gamma=\text{VA})=-0.15$ ($\beta_3=0.15=-0.45+0.60$, $p<0.1$) for top-50 percentile tax-difference foreign firms (model 20), $\partial s'/\partial(g_\gamma=\text{VA})=-0.51$ ($\beta_3=0.51$, $p<0.05$) for top-33 percentile tax-difference foreign firms (model 21), and $\partial s'/\partial(g_\gamma=\text{VA}))=-0.52$ ($\beta_3=0.52$, $p<0.1$) for tax haven based foreign firms (model 22). So we conclude that in the host country, VA score estimates GI quality that provides the function of restricting negative externalities.

For the foreign country (Table 5) we also observe that the WGI scores of government effectiveness (GE) and political stability and non-violence (PSNV) are positively correlated with earnings shock. That is in the foreign country we see that $\partial s'/\partial g_\rho>0$ for $g_\rho=$(GE and PSNV scores). We see that $\partial s'/\partial(g_\rho=\text{GE})=0.20$ ($\beta_3=-0.20=-0.93+0.73$, $p<0.1$) for all foreign owned firms (model 23), $\partial s'/\partial(g_\rho=\text{GE})=0.17$ ($\beta_3=-0.17=-0.79+0.62$, $p<0.05$) for top-50 percentile tax-difference foreign firms (model 24), $\partial s'/\partial(g_\rho=\text{GE})=0.17$ ($\beta_3=-0.17=-0.68+0.51$, $p<0.05$) and $\partial s'/\partial(g_\rho=\text{PSNV})=0.71$ ($\beta_3=-0.71$, $p<0.05$) for top-33 percentile tax-difference foreign firms (models 25 and 29), and $\partial s'/\partial(g_\rho=\text{GE})=0.19$ ($\beta_3=-0.71+0.52$, $p<0.1$) and $\partial s'/\partial(g_\rho=\text{PSNV})=0.78$ ($\beta_3=-0.78$, $p<0.05$) for tax haven based foreign firms (models 26 and 30). Here $\beta_3<0$ implies $\partial s'/\partial g\rho>0$. This finding also conforms to Dharmapala and Hines Jr.'s (2009) observation that tax haven foreign countries are specifically characterized by good governance institutions. So we conclude that in the foreign country, GE and PSNV scores estimate GI quality that provides the function of supporting economic activity and transactions.

These findings lend support to Propositions 3(a) and 3(b). In summary, for the host country we identify VA and GE scores to represent GI quality that increases shifting costs ($(\partial s'/\partial(g_\gamma=\text{VA, GE}|\text{host}))<0$) by restricting negative externalities. In case of foreign country we identify VA score to estimate the GI function that increases shifting costs ($(\partial s'/\partial(g_\gamma=\text{VA}|\text{foreign}))<0$) by restricting negative externalities. And we find that for the foreign countries GE and PSNV scores reduce the costs of shifting ($(\partial s'/\partial(g_\rho=\text{GE, PSNV}|\text{foreign}))>0$) providing the GI function of supporting economic activity and transactions.

An attractive feature of the empirical estimation of our model is that we are not restricted to any specific estimate or indicators of GI quality. By checking the sign of any other valid indicator of GI quality that show statistically significant association with the

Table 4 Influence of host-country governance infrastructure [P 3(a)]

EBIDTA	11 P3(a)	12 P3(a)	13 P3(a)	14 P3(a)	15 P3(a)	16 P3(a)	17 P3(a)	18 P3(a)
Own Shock (Predicted EBIDTA)	6.63**	6.25**	6.23**	6.21**	6.28**	6.16**	6.07**	6.12**
	(2.77)	(2.86)	(2.84)	(2.87)	(2.78)	(2.87)	(2.85)	(2.88)
Own Shock Interactions								
× Foreign Owner Dummy	–1.65***				–0.20**			
	(0.56)				(0.08)			
× Foreign Dummy (Top 50 pc Tax Diff.)			–1.17				–0.24**	
			(1.15)				(0.10)	
× Foreign Dummy (Bot. 50 pc Tax Diff.)			–0.14				–0.13	
			(0.09)				(0.09)	
× Foreign Dummy (Top 33 pc Tax Diff.)		–0.51				–0.25**		
		(1.59)				(0.10)		
× Foreign Dummy (Bot. 66 pc Tax Diff.)		–0.15				–0.14		
		(0.09)				(0.09)		
× Foreign Dummy (Tax Haven)				–0.61				–0.25**
				(1.64)				(0.11)
× Foreign Dummy (No Tax Haven)				–0.14				–0.13
				(0.09)				(0.09)
Interactions with Host-Country (India) Governance Scores								
× Voice & Accountability	0.68	0.77	0.75	0.76				
	(0.49)	(0.49)	(0.49)	(0.49)				
× Foreign Dummy × Voice & Accountability	2.59*							
	(1.54)							
× Foreign Dummy (Top 33 pc Tax Diff.) × Voice & Accountability		0.13						
		(3.46)						
× Foreign Dummy (Top 50 pc Tax Diff.) × Voice & Accountability			1.53					
			(2.60)					
× Foreign Dummy (Tax Haven) × Voice & Accountability				0.43				
				(3.55)				
× Govt. Effectiveness					0.24	0.29	0.28	0.29
					(0.19)	(0.18)	(0.18)	(0.18)
× Foreign Dummy × Govt. Effectiveness					1.07**			
					(0.42)			
× Foreign Dummy (Top 33 pc Tax Diff.) × Govt. Effectiveness						0.45		
						(0.66)		
× Foreign Dummy (Top 33 pc Tax Diff.) × Govt. Effectiveness							0.79	
							(0.63)	
× Foreign Dummy (Tax Haven) × Govt. Effectiveness								0.44
								(0.67)

Controls								
Own Shock × Indian Group Dummy	−0.13*	−0.13*	−0.13*	−0.13*	−0.13*	−0.13*	−0.13*	−0.13*
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Own Shock × Year of Incorporation	−0.00**	−0.00**	−0.00**	−0.00**	−0.00**	−0.00**	−0.00**	−0.00**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Own Shock × Log(Total Assets)	0.04	0.04	0.04	0.04	0.06	0.05	0.05	0.05
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Log(Total Assets)	58.95***	60.45***	60.57***	60.54***	61.74***	61.98***	62.35***	62.05***
	(11.47)	(11.55)	(11.54)	(11.55)	(11.36)	(11.39)	(11.39)	(11.39)
Own Shock × RnD-to-Sales Intensity	0.01***	0.01***	0.01***	0.01***	0.02***	0.02***	0.02***	0.02***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
RnD-to-Sales Intensity	−380.14**	−382.83**	−382.70**	−382.88**	−383.45**	−383.36**	−383.39**	−383.30**
	(191.65)	(191.71)	(191.71)	(191.64)	(192.99)	(192.71)	(192.72)	(192.61)
Own Shock × Advert.-to-Sales Intensity	0.14	0.13	0.13	0.13	0.12	0.12	0.11	0.11
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
Advert.-to-Sales Intensity	−760.67***	−744.16***	−736.95***	−740.27***	−702.55***	−700.30***	−691.63***	−697.50***
	(268.90)	(267.18)	(266.56)	(266.74)	(253.85)	(253.50)	(252.84)	(253.25)
Own Shock × Debt to Asset Ratio	−0.06	−0.04	−0.04	−0.04	−0.04	−0.04	−0.03	−0.03
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Debt to Asset Ratio	−72.40***	−77.77***	−78.15***	−78.16***	−78.87***	−80.36***	−81.45***	−80.68***
	(12.84)	(13.17)	(13.19)	(13.21)	(12.90)	(13.07)	(13.12)	(13.07)
Own Shock × Investments	−0.00***	−0.00***	−0.00***	−0.00***	−0.00***	−0.00***	−0.00***	−0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Investments	0.12***	0.11***	0.11***	0.11***	0.11***	0.11***	0.11***	0.11***
	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observation	23,217	23,217	23,217	23,217	23,217	23,217	23,217	23,217
Adjusted *R*-Squared	0.489	0.488	0.488	0.488	0.489	0.488	0.489	0.488

* $p<0.10$; ** $p<0.05$; *** $p<0.01$.
Robust standard errors clustered at firm level are presented in parentheses.

Table 5 Influence of foreign-country governance infrastructure [P 3(a) and P3(b)]

EBIDTA	19 P3(a)	20 P3(a)	21 P3(a)	22 P3(a)	23 P3(b)	24 P3(b)	25 P3(b)	26 P3(b)	27 P3(b)	28 P3(b)	29 P3(b)	30 P3(b)
Own Shock (Predicted EBIDTA)	6.74** (2.88)	5.66** (2.87)	5.63** (2.87)	5.61* (2.87)	5.60* (2.89)	5.60* (2.89)	5.62* (2.89)	5.61* (2.89)	5.44* (2.86)	5.61* (2.89)	5.66* (2.90)	5.67* (2.90)
Own Shock Interactions												
× Foreign Owner Dummy	–2.32*** (0.62)				0.21 (0.36)				0.17 (0.37)			
× Foreign Dummy (Top 50 pc Tax Diff.)		–0.45* (0.24)				0.21 (0.48)				0.58 (0.48)		
× Foreign Dummy (Bot. 50 pc Tax Diff.)		0.28 (0.22)				1.11** (0.46)				–0.02 (0.39)		
× Foreign Dummy (Top 33 pc Tax Diff.)			–0.38 (0.24)				0.25 (0.51)				0.96* (0.55)	
× Foreign Dummy (Bot. 66 pc Tax Diff.)			0.19 (0.20)				0.93** (0.40)				0.03 (0.36)	
× Foreign Dummy (Tax Haven)				–0.39 (0.25)				0.29 (0.56)				1.05* (0.62)
× Foreign Dummy (No Tax Haven)				0.18 (0.20)				0.98** (0.41)				0.03 (0.36)
Interactions with Foreign-Country Governance Scores												
× Voice & Accountability	–4.28*** (1.15)	–0.45* (0.26)	–0.35 (0.22)	–0.35 (0.22)								
× Foreign Dummy × Voice & Accountability	4.50*** (1.22)											
× Foreign Dummy (Top 50 pc Tax Diff.) × Voice & Accountability		0.60** (0.29)										
× Foreign Dummy (Top 33 pc Tax Diff.) × Voice & Accountability			0.51** (0.25)									
× Foreign Dummy (Tax Haven) × Voice & Accountability				0.52* (0.26)								
× Govt. Effectiveness					–0.93* (0.50)	–0.79*** (0.29)	–0.68*** (0.25)	–0.71*** (0.26)				

× Foreign Dummy × Govt. Effectiveness					0.73*							
					(0.44)							
× Foreign Dummy (Top 50 pc Tax Diff.) × Govt. Effectiveness						0.62**						
						(0.30)						
× Foreign Dummy (Top 33 pc Tax Diff.) × Govt. Effectiveness							0.51*					
							(0.29)					
× Foreign Dummy (Tax Haven) × Govt. Effectiveness								0.52*				
								(0.29)				
× Political Stability & Non-Violence									−0.13	−0.04	−0.07	−0.07
									(0.26)	(0.19)	(0.17)	(0.17)
× Foreign Dummy × Political Stability & Non-Violence									0.01			
									(0.30)			
× Foreign Dummy (Top 50 pc Tax Diff.) × Political Stability & Non-Violence										−0.47		
										(0.33)		
× Foreign Dummy (Top 33 pc Tax Diff.) × Political Stability & Non-Violence											−0.71**	
											(0.36)	
× Foreign Dummy (Tax Haven) × Political Stability & Non-Violence												−0.78**
												(0.39)
All Controls from Table 4[P3(a)]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Own Shock × Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	23,210	23,210	23,210	23,210	23,210	23,210	23,210	23,210	23,210	23,210	23,210	23,210
Adjusted *R*-Squared	0.492	0.490	0.490	0.490	0.491	0.491	0.491	0.491	0.490	0.491	0.492	0.492

p<0.1; ** *p*<0.05; *** *p*<0.01.
Robust standard errors clustered at firm level are presented in parentheses.

Table 6 Influence of principal–principal agency conflict [P4]

EBIDTA	31 P4	32 P4	33 P4	34 P4	35 P4	36 P4	37
Own Shock (Predicted EBIDTA)	7.26** (2.83)	6.71** (2.87)	6.72** (2.90)	6.67** (2.90)	6.40** (2.74)	5.38** (2.64)	7.54** (2.93)
Own Shock Interactions							
× Foreign Owner Dummy	–0.25** (0.11)				–0.16 (0.12)	–0.29** (0.14)	–0.23* (0.14)
× Foreign Dummy (Top 50 pc Tax Diff.)		–0.35** (0.14)					
× Foreign Dummy (Bot. 50 pc Tax Diff.)		–0.05 (0.10)					
× Foreign Dummy (Top 33 pc Tax Diff.)			–0.34** (0.15)				
× Foreign Dummy (Bot. 66 pc Tax Diff.)			–0.05 (0.09)				
× Foreign Dummy (Tax Haven)				–0.36** (0.15)			
× Foreign Dummy (No Tax Haven)				–0.05 (0.10)			
Interactions with Other Principal Ownership Stake							
× Foreign Institutional Investor (FII) Stake	0.56*** (0.20)	0.57*** (0.20)	0.57*** (0.20)	0.57*** (0.20)			
× Foreign Dummy × FII Stake	1.67* (0.88)						
× Foreign Dummy (Top 50 pc Tax Diff.) × FII Stake		2.24* (1.24)					
× Foreign Dummy (Top 33 pc Tax Diff.) × FII Stake			2.04 (1.33)				
× Foreign Dummy (Tax Haven) × FII Stake				2.13 (1.36)			
× Domestic (Indian) Owner Stake					0.12 (0.14)		
× Foreign Dummy × Domestic (Indian) Owner Stake					–1.17 (1.01)		
× Domestic Institutional Investor (DII) Stake						0.39 (0.27)	
× Foreign Dummy × DII Stake						0.39 (0.69)	

× Dispersed Public Stake							–0.38
							(0.29)
× Foreign Dummy × Dispersed Public Stake							0.23
							(0.97)
Controls							
Own Shock × Indian Group Dummy	–0.14**	–0.14**	–0.14**	–0.14**	–0.12*	–0.14**	–0.13*
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Own Shock × Year of Incorporation	–0.00***	–0.00**	–0.00**	–0.00**	–0.00**	–0.00**	–0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Own Shock × Log(Total Assets)	0.02	0.02	0.02	0.02	0.05	0.04	0.03
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Log(Total Assets)	52.83***	53.93***	53.77***	53.84***	57.51***	58.01***	56.46***
	(11.79)	(11.92)	(11.95)	(11.95)	(11.33)	(11.31)	(12.17)
Own Shock × RnD-to-Sales Intensity	0.02***	0.01***	0.01***	0.01***	0.02***	0.02***	0.02***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
RnD-to-Sales Intensity	–366.44**	–367.50**	–367.21**	–367.43**	–364.52**	–353.41**	–356.25**
	(167.77)	(168.18)	(168.08)	(168.11)	(172.05)	(170.63)	(169.85)
Own Shock × Advert.-to-Sales Intensity	0.13	0.12	0.12	0.12	0.13	0.13	0.15
	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)
Advert.-to-Sales Intensity	–622.58**	–600.81**	–603.62**	–602.09**	–736.33***	–715.22***	–770.74***
	(270.26)	(270.33)	(270.66)	(270.51)	(260.14)	(261.14)	(265.80)
Own Shock × Debt to Asset Ratio	–0.06	–0.04	–0.04	–0.04	–0.11*	–0.09	–0.10
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Debt to Asset Ratio	–70.11***	–75.49***	–75.10***	–75.42***	–66.67***	–70.08***	–65.09***
	(12.82)	(13.03)	(13.02)	(13.04)	(12.57)	(12.67)	(12.49)
Own Shock × Investments	–0.00***	–0.00***	–0.00***	–0.00***	–0.00***	–0.00***	–0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Investments	0.11***	0.10***	0.10***	0.10***	0.11***	0.11***	0.11***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Own Shock × Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observation	23,217	23,217	23,217	23,217	23,217	23,217	23,217
Adjusted *R*-Squared	0.499	0.500	0.499	0.500	0.488	0.490	0.490

* $p<0.1$;** $p<0.05$; *** $p<0.01$.
Robust standard errors clustered at firm level are presented in parentheses.

Table 7 Summary of model parameters and empirical results

Corporate Tax Rate

Proposition 1
$\frac{\partial s'}{\partial f} < 0 (= -0.53)$

Proposition 2
$\Delta t_{threshold} \geq 17\,\%$

$$t_{\max} = \underbrace{(0.25)}_{\substack{Governance\\ Infrastructure\\ Cost}} + \underbrace{(0.75)\,f}_{\substack{Corporate\\ Governance\\ Cost}}$$

Governance Infrastructure

Proposition 3(a)
$\frac{\partial s'}{\partial g_\gamma} < 0$

Host Country
$\frac{\partial s'}{\partial (g_\gamma = \mathrm{VA})} = -2.59$
$\frac{\partial s'}{\partial (g_\gamma = \mathrm{GE})} = -1.07$

Foreign Country
$\frac{\partial s'}{\partial (g_\gamma = \mathrm{VA})} = -0.15 \text{ to } -0.52$

Proposition 3(b)
$\frac{\partial s'}{\partial g_\rho} > 0$

Host Country
Not Applicable

Foreign Country
$\frac{\partial s'}{\partial (g_\rho = \mathrm{GE})} = 0.17 \text{ to } 0.20$
$\frac{\partial s'}{\partial (g_\rho = \mathrm{PSNV})} = 0.71 \text{ to } 0.78$

Corporate Governance

Proposition 4
$\frac{\partial s'}{\partial \lambda_{CG}} < 0$

$\frac{\partial s'}{\partial (\lambda_{CG} = \lambda_{FII})} = -2.84 \text{ to } -2.23$

Model Parameters and Variable Definitions

s = Fraction of profits shifted

s' = Optimal profits shifting fraction that maximizes value of firm to the foreign owner

γ = Parameter representing quality of GI that restricts negative externalities and increases costs of private shifting transactions – for instance by the presence of strong institutions of collective/common action.

ρ = Parameter representing quality of GI in foreign country that supports economic activities and improves efficiency of transactions and reduces costs due to loss of shifted profits – for instance by protecting private property and effective enforcement of contract.

g_γ = Indicator that is an estimate of γ obtained from real-world observations

g_ρ = Indicator that is an estimate of ρ obtained from real-world observations.

μ = Parameter representing the costs introduced by corporate governance. For instance by monitoring by vigilant institutional investors.

λ = Foreign ownership share

λ_{CG} = Vigilant institutional investor share, used as an estimate of μ

t = Host-country corporate tax rate

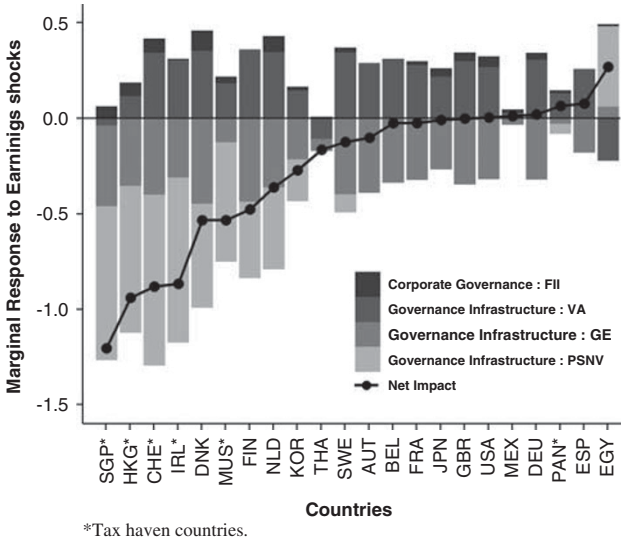
f = Foreign corporate country tax rate

Δt_{TH} = Host-to-foreign threshold tax difference beyond which profit shifting is optimal

firm's earnings shock, we can identify if that particular indicator is measuring a restrictive ($(\partial s'/\partial g_\gamma)<0$) or a facilitating role ($(\partial s'/\partial g_\rho) > 0$) in profit shifting.

Models 31–36 (Table 6) test the influence of dominant other principal on profit shifting ($(\partial s'/\partial \lambda_{CG})<0$) (Proposition 4). First, we test the influence of foreign institutional investors' (FII) share (models 31–34). Estimates from model 31 foreign ownership dummy $\partial s'/\partial \lambda_{CG} = -2.23$: ($\beta_3 = 2.23 = 0.56+1.67$, $p<0.1$) and model 32, top-50 percentile tax-difference foreign dummy $\partial s'/\partial \lambda_{CG} = -2.84$: ($\beta_3 = 2.84 = 0.57+2.24$, $p<0.1$) suggest that FII stake is associated with a reduction in profit shifting. That is we observe $\partial s'/\partial \lambda_{CG}<0$ for $\lambda_{CG} = \lambda_{FII}$(share of FIIs). Here $\beta_3 > 0$ implies $\partial s'/\partial \lambda_{CG}<0$. However, this influence is not significant in the case of foreign-owned firms in the top-33 percentile tax-difference foreign-country.

The Indian owners' stake as well as the domestic institutional investors' stake (DII) shows no significant association with profit shifting. This is in alignment with David et al.'s (2010) empirical findings. They observe that in the case of Japanese corporations, "relational" shareholders (in this case DIIs and Indian owners) primarily seek growth rather than profitability, whereas "transactional" (FII) shareholders primarily seek rents from financial profits. Thus FIIs have stronger incentives to monitor and arrest profit shifting. The observed influence of FIIs is also in line with the findings reported in the extant literature (Douma, George, & Kabir, 2006) that the FIIs exert stronger management influence on Indian firms than the DIIs do. A larger dispersed public ownership stake results in weaker monitoring; therefore, we do not expect such ownership to have a significant influence on earnings shock. We test the



*Tax haven countries.
Statistically significant indicators are plotted. PSNV is significant only for top 33 percentile tax-difference and tax-haven countries.

Figure 3 Mean impact of governance infrastructure scores and corporate governance on profit shifting for countries in the sample.

influence of dispersed or neutral public ownership in model 37. As expected, we find that increasing public ownership has no significant impact. Overall, these estimates offer support to Proposition 4.

We summarize the empirical findings corresponding to the model propositions in Table 7. We also tabulate definitions for key variables and model parameters for quick reference in Table 7. Based on the estimated effect of GI scores (VA, GE and PSNV) and corporate governance impact of FII ownership on the firm's earnings response, we plot the mean effects of each of these components for all the countries in the sample in Figure 3. The figure depicts the difference between countries in the proportion of the impact of each of the dimensions of the quality of GI (i.e., VA, GE and PSNV) and corporate governance (i.e., FII). Notably, the tax havens cluster together toward the left side of the plot, with a relatively higher negative net impact on earnings of the affiliate firm in the host country. Additional plots containing more information on theory, data set and empirical results are available in the supplementary companion file to the article.

CONCLUSION

In this article we develop a conceptual model of how country-level corporate governance and firm-level corporate governance together influence tax-motivated international profit shifting. In contrast to "unidimensional" and "thin" conceptualization of institutions in the extant work – as Jackson and Deeg (2008) pointed out, our article attempts to elucidate the underlying mechanisms in an integrated framework. We believe that a pioneering contribution of this work is the simple yet integrated framework that enables theoretical examination of profit shifting and derivation of empirically testable propositions.

To the best of our knowledge, this study is also the first empirical investigation of international corporate profit shifting using micro-level data in a large emerging economy context. Furthermore, we present a novel application of the exogenous earnings shock technique following Bertrand et al. (2002) to estimate corporate profit shifting. To our knowledge, the only other published work applying the earnings shock method to discern income shifting is Dharmapala and Riedel (2013) that focus on identifying tax-motivated shifting in the European context. Whereas we apply this technique to test empirically how the country-level institutional quality and corporate governance mechanisms moderates/facilitates profit shifting. Our empirical technique is also flexible enough to accommodate multiple measures of GI quality and corporate governance effectiveness.

We believe our work on tax-driven profit shifting emphasizes the greater focus of the interlinkages between GI quality and corporate governance in international business studies. In particular, our work suggests that the influence of institutional quality on corporate behavior should be treated in a more fine-grained manner than what is proposed by broad brush conjectures that better country-level institutions lead to better corporate governance. On the country-level GI front, our model suggests that GI dimensions that reduce negative externalities of economic transactions in the host and foreign country restricts the profit shifting, while GI dimensions providing secure property rights and contracting in the foreign country enhances profit shifting. We also empirically depict that World Bank WGI indicators (VA, GE and PSNV) that estimate GI quality are correlated with profit shifting along directions consistent with our predictions.

From a host-country perspective, the negative association of VA and GE scores with profit shifting emphasizes the importance of transparency and collective action in containing negative spillovers of economic transactions. This is in line with studies such as Olson (1993) who suggests that democracy prevents disproportionate embezzlement of social surplus by elites and Acemoglu, Johnson, and Robinson (2005) who argue that democratic political

institutions lead to economic institutions that support the distribution of resources and long-term growth. From a foreign country perspective, the positive association of GE and PSNV scores with profit shifting is consistent with observations by Dharmapala and Hines Jr. (2009). They find that lower taxes along with better governance assuring the safety of the shifted profits are the defining characteristics of tax haven countries. An important addition to this empirical regularity that we find is the negative association of voice and accountability (VA) score with profit shifting, even in high-tax difference countries and tax havens. Therefore institutions that support transparency and collective action play a significant role in curbing shifting activities even in tax havens. We speculate that this restrictive role could be driven by the risk of potential reputational damages to firms operating from countries that are labeled as "tax havens."

Regarding corporate governance, the implications of profit shifting for internal governance mechanisms through the principal–principal agency conflict merit further substantive investigation. For instance, incentives for shifting earnings can influence managerial behavior, with consequences for governance and firm strategy. Desai and Dharmapala (2006) demonstrate complementarities between managerial diversion and tax-motivated shifting, thus complicating the classical agency notion of better alignment of manager–principal interests with high-powered managerial incentives. This suggests that the linkage between managerial diversion and profit shifting could affect several other strategic decisions, especially the ones that involve linkages with other vigilant principals such as foreign institutional investors. Therefore several strategic choice variables investigated in the international business scholarship merit detailed examination when viewed in the context of managerial incentives coupled with tax-motivated profit shifting.

While our model framework and accompanying empirical approach is context independent, we acknowledge the inherent limitation in concluding broader implications or the generalizability of empirical findings based on India as the host country. However, we submit that the governance infrastructure and corporate governance prevailing in India is archetypical of governance infrastructures and ownership structure norms prevalent in several non-Anglo-Saxon settings. As La Porta et al. (1999) depict in their investigation of legal rules and ownership across countries, there are fundamental differences between countries in investor protection rights, enforcement of laws and ownership concentration which manifest in differences in the underlying agency issues – principal–principal agency issues being paramount in non-Anglo-Saxon or civil law jurisdictions as opposed to principal–agency issues that are predominant in Anglo-Saxon or common law jurisdictions contexts. These institutional divergences have long run implications for the phenomenon at the core of our study, that is, earnings or profit shifting. Therefore we strongly believe that there is a pressing need to analyze the phenomenon in these alternative settings.

We firmly believe that our article serves as a clarion call for more work in the international business and corporate governance domains for phenomenon-centric institutional analysis – focusing on institutional forces that are relevant to firm behavior linked to the phenomenon of interest, tax-motivated profit shifting being a case in point.

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NOTES

[1]In the Indian context as well as in many emerging economies, ownership in MNE subsidiaries is typically held by several host-country entities along with the foreign owner. This form of ownership is commonplace because of several factors including host-country regulations. Such regulations either limit the extent of foreign ownership or mandate a minimum level of domestic ownership. Further, the issue of divergence of shareholder interests arising from profit shifting is primarily relevant in the context of multiple claimants

on the firm's rents. Hence our theoretical exposition (and empirical investigation) focuses on firms with multiple ownership stakes and excludes private wholly owned foreign subsidiaries.

[2]During the study period (2001–2010), the income tax rate for foreign companies with a total income exceeding INR 10 million in India was 42.23% (source: Department of Revenue, Ministry of Finance, Government of India, http://law.incometaxindia.gov.in/DIT/intfccont.aspx). In comparison, the median tax rate during this period for the 23 other home countries in our sample was nearly 30% of total income. The distribution of income tax rates in our sample is available in the online supplement to this paper.

[3]"Transparency will also help curb the more aggressive forms of corporate tax avoidance. As Starbucks's experience has shown, companies that shift money around to minimize their tax bills endanger their reputations. The more information consumers have about such dodges, the better" (*The Economist*, 2013, February 16).

[4]Following Acemoglu and Johnson (2005: 951), we define institutions of property rights to be "intimately linked to the distribution of political power in society because they regulate the relationship between ordinary private citizens and the politicians or elites with access to political power." The governance score on the dimension of "political stability and non-violence" (PSNV) as measured by Kaufmann et al. (2010) provides the closest match to this notion of property rights. Hence for our empirical study, we use the PSNV score as a proxy measure of the institutional quality of the security of property rights.

[5]The five-digit National Industrial Classification (NIC) system is prepared by the Ministry of Statistics and Programme Implementation, Government of India. For our study, we classify the industries at the level of four-digit NIC codes, mostly equivalent to the four-digit SIC.

[6]Since controlling foreign ownership is not defined consistently and unambiguously by PROWESS, we use an ownership threshold-based definition (greater than or equal to 51% of foreign owner equity stake) to clearly identify a firm that is under controlling foreign ownership. PROWESS broadly reports equity shareholders as promoters and non-promoters. Owner equity shareholders include Indian and foreign owners; non-owners include institutional investors, corporate investors, individuals and others.

[7]In order to trace the owners' home country, we first obtain name-identity and location information from PROWESS. We then fill in missing location (home country) data in PROWESS by manually searching the ownership information filed by the companies at the Indian stock exchanges (www.nseindia.com/ & http://www.bseindia.com/). Such disclosure is required by clause 35 of the listing agreement specified by the Securities and Exchange Board of India (http://www.sebi.gov.in/commreport/clause35.html). When home country information is missing from the exchange filings, for those remaining data-points we search the EDGAR database (http://www.sec.gov/edgar/searchedgar/webusers.htm#.U0MF7VemXf0) for information on subsidiary location.

[8]The Office of Tax Policy Research (OTPR), Stephen M. Ross School of Business, at the University of Michigan, formerly maintained global statutory corporate tax rates in their World Tax Database, but no longer updates or provides support for the database. Hence we prepared the final data set on corporate income tax for 24 countries by collating data from multiple sources. For the 16 OECD member countries, we obtained tax information for 2001–2010 from the OECD tax database of 34 member states (maintained at www.oecd.org/ctp/taxdatabase). For the remaining eight non-OECD countries, we collected tax data published by Deloitte International Tax Source (maintained at http://www.dits.deloitte.com/), Price Waterhouse Coopers Worldwide Tax Summaries (maintained at http://taxsummaries.pwc.com/), and the University of Michigan's World Tax Database (maintained at http://www.bus.umich.edu/otpr/otpr/default.asp).

[9]We express all monetary variables in millions of Indian rupees (INR) deflated to constant year 2001 rupee value (index of 100 for year 2001). We use the Consumer Price Index obtained from the Labour Bureau, Government of India (maintained at http://labourbureau.nic.in/indexes.htm) for computing the deflated variables. To remove noisy observations, we only select firms reporting positive sales value with total assets worth at least INR 1 million. We clean the sample of erroneous and missing data points and remove 1% of firms reporting extreme performance measures (EBITDA) and 1% of the highest leveraged (debt/equity) firms from the sample.

[10]We note that in comparative studies of tax systems, economists often use the effective tax rate as an alternative measure of the overall tax burden on the corporate. Several factors explain the differences in statutory and effective tax rates including the effectiveness of enforcement and government tax incentives. Effective tax rates implicitly contain information on the efficacy of the tax enforcement institutions, which may confound our dependent institutional quality variables. This would render the results of any empirical study using effective tax rates sensitive to these assumptions. Therefore following Grubert and Mutti (1991), we use statutory tax rates for our study.

[11]See note 8 for details on multiple sources utilized for collecting information on corporate tax rates.

[12]There is a possibility of tax policy being endogenous to foreign country institutional quality. This is a general problem faced by several other empirical studies in the area. Our estimates of the variables of institutional quality depict both cross-sectional and temporal variation, and tax policy is more likely to be correlated with slow changing institutional characteristics. To control for these country-level institutional factors potentially correlated with tax policy we include country dummies in the specification. In our model, this effect reflects in the fact that tax differential threshold for profit shifting is determined jointly by the country's institutional quality and firm's corporate governance efficacy (Proposition 2). In fact, this aligns with our argument that one needs to examine the contingent effects of governance infrastructure and corporate governance which may be aligned to inclusive/entrepreneurial institutions rather than an exclusive focus on tax differentials. The decomposition of institutional and corporate governance effects in Proposition 2 elucidates this point. While these efforts mitigate concerns of endogeneity in our empirical results, they are not completely eliminated. We also note that since low taxes and quality of institutions are likely to be positively correlated then we expect the regression coefficient to measure a negative omitted variable bias, which would work against our hypothesis.

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APPENDIX

A Simple Model of Optimal Profit Shifting

Refer to Table 7 for all variable/parameter definitions used here. We start with a model of corporate governance in the presence of corporate income tax (Desai et al., 2007) in Eq. (A1).

$$V = (1-s)(1-t)\lambda + s - \frac{1}{2}\gamma s^2 \qquad \text{(A1)}$$

We develop this base model by including the effect of: (a) the foreign country tax rate f, (b) the cost to shifting due to governance infrastructure $C_g(s)$, and (c) the costs of shifting due to corporate governance $C_{cg}(s)$. We assume a quadratic cost function such that:

$$C_g(s) = \frac{1}{2}\gamma s^2, \text{ where } \gamma > 0$$
$$C_{cg}(s) = \frac{1}{2}\mu s^2(1-\lambda), \text{ where } \mu > 0$$

Such that, for a wholly owned firm, when $\lambda \to 1$, the cost due to monitoring by other principals also vanishes, $C_{cg}(s) \to 0$. Further we assume that only a fraction ρ $(0<\rho<1)$ of the post-tax shifted profits $s(1-f)\rho$ is available to the foreign owner. In the model we use parameter ρ to proportionately represent the foreign country institutional quality of property rights and contract enforcement, such that when the quality of these institutions improves, ρ approaches 1 $(\rho \to 1)$.

Incorporating these additional terms in Eq. (A1), we define the value of firm to the foreign owner as:

$$V_f = (1-s)(1-t)\lambda + s(1-f)\rho - \frac{1}{2}\gamma s^2 - \frac{1}{2}\mu s^2(1-\lambda) \qquad \text{(A2)}$$

Equation (A2) is the same as Eq. (1) in the article. The foreign owner would limit profit shifting to a level such that total value V_f is maximized. We obtain this optimal level of shifting s' from the first order condition $(\partial V_f/\partial s) = 0)$:

$$s' = \frac{(1-f)\rho - (1-t)\lambda}{\gamma + (1-\lambda)\mu} \qquad \text{(A3)}$$

Equation (A3) is the same as Eq. (2) in the article. A valid range of values for s' is $0 \leqslant s' < 1$, we can define

the range of model parameters ρ, γ and μ to satisfy this condition. To ensure that s' is confined within the valid range, without loss of generality, we scale ρ to:

$$\left(\frac{1-t}{1-f}\right)\lambda < \rho < 1 \tag{A4}$$

Propositions and Proofs

Proposition 1: For a firm with controlling foreign ownership stake (λ) in a relatively high-tax host country, increase in host-country corporate tax rate (t) increases outward profit shifting, and increase in foreign country (f) tax rate decreases outward profit shifting(s'), *ceteris paribus*.

Proof: Differentiating s' with respect to t and f:

$$\frac{\partial s'}{\partial t} = \frac{\lambda}{\gamma+(1-\lambda)\mu} > 0 \text{ and } \frac{\partial s'}{\partial f} = \frac{-\rho}{\gamma+(1-\lambda)\mu} < 0$$

Therefore the optimal outward shifting s' increases with higher host-country tax rate t and decreases with higher home-country (foreign country) tax rate f. □

Proposition 2: For firms with controlling foreign ownership stake (λ) in a relatively high-tax (t) host country, higher foreign ownership increases outward profit shifting (s'), when the host-to-foreign country tax difference (Δt) is greater than a threshold(Δt_{TH}).

Proof:

$$\frac{\partial s'}{\partial \lambda} = \frac{(\rho(1-f)-(1-t))\mu-(1-t)\gamma}{(\gamma+(1-\lambda)\mu)^2}$$

Profit shifting increases with higher foreign ownership if:

$$\frac{\partial s'}{\partial \lambda} > 0$$

For the case of relatively high-tax host country, $0<f<t<1$, this derivative is positive when the following condition is met:

$$(\rho(1-f)-(1-t))\mu-(1-t)\gamma > 0$$

Rearranging the terms we get:

$$\Delta t > \left(\frac{\gamma+\mu(1-\rho)}{\gamma+\mu}\right)(1-f) = \Delta t_{TH}$$

where

$$\Delta t = (t-f)$$

Thus for a given foreign country tax rate, f, higher foreign ownership increases outward profit shifting when the host-to-foreign country tax difference, $\Delta t = (t-f)$, is greater than threshold $\Delta t_{TH} = (1-f)(\gamma+\mu(1-\rho))/(\gamma+\mu)$.

Rewriting the condition for $(\partial s'/\partial \lambda > 0)$ in Proposition 2, in terms of host-country tax t we get:

$$t > \frac{(\gamma+\mu(1-\rho))+f\,\mu\rho)}{\gamma+\mu}$$

Such that, the maximum host-country tax rate $t_{\max}$ beyond which shifting increases with increasing foreign ownership $(\partial s'/\partial \lambda > 0)$ is:

$$t_{\max} = \left[\underbrace{\left(\frac{\gamma+\mu(1-\rho)}{\gamma+\mu}\right)}_{\substack{\text{Governance}\\ \text{Infrastructure}\\ \text{Cost fraction}}} + \underbrace{\left(\frac{\mu\rho}{\gamma+\mu}\right)f}_{\substack{\text{Corporate}\\ \text{Governance}\\ \text{Cost fraction}}}\right] \tag{A5}$$

Equation (A5) is the same as Eq. (3) in the article. Therefore the sub-region in the space $t \times f \subset \mathbb{R}^2$ that satisfies Eq. (A5) is bound by a line segment with intercept $= ((\gamma+\mu(1-\rho))/(\gamma+\mu))$ or $= (\gamma/(\gamma+\mu)|\rho\to 1)$, hence we call this term as the "governance infrastructure cost fraction." The slope of which is $= (\mu\rho/(\gamma+\mu))$ or $= (\mu/(\gamma+\mu)|\rho\to 1)$, which we denote as the "corporate governance cost fraction." Where the sum of parameters $= (\gamma+\mu)$ represents total cost of profit shifting and $\rho\to 1$ is typical of tax haven countries with secure property rights. □

Proposition 3(a): In firms with controlling foreign ownership (λ), higher costs of income shifting due to superior quality of governance infrastructure restricting negative externalities (γ), negatively moderates the extent of profit shifting (s') from the focal firm.

Proof: Costs of income shifting due to host and foreign country GI that restricts negative externalities is represented in the model by γ. Let g_γ be a measure of the quality of foreign country GI restricting negative externalities. If we assume that γ is a monotonically increasing function F_γ of g_γ

such that,

$$\gamma = F_{\gamma}(g_{\gamma}) \text{ and } \frac{\partial \gamma}{\partial g_{\gamma}} > 0$$

Differentiating s' with respect to γ:

$$\frac{\partial s'}{\partial \gamma} = \frac{-(\rho(1-f)-(1-t)\lambda)}{(\gamma+(1-\lambda)\mu)^2} < 0$$

Therefore

$$\frac{\partial s'}{\partial g_{\gamma}} = \frac{\partial s'}{\partial \gamma} \times \frac{\partial \gamma}{\partial g_{\gamma}} < 0$$

Hence profit shifting is negatively moderated by g_{γ} or higher quality of GI in the host and foreign country that restricts negative externalities. □

Proposition 3(b): In firms with controlling foreign ownership (λ), lower costs of profit shifting due to superior quality of governance infrastructure (ρ), supporting economic activities and transactions in the foreign country, positively moderate the extent of profit shifting (s') from the focal firm.

Proof: We represent the quality of GI supporting economic activities and transactions in the foreign country by ρ in the model. Let g_{ρ} be a measure of quality of foreign country GI supporting economic activities and transactions by securing property rights and efficient contracting. If we assume that ρ is a monotonically increasing function F_{ρ} of g_{ρ} such that,

$$\rho = F_{\rho}(g_{\rho}) \text{ and } \frac{\partial \rho}{\partial g_{\rho}} > 0$$

Differentiating s' with respect to ρ:

$$\frac{\partial s'}{\partial \rho} = \frac{(1-f)}{\gamma+(1-\lambda)\mu} > 0$$

Therefore

$$\frac{\partial s'}{\partial g_{\rho}} = \frac{\partial s'}{\partial \rho} \times \frac{\partial \rho}{\partial g_{\rho}} > 0$$

Hence profit shifting is positively moderated by increasing g_{ρ} or with higher quality of GI supporting economic activities and transactions in the foreign country. □

Proposition 4: In firms with controlling foreign ownership (λ), better corporate governance achieved through monitoring by vigilant other principals (λ_{CG}) negatively moderates the extent of profit shifting (s').

Proof: In the model of optimal profit shifting, μ represents the costs introduced by corporate governance. Let λ_{CG} be the share of vigilant other shareholders of the firm. If we assume that the cost to shifting due to monitoring, μ, is a monotonically increasing function F_{CG} of λ_{CG} such that,

$$\mu = F_{CG}(\lambda_{CG}) \text{ and } \frac{\partial \mu}{\partial \lambda_{CG}} > 0$$

Differentiating s' with respect to μ:

$$\frac{\partial s'}{\partial \mu} = \frac{-(1-\lambda)(\rho(1-f)-(1-t)\lambda)}{(\gamma+(1-\lambda)\mu)^2}$$

From Eq. (A4) we have

$$\left(\frac{1-t}{1-f}\right)\lambda < \rho < 1$$

The condition implies that

$$\rho(1-f)-(1-t)\lambda > 0$$

and

$$\frac{\partial s'}{\partial \mu} < 0$$

Therefore

$$\frac{\partial s'}{\partial \lambda_{CG}} = \frac{\partial s'}{\partial \mu} \times \frac{\partial \mu}{\partial f_{CG}} < 0$$

Hence earnings outflow is negatively moderated by higher ownership stake of vigilant minority shareholders. □

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