

# Real Firms in Tax Systems

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Economic analysis of taxation often assumes a homogeneous, usually perfectly competitive production sector in which individual firms are immaterial. This paper discusses some recent developments bringing key characteristics of real firms into the analysis of tax systems, which include enforcement rules and remittance regimes alongside tax rates and bases. Introducing more realistic firms into the analysis of tax systems has enabled progress in understanding the role of information in tax administration, the tradeoff between production efficiency and minimizing the administrative costs of tax collection, the consequences of remittance responsibility, and the fundamental role of firm heterogeneity in tax incidence.

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## 1. Introduction

Firms are the workhorses of modern tax systems. Firms remit between 85 and 90 % of all tax revenue in most OECD countries and in India (OECD, 2017; Slemrod and Velayudhan, 2017). Tax authorities rely on firms to provide information about other businesses, employees, owners, and customers. The treatment of firms is thus an important ingredient in the analysis of tax systems, which consist of tax rates and bases and the accompanying remittance and enforcement rules. Tax systems analysis should not treat firms as immaterial, exemplified by the homogeneous, constant-returns-to-scale, perfectly competitive production sector in the seminal model of Diamond and Mirrlees (1971), but instead should capture the diversity of real-world firms that underpins both the technology of tax administration and the tradeoffs tax systems face between production efficiency and obtaining tax revenue.

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Incomplete information is fundamental to many of the challenges tax administrations face, and real firms vary widely both in their ability to conceal information from tax authorities and in their ability to provide information about other firms and people to tax authorities. From insular family firms to platform companies with a near-omniscient view of a market, real firms are far from homogeneous information environments. Informal firms, concealing even their existence from tax authorities, are rarely if ever large, although it is far from obvious how best to measure the relevant dimension of firm size. Large corporations employ tax advisors who guide precisely how to characterize information in disclosures to tax authorities to manage their tax liability. Perfect-information models cannot address many important tax-systems concerns, among them detecting income and evasion and the use of firms as wage-reporting agents.

Efficient administrative technologies—the tax bases and remittance and enforcement rules that yield the greatest tax revenue at the lowest administrative cost—often come at a cost in production efficiency, contra Diamond and Mirrlees (1971), precisely because of certain differences between real firms. Real firms differ in both productivity and evasion technology, with the result that changes in remittance rules can alter tax incidence and production efficiency. It is often costlier to obtain information about tax liability and tax payments from smaller firms, leading to, for example, VAT exemption thresholds. In what follows, we address several issues that arise when considering the role of real firms in tax systems. We begin by defining the key terms comprising the essay's title.

### 1.1. Tax Systems

A tax system is a set of rules, regulations, and procedures with three aspects. It defines what events or states of the world trigger tax liability, and what rate of tax applies; these are *tax bases and rates*. It specifies who or what entity must remit that tax and when: these are *remittance rules*. It details procedures for ensuring compliance, including audit coverage and third-party information reporting requirements as well as the consequences of not remitting legal liability: these are *enforcement rules*. Until recently, tax economists have focused overwhelmingly on the first aspect—the positive and normative aspects of the choice of tax bases and rates. Although this paper focuses on remittance rules and enforcement rules, these rules do interact with tax rates and bases; for example, the impact of tax rates on behavior depends on the efficacy of the enforcement regime.

Although an analysis of real firms in tax systems raises many issues that standard analysis largely ignores, it shares several features with standard analysis. Firms are (merely) instrumental in normative analysis: individuals are the

ultimate concern of welfare analysis, and are affected by taxation in their roles as consumers, workers, entrepreneurs, capital providers, and so on. A natural starting point would be to keep a representative consumer and a focus on efficiency, although this approach cannot address some material issues. In particular, analysis with a representative individual sets aside any distributional effects of firm taxation, notably including the popular notion that conflates taxing larger businesses with assigning the incidence of taxation to wealthier people.

## 1.2. Real Firms

In several ways that matter for tax systems, particularly but not solely remittance and enforcement regimes, actual firms depart from the idealized characterization that has been the standard treatment in, especially, optimal taxation. Some real firms are larger than others, of course, and the technology of tax administration differs greatly between large and small firms, as does the technology of tax avoidance and evasion. Avoidance and evasion technologies also differ across sectors; for example, the presence of intangible assets provides greater opportunities for avoidance.

The word “real” also connotes behavioral responses to taxation that materially alter production, such as firms changing their volume of investment, input choice or the location of production. Firm behavioral responses to taxation are both broader and more interrelated than this: most real firms (legally) avoid taxes, and many also seek to (illegally) evade taxes, through a combination of decisions that may or may not directly affect production. Moreover, firms can respond to taxation using means that are not applicable to individuals. Real firms can break up, or merge, in ways that individuals cannot. They can proliferate to obfuscate true ownership and control by creating “shell” corporations.

## 2. Real Firms Shape the Availability of Information in Tax Systems

If costlessly provided with perfect information, tax authorities would no longer need to devote considerable resources to the difficult task of ascertaining tax liability and could instead concentrate on enforcing the remittance of tax payments. Conversely, raising government revenue with no information whatsoever would require *capricious* assignment of tax liability. The efficiency costs of capricious taxation are hard to quantify, and evaluating the equity implications would require incorporating differences between people and would not be straightforward given the lack of an accepted framework for addressing

horizontal inequity. The social benefits of informed tax administration remain unclear, if likely substantial given the expenditures made to obtain information and facilitate taxation on bases that are not capricious.

Employers pervasively report information about employee wages and salaries to tax authorities, as well as information about dividends, interest, share sales and real estate sales. Information reporting is also built into most invoice-credit value-added tax systems, when credits for purchases from other firms are allowed only if accompanied by information on the seller—confirming that they remitted tax on their sales—which can in principle be checked against the VAT returns of those sellers; this “self-enforcing” aspect of VATs does not apply to the final sale in the value-added chain. Recent evidence corroborates the importance of the VAT’s information reporting regime. For example, Pomeranz (2015) shows that, upon mailing increased-audit-threat letters to Chilean firms, the increase in VAT receipts (and therefore the inferred level of previous evasion) induced by the letters is concentrated at the level of sales from firms to final consumers, for which there is no paper trail. Consumers do serve as information reporters in the São Paulo VAT regime Naritomi (2016) studies. Business income tax systems struggle to monitor business expenses, which could in principle be addressed by requiring that businesses report the identity of their customers and input providers, as they do under a VAT, and having the tax authority link and monitor these reports.

### 2.1. Informal Firms and the Self-Employed

Modern tax systems rely heavily not on all types of firms, but specifically on medium-sized and large firms, because efficiently collecting tax from small firms and the self-employed is ubiquitously problematic. Theory provides several possible explanations, but not a clear way to adjudicate between them. Tax systems struggle to implement third-party information reporting of non-employee income, as information reporting often benefits from opposition between the interests of two parties, which is absent for self-employment income. Small businesses face fewer potential arm’s-length or employee whistleblowers, an argument formalized by Kopczuk and Slemrod (2006) and Kleven et al. (2016). Small businesses are also less reliant on the financial system, and Gordon and Li (2009) suggest that this provides them with less reason to keep records that the tax authority could use in an audit.

A mountain of individual- and firm-level evidence using multiple methodologies, surveyed in Slemrod (2017), documents a strong association between self-employment and noncompliance and between self-employment and the “flexibility” of reported taxable income locally to kinks and notches in tax schedules. Kleven (2014) plots for over 80 countries the fraction of workers who are self-employed against the tax/GDP ratio, and documents a strong

negative relationship: countries that have more self-employed collect less tax. Although no causal inferences can be drawn from such a graph, it seems clear that the availability of third-party information on employee income provided by employers plays a key role in tax compliance and in explaining a country's overall tax take. Consistent with this conclusion, Jensen (2016) shows that, as countries develop, their employment structures shift away from self-employment, and then exemption thresholds for income tax liability fall, a pattern that is consistent with tax authorities setting the threshold at a level that justifies enforcement costs.

## 2.2. Family Firms

Family firms provide a fascinating special case of several of the phenomena already discussed. Bertrand and Schoar (2006) note the pervasiveness of family firms around the world, and analyze cross-country data to inform why they are so prevalent without considering the possible role of taxation. Kopczuk and Slemrod (2011) sketch a model of the taxation of family firms, stressing that in some developing countries the weakness of legal institutions encourages the formation of family firms, whose bonds provide an informal means to discourage employee theft and misbehavior. While family ties are beneficial replacements for weak legal institutions, these bonds have a social cost because they increase the opacity of firms, making tax enforcement more difficult. The same threat of family ostracism that constrains theft also inhibits the kind of whistleblowing that aids tax enforcement. This calls into question whether family firms should receive the tax preferences they often do, perhaps because it is difficult to determine and tax the labor income attributable to family members, and raises the issue of whether optimal enforcement policy ought to take into account whether a business is a family firm.

One piece of evidence suggests that, in at least one setting, family firms are relatively less tax-aggressive, which is not the same as tax noncompliant. Using data from S&P 1500 firms in the period 1996–2000, Chen et al. (2010) show that family firms exhibit lower tax aggressiveness than their non-family counterparts, as measured by their having higher effective tax rates and lower book-tax differences. This could be due to family owners being willing to forgo tax benefits to avoid the non-tax cost that might arise from minority shareholders' concern with family rent-seeking masked by tax avoidance activities. Alternatively, family owners may be more concerned with the potential penalty and reputation damage from an IRS audit than non-family firms. Not explored is whether this finding applies to tax evasion in addition to aggressive tax avoidance. Nor is it clear that this finding for the largest family-owned firms applies to the much larger population of small family firms, where the opportunities family structure provides for evasion are larger.

### 2.3. The Platform Economy

The rise of the platform economy, in which businesses provide web-based platforms to facilitate transactions between individual buyers and sellers, has intriguing implications for the tax system. Major platforms intermediate borrowing goods, loaning money, performing tasks, and selling places to sleep and car rides. Tax rules are beginning to adapt to the growing numbers of people using platforms not only as customers but as small-scale sellers, effectively functioning as tiny firms, by exempting such activities below a threshold amount from taxation or reporting rules. For example, the U.K. has a Rent a Room Scheme that permits £7,500 per year of rental revenue tax-free, and in the U.S. there is a 15-day threshold below which rental income from a property need not be reported as business income, reducing the information required.

What role should platform providers play in tax systems? Their role as transaction intermediaries equips them to remit taxes on large numbers of transactions at low cost. Platform providers are likewise well-situated to provide information reports to tax authorities. The novel relationships between platform providers and the buyers and sellers using the platform also pose challenges for the rules in existing tax systems. As of April 2017, the online retailer Amazon remits sales taxes on orders shipped to all 45 U.S. states that have a state sales tax and to Washington, D.C.; before these agreements the consumer was responsible for remitting the “use tax” levied at the same rate as sales tax on out-of-state purchases, for which compliance was universally assumed to be abysmally low. Airbnb remits the hotel and occupancy taxes due on the short-term rentals and accommodations it provides in 275 jurisdictions in the United States and France; absent these agreements, the property owner was responsible for remitting these taxes, and it was widely suspected that compliance was minimal. Wilking (2016) finds that the change in remittance responsibility increased tax-inclusive rental prices, suggesting that consumers bear a greater share of the tax burden when the remittance obligation is shifted to a party with fewer evasion opportunities. A primary tax difference under the U.S. income tax system between classifying drivers for the ride-sharing service Uber as employees or as independent contractors (as is the current interpretation of their relationship to Uber) is that only in the former case would Uber be responsible for withholding (i.e., remitting) an approximation of the income tax liability the driver incurs. The growth of the platform economy thus both enables new remittance and enforcement regimes and poses challenges to existing regimes.

### 3. The Tradeoff Between Production Efficiency and Tax Administration Cost Minimization

The venerable result that even a distortionary tax should not interfere with production efficiency, due to Diamond and Mirrlees (1971), holds only under certain assumptions about how real firms and tax systems interact. For example, Diamond and Mirrlees (1971) note that if some production sectors, in their example agriculture, are “untaxable”, taxation should take place at the boundary between the rest of the production sector and the untaxable sector, rather than at the boundary between the untaxable sector and consumption. Diamond and Mirrlees assume a constant-returns-to-scale setting from which real firms are entirely absent. The result that production efficiency should be preserved fails, for example, when there are fixed per-firm administrative costs, as Dharmapala et al. (2011) show. Best et al. (2015) show theoretically that, in the presence of evasion, the optimal tax base sacrifices some production efficiency in order to curtail evasion levels. Exploiting a size-based policy notch in Pakistan, they estimate that the switch from a profit tax to a turnover tax reduces evasion levels by up to 60 to 70 % of corporate income. It should be possible to derive more general conditions on the nature of administrative costs and the structure of production that clarify when production efficiency should and should not be disturbed.

#### 3.1. Firm Size

A growing but incomplete literature studies the role firm size plays in tax systems. To the extent that firm size predicts compliance behavior, optimal tax systems may well treat firms differently based on their size, even though this may distort the structure of production. Several aspects of real-world tax systems provide firms with incentives to change their size; for example, the cascading nature of a gross receipts tax without exemptions for business-to-business sales provides incentives to vertically integrate (while a pure VAT, for example, does not). In this case, tax liability depends on where economic activity takes place relative to the border between firms.

One particular example has received substantial attention in the literature: given fixed per-firm costs of tax enforcement and in particular of conducting an audit, it may make sense to exempt small firms from the tax net altogether, even in light of the incentives this gives firms to stay small and the distortion induced by taxing some firms in an industry and not others. Dharmapala et al. (2011) lay out the logic of business income tax administration with an exemption threshold. Keen and Mintz (2004) develop a simple rule characterizing the optimal threshold (when firms’ sizes are fixed) for a VAT in terms of a trade-off between tax revenues and collection costs and then consider the

implications for the optimal threshold of the production inefficiencies implied by the differential treatment of those above and below the threshold. Liu and Lockwood (2016) study behavior at one such threshold in the United Kingdom, finding suggestive evidence that firms bunch below the VAT threshold by underreporting sales.

Taxes can be collected at lower cost when the tax authority can make use of information generated (and reported) by arms-length transactions between firms and between firms and employees. Firm boundaries alter the nature and extent of these information flows, and so firm size may produce externalities for purposes of tax administration. All this suggests that, in the presence of taxes, the equilibrium distribution of firm size need not be optimal, contrary to the suggestion of Coase (1937). Sole proprietorships and family and other small businesses are difficult for the tax authority to penetrate, for example, and replacing them with larger firms could be desirable on tax administration grounds even if it results in production inefficiency, contrary to the classic result of Diamond and Mirrlees (1971). Larger firms are not a panacea for tax collection, however, because while they are easier to detect and monitor, they are also better able to take advantage of returns to scale in tax avoidance. Multinational firms in particular have access to a variety of tools they can use both to avoid tax and to reduce the transparency of their operations to tax authorities. Further research could more precisely trace out the shape of the relationship between firm size and administrative efficiency.

#### **4. Real, Heterogeneous Firms, Remittance Responsibility, and Tax Incidence**

As already mentioned, firms are the linchpin of modern tax systems' remittance and collection regimes, remitting over 85 percent of taxes in most countries for which data are available. This fact may seem irrelevant given the common notion that who or what entity remits taxes does not matter. Although it is commonly asserted in as irrefutable truth in undergraduate public-finance textbooks, the assertion that remittance is irrelevant is certainly just folk wisdom, in the sense that it is rarely posed formally, laying out the assumptions required and addressing what happens when these conditions do not hold. This remittance-is-irrelevant folk wisdom does not accord well to a world of real firms.

There are several ways to show that the remittance-is-irrelevant folk wisdom does not hold in general. Its truth in fact rests on severe assumptions, including that evasion opportunities do not depend on who remits. Empirical studies confirm that, in contrast, the remittance regime can matter. Brockmeyer and Hernandez (2017) show that doubling the rate of withholding by



credit-card companies in Costa Rica increased sales tax collection from those subject to withholding by 33 percent, even as the information reported to the tax authority did not change. Kopczuk et al. (2016) present empirical evidence that the identity of the remitting party in the U.S. diesel fuel market affects both the revenue collected and the pass-through of taxes; retail diesel prices are higher, and a larger fraction of diesel taxes are passed through to retail prices, in states where the point of collection is at the distributor or prime supplier level rather than at the retail level, suggesting that this collection regime reduces evasion and alters the incidence of the tax.

The prevalence of particular remittance patterns is also at odds with the folk wisdom. As stated above, firms remit most tax. Among consumption taxes, value-added taxes are far more common than retail sales taxes, although the substantive difference between the two is in which firms must remit—the remittance regime. Tax systems rarely, if ever, feature individuals remitting taxes in their role as consumers. When consumers do feature, the system is designed so that they remit minimal or negative taxes. The average individual receives a refund, for example, in the U.S. income tax system, and consumers receive lottery tickets for providing information to the tax authority in the VAT system Naritomi (2016) documents in São Paulo.

The remittance-is-irrelevant folk wisdom has extreme implications: not only does it not matter if the buyer or seller remits, it doesn't matter if anyone else remits a given tax liability, as long as there is a sufficiently thick web of connections among firms and people. To the extent that the implications of the extended model are patently false, the model must be flawed. This exercise would be in the spirit of Bernheim and Bagwell (1988), who cast doubt on the dynastic model underlying Ricardian equivalence by showing that carrying the model to its logical extreme implies that everything is neutral—including the irrelevance of all public redistributions, distortionary taxes, and prices.

Surprisingly little research attention has been devoted to compliance by firms in their role as withholders for taxes “on” workers. A recent exception is the randomized experiment Boning et al. (2017) study, in which U.S. employers received an in-person visit or letter intended to increase timely compliance with their income tax withholding and payroll tax obligations. Both treatments increased compliance, and the in-person visit also increased compliance among firms connected to a visited firm by a shared tax preparer. In the U.S., there is a special, and especially stringent, penalty regime for employer remittances of payroll and income taxes, which are called trust fund taxes because legally the firm holds the employee's money in trust until it makes a federal tax deposit. Noncompliance can trigger a 100 % “trust fund recovery penalty” that pierces the corporate veil, and can be levied on any person who has the duty to perform and the power to direct the collecting, accounting, and payment of trust fund taxes, including but not restricted to officers or an employee

of a corporation as well as a corporate director or shareholder. Whether this qualitatively different penalty feature has a qualitatively different deterrent effect than standard penalties for, e.g., corporate income tax noncompliance, is not known. In principle, reports from a firm's employees could be matched to the reports of the withholding employers to monitor their payments. This is, however, likely less effective than using employer reports to verify payments received by workers. Some employees may have income below the threshold at which filing an income tax return becomes mandatory, and thus may not provide information about their employer. More generally, discrepancies between a firm's total report and the sum of its employees' reports is a weaker sign of noncompliance than disagreement between one employee's self-report and the firm's report about that employee.

Finally, workers and firms, especially small firms, may in some situations collude to facilitate evasion, as was explored theoretically by Yaniv (1993). Best (2014) finds that firms in Pakistan aggregate the preferences of workers and facilitate tax avoidance (not evasion) by bunching salary offers around kinks in the tax schedule. If and under what circumstances such collusion facilitates evasion in practice is worth exploring. One setting in which this is suspected is firms' reclassifying workers as independent contractors rather than employees. As discussed above, this eliminates the firm's responsibility to withhold and remit tax. This makes it more costly to enforce the worker's compliance because remittance responsibility is not irrelevant, and lower compliance can reduce the firm's labor costs.

How should an optimal tax system strike a balance between keeping firms formal so that they provide tax revenue and information reports and at the same time maximizing the value of the taxes and information reports provided? Again, a model of the social benefits of information reporting is needed.

#### 4.1. Heterogeneous Firms and Tax Incidence

The differences between real firms fundamentally change the analysis of tax incidence, especially the analysis of the incidence of tax evasion. For example, Suárez Serrato and Zidar (2016) find that the incidence of state taxes diverges from the predictions of standard open-economy models when firms' location-specific productivities are allowed to differ, and so some firms' location decisions are inframarginal. In general, many real firms earn economic profits, and taking that possibility into consideration alters incidence calculations.

If one took the standard model of commodity taxation literally, or at least naively, one might think that consumers are responsible for remitting the tax due. Then, if retailers charge the same price for a given good to everyone, those consumers who successfully evade the tax due end up relatively better off. The amount of aggregate evasion, if it affects purchasing decisions, would

increase demand and the consumer price depending on the relative supply and demand elasticities, so that non-evaders may bear an additional burden due to others' evasion.

However, in practice consumption taxes are almost always remitted by businesses, and as discussed above real businesses differ in their ability to evade taxes. As Kopczuk et al. (2016) demonstrate in the case of diesel taxes, tax evasion opportunities differ depending on which firms in the supply chain are required to remit the tax. Moving remittance responsibility to a relatively small number of upstream producers can make it easier to monitor tax compliance.

An analogy can be drawn between settings in which firms differ in production technologies and settings in which firms differ in evasion technologies. Tax incentives to use one production technology instead of another parallel the incentives remittance responsibility provides to evade taxes. In either case, production distortions result. A substantial extension to any incidence framework is needed to account for differential evasion technology across firms.

## 5. Conclusion

Although modern tax systems rely overwhelmingly on firms to collect revenue, tax economists have only recently begun to explore the implications of this empirical reality. Several interesting directions of research in tax systems stem from replacing the representative firm with real firms. The costs tax authorities incur to obtain information and the benefits that information provides both stem from the varied information environments real firms provide. Differences between firms make administrative policies that vary across firms according to their size cost-effective. Some firms are better positioned to evade than others, and both administrative policy and evasion technology can provide a competitive advantage to firms that need not be the most productive. Remittance responsibility has consequences when firms are realistic, and differences between firms can be essential for incidence.

More work is needed on several fronts. A solid theory of the social benefit of information to the tax authority would help to quantify the efficiency and equity improvements that result from better information. Theory can also help to explain which differences between firms are material and why, though empirical work will be needed to distinguish between the competing explanations. More realistic theories of firms will enable researchers to better evaluate the optimal design of firm-specific policies, like VAT thresholds, that tax authorities have adopted as a matter of practical necessity. As firms are central to the remittance systems of OECD countries and of India (Slemrod and Velayudhan, 2017), while countries may differ in their ability to raise rev-

enue, what revenue they do raise is mostly obtained via firms. Future research can help to illuminate the relationships between real firms and differences in fiscal capacity. Empirical work can also broaden our understanding of which features of real firms are essential when considering information reporting, remittance responsibility, and incidence. Fortunately, administrative microdata on firms are becoming more widely available for research purposes, and these data enable researchers to study real firms in ever greater detail.

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