

Transfer Pricing and the Decision-making Authority of the Tax Function in Multinational Companies*

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Abstract

Our study investigates the extent to which the centralization of decision-making authority for determining transfer prices is associated with transfer pricing outcomes. Analyzing survey data from transfer pricing managers at multinational corporations (MNCs), we find that when transfer pricing decision-making authority is allocated to the tax department of a firm's headquarters, disputes with local tax authorities become more likely, in particular in the case of transactions involving financial activities, intellectual property, and services. At the same time, firms that centralize their transfer pricing decisions report lower effective tax rates. These results are consistent with theory in organizational design. Surprisingly, internal coordination at MNCs turns out to be unaffected by the allocation of transfer pricing decision-making authority.

Keywords: transfer pricing, tax compliance, decision-making, decentralization

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1. Introduction

Transfer pricing is an integral part of strategy as it supports management control and aims to induce an efficient level of internal trade in diversified firms (Eccles 1985, Holmstrom and Tirole 1991). At the same time, transfer pricing is a key instrument to manage a firm's tax burden but also a source of financial uncertainty (PwC 2015, Dyreng et al. 2017) as recently showcased by Apple Inc.'s dispute with the European Commission worth USD 14.5 bn.¹ Using unique survey data collected from transfer pricing managers at 325 large multinational corporations (MNCs), we investigate the association between fundamental characteristics of transfer pricing systems and their outcomes. In particular, we document that larger and more complex firms choose to allocate transfer pricing decision-making authority to a central tax department instead of employing decentralized decision-making structures. We then analyze the extent to which the centralization of transfer pricing decisions relates to adverse outcomes in tax audits (external conflicts with authorities), some resulting in ex-post transfer price adjustments and double taxation risks, and to the reported effective tax rates as the financial outcome of transfer pricing strategies. We also assess whether centralization of transfer pricing decisions is associated with coordination conflicts when divisional managers negotiate over prices potentially causing haggling costs, holdup problems, and suboptimal investment decisions (Eccles 1985, Baldenius 2008).

In recent years, international tax policy has become increasingly concerned with combatting the alleged misuse of transfer prices for tax minimization (OECD 2015a). Given the increasing scrutiny by tax authorities and the sheer volume of cross-border intrafirm transactions,² transfer pricing is nowadays a primary tax challenge (Ernst & Young 2013, Jost et al. 2014, PwC 2015, Mulligan and Oats 2016, Klassen et al. 2017, Towery 2017). The number of transfer pricing disputes between MNCs and tax authorities is steadily increasing (OECD 2015b, European Commission 2016). For the companies involved, such disputes are significant cost factors and sources of uncertainty (Borkowski and Gaffney 2012, Scholes et al. 2014, p. 343, Ernst & Young 2014, Jost et al. 2014, Mulligan and Oats 2016, Dyreng et al. 2017, Hanlon et al. 2017)³. To avoid tax disputes, firms may choose more conservative prices to ensure compliance (Klassen et al. 2017). In contrast, the use of more tax-aggressive pricing facilitates profit

¹ See <https://www.reuters.com/article/us-cu-apple-tax-avoidance-court/apple-appeal-against-eu-tax-demand-would-break-new-ground-idUSKCN118155> (02 September 2016).

² In terms of volume, intrafirm transactions account for more than 50 percent of global trade (OECD 2010a).

³ For instance, GlaxoSmithKline's (GSK) transfer pricing dispute settlement with the IRS in 2006 amounted to USD 3.4bn and Daimler made an ex-post payment of USD 1.5bn relating to a transfer pricing scheme with its former Chrysler affiliates in 2011.

shifting when tax optimization is a primary objective (Klassen et al. 2017, Grubert and Mutti 1991, Clausing 2003, Huizinga and Leaven 2008)⁴.

From an internal business perspective, transfer pricing needs to serve both tax and incentive (i.e. managerial accounting) functions. Optimal transfer pricing strategies integrate tax policy objectives (Scholes et al. 2014, pp. 338-339) and efficient resource allocation (Baldenius et al. 2004, Hyde and Choe 2005, Martini 2015). However, transfer pricing policy can hardly be optimal and might lead to conflicts given the restrictive regulatory framework, information asymmetries across MNCs' legal entities and departments, and conflicting firm objectives (Baldenius et al. 2004, Baldenius and Reichelstein 2006, Keuschnigg and Devereux 2013, Shunko et al. 2014, Martini 2015).

Empirical evidence on how firms design their transfer pricing systems to pursue those often conflicting objectives is scarce because the roles and responsibilities of financial managers are hardly observable (Graham et al. 2015). As for any corporate decision (Bolton and Dewatripont 2013, p. 343), a firm has to define the lines of authority for determining transfer prices. Firms may opt for decentralized structures across MNCs' legal entities and departments to avoid information overload for central managers (Rivkin and Siggelkow 2003, p. 300) and benefit from increased participation and improved information quality (Ocasio 1997). Alternatively, they may centralize decision-making authority at a single legal entity or department to facilitate information flow and fast decision-making (Egelhoff 1988, Eisenhardt 1989). Empirical evidence in management research supports contingency theory in the sense that the optimal degree of centralization depends on a firm's environment and characteristics (e.g. Boone and Hendriks 2009). Recent studies in finance and accounting seize on these concepts and show that the allocation of authority for making financial decisions is an explanatory factor of performance (Robinson and Stocken 2013, Graham et al. 2015). Overall, firms have to weigh the benefits of centralization against the drawbacks when allocating decision-making authority.

Recent evidence suggests that the tax department has an increasing stake in financial, operational, and functional decisions (Graham et al. 2017, Feller and Schanz 2017). All these decisions are all interrelated with the transfer pricing system. Previous research on transfer pricing systems and performance largely ignores the direct role of the allocation of decision rights, i.e. the question of who makes the ultimate decision on how an intracompany transaction is priced.⁵ The scant empirical evidence supports the view that centralization might facilitate

⁴ See Heckemeyer and Overesch (2017) for a meta-analysis of existing empirical evidence.

⁵ To the best of our knowledge, Cravens (1997) and Chan et al. (2006) are the only studies to observe the roles in the decision making process. Analyzing survey data, Cravens finds a positive association between decisions

tax burden management (Cravens 1997, Blouin et al. 2017) but hampers tax compliance across several jurisdictions and, thus, triggers scrutiny in tax audits (Chan and Lo 2004, Chan et al. 2006). Other related empirical and case study research provides indirect evidence that tax considerations, related to both compliance and tax optimization, play a significant role in MNCs' transfer pricing policy (e.g. Grubert and Mutti 1991, Bartelsman and Beetsma 2003, Clausing 2003, Cools et al. 2008, Klassen et al. 2017). The integration of the transfer pricing function with other management functions and transfer pricing policies, however, varies considerably across companies (Ernst & Young 2013, p. 3, Chen et al. 2015, Blouin et al. 2017).

This study aims to shed more light on the nature of transfer pricing systems. Specifically, we first explore the design of transfer pricing system used to integrate the objectives of managerial control, tax optimization, and reducing tax uncertainty through compliance. In particular, we are interested in MNCs' allocation of decision-making authority given the different functional objectives. We then use regression analyses to investigate how this organizational choice relates to transfer pricing outcomes in terms of external transfer pricing conflicts with tax authorities, effective tax rates, and internal coordination conflicts.

To tackle the challenge of limited observability of transfer pricing aspects and firm organization, we use a survey as an appropriate data source for our investigation (Hanlon and Heitzman 2010, p. 157, Graham et al. 2015). Our survey in 2013 of over 2,000 firms yielded more than 300 responses by primary large MNCs across all industries with significant operations in the German-speaking market. We analyze unique data provided by transfer pricing managers at both the tax and the managerial accounting function. In doing so, we contribute to existing literature by offering direct, descriptive insights and unique empirical evidence on MNCs' choices on decision-making structures in transfer pricing systems and their respective outcomes.

Regarding the conflicting purposes of taxes and coordination, we observe that our sample firms consider tax optimization a less important purpose of transfer pricing in relation to management control (12 vs. 41 percent of 179 vs. 180 survey responses). We confirm the findings of Klassen et al. (2017) that tax compliance is the most important goal of transfer pricing (58 percent). We further document that the tax department has a strong stake in transfer pricing-related decisions (36 percent). Centralization measured as the tax department at the central office (headquarters) having the ultimate decision-making authority over transfer prices is less prevalent in some

made by higher corporate levels and perceived transfer pricing effectiveness in bivariate tests. Chan et al. (2006) observe the degree of autonomy of Chinese affiliates in confidential data provided by the tax authority.

industries, e.g., 11 percent of survey responses in the information technology sector and more prevalent in other industries, e.g., 30 percent of responses in the financial sector. Interestingly, firms are also heterogeneous as to their choice of transfer pricing methods. The cost-plus method is predominant even for transactions involving intellectual property. The frequency of the application of other methods, in particular the profit split method, varies across industries and transaction types. To the best of our knowledge, our research reveals unique insights into the state-of-the-art use of available transfer pricing methods as postulated in the regulatory guidelines.

We next investigate the empirical relationship between the centralization of decision-making authority and transfer pricing outcomes. The analysis takes into account those features of transfer pricing systems that have turned out to determine transfer pricing outcomes in prior studies – such as objectives, organizational characteristics (coordination and information systems), and tax planning opportunities. Relying on the attention-based view of the firm (Ocasio 1997), we predict that firms with centralized decision-making authority will face a higher degree of disputes in audits by local tax authorities since managers at the headquarters' tax department will focus on the firm-wide goal of optimizing the effective tax rate. Consistent with our prediction, we find that the centralization of transfer pricing decisions at the tax function of an MNC's headquarters is associated with a 10-percentage-point higher probability of transfer pricing adjustments as a result of disputes with tax authorities. This result translates into a relative increase in the probability of price adjustments of more than 60 percent (evaluated at mean). For those firms that primarily pursue the management control function of transfer pricing, however, the association between centralization and the likelihood of tax disputes is insignificant consistent with these firms being able to document an internal pricing structure not motivated by tax considerations. A more decentralized operational supply chain (e.g., fully-fledged distributors or licensed manufacturer) is negatively associated with external conflicts. In an additional analysis, we complement the recent findings on the sources of tax uncertainty by Dyreng et al. (2017). We disaggregate the survey data to the transactional level and show that transactions involving services, intellectual property, and financial instruments are the primary targets of scrutiny in tax audits and thus majority contribute to transfer pricing risk. Further, the choice of transfer pricing methods is significantly related to authorities' scrutiny.

While centralization hampers transfer pricing compliance, we expect firms centralizing their transfer pricing decision-making at the headquarters' tax department to report lower GAAP effective tax rates since these managers with decision authority will focus on the firm-wide goal

of tax optimization and benefit from informational advantages (Ocasio 1997, Graham et al. 2015). Consistent with our conjecture, we find that those firms report, on average, 2.3 percentage points lower effective tax rates. In cross-sectional tests, we show this negative effect is diminishing in firm size suggesting that the tax-related benefits of centralization might be limited by firm complexity.

Last, we consider internal coordination conflicts that might be affected by decision-making authority being allocated to the central tax department since a mere focus on tax-optimal pricing distorts efficient intracompany trade (Baldenius et al. 2004). We observe that divisions mainly dispute over transfer prices of physical products and services. On average, we do not find a connection between the decision-making structure and internal transfer pricing conflicts. Yet, we document that the use of transfer pricing method postulated in tax regulatory guidelines is related to managerial transfer pricing outcomes in the form coordination conflicts.

Our study places the focus on the transfer pricing function, which is typically hard to observe and thus still underexplored. However, the design of transfer pricing systems and decision-making structures, in general, are of primary relevance for tax management, internal coordination, and firm performance (Graham et al. 2014, Cools 2014, Rossing and Rohde 2014, Graham et al. 2015). We answer the call for exploratory analyses on organizational decisions (Gow et al. 2016), for research on transfer pricing arrangements and the underlying objectives (Hanlon and Heitzman 2010), and for analyses on delegation in line with specific corporate policies (Graham et al. 2015). Specifically, we investigate to which extent the design of transfer pricing systems is associated with the effectiveness of balancing transfer pricing objectives and thus integrate into our study transfer pricing outcomes that have been investigated separately in the past. In the vein of Robinson et al. (2010) and Chen et al. (2015) we provide empirical evidence that the decision-making authority and the role of the tax function can influence a firm's performance. In particular, we offer novel insights on transfer pricing conflicts with tax authorities that are a main driver of tax uncertainty (Dyreng et al. 2017, Hanlon et al. 2017, Towery 2017). The outcomes of these audits are usually unobserved by empirical research since they do not result in book-tax differences (Hanlon and Heitzman 2010). We further extend the recent evidence of Klassen et al. (2017) and shed light on conflicts that result from the scrutiny by tax authorities or from internal coordination problems as additional outcomes of transfer pricing. Our insights are of relevance for businesses, policy-makers and tax authorities because the tax function at MNCs contributes to financial performance and risk (Dyreng et al. 2017)

and can exert substantial power on corporate decisions as well as the application and design of law (Mulligan and Oats 2016, Graham et al. 2017).

The remainder of this paper is structured as follows. We review theory, the regulatory background, and prior literature on the allocation of decision-making authority and transfer pricing in the next section. Section 3 derives our hypotheses, building on theoretical considerations and prior empirical evidence in accounting research. In Section 4 we present our survey data and conduct an exploratory analysis of transfer pricing systems. Section 5 reports on our empirical results based on the survey data and matched financial information. In the concluding Section 6, we discuss the implications and potential limitations of our analysis.

2. Theory and the Institutional Background of Transfer Pricing

2.1. Centralizing Decision-Making at Multi-Layered Firms

A firm's allocation of decision rights is a core element of its organizational structure and affects reliability, financial performance, corporate policies, and the firm's value (e.g. Colombo and Delmastro 2008, Christensen and Knudsen 2010, Graham et al. 2015, Blenko and Mankins 2010). Allocating decision-making rights to agents in more than one location at a firm is referred to as decentralization. Centralization means that a principal at the top of a firm's organizational hierarchy makes the decisions (Shubik 1962, Aghion and Tirole 1997⁶, Colombo and Delmastro 2008, p. 28).⁷ Contingency theory postulates that firms should base the degree of their centralized decision-making on their environments (Birkinshaw et al. 2002, Caves 2007, p. 80, Colombo and Delmastro 2008, p. 61).

Centralized decision-making is typically associated with closer control. However, it comes at the cost of potentially overloading the principal and diminishing the agent's initiative and incentive to acquire and process relevant information (Aghion and Tirole 1997, Siggelkow and Rivkin 2003, Colombo and Delmastro 2008, p. 16). Thus, optimal organizational design weighs the benefits and costs of centralization in the environment at hand. When decision-making authority is allocated to the central office, the attention-based view of the firm (Ocasio 1997) implies that managers put most focus on issues and respective answers that affect the firm as a whole (e.g. firm-wide rather than divisional goals). Decentralized decision-making is

⁶ Aghion and Tirole (1997) differentiate between formal authority (the right to make decisions) and real authority (control over decisions and actions).

⁷ We focus on decision-making only. The early literature distinguishes between centralization of control and decision-making (Zannetos 1965, pp. 56-57). Decision-making is considered to go beyond the concept of control since it encompasses future actions of a firm, while control solely refers to the allocation of resources within a current set of actions.

considered superior in vertically integrated firms where coordination between different subdivisions is more important than coordination with the headquarter (Shubik 1962, Alonso et al. 2008). Centralized decision-making is effective if the central office receives complete information and fosters effective communication with subunits (Shubik 1962, Aghion and Tirole 1997, Siggelkow and Rivkin 2005). In addition, centralizing decision-making is less costly for firms with expert knowledge in only a limited number of locations (Birkinshaw et al. 2002) and when decisions need to be made quickly (Eisenhardt 1989).

Accounting research provides some empirical evidence on firms' choice of decision-making structure. Baiman et al. (1995) and Robinson and Stocken (2013) find that decision-making authority is decentralized if subsidiaries have greater financial and staff-related independence from the parent firm, more presence in the local markets, and greater economic importance. Graham et al. (2015) show that the degree of centralization of financial decisions is positively associated with information advantages at the central office, policy involvement of CEOs, and other CEO-related factors such as tenure and education. Similar to the evidence on subsidiary characteristics by Robinson and Stocken (2013)⁸, they find decentralizing is positively associated with firm size and complexity as proxies for decision overload.

2.2. The Roles of Transfer Pricing in Accounting and Tax Management

Eccles (1985) identifies the core function of transfer pricing as preventing the advantages of dividing a firm's organization into multiple profit centers in the course of vertical integration. At the same time, transfer pricing crucially influences a firm's total tax burden (Baldenius 2008). Accordingly, different streams of literature suggest that transfer pricing needs to serve both tax and incentive (i.e. managerial accounting) functions. Today's optimal transfer pricing strategies thus integrate tax policy objectives and efficient resource allocation (Scholes et al. 2014, pp. 338-339, Hanlon and Heitzman 2010, p. 158, EY 2017, Baldenius et al. 2004, Hyde and Choe 2005, Martini 2015).

From a tax perspective, transfer prices affect international profit allocation and thus, the amount of taxable profits in jurisdictions with different tax rates. MNCs can ultimately manage their effective tax rate in this way and have therefore to adhere to an established international regulatory framework.⁹ Under the arm's length principle, transfer prices have to be determined

⁸ They define decentralization as a foreign subsidiary's functional currency deviating from the parent's functional currency as a proxy for the delegation of "real" decision-making rights.

⁹ The internationally accepted regulatory framework to determine transfer prices is based on the arm's length principle codified in Article 9 of the OECD Model Tax Convention and Article 9 of the UN Model Double Taxation Convention, as well as in domestic tax law of many jurisdictions around the globe. In addition, the

according to prices that unrelated parties would agree upon for the same or similar transactions under similar conditions. The OECD transfer pricing guidelines for MNCs and tax administrations (OECD 2017) recommend five methods to approximate arm's length pricing of intercompany transactions: the cost-plus method, the resale price method, the comparable uncontrolled price, the transactional net margin method (or comparable profits method), and the transactional profit split method.¹⁰ The OECD guidelines acknowledge that transfer pricing is not an exact science but requires the exercise of judgment and that the choice of methodology for establishing arm's length transfer pricing will often not be unambiguous (OECD 2017, p. 36). Depending on the situation and the involved tax authorities in different jurisdictions, certain methods are found to be more appropriate than others. This structural lack of clear guidance combined with international income tax rate differentials provides a financial incentive to use transfer prices for tax minimization.

In this context, tax authorities are scrutinizing MNCs' transfer pricing practices more closely, and the numbers and values of transfer pricing disputes are growing in many countries.¹¹ Tax authorities might enforce price adjustments during tax audits that lead not only to a higher burden but also to double taxation and are therefore considered a major tax risk (De Waegenaere et al. 2006, Scholes et al. 2014, p. 341, Dyreng et al. 2017, Hanlon et al. 2017). Anecdotal evidence shows that transfer pricing disputes between MNCs and tax authorities have resulted in some of the largest tax controversies and settlements. For instance, the US tax authorities and the pharmaceutical corporation GlaxoSmithKline (GSK) settled a transfer pricing dispute in 2006, as a result of which GSK had to pay additional taxes of approximately USD 3.4 billion.¹² The technology firm Apple is currently involved in a tax dispute with the European Commission related to transfer pricing with an alleged undue tax benefit of up to EUR 13 billion.¹³ Tax authorities often use mutual agreement procedures (MAPs) to resolve tax treaty-related disputes and particularly transfer pricing disputes (Scholes et al. 2014, p. 340). The number of new MAP cases initiated has outnumbered completed MAP cases in recent years. In

arm's length principle is codified in many national tax codes, such as in IRS Section 482 in the U.S. and Section 1 of the Foreign Tax Code in Germany.

¹⁰ The pricing of a controlled transaction must be determined using the OECD-recognized method that provides the most appropriate measure of an arm's length result for each case in view of the nature of the controlled transaction, the availability of reliable information, and the degree of comparability between controlled and uncontrolled transactions.

¹¹ When tax authorities in tax audits conclude that transfer prices differ from approximated market prices, price adjustments and fines can be imposed. Moreover, litigation costs are extremely high due to the fact based nature of transfer pricing.

¹² See <https://www.irs.gov/uac/irs-accepts-settlement-offer-in-largest-transfer-pricing-dispute>.

¹³ See http://europa.eu/rapid/press-release_IP-16-2923_en.htm. For The Coca-Cola Company's transfer pricing dispute with the IRS see Finley (2015).

Germany, 374 MAPs were initiated in 2014 compared to 186 in 2007 (OECD 2015b). Around one-third of MAPs relate to transfer pricing disputes (European Commission 2016), indicating an increase in costs and compliance burdens due to disputes between MNCs and local tax authorities. Recent evidence highlights that cross-border transfer pricing accounts for the largest and most uncertain tax positions in financial statements (Borkowski and Gaffney 2012, Towery 2017). This uncertainty results from the unpredictability of outcomes of transfer pricing disputes between firms and tax authorities. Dyreng et al. (2017) study the interrelation between tax avoidance (as a firm-wide goal) and tax uncertainty.¹⁴ They identify transfer pricing as a primary tool of tax avoidance that increases the probability of costly conflicts with tax authorities.

Empirical results in literature suggest that firms that MNCs shift profits by means of transfer pricing to minimize their global tax burden (e.g. Grubert and Mutti 1991, Bartelsman and Beetsma 2003, Clausing 2003; see Dharmapala 2014, and Heckemeyer and Overesch 2017 for reviews). Limited direct evidence on intrafirm transfer prices substantiates this finding. Blouin et al. (2017) examine intrafirm trade between a US parent and its foreign affiliates and find that transfer pricing has the function to lower both the customs burden and tax burden. Hopland et al. (2016) examine Norwegian tax return data and find that intrafirm prices are adjusted ex-post to offset tax losses at affiliates. Klassen et al. (2017) confirm the tax minimization function of transfer pricing by analyzing survey data on US MNCs' tax managers. Firms whose primary transfer pricing objective is tax minimization rather than tax compliance report significantly lower tax burdens. The association between tax minimization goals and lower reported tax burdens is particularly strong for firms with more tax planning opportunities such as foreign operations.

Case study research and survey data suggest that compliance is another important function of transfer pricing (e.g. Cravens 1997, Klassen et al. 2017, EY 2017). However, it is challenging and costly to comply with the arm's length principle at the level of every taxable entity of an MNC (De Waegenaere et al. 2006, Blumenthal and Slemrod 1995). Increasingly integrated supply chains, ever-closer scrutiny by tax authorities, and the lack of harmonization in domestic tax law and enforcement across jurisdictions contribute to this challenge consistent with firms that employ compliance-oriented transfer pricing strategies reporting higher tax burdens (De

¹⁴ Firms pursuing more aggressive tax strategies face significantly greater tax uncertainty, in particular when reporting high R&D expenses and holding affiliates in tax havens. In particular, transfer pricing of intangibles is used for income shifting, resulting in increased scrutiny by tax authorities. When including R&D expenses and the availability of tax haven affiliates, the tax avoidance measure alone does not explain tax uncertainty but its interaction with R&D expenses and tax havens has a significant and positive impact on tax uncertainty.

Waegenare et al. 2006, Klassen et al. 2017). Given the increase in regulatory pressure, the tax risk of transfer pricing is considered a function of the trade-off between tax optimization and tax compliance (Rossing 2013).

Transfer pricing also plays an important role in management information and control systems (Colbert and Spicer 1995). Theory postulates that the transfer pricing function has to trade off tax-related goals against effective management control to optimize resource allocation (e.g. Baldenius et al. 2004). If market prices are available for goods exchanged between affiliates, market-based transfer pricing conforms to the arm's length principle and can also help to allocate resources effectively. Yet, Keuschnigg and Devereux (2013) conclude that the use of the arm's length principle for determining transfer prices for taxation distorts optimal resource allocation since integrated firms are hampered in their opportunity to circumvent capital constraints through internal trade. If market prices are not competitive or are unsuitable to account for intrafirm particularities, firms should always depart from tax-compliant transfer prices to ensure efficient decentralization in operational decisions (Baldenius and Reichelstein 2006). Overall, intrafirm incentives usually cannot be optimally reflected in transfer prices designed to optimize the tax burden or strictly comply with the arm's length principle which can lead to coordination conflicts arise between management divisions.

In summary, tax regulation following the arm's length principle sets the boundary for determining tax optimal transfer prices, and the literature suggests at least two trade-offs within the transfer pricing function: tax compliance vs. tax optimization, and tax considerations vs. management control. If transfer prices are not compliant with domestic regulation, tax uncertainty arises due to potential conflicts in tax audits with authorities demanding price adjustments. If transfer pricing does not appropriately fulfill its management control function, coordination conflicts can arise, and the performance of a firm's divisions can suffer. Prior research has studied these trade-offs and potential outcomes separately or from an analytical perspective.

2.3. Transfer Pricing Systems and Centralization

The optimal design of the transfer pricing system aims not only to find prices to ensure an efficient level of intrafirm trade without allocation distortions (Holmstrom and Tirole 1991, Eccles 1985), but also to avoid or moderate disputes with tax authorities and manage the tax burden (Klassen et al. 2017, EY 2017). The specific design of MNCs' transfer pricing systems to achieve these goals remains largely unexplored because the relevant information is not publicly accessible. However, theory and some evidence suggest that the degree of

communicating information and performance measurement, the mechanisms and methods for determining transfer prices, and the allocation of decision-making rights are important features of transfer pricing systems.

It is particularly difficult to balance the trade-off between tax goals and management control objectives if the same transfer price for a transaction (one set of books) is used for tax compliance and management control.¹⁵ Although firms can use two distinct transfer prices (two sets of books) to pursue both objectives, these prices might still be interrelated, and the outcomes can still be suboptimal from a tax or management control perspective (Baldenius et al. 2004, Hyde and Choe 2005).¹⁶ Dürr and Göx (2011) extend these analyses and show that firms have incentives to use only one set of books even if strategic and tax considerations conflict, especially when product competition is intense.

The choice of transfer pricing methods can influence the price range, the outcomes of transfer pricing audits (external conflicts) (Ernst & Young 2014, PwC 2015), and the effectiveness of performance management (internal conflicts) (Halperin and Srinidhi 1991, Hiemann and Reichelstein 2012, Huh and Park 2013, Gao and Zhao 2015). Managerial accounting research typically distinguishes between cost-based, negotiated, and market-oriented internal pricing methods (Baldenius 2008). Eccles and White (1988) argue that the best method for management control objectives can be contingent on the extent to which decision-making authority on resource allocation (reflected through transfer prices) is centralized. They state that market-based pricing should accompany decentralized decision-making, whereas cost-based methods are more suitable when decision-making authority is centralized. Theoretical models in managerial accounting offer more diverse solutions depending on the presence of external markets, the degree of information asymmetry between a firm's division, and monopoly power (see Baldenius 2008 for an overview). From a tax perspective, companies are usually constrained to use pricing methods prescribed in official guidelines by the OECD or national tax authorities that often contain a mix of cost-based and market-based elements (see section 2.2, Baldenius 2008).

Past evidence from the field suggests that the use of transfer pricing methods depends on firms' characteristics and environmental factors. Borkowski (1990) finds that even when market prices are known and relevant, market-based methods are not always used. Larger firms, firms in

¹⁵ See Baldenius et al. (2004) for a model that predicts optimal transfer prices under the arm's length principle and given cost structures of MNCs. In an earlier study, Halperin and Srinidhi (1991) model the effect of tax-motivated transfer prices on resource allocation for different transfer pricing methods.

¹⁶ This holds true particularly when transfer prices have to be at arm's length for tax purposes.

process industries, and firms with decentral supply chains are more likely to use market-based methods. Colbert and Spicer (1995) observe a positive relationship between the use of cost-based methods and the asset specificity of a firm's component division. Cravens and Shearon (1996) and Cravens (1997) find that the cost-plus method is predominant, and firms that are more international use a greater variety of methods. Borkowski (1997) asserts that the choice of methods might depend on management philosophy after observing that Japanese MNCs predominantly use market-based and negotiated methods whereas U.S. MNCs prefer cost-based methods.

The pricing of goods is one relevant function in which decisions can be made by central management or be delegated to decentral units (Shubik 1962). Based on the seminal field research of Eccles (1985), Eccles and White (1988) find that a firm's transfer pricing policy is driven by the social relationships of managers, including their authority to make decisions. Holmstrom and Tirole (1991) confirm this finding and highlight that the optimal degree of centralization for transfer pricing depends on firm and market characteristics such as vertical integration, production cost, and uncertainty perceived by the manager. Under centralized decision-making, local manager's investment in quality and efficiency is unobservable to the decision-makers but can be controlled by tying rewards to profits, i.e., defining and enforcing key performance indicators (KPIs). However, negotiated transfer pricing mechanisms implying decentralized decision-making on final prices is generally superior because the bargaining process between management units reveals information for optimal resource allocation (Baldenius 2008). With a better transfer of information in a transfer pricing system, top management's improved ability to set appropriate prices can outweigh the informational disadvantage of centralized decision-making (Dikolli and Vaysman 2006).¹⁷ Few studies incorporate taxes when investigating decision-making authority in transfer pricing. When modeling product market competition, Narayanan and Smith (2000) show that firms employ centralized decision-making structures to use transfer prices for tax reduction.

3. Hypothesis Development

Our study centers around the allocation of decision-making authority within the transfer pricing function and its potential consequences for tax management and coordination. In general, the optimal decision-making structure depends on a firm's environment and should be decentral if a firm wants to maximize local managers' participation (Aghion and Tirole 1997, Siggelkow and Rivkin 2003) and draw managers' attention to issues at the divisional level (Ocasio 1997).

¹⁷ Pfeiffer et al. (2011) further show that centralized (cost-based) decision-making is superior when the central office faces low cost uncertainty (i.e. when the need to analyze additional information is low).

Transfer pricing, however, pursues firm-wide goals of management control and tax optimization and involves complex tasks for which expert knowledge of, inter alia, the tax function is required. Typically, such tax-specific knowledge is concentrated at a firm's headquarters (KPMG 2016). As the importance transfer pricing increases in a firm's trading volume, we hypothesize that larger firms with more decentral supply chains are more likely to centralize decision-making at the headquarters' tax department for transfer pricing purposes.

H1: Centralized transfer pricing decision-making at the tax department of the firm's headquarters is positively associated with firm size and complexity.

The attention-based view of the firm (Ocasio 1997) would suggest that managers at the tax department of the central office are focused on the financial consequence transfer pricing has for the firm as a whole which is the group-wide tax burden expressed in the GAPP effective tax rate. In a scenario of centralized decision-making where firm-wide objectives are pursued (Siggelkow and Rivkin 2005), decisions might be made at the expense of some affiliates' performance. Joseph et al. (2016) similarly argue that decision-makers will then focus on issues arising to the firm as a whole even if negative (local) consequences arise. Such local consequences are the outcomes of tax audits is a task at the affiliate level in multiple jurisdictions at different times. Accordingly, transfer pricing decision-makers at the central office might be less concerned about transfer pricing issues in local tax audits. In contrast, delegating decision-making authority to managers of subunits increases their participation and incentive to contribute to divisional performance (Aghion and Tirole 1997) which, from a tax perspective, would include a smooth relationship with local tax authorities increasing the ease in tax audits.

In the context of the organization of global tax functions of MNEs, local transfer pricing managers are typically concerned with tax compliance of the respective operative unit (KPMG 2016), and decentralization should thus be positively associated with higher levels transfer pricing compliance and lower levels of scrutiny in local tax audits. In contrast, local tax authorities might perceive centralization as a signal that a firm's focus is on tax burden minimization causing additional attention in audits since authorities are increasingly questioning on how firms implement and adjust prices (EY 2013, p. 27, 30).

Some evidence from field research supports that decentralized mechanisms for determining transfer prices can prevent conflicts with local tax authorities. Interviewing a small sample of MNCs, Chan and Lo (2004) observe that companies use market-based pricing methods with less discretion at the central tax department at their headquarters to foster the relationship with

Chinese tax authorities auditing their local subsidiaries. Analyzing administrative data on tax audits in China, Chan et al. (2006) show that tax authorities make larger price adjustments when local subsidiaries have less autonomy to negotiate transfer prices with other affiliates.

In line with this limited evidence supporting the outlined conjecture, we postulate the following hypothesis:

*H2a: MNCs that centralize transfer pricing decision-making at the tax department of the firm's headquarters are **more likely to face transfer pricing disputes** with local tax authorities (external conflicts).*

Field evidence suggests that some firms prioritize effective management control when setting transfer pricing strategies (Cravens 1997) or aim to optimize their management control system contingent on sufficient tax compliance (Cools 2008, Rossing 2013). Often, these firms centralize decision-making authority for transfer pricing, which is consistent with the notion that under specific conditions absent of taxes, centralized decision-making structures can lead to effective management control (e.g. Holmstrom and Tirole 1991, Dikolli and Vaysman 2006). If the management control purpose of transfer prices is convincingly documented, tax authorities tend to be less skeptical whether they are confirming with the arm's length standard (Baldenius et al. 2004). Therefore, allocating transfer pricing decision-making authority to the central office is not necessarily associated with transfer pricing disputes if management control is the primary objective.

*H2b: For MNCs that prioritize the goal of effective management control via transfer pricing, centralizing transfer pricing decision-making at the tax department of the firm's headquarters is **not associated with a higher likelihood of transfer pricing disputes** with local tax authorities (external conflicts).*

Empirical literature supports the view that transfer prices are used to minimize the global tax burden of a firm via profit shifting (e.g. Grubert and Mutti 1991, Bartelsman and Beetsma 2003, Clausing 2003). However, there is little direct evidence on how firms employ transfer prices including the allocation of decision-making authority to achieve tax optimization. Cravens (1997) finds that managers rate their transfer pricing system as more effective in managing the tax burden when the decision on the transfer pricing method is made at the central corporate level. Blouin et al. (2017) examine the role of coordination within transfer pricing systems where coordination is measured as the use of the currency of the parent firm (i.e. U.S.) as the

functional currency of the MNC.¹⁸ Similar to Cravens (1997), they find that firm-wide coordination by centralized rules and processes is associated with a lower overall customs and tax burden. Case study research supports the view that MNCs centralize decision-making when they attempt to reduce tax uncertainty (Rossing 2013). Studying a different feature of organizational design by exploiting CFO survey data, Robinson et al. (2010) show that evaluating a firm's tax department as a profit center provides an incentive for tax managers to contribute to the firm-wide goal of maximizing net income. As a result, those firms report significantly lower effective tax rates.

Minimizing the tax burden at the group level of an MNC is a firm-wide objective of transfer pricing. In the spirit of the attention-based view (Ocasio 1997), managers at the central tax department should thus primarily be concerned with minimizing the firm's effective tax burden. Also, centralized decision-making is usually associated with central managers' informational advantages (Graham et al. 2015), which, in the context of tax management, should facilitate optimizing the firm-wide effective tax rate. Given tax managers' incentives, attention and informational advantages under centralization, and the related empirical findings, we hypothesize as follows.

H3: Centralizing transfer pricing decision-making at the tax department of the firm's headquarters is associated with a lower effective tax rates.

Transfer pricing theory predicts that a less centralized transfer pricing system and the tax department having less decision-making authority help to fulfill the performance management function of transfer pricing, balance conflicting incentives of management units, and allocate resources efficiently (Baldenius et al. 1999, Baldenius et al. 2004, Baldenius and Reichelstein 2006, Martini 2015).¹⁹ Otherwise, internal coordination conflicts can arise because transfer prices cannot simultaneously reflect divisional objectives (i.e. divisional financial performance) and firm-wide objectives (i.e. total tax burden). However, the optimal degree of bargaining power, and hence the allocation of decision authority, depends on whether a firm's headquarters or subdivisions have more information and investment opportunities (Baldenius 2008).

¹⁸ See also Robinson and Stocken (2013).

¹⁹ The model of Martini (2015) shows that negotiated – and thus less centralized – transfer prices make for the optimal policy to balance the trade-off between pre-tax profitability (maximizing managerial effectiveness) and tax minimization in particular when productivity in high-tax locations is high. For the effects of negotiated transfer prices using a two book system, see Hyde and Choe (2005). Dürr and Göx (2013) discuss several shortcomings of negotiated transfer prices based on the model of Edlin and Reichelstein (1995) for tax and management purposes and propose mechanisms for adjusting negotiated prices.

Recent empirical evidence indeed suggests that the association between centralized decision-making and efficient resource allocation or effective coordination depends on cross-sectional firm characteristics.²⁰ Based on a sample of Chinese firms, Chen et al. (2015) find that perceived managers' transfer pricing effectiveness, such as efficient resource allocation, is significantly lower when the degree of transfer pricing autonomy is not optimal.²¹ This conclusion is in line with Robinson and Stocken (2013) stating that overall firm performance is expected to improve if the degree of centralizing decision-making reflects a subsidiary's economic relevance and independence. We thus make no prediction on the association between the centralization of transfer pricing decisions at the tax department and the degree of internal coordination conflicts, and we investigate the relevance of cross-sectional differences in our empirical analyses.

*H4: MNCs that centralize transfer pricing decision-making at the tax department of the firm's headquarters are **not more likely to face coordination problems** (internal conflicts).*

4. Insights into Transfer Pricing Systems and Conflicts

4.1. Survey Data

Since common archival firm data is not suitable to measure allocation of decision-making authority and to explore the design and non-financial outcomes of transfer pricing systems, we draw on confidential survey data of large MNCs with affiliated companies in Austria, Germany, and Switzerland.²² A particular feature is that (i) this survey was sent to transfer pricing managers from different functional departments and (ii) responses are distributed equally between the tax and managerial accounting departments. This holistic scope is beyond that of surveys regularly conducted by accounting firms. Also, this study is the first to focus on the allocation of decision-making rights among functional departments and hierarchies as well as the goals, tools, mechanisms, and outcomes of transfer pricing. The questionnaire was mailed

²⁰ Management research confirms contingency theory in the sense that the optimal choice of organizational structure depends on a firm's environment and characteristics. Boone and Hendriks (2009) study the association between firm performance and the interaction of centralized decision-making with the functional background and locus of control of management teams.

²¹ Suboptimal levels of autonomy are defined as a mismatch between the actual degree of autonomy and the optimal degree of autonomy based on organizational characteristics. The measure of mismatch is computed based on the residuals from a model predicting transfer pricing autonomy contingent on firm characteristics and other controls. Chen et al. (2015) investigate transfer pricing effectiveness in terms of performance management as a synthesized measure of perceived autonomy, efficient resource allocation, fairness, motivation and goal congruence. The measure relates to divisional and operational managers' perceptions and thus represents a subjective outcome variable of the transfer pricing system.

²² The survey was jointly conducted by the consulting firm Horváth & Partners and the tax firm Flick Gocke Schaumburg in collaboration with the authors. The survey contains 33 questions and was developed by tax and management accounting consultants with long-standing experience in the transfer pricing practice area and relevant academic backgrounds.

electronically and in hardcopy to 2314 transfer pricing specialists. A total of 325 questionnaires were returned, resulting in a response rate of 14 percent which is in the range of those of other studies in accounting research using survey data.²³ Our data is qualitatively comparable to survey data previously exploited in studies with a focus on the tax function in the U.S. or Chinese context (e.g. Robinson et al. 2010, Chen et al. 2015, Klassen et al. 2017).

Using survey data also may entail some caveats, and we discuss potential limitations or our approach.²⁴ A survey sample might not be representative, and results might be driven by sample selection bias. We test for the representativeness of our sample based on consolidated financial information available in the databases by Bureau van Dijk (BvD). Table 1 shows that the contacted and, in particular, the responding firms are, on average, substantially larger than German or European firms with available information in the Dafne and Amadeus databases of BvD. The sample tests in Table 2 show significantly different means for the absolute values for the number of employees, total assets, and sales (Column 1). However, the contacted firms do not substantially differ in their characteristics from the sample of German public firms (Column 2). Further, responding firms are similar to the sample of German public firms with respect to relative figures such as the number of affiliates, the share of foreign sales, the effective tax rate, and profitability (Column 4). We are thus confident that our sample is representative of firms for which transfer pricing is of high relevance. Transfer pricing policy is particularly relevant for large firms and should not systematically vary contingent on the location of a firm's headquarters since all MNCs face the same internal challenges and tax authorities across the globe once they generate a substantial amount of revenues through foreign subsidiaries.

As participating in the survey was voluntary, our data could suffer from non-response bias. Column 5 in Table 2 reveals that responding firms are indeed substantially larger, slightly more profitable, and have a larger share of intangibles than non-responding firms. The bias towards large and profitable firms stems from the fact that most of the firms listed in the German Stock Index that were contacted provided answers to the survey questions while many smaller and private companies did not participate or did not disclose their identity. Our sample may therefore not be representative of the total population of MNCs including international small

²³ The response rate in the related study by Klassen et al. (2017) was 8.1 percent. Graham et al. (2015) rely on response rates of 6–11 percent in their study on delegation of financial decision-making rights. Some earlier transfer pricing surveys used data from surveys with higher response rate (21 percent in both Al Eryani et al. 1990 and Cravens and Shearon 1996, 48 percent in Chen et al. 2015). Chen et al. (2015) obtained their data from direct interaction with survey respondents as they were part of the authors' executive teaching classes.

²⁴ Also see Graham et al. (2014) pp. 995-996 for a detailed discussion.

and medium-sized firms but rather for the group of firms for which transfer pricing matters most. Responding and non-responding firms do not statistically differ in terms of the effective tax rate, share of foreign sales, and leverage, all of which are financial figures with a direct relation to the transfer pricing function.

Another drawback of survey data could be respondents not telling the truth or misunderstanding the questions. We are confident that false answers are not a likely source of bias in our study for two reasons. First, questions were formulated by industry experts and experienced academics, and additional explanations including a glossary were attached to the questionnaire. Questionnaires were sent directly to the transfer pricing specialists to ensure that questions were answered by people familiar with and responsible for transfer pricing at their firm. Second, there was no incentive for misreporting. Data confidentiality was ensured, and respondents were informed that the information would be used only internally and for academic research. The survey includes no questions on tax planning topics that a firm would be unwilling to answer in light of the current political debate around the OECD's BEPS project, which had started at the time of the survey. Further, we use only unambiguous questions for our analysis. However, we are aware that we cannot fully ensure impartiality and representativeness of the survey data.²⁵

Despite its drawbacks, the use of survey data provides direct insights into managerial motives and patterns of decision-making that are not observed by archival data and is therefore valuable for research (Dichev et al. 2013, Graham et al. 2014). Our survey data should be particularly suitable for gaining knowledge on the design and the outcomes of transfer pricing systems as there is no other form of data observing these phenomena. In particular, we examine three types of information via the survey: the allocation of decision-making authority for transfer pricing, the purposes of and technical features for managing and determining transfer prices, and outcomes of transfer pricing in terms of disputes with tax authorities and internal coordination conflicts (i.e. when divisional managers assume conflicting positions in negotiations over internal prices). We therefore share the motivation of earlier survey studies (e.g. Robinson et al. 2010, Chan et al. 2015, Klassen et al. 2017) to shed light on the design and corresponding outcomes of tax management with a special focus on transfer pricing.

²⁵ For similar issues, see Graham et al. 2017.

4.2. Transfer Pricing System Design

We begin with an exploratory analysis of our unique dataset by providing insights into the internal transfer pricing policy of our sample firms.²⁶ To identify the decision-making authority, we first inquire which functional department makes the ultimate decision about determining a transfer price for intrafirm transactions. Figure 1 reveals that, in 36.4 percent of firms, transfer pricing decisions are made in a tax department, and at 38.5 percent of firms the management accounting department takes the final decision. This equal distribution reflects the inherent trade-off between tax goals and management control objectives as identified in theory (Baldeuius et al. 2004). In the empirical analysis, we examine heterogeneity in the allocation of decision-making authority among departments and whether decisions are made at the central (parent) or the decentral (affiliate or divisional) level. For the purpose of our analysis, we define the allocation of decision-making authority to the tax department of the central office as the strictest form of centralization. We observe centralized decision-making at almost 19 percent of firms. The extent of centralization varies by industry: We document the largest proportion of centralized firms in the financial services sector (30 percent) and the smallest proportion in the biochemical, heavy industry and energy sectors, and the information technology sector (11–14 percent) (Figure 2).

[Insert Figure 1 here]

[Insert Figure 2 here]

To account for vertical integration as a direct measure of complexity, firms were asked about the degree of supply chain decentralization (*SC_DECENTRAL*). Figure 3 shows the average degree of supply chain decentralization across firms with centralized vs. decentralized transfer pricing decision-making and across industries. The relative patterns in Figure 3 indicate variation across industries and the degree of decision-making centralization. Firms in the engineering, heavy industry, and IT sectors have the most decentralized supply chains. Firms in the heavy industry and IT sectors have substantially more complex supply chains when transfer pricing decision-making is decentralized, whereas firms in other industries do not show such large differences. It is remarkable that, on average, firms in all but the biochemical and wholesale/retail industries combine more complex supply chains and centralized decision-making authority on transfer prices. This finding is particularly interesting as it contradicts theory and evidence on more general decision-making such as investments suggesting that firm complexity implies decision overload for the central office, which in turn should emphasize

²⁶ The exploratory analysis is based on 149 to 248 observations. Sample selection is reported in Table 3.

delegation of decision-making rights (Aghion and Tirole 1997, Siggelkow and Rivkin 2003, Graham et al. 2015). Apparently, transfer pricing is of such a special nature that decision-making is more likely to be centralized when firm structures become more complex.

[Insert Figure 3 here]

We further gauge the degree of information sharing and the use of financial key performance indicators as main features of the transfer pricing system. On average, we observe a more intense use of KPIs (*KPI*, Figure 4) and a larger share of firms in which information is regularly exchanged (*INFO*) when transfer pricing decision-making is centralized (Table 3). A wider use of internal communication and KPIs is consistent with Aghion and Tirole (1997), Siggelkow and Rivkin (2005), and Dikolli and Vaysman (2006), who show that improved information systems and performance measurement can mitigate the downsides of centralizing decision-making authority in terms of overload and lacking incentives for agents' participation.

In Table 3 we present sample characteristics and insights into other characteristics of transfer pricing systems contingent on a firm's transfer pricing decision-making structure. We note that centralized and decentralized firms do not statistically differ with respect to their financial characteristics, except for centralized firms having a 10 percentage point larger share of foreign sales. This finding is consistent with a larger proportion of centralized transfer pricing decision-making in the presence of decentral supply chains as discussed in Figure 3. More than half of the firms in our sample organize the transfer pricing function as a separate department (*TP_DEP*), and only around 30 percent assign entrepreneurial risk functions (such that an entity is considered a profit center according to the tax regulatory guidelines) to more than one entity within the firm (*TP_INTENSE*). Interestingly, centralized and decentralized firms do not statistically differ in these transfer pricing characteristics. As in earlier transfer pricing studies (Czechowicz et al. 1982, Borkowski 1996, Blouin et al. 2017²⁷), we find that the majority of firms use one set of books to determine transfer prices for both tax and management control purposes (7 percent of sample firms in our empirical analysis, Table 7). We spoke to a leading tax practitioner who explained this finding is not surprising since decoupling prices from the arm's length standard as mandated by tax regulation for the purpose of management control would incur additional complexity and potentially closer scrutiny by tax auditors (see also

²⁷ The findings of Blouin et al. (2017) suggest that firms use consistent transfer prices (one book) since transfer prices differ significantly across firms with conflicting or congruent incentives for customs and income tax management.

Baldenius et al. 2004).²⁸ However, a statistically significant larger proportion of firms with centralized decision-making authority relative report that they use two sets of books (*TWOBOOK*, 19 vs. 7 percent). One explanation is that using transfer prices decoupled from arm's length prices can serve as an instrument to account for the special characteristics of intrafirm trade. As a result, the central office can overcome informational disadvantages caused by centralized decision-making authority and effectively reallocate capacity (Baldenius and Reichelstein 2006).

Following Graham et al. (2014) and Klassen et al. (2017), we directly ask managers about the main objectives, here concerning the transfer pricing function. Similar to the survey of U.S. MNCs conducted by Klassen et al. (2017), responding managers name tax compliance as the dominant objective (56 percent based on the sample used for regression analysis). Fewer than 20 percent of respondents name tax optimization as their most important objective.²⁹ Centralized and decentralized decision-making firms do not statistically differ in terms of these tax objectives. We also reveal that management control indeed is a conflicting objective relative to the tax objectives (42 percent of firms based on the sample used for regression analysis, Table 7) and thus confirm theory (Baldenius et al. 2004). In Table 3 we report a statistically significant larger (16.7 percentage points) proportion of firms with decentralized decision-making that name management control as their primary transfer pricing objective. We conclude that firms with a focus on management control indeed tend to decentralize decision-making for the sake of effective coordination, which is in line with theoretical considerations by, e.g. Baldenius et al. (1999), Baldenius et al. (2004), Baldenius and Reichelstein (2006), and Martini (2015).

[Insert Figure 4 here]

[Insert Table 3 here]

Our survey instrument contains a detailed inquiry into the transfer pricing methods used by firms depending on the underlying transactions. Descriptive results are shown in Table 4. We confirm the early finding by Cravens (1997) that the cost-plus method is used most frequently across all industries (51.5 percent). In general, we observe that the relative importance of

²⁸ These explanations were mentioned in the study by Baldenius et al. 2004 who, however, asserted that a growing number of firms tend to use two sets of books. We consider the prevalence of one-book systems an advantageous research setting in which external and internal transfer pricing conflicts should arise due to the inherent lack of goal congruence.

²⁹ Please refer to Table 3 for the tabulation of summary statistics by decision-making centralization and to Table 7 for regression sample summary statistics.

methods does not substantially differ across industries, with the resale price method and the comparable uncontrolled price being nominally the second most important category of methods and transactional profit-based methods being used less frequently. However, we identify certain preferences over methods across industries as well as across transaction types. The cost-plus method is least dominant in the engineering sector and most dominant in the IT and telecommunications sector (45.9 vs. 56.7 percent). Transactional profit-based methods (comparable profit method/transactional net margin method and profit split method) are relatively unimportant in the IT and telecommunications sector (13 percent) and relatively important in wholesale/retail/logistics and biochemicals/pharmaceuticals (24.1 and 22.4 percent, respectively). In the financial sector, the rather frequent use of the comparable uncontrolled price method (29.3 percent) indicates the availability of market prices for transactions in this sector. For specific transactions, the cost-plus method is most frequently used where unfinished products are sold or where the controlled transaction is the provision of services, which is in line with the OECD guidelines if the tested affiliate does not perform economically significant business functions and does not assume economically significant risks. However, the cost-plus method is also applied in the relatively rare cases of transactions involving intellectual property, which is not consistent with commonly accepted guidelines recommending the use of transactional profit-based methods for intellectual property. Only firms in the biochemical and pharmaceutical sector report that they frequently apply the profit split method for intellectual property transactions. For transactions involving sales (and thus finished products or services), we observe the greatest variation with an equal distribution over the cost-plus and transactional profit methods. The disaggregated survey data shows that, surprisingly, some firms choose multiple methods for the same kind of transaction. Our exploratory analysis of transfer pricing methods is the first of its kind in such detail and is motivated by anecdotal evidence and theory suggesting that the choice of methods might affect both the outcomes of transfer pricing audits (Ernst & Young 2014, PwC 2015) and the effectiveness of performance management (e.g. Halperin and Srinidhi 1991).³⁰

[Insert Table 4 here]

³⁰ Additionally, the survey covers technical aspects of transfer pricing systems such as instruments used for risk mitigation (in particular APAs) and the number of information technology systems employed to process transfer prices. We acknowledge that firms are heterogeneous with regard to these characteristics and therefore include variables capturing these characteristics in additional robustness tests of our empirical analysis.

4.3. Transfer Pricing Outcomes

Our study focuses on the performance of transfer pricing systems in terms of conflicts. We gauge external and internal conflicts based on two questions that cover specific types of intrafirm transactions. First, managers were asked what types of transactions were scrutinized in the most recent tax audit and whether the tax audit resulted in any disputes. Respondents could indicate whether a certain type of transaction was scrutinized and whether the tax audit resulted in price adjustments. The detailed nature of the answer allows us to conduct a transaction type-specific analysis. Figure 5 reveals that the frequency of disputes in terms of transfer price adjustments in tax audits varies by type of transaction and industry. On average, price adjustments are most likely for transactions involving sales, services, and IP. In the engineering sector, price adjustments are most frequent for transactions involving unfinished physical products, which reflects the manufacturing-intensive supply chain. The high likelihood of price adjustments for services, financial transactions, and seconded employees (expatriates) reflects the typical business models of firms in the financial services sector. Frequent price adjustments for intellectual property transactions mirror the typically busy patenting activity in the biochemical and pharmaceutical sector. The lack of such disputes in the IT (and thus also software) industry is somewhat surprising. Overall, we conclude that the outcomes of audits reflect the relevance and performance of transfer pricing for tax purposes that are obviously specific to certain industries – if not even specific to individual firms.

Second, the survey included a direct question on internal coordination conflicts, i.e. whether the managers at the two divisions involved in the intracompany transaction disputed over the determination of respective transfer prices. Such disputes in negotiations incur costs due to haggling as well as due to holdup of investments and internal trade (Baldenius 2008). These conflicts occur, *inter alia*, when the central office mandates a transfer price in line with the corporate objective of maximizing net profits (including minimizing the effective tax rate) but subunit managers seek to maximize divisional profits that are only maximized via a different (managerial) transfer price (Baldenius et al. 2004). Figure 6 shows that internal conflicts are, on average, more frequent than disputes in tax audits, thereby underlining the importance of management control through transfer pricing. Again, transactions involving sales and services are prone to conflicts across industries. Transactions involving IP seem to be less relevant for the coordination of firms' departments and legal entities.³¹

³¹ Since transfer pricing for internal purposes is less technocratic than in the context of tax audits, the scope of answer options was limited to the main types of transactions with unfinished physical products, sales/transfer of finished products, services, and IP.

[Insert Figure 5 here]

[Insert Figure 6 here]

5. Empirical Analysis

5.1. Determinants of Transfer Pricing Centralization

Empirical model

We begin our multivariate analysis by exploring the determinants of centralizing decision-making among our sample firms. We estimate an OLS and a logit regression based on the following equation:

$$TP_CENTRAL_i = \alpha_0 + \alpha_1 SALES + \alpha_2 SC_DECENTRAL_i + \alpha_3 TP_INTENSE_i + \alpha_4 TWBOOK_i + \alpha_5 TP_DEP_i + \alpha_6 INFO_i + \alpha_7 KPI_i + \alpha_8 GOAL_CONTROL_i + \alpha_9 GOAL_COMPL_i + \alpha_{10} GOAL_TAX_i + \varepsilon_i \quad (1)$$

TP_CENTRAL is a binary variable, taking on a value of 1 if decision-making authority is allocated to the central tax department, and 0 otherwise.³² To test *H1*, we include size (*SALES*), our measure of supply chain decentralization as a proxy for firm complexity (*SC_DECENTRAL*) and expect positive associations with *TP_CENTRAL*, respectively. We control for the form of information sharing (*INFO* as a binary variable, 1 indicating a regular exchange of information, 0 otherwise) and expect a positive association since centralized decision-making is more effective if the central office receives more information (Aghion and Tirole 1997). We further control for the use of two sets of books (*TWBOOK*), allocating entrepreneurial risks to more than one legal entity for transfer pricing purposes (*TP_INTENSE*), and the existence of a separate transfer pricing department (*TP_DEP*). To account for the potential impact of conflicting objectives on centralization, we include the different transfer pricing goals in our analysis. We consider minimizing total taxes (*GOAL_TAX*) to be a goal at the level of the firm that suggests more centralized decision-making structures. Being tax-compliant (including minimizing tax disputes, *GOAL_COMPL*) and pursuing effective management control (*GOAL_CONTROL*) are goals that target performance at the level of the entity, suggesting more decentralization. In an additional test, we include control variables on size, the use of intangible assets, internationalization, profitability, and sales volatility as a proxy for uncertainty from hand-collected firm-level financial account data.

Results of the determinants model

³² See the appendix for a summary of variable definitions.

Table 5 reports the regression results of equation (1). We find a significantly positive association between size in terms of revenues and centralized transfer pricing decision-making. Further, operating through a more decentral supply chain is associated higher probability of centralizing decisions. The coefficients on *SALES* and *SC_DECENTRAL* remain significant in all other specifications, indicating that larger and more complex firms are more likely to centralize their decision-making authority for transfer pricing. We find some evidence for a negative association with primarily pursuing the goals of tax compliance and management control consistent with the notions that these goals can be achieved most effectively when divisional managers' participation is high.

Our findings are in line with organizational theory stating that centralization is favorable when the environment is complex due to the interrelation of decisions (Siggelkow and Rivkin 2005). Our exploratory findings already indicate that pricing decisions are of a particular nature such that there is no delegating decision-making authority to avoid overload. We argue that transfer pricing decisions belong to the category of decisions for which findings in industrial organization research promote centralization if the needs for coordination, e.g. due to size and complexity, are strong (Alonso et al. 2008). We interpret these empirical findings in the way that expert knowledge in the tax function is bundled at the headquarters' location such that decision-making for tax and transfer pricing purposes to pursue to overall firm's tax strategy is more effective when centralized (Birkinshaw et al. 2002). Transfer pricing is certainly a complex and highly technical area in which decisions are closely interrelated, for instance since the determination of one price affects at least two divisions. In sum, the regression results provide new evidence on the determinants of centralizing decision-making authority in the tax function and suggest that internal, non-operational decision-making such as the determination of transfer prices is structured differently compared to operational decision-making studied in the management literature.

[Insert Table 5 here]

5.2. Consequences of Transfer Pricing Centralization

Empirical model for transfer pricing conflicts

Next, we focus on the outcomes of centralization transfer pricing decision-making as the main object of our study. Since we observe conflicts on a transactional level, we assume the following pooled OLS model of external transfer pricing conflicts:

$$\begin{aligned}
CONFLICT = & \beta_0 + \beta_1 TP_CENTRAL_i + \beta_2 SALES_i + \beta_3 SC_DECENTRAL_i + \\
& \beta_4 TP_INTENSE_i + \beta_5 TWOBOOK_i + \beta_6 TP_DEP_i + \beta_7 INFO_i + \beta_7 KPI_i + \\
& \beta_8 GOAL_CONTROL_i + \beta_9 GOAL_COMPL_i + \beta_{10} GOAL_TAX_i + \varepsilon_i
\end{aligned}
\tag{2}$$

CONFLICT is a binary dependent variable specified as 1 if a price adjustment was made during the most recent tax audit of a specific transaction (*PRICE_ADJUST*) or if scrutiny of a price adjustment increased during the most recent tax audit (*PRICE_SCRUTINY*). Our variable of interest is now *TP_CENTRAL*. Based on our considerations in Section 3, we predict a positive coefficient β_1 for conflicts in tax audits (*H2a*). We include *INFO* and *KPI* as control variables as effective information systems and performance measurement can counteract the downsides of centralization when compensating divisional managers.

Given the immanent trade-off between tax and management control, we expect a positive association between external conflicts and *GOAL_CONTROL* since transfer management might not be concerned with optimizing the outcomes of tax audits. Tax optimization as the main transfer pricing purpose (*GOAL_TAX*) should be a proxy for taking on a more aggressive tax position that is expected to increase conflicts with tax authorities (Dyrenge et al. 2017).³³ Tax compliance (*GOAL_COMPL*), however, should be associated with fewer external conflicts.

Since the allocation of decision-making authority might be correlated with other aspects of transfer pricing complexity, we include three other direct characteristics *TP_DEP*, *TP_INTENSE*, and *SC_DECENTRAL* to disentangle the effect of allocating decision-making rights. Allocating entrepreneurial risks to more than one legal entity for transfer pricing purposes (*TP_INTENSE*) is at the firm's discretion. It implies a more complex transfer pricing structure because risk-bearing entities should be entitled to the residual profits or losses from transactions after other entities performing routine functions have been compensated. On the one hand, a more intense transfer pricing system usually reflects the business reality of an MNC with strategic operations across the globe and should thus conform to international tax standards. On the other hand, having more than one entrepreneurial entity increases perceived risk and complexity, including compliance with tax law in multiple jurisdictions (Jost et al. 2014). Similarly to *TP_INTENSE*, the association between a more complex and decentral supply chain (*SC_DECENTRAL*) and external conflicts is ambiguous since tax disputes might be incurred due to greater complexity or mitigated because profits will be allocated more smoothly across jurisdictions. Using two sets of books is considered as a tool that balances

³³ We do not explicitly expect to find any effects of *GOAL_COMPL*, since the large majority of firms state compliance is a common objective. Since multiple answers were available on the survey question on transfer pricing objectives, we interpret a lack of tax optimization as a main objective (*GOAL_TAX=0*) with a stronger focus on compliance.

conflicting transfer pricing objectives but also draws tax authorities' awareness to the possibility of transfer prices deviating from the arm's length standard. We thus include a binary measure (*TWO_BOOK*) and consider the directional association with outcomes in tax audits an empirical question.

Tax planning opportunities might be correlated with a firm's decision to centralize transfer pricing decisions to pursue tax optimization and also influence the number of external conflicts. In particular, a certain degree of internationalization in terms of foreign sales, R&D activity, and size are prerequisites for firms to benefit from international tax rate differentials and shift profits (e.g. Hines and Rice 1994, Huizinga and Laeven 2008, Robinson et al. 2010, Graham et al. 2014, Taylor et al. 2015, Dyreng et al. 2017). Taylor et al. (2015) find that firms with a large proportion of intangibles, a relatively large number of foreign subsidiaries, and a large number of affiliates located in tax havens employ more aggressive transfer prices.³⁴ We thus include such firm characteristics in our analysis to control for tax planning opportunities that should be related to more scrutiny in tax audits (Dyreng et al. 2017).

Results on centralizing transfer pricing decision-making and transfer pricing conflicts

Table 8 reports the main results of the formal tests on the association of centralization of transfer pricing decision-making with external conflicts in terms of tax audit disputes. We report correlations in Table 6 and summary statistics in Table 7.³⁵ We find that, on average, centralizing transfer pricing decision-making is associated with adverse outcomes in tax audits. Results are highly significant ($p < 0.01$) across most specifications and indicate a higher probability of price adjustments by the authorities of around 7-10 percent consistent with our conjecture that centralization draws tax managers' attention towards tax burden management instead of easing local audits and induces authorities' scrutiny (*H2a*).

[Insert Table 6 here]

[Insert Table 7 here]

The coefficient on *SC_DECENTRAL* is significantly negative across all specifications. This result implies that firms face fewer transfer pricing disputes when their supply chain is characterized as decentral for operational and transfer pricing purposes. In practice, such a characterization implies the allocation of a larger share of firm-wide profits to local entities, which should contribute to an ease in tax audits since tax authorities might not feel deprived of

³⁴ They compute a measure for transfer pricing aggressiveness based on the information on intragroup transactions that deviates from commercial standards reported in the financial statements.

³⁵ We do not discuss the statistics here since section 4 describes the variables in detail.

tax revenue. The significant and positive coefficient on *TWOBOOK* in some specifications confirms practitioners' concerns that decoupling transfer prices from the arm's length standard for internal purposes might trigger closer scrutiny by tax authorities. Indeed, the likelihood of price adjustments for firms using two sets of books is about 10 percentage points higher. Regarding our proxies for information systems and performance measurement, we find a positive coefficient on *INFO* and a negative coefficient on *KPI*. The positive association between information sharing and conflicts in tax audits is somewhat surprising. However, the negative association between *KPI* and conflicts in tax audits is consistent with firms consistently using financial performance indicators being able to provide detailed and convincing transfer pricing documentation. We find no evidence of an association with external conflicts. We stress that results on *SALES*, *TWOBOOK*, *INFO*, and *KPI* should be interpreted with caution since the coefficient become insignificant when including financial control variables from the matched dataset. Our main results, however, are unchanged when controlling for financial firm characteristics. In addition, we document that uncertainty in terms of sales volatility is negatively associated with disputes in tax audits. All results are robust to including industry dummies as a control for the potential influence of specific industries with a higher probability of transfer pricing conflicts.³⁶

We further test whether the association between *TP_CENTRAL* and disputes in tax audits depends on cross-sectional differences. We confirm *H2b* that centralization of decision-making authority is not associated with adverse outcomes in tax audits if firms pursue the primary goal of management control via transfer pricing consistent with transfer pricing strategies likely to be less aggressive.³⁷ For firms that do not pursue the goal of management control, centralizing decision-making authority is associated with 14 percentage points higher probability of price adjustments. Relative to this group of firms, the effect is significantly smaller by 22 percentage points for firms primarily pursuing the goal of management control (point estimate of -0.22 for the interaction term between *TP_CENTRAL* and *GOAL_CONTROL*, $p < 0.01$). For those firms, the effect of centralization is not statistically significant from zero (joint effect of -0.09, $p > 0.25\%$). In untabulated test, we find no significant results when interacting *TP_CENTRAL* with our measure of size, supply chain complexity, uncertainty or the industry dummies.

³⁶ For instance, firms in industries where intangible assets are highly important are generally considered more critical in terms of determining transfer prices for tax purposes.

³⁷ The coefficient on *TP_CENTRAL* and the on interaction term of *TP_CENTRAL* and *GOAL_CONTROL* are jointly significant ($p < 0.01$).

While consistent with theory and transfer pricing practices including the strategic behavior of tax authorities, the results on the outcomes of transfer pricing design are novel and show that the specific design of transfer pricing systems has economic implications for transfer pricing performance.

Empirical model for effective tax rates

To test the association of transfer pricing centralization with financial outcomes of transfer pricing, we use *GAAP_ETR* as the dependent variable and estimate a pooled cross-sectional OLS regression (Hoopes et al. 2012, Klassen et al. 2017) for firm *i* in year *t* for the period 2008–2013 and control for industry and time-fixed effects.³⁸

$$GAAP_ETR_{it} = \gamma_0 + \gamma_1 TP_CENTRAL_i + \gamma_2 TP_CENTRAL_i * GOAL + \gamma_3 GOAL_{CONTROL_i} + \gamma_4 GOAL_{COMPL_i} + \gamma_5 GOAL_{TAX_i} + \gamma_6 LOG_{SALES_{it}} + \gamma_7 FORSALES_{it} + \gamma_8 INTAN_{it} + \gamma_9 ROA_{it} + \gamma_{10} LEV_{it} + FE + \varepsilon_i \quad (3)$$

The main variable of interest is our centralization variable *TP_CENTRAL*. We test *H3* expecting a negative association of *TP_CENTRAL* with the effective tax rate since the allocation of transfer pricing decision-making authority to the central tax office emphasizes managers' attention on the firm-wide goal of managing the tax burden and less focus will be on country-specific compliance. We again control for transfer pricing goals expecting a focus on compliance (tax optimization) to be associated with higher (lower) effective tax rates (Klassen et al. 2017). As in prior studies on tax avoidance, we further include variables on firm size, international operations, and the use of intangibles, leverage, and profitability on the firm-year level as proxies for tax planning opportunities.³⁹

Results on centralizing transfer pricing decision-making and effective tax rates

Table 9 reports the corresponding regression results. We confirm *H3* and find a negative and significant association between centralizing transfer pricing decisions and the reported effective tax rate. At face value, firms centralizing transfer pricing decision-making authority report an effective tax rate that is around 2.3 percentage points lower than that of firms with decentralized structures. We do not confirm the finding of Klassen et al. (2017) that transfer pricing goals are directly associated with the effective tax rates of our sample firms. While not significant in terms of economic magnitude, we find that larger and more profitable firms as well as this with a higher financial debt ratio and a higher share of foreign sales report lower effective tax rates.

³⁸ Although the transfer pricing variables are drawn from the 2014 survey, the design and the purpose of the transfer pricing system are unlikely to change over time (Klassen et al. 2017).

³⁹ In line with current research and to mitigate the effect of outliers, we limit the range of *GAAP_ETR* to between 0.0 and 0.5 (e.g. Dyreng et al. 2008, Hoopes et al. 2012) and also exclude firms with *ROA* below -1 and above 1.

We provide the novel insight that sales volatility is associated with a higher effective tax rate suggesting that tax planning becomes more difficult in uncertain firm environments.

Since transfer pricing goals that have recently been found to explain tax avoidance (Klassen et al. 2017), we also test for the effect of the interaction of centralization with the transfer pricing goals but do not find significant results in this cross-sectional test. However, we find that the negative association between *TP_CENTRAL* and *GAAP_ETR* is decreasing in sales suggesting that centralization does not help to minimize the tax burden of a firm if a firm is sufficiently large (and probably complex). Also, we find that the association differs across industries (see Figure 7 for the marginal effects depending on firm size and industries). Firms in the engineering and the financial sector (as well as in “others”) reporting significantly lower effective tax rates when decision-making is centralized (c. 7 percent and 5.5 percent, respectively). While the share of firms with centralized decision-making authority is above average in these two industries, firms in the engineering sector have typically more decentral supply chains (see Figure 3). This result provides some evidence that firms are particularly successful in optimizing the effective rate through centralization when the degree of vertical integration is high. In untabulated tests, we find no other significant results in cross-sectional tests on our direct measure of supply chain decentralization or uncertainty.

Overall, our results on the tax consequences authority are in line with the attention-based view of the firm (Ocasio 1997) in the way that the accumulated expertise at the headquarters’ tax department is primarily used to optimize the tax burden of the whole firm at the expense of increased scrutiny in local tax audits. Our results are further consistent with a stronger influence of the central office leading to transfer pricing effectiveness in terms of lower tax burdens (Blouin et al. 2017) and informational advantages for firm-wide tax management under centralization (Graham et al. 2015). Firms thus have to weigh the benefits of optimizing the effective tax rate against the costs of a higher degree of scrutiny in local tax audits when centralizing transfer pricing decision-making. We show that the benefits of centralizing are limited when firm size increases and that they can differ across industries.

[Insert Table 9 here]

[Insert Figure 7 here]

Centralizing transfer pricing decision-making and internal coordination conflicts

As centralization and a high say on transfer pricing of the tax department might affect management control, we estimate equation (2) and use internal coordination conflicts when

determining the transfer price of a specific transaction (*INTERNAL_CONFLICT*) as the dependent variable.⁴⁰ We consider the association between *TP_CENTRAL* and internal coordination conflicts an empirical question. We expect a positive coefficient on *GOAL_TAX* and *GOAL_COMPL* since tax objectives are usually not balanced with management incentives which could lead to more coordination conflicts.⁴¹ We particularly conjecture that tax compliance (*GOAL_COMPL*) should be associated with a higher probability of internal conflicts given the shortcomings of arm's length prices to maximize internal trade and profits (Devereux and Keuschnigg 2013). *GOAL_CONTROL*, in turn, should intuitively be associated with a lower degree of coordination conflicts. Further, we expect the use of a two book system to alleviate the tension of conflicting tax and control objectives and thus to be associated with a lower probability of coordination conflicts.

As results reported in Table 10 show, all coefficients on firm characteristics and transfer pricing system characteristics are insignificant in the baseline specification except for the significantly positive coefficient *GOAL_COMPL*. When including financial firm data, we find no significant results at all. In contrast to outcomes of tax audits and effective tax rates, internal coordination conflicts cannot be explained by our data on transfer pricing systems and thus seem to be driven by firm-specific unobserved variation.

Analogously to our analysis of tax-related transfer pricing outcomes, we test for cross-sectional differences in the association between *TP_CENTRAL* and coordination conflicts. We find no significant effects when interacting *TP_CENTRAL* with the firm-specific goals, but we find that there is a significant association depending on a firm's industry and level of supply chain decentralization. We document a significantly negative association between *TP_CENTRAL* and coordination conflicts for firms in the engineering and the wholesale/retail/logistics ("trade") sectors and a positive association for "other" sectors. For firms with the lowest degree of supply chain decentralization, i.e. low level of vertical integration from a transfer pricing perspective, *TP_CENTRAL* is associated with a significantly lower probability of coordination conflicts (see Figure 8 for the marginal effects depending on firm size and industries). In these cross-sectional tests, we also find a significantly negative association between *TWOBOOK* and coordination

⁴⁰ We use the same approach of a pooled OLS model over the types of transaction. The number of observation is smaller since we observe five types of transactions for which internal conflicts can arise compare to nine types of transactions that might be challenged in tax audits (external conflicts).

⁴¹ We do not explicitly expect to find any effects of *GOAL_COMPL*, since the large majority of firms state compliance is a common objective. Since multiple answers were available on the survey question on transfer pricing objectives, we interpret a lack of tax optimization as a main objective (*GOAL_TAX=0*) with a stronger focus on compliance.

conflicts consistent with the view that decoupling is a means to foster effective management control despite tax-motivated transfer pricing.

We conclude that centralizing the decision-making authority for transfer pricing at the tax department is, on average, not related to a higher degree of internal coordination conflicts. Such allocation of decision-making authority is even negatively related to coordination conflicts for firms with less decentralized supply chains and firms in the trade and engineering industry although firms in the engineering sector have, on average, more decentralized supply chains. We provide some evidence that coordination conflicts are more likely for firms that prioritize tax compliance within the transfer pricing function consistent with theory stressing the main trade-off between managerial and tax objectives (e.g. Baldenius et al. 2004). From a management control perspective, however, internal conflicts are not necessarily harmful since they reveal information necessary to optimize decision-making (Eccles and White 1988, Holmstrom and Tirole 1991). We thus highlight that our measure of internal coordination conflicts does not necessarily measure inefficient management control and resource allocation and consider the consequences of a tax-motivated design of the transfer pricing system on overall firm performance an interesting object for further research.

[Insert Table 8 here]

[Insert Figure 8 here]

5.3. Additional Analysis: Transfer Pricing Conflicts across Transaction Types and Pricing Methods

Dyreng et al. (2017) and Hanlon et al. (2017) characterize transfer pricing is a driver of tax uncertainty that has to be recognized as uncertain tax benefits (UTB) according to US GAAP. Dyreng et al. (2017) show that tax uncertainty is higher for firms with a more frequent patenting activity and more tax-haven subsidiaries as proxies for intangibles-related transfer pricing strategy. Our survey data allows us to directly observe the drivers of transfer-pricing related conflicts in tax audits as sources of tax uncertainty (Figure 5). In the vein of Dyreng et al. (2017), this first additional analysis aims to identify the sources of tax uncertainty in terms disputes of transfer pricing tax audits contingent on a firm's decision-making structure and transfer pricing system design. We use equation (2) and run separate regressions for each specific type of intrafirm transactions that require the determination of transfer prices. Again, we differentiate between *PRICE_ADJUST* and *PRICE_SCRUTINY* as the dependent variables with *PRICE_ADJUST* being the stricter measure of tax uncertainty since price adjustments lead to an additional tax burden or, equivalently, the loss of an uncertain tax benefit through tax

planning (Dyreng et al. 2017, Hanlon et al. 2017). Based on anecdotal evidence on transfer pricing disputes and empirical literature on profit shifting, we expect intrafirm transactions involving intellectual property (Dyreng et al. 2017) and services as well as financial transactions to receive the closest attention in tax audits (Ernst & Young 2010).

Panel A in Table 11 contains the results when *PRICE_ADJUST* is used as the independent variable. In Panel B, the dependent variable is *PRICE_SCRUTINY*. In line with our conjecture, we find that intrafirm transactions involving intellectual property and financial transactions, but also the intrafirm provision of services, are likely to be subjects of tax disputes when decision-making authority is centralized with significant coefficients of 0.19, 0.34 and 0.24, respectively. When we use *PRICE_SCRUTINY* as the dependent variable, the coefficients are larger (except for financial transactions), with an increased probability of conflicts relating to intrafirm services when decision-making is centralized of 40 percent ($p < 0.01$). Other control variables are not shown in Table 11 as results do not change relative to Table 8, except for the coefficient on *SC_DECENTRAL* becoming insignificant for the provision of services. This is a consistent reflection of practice since the remuneration for the provision of management services and low-value-adding services is often independent of the operational supply chain. Moreover, intrafirm activities that are usually performed by the parent or a holding company solely in their capacity as the shareholder are not considered to be an intrafirm service and thus do not justify charging a service fee under the arm's length principle. However, the distinction between shareholder activities (non-chargeable) and services (chargeable) requires a complex analysis and thus is often exposed to tax disputes.

[Insert Table 11 here]

To the best of our knowledge, there is no evidence on the current use of transfer pricing methods and associated outcomes both from a tax and a managerial perspective although the choice of the transfer pricing method is fundamental (e.g., Baldenius and Reichelstein 2006, p. 2). Analytical models in accounting analyze the merits of cost-based, market-based, and negotiated transfer pricing methods under different circumstance but do not acknowledge that tax regulation typically specifies a set of explicit methods that entail both cost-based and market-based elements (Baldenius 2008). We particularly observe the use of these methods (Table 4). In this second additional analysis, we provide novel insights by examining the association between the choice of a transfer pricing method for a specific type of transaction and the

external or internal conflicts.⁴² We run separate transaction-level regressions based on equation (2) and include dummy variables taking on the value of 1 if the method in question is used for the transaction represented in the dependent variable *CONFLICT* (*TP_CENTRAL*, *COSTPLUS*, *RESALE*, *COMPUNCPRICE*, *COMPPROFIT*, *TNMM*, *PROFITSPLIT*).

We report results Table 12 for each of our dependent variables, *PRICE_ADJUST*, *PRICE_SCRUTINY*, and *INTERNAL_CONFLICT*. Overall, results on *TP_CENTRAL* remain robust when including the choice of transfer pricing methods. Considering the impact of transfer pricing methods, our results suggest that, though not for all types of transactions, the use of the cost-plus method is positively associated with both external and internal transfer pricing conflicts. The result for external conflicts in tax audits suggests that local authorities regularly challenge cost-based pricing structures since only a small fraction of firm-wide profits are allocated to the entity in the specific country resulting in little tax revenue in the respective country. The positive association between cost-plus transfer pricing and internal coordination conflicts is consistent with theory stressing the challenges to incorporate correct cost and revenue information into internal pricing due to information asymmetries between the trading divisions (Baldeuius 2008, Baldeuius et al. 1999).

However, the picture is more diverse for other available methods. We find that, alongside the cost-plus method, the transactional net margin method (and for sales and service transactions, also the profit split method) is positively associated with *internal* conflicts. Considering further transfer pricing methods, the empirical relationship between these methods and the probability of a dispute varies considerably with the type of transaction. For instance, we find a positive association between external conflicts and the resale price method for sales and a negative association for services. An explanation could be that market prices for services are more readily available. When intrafirm transactions involve intellectual property, the use of the resale price and comparable profit method is strongly associated with higher probability of disputes in tax audits, a result which is consistent with practical difficulties in valuing intangible assets (OECD 2015a).

6. Implications and Conclusions

We employ survey analysis to gain insights into the characteristics and outcomes of transfer pricing systems. We report robust empirical results on the association between transfer pricing design characteristics and transfer pricing conflicts with tax authorities. In particular, we find

⁴² With respect to internal conflicts, the data allows us to perform this analysis for transactions involving primary physical goods, intellectual property and services.

that centralizing transfer pricing decision-making at the tax department of a firm's headquarters is associated with a higher probability of price adjustments in tax audits of 10 percentage points. We highlight that these conflicts stem from transactions involving financial activities, intellectual property, and services. Further, the choice of transfer pricing methods can be a driver of such conflicts, in particular with intellectual property. Other aspects of decentralization, such as a more sophisticated allocation of risks to affiliates and the implementation of a decentralized supply chain, can moderate scrutiny in tax audits. At the same time, centralizing transfer pricing decisions is associated with 2-3 percentage point lower effective tax rates.

We acknowledge that our analysis has potential limitations. In particular, we are not able to fully econometrically address bias from omitted variables, reverse causality or self-selection into centralization given the limited sample size.⁴³ Our results should therefore be interpreted with caution. However, we include an extensive set of control variables reflecting potential determinants of transfer pricing outcomes and report empirical results that are consistent with our predictions based on theory and evidence in prior literature.

Transfer pricing is an economically and politically relevant aspect of company taxation and performance management but often remains a black box to researchers due to limited observability. We shed light on the drivers and outcomes of the allocation of decision-making authority as an important aspect of organizational design. In addition, we empirically explore the role of the tax function within MNCs and a broad set of technical aspects of the transfer pricing system.

Our study has implications that are of interest to a broad spectrum of readers. Our results suggest that decentralizing decision-making is a promising tool to mitigate the financial risk stemming from transfer pricing audits. Assuming a firm's supply chain cannot be easily transformed, managers might consider decentralizing both transfer pricing decisions and the distribution of entrepreneurial functions across the value chain for transfer price determination. Moreover, we show that centralizing transfer pricing decision-making authority appears suitable for pursuing the firm-wide objective of tax minimization consistent with the attention-based view of the firm. Our analysis of internal coordination conflicts suggests that the organizational choice of allocating decision-making authority might be made for tax purposes without deterring intragroup coordination and performance. Notably, these implications are independent of a

⁴³ Several other studies based on survey data face similar problems establishing causal relationships, for instance Klassen et al. (2017) and Graham et al. (2015).

firm's transfer pricing goals. We conclude that firms need to weigh the benefits of achieving the firm-wide goal of tax optimization against the cost of tax risk in the course of local tax audits when allocation decision-authority within the transfer pricing function. However, the inherent transfer pricing trade-off between tax and control objectives does not seem to be present in the choice of decision-making hierarchies for ultimate pricing. We stress that we do not provide a blueprint for evaluating transfer pricing of MNCs and consider the design of transfer pricing systems as well as its outcomes as an interesting area for future research.

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Appendix

Variable definitions

PRICE_ADJUST	Measure of external conflict: 1 if transfer price of specific transaction type was adjusted by authorities during tax audit; 0 otherwise
PRICE_SCRUTINY	Measure of external conflict: 1 if transfer price of specific transaction type was intensively scrutinized or adjusted by authorities during tax audit; 0 otherwise
INTERNAL_CONFLICT	Measure of internal conflict: 1 if transfer price of specific transaction type incurred coordination conflict between management units; 0 otherwise
GAAP_ETR	Effective tax rate reported in consolidated financial statements
AVG_PADJUST	Average of PRICE_ADJUST over nine types of transactions
AVG_PAUDIT	Average of PRICE_AUDIT over nine types of transactions
AVG_INTCONFLICT	Average of INTERNAL_CONFLICT over four types of transactions
COMPPROFIT	1 if comparable profit method used for determining the transfer price for a specific type of transaction; 0 otherwise
COMPUNCPRI	1 if comparable uncontrolled price method used for determining the transfer price for a specific type of transaction; 0 otherwise
COSTMETHOD	1 if MNC uses cost-based transfer pricing methods for more than two types of transactions; 0 otherwise
COSTPLUS	1 if cost-plus method used for determining the transfer price for a specific type of transaction; 0 otherwise
FOR_SALES	Share of MNC's sales generated in foreign markets (outside jurisdiction of parent firm) according to consolidated financial statements
GOAL_COMPL	1 if MNC's primary goal regarding the use of transfer pricing is tax compliance; 0 otherwise
GOAL_CONTROL	1 if MNC's primary goal regarding the use of transfer pricing is controlling and managing the performance of different legal entities and managerial functions; 0 otherwise
GOAL_TAX	1 if MNC's primary goal regarding the use of transfer pricing is optimizing the tax burden; 0 otherwise
INFO	1 if firm has an established standardized flow of information (information across divisions and hierarchies of MNCs is shared on a regular basis); 0 otherwise
INTANGIBLES	Share of MNC's intangible assets (relative to total assets) according to consolidated financial statements
KPI	Degree of guidance on and usage of KPIs in internal control systems for management control purposes; ranging from 1-4
LEV	Leverage, share of MNC's financial term debt (relative to total assets) according to consolidated financial statements
PROFIT	MNC's profitability defined as earnings before taxes over sales according to consolidated financial statements
PROFITSPLIT	1 if profit split method used for determining the transfer price for a specific type of transaction; 0 otherwise
RESALE	1 if resale price method used for determining the transfer price for a specific type of transaction; 0 otherwise
ROA	Return on assets defined as earnings before taxes over total assets according to consolidated financial statements
SALES	Either categorical value (<i>CAT_SALES</i>) defined as a MNC's sales in FY 2013 as indicated in survey; categorical variable: 1 if < EUR 500m, 2 if EUR 500-5,000m, 3 if > EUR 5,000m; or the natural logarithm of MNC's sales according to consolidated financial accounts (<i>LOG_SALES</i>)
SALES_VOLA	Volatility of LOG_SALES over the period 2008-2013 (standard deviation) as a proxy for uncertainty.
SC_DECENTRAL	Degree of decentralization of MNC's supply chain, ranging from 0-3
TNMM	1 if transactional net margin method used for determining the transfer price for a specific type of transaction; 0 otherwise
TP_CENTRAL	1 if the tax department at MNC's parent firm ultimately decides about the determination of transfer prices; 0 otherwise
TP_DEP	1 if MNC has a distinct department for transfer pricing; 0 otherwise
TP_INTENSE	1 if MNC has more than one legal entity classified as an entrepreneur for transfer pricing purposes; 0 otherwise
TWOBOOK	1 if MNC uses two sets of books for transfer pricing; 0 otherwise

Table 1: Comparability of the Survey Sample

Variable	Survey respondents		Survey non-respondents		Firms contacted		German database		European database		German public firms	
	(1)	(1)	(2)	(2)	(3)	(3)	(4)	(4)	(5)	(5)	(6)	(6)
	N	mean	N	mean	N	mean	N	mean	N	mean	N	mean
<i>EMPLOYEES</i>	64	25,916	324	6,351	388	9,578	4,309	2,364	25,227	1,203	333	8,814
<i>TOTAL ASSETS</i>	64	11,992	324	1,892	388	3,558	4,309	644.2	25,227	506.8	333	4,143
<i>SALES</i>	64	10,386	324	1,924	388	3,320	4,309	647.5	25,227	331.8	333	3,068
<i>AFFILIATES</i>	64	290.3	324	143.3	388	167.5	4,309	79.23	25,223	64.08	333	190.0
<i>FOR_SALES</i>	10	0.578	119	0.498	129	0.504	1,404	0.606	n.a.	n.a.	66	0.483
<i>ETR</i>	64	0.279	276	0.287	340	0.286	3,493	0.275	19,559	0.282	265	0.300
<i>LEVERAGE</i>	64	0.602	324	0.606	388	0.605	4,309	0.625	25,226	0.593	333	0.543
<i>PROFIT</i>	64	0.0791	324	0.0508	388	0.0555	4,309	0.0387	25,227	0.0438	333	0.0480
<i>INTANGIBLES</i>	64	0.112	324	0.0716	388	0.0782	4,281	0.0663	24,836	0.0822	333	0.172

Notes: This table includes descriptive statistics taken from the Bureau von Dijk DAFNE and AMADEUS databases based on consolidated financial statements with fiscal years ending in 2013. All variables are defined in the Appendix.

Column (1) consists of the number of observations and mean values for survey respondents and available financial information in the databases,

Column (2) in each case for survey non-respondents and available financial information in the databases,

Column (3) in each case for all contacted firms and available financial information in the databases,

Column (4) in each case for all firms in the database for German firms (DAFNE) and available consolidated financial information in 2013,

Column (5) in each case for all firms in the database for European firms (AMADEUS) and available consolidated financial information in 2013,

Column (6) in each case for all public firms in the database for German firms (DAFNE) and available consolidated financial information in 2013.

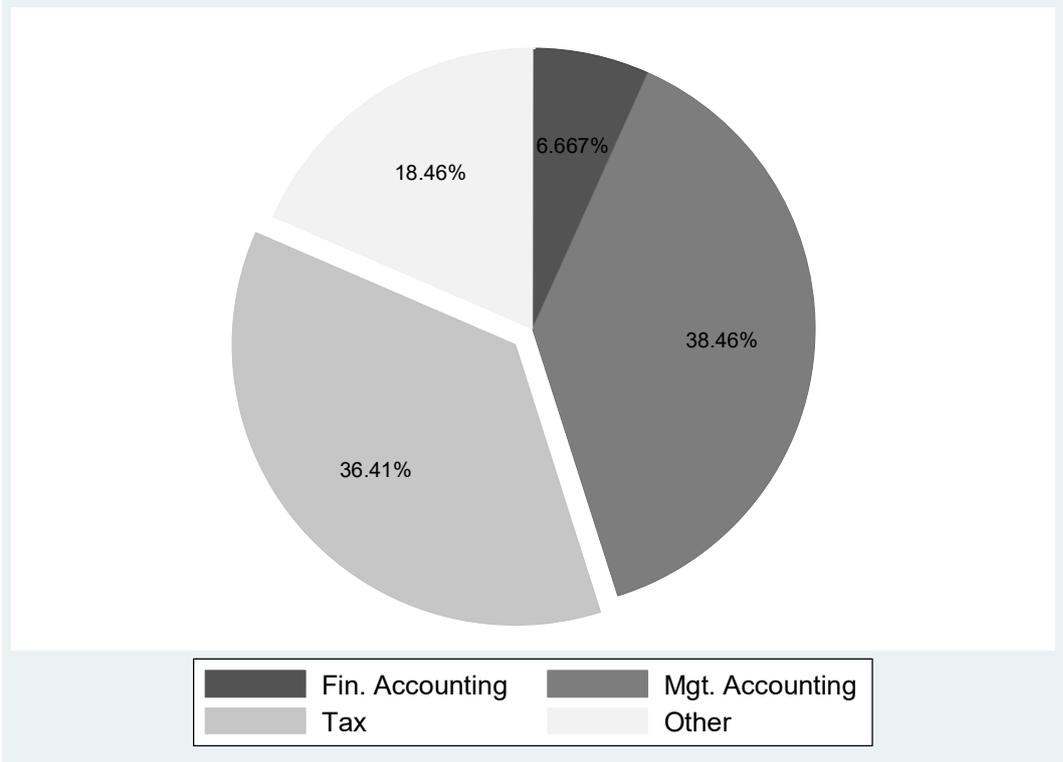
Table 2: Sample Selection Tests and Non-response Bias Test

Sample test:	(1) Contacted vs. DE	(2) Contacted vs. DE public	(3) Resp. vs DE	(4) Resp. vs. DE public	(5) Resp. vs. non- resp.
<i>EMPLOYEES</i>	-7214.3*** (-12.58)	-763.9 (-0.44)	-23552.5*** (-18.58)	-17102.1*** (-4.72)	-19565.5*** (-6.59)
<i>TOTAL ASSETS</i>	-2914.0*** (-9.31)	584.7 (0.54)	-11347.5*** (-15.51)	-7848.8*** (-3.09)	-10099.4*** (-6.22)
<i>SALES</i>	-2672.0*** (-11.39)	-251.7 (-0.33)	-9738.7*** (-18.00)	-7318.3*** (-4.15)	-8462.5*** (-6.44)
<i>AFFILIATES</i>	-88.32*** (-3.21)	22.49 (0.45)	-211.1*** (-3.20)	-100.3 (-0.92)	-147.0** (-2.43)
<i>FOR_SALES</i>	0.101 (0.18)	-0.0217 (-0.56)	0.0274 (0.01)	-0.0955 (-1.05)	-0.0801 (-1.00)
<i>GAPP ETR</i>	-0.0102 (-1.09)	0.0146 (1.14)	-0.00361 (-0.17)	0.0212 (0.96)	0.00808 (0.39)
<i>LEVERAGE</i>	0.0195* (1.89)	-0.0625*** (-4.59)	0.0232 (0.94)	-0.0588** (-2.32)	0.00436 (0.18)
<i>PROFIT</i>	-0.0168*** (-3.30)	-0.00751 (-0.86)	-0.0403*** (-3.30)	-0.0311 (-1.62)	-0.0282*** (-2.76)
<i>INTAN</i>	-0.0119* (-1.80)	0.0942*** (8.72)	-0.0456*** (-2.87)	0.0606*** (2.65)	-0.0403** (-2.56)

Notes: This table presents the differences in means between the groups of companies in the preceding table. It also reports the results of the tests on the statistical significance of these differences with t statistics in parentheses. *, **, *** Denote two-tailed statistical significance at the 10, 5, and 1 percent levels, respectively.

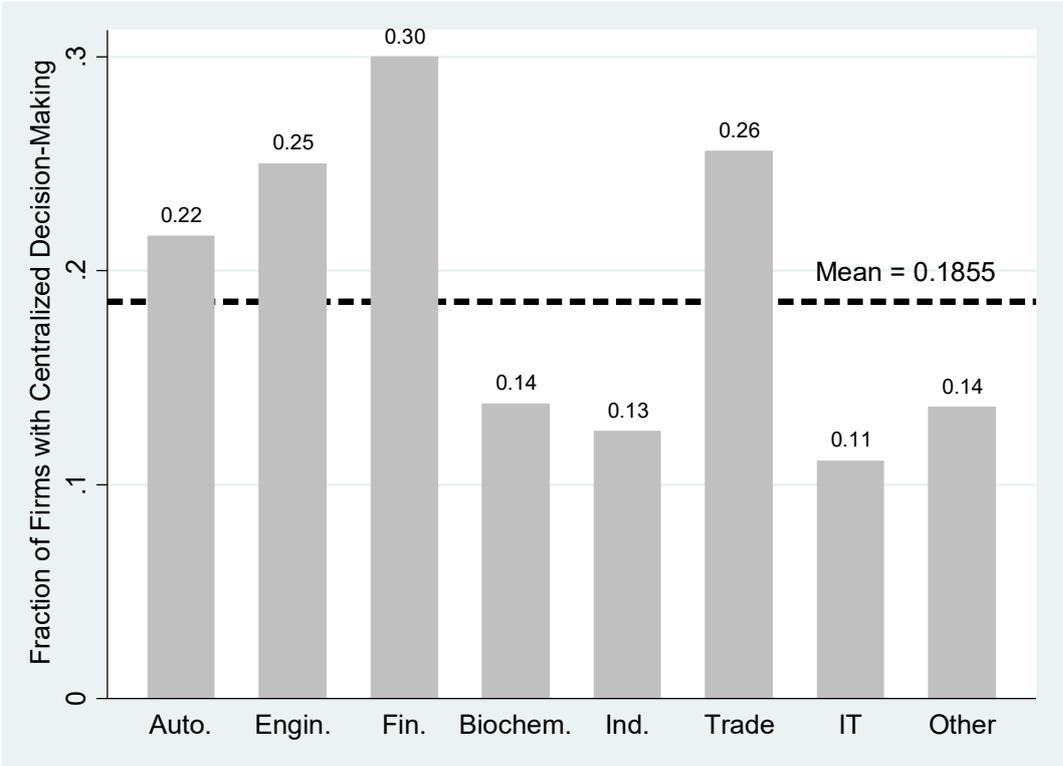
For reasons of confidentiality, firms with more than 200,000 employees were excluded.

Figure 1: Distribution of Transfer Pricing Decision-making authority across Functions



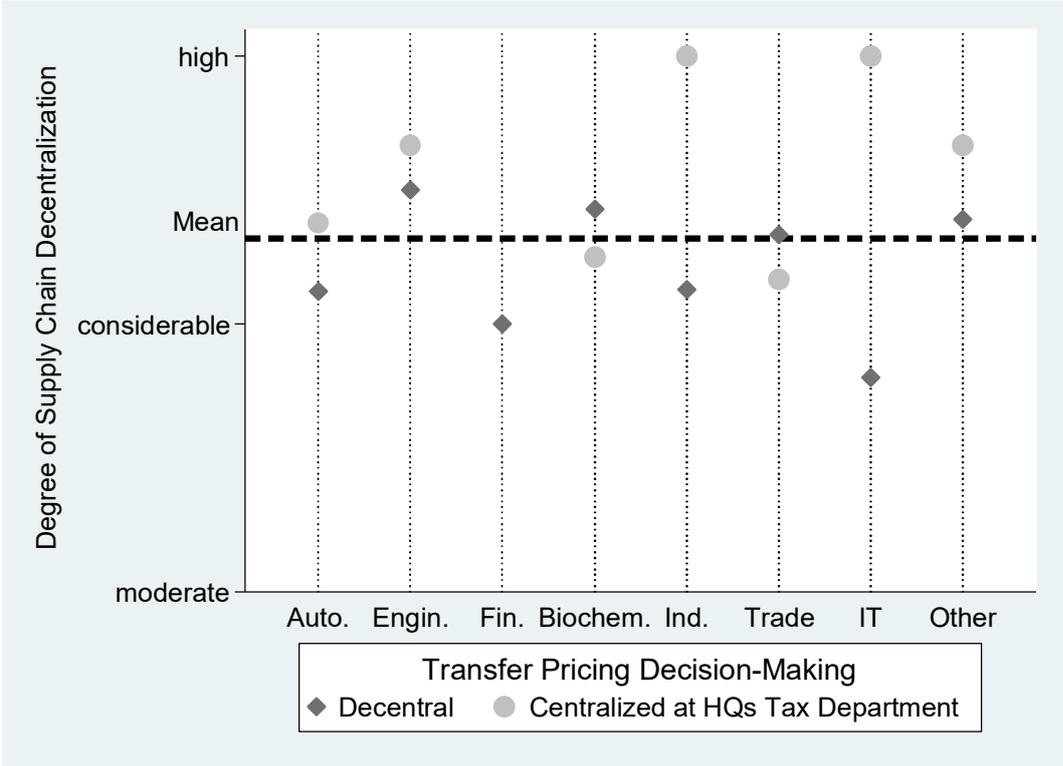
Notes: This chart describes which business function within a company ultimately takes transfer pricing decisions. Survey Question: Which functional department assumes ultimate decision-making authority when multiple departments have conflicting objectives in determining transfer prices?

Figure 2: Centralization of Transfer Pricing Decision-Making across Industries



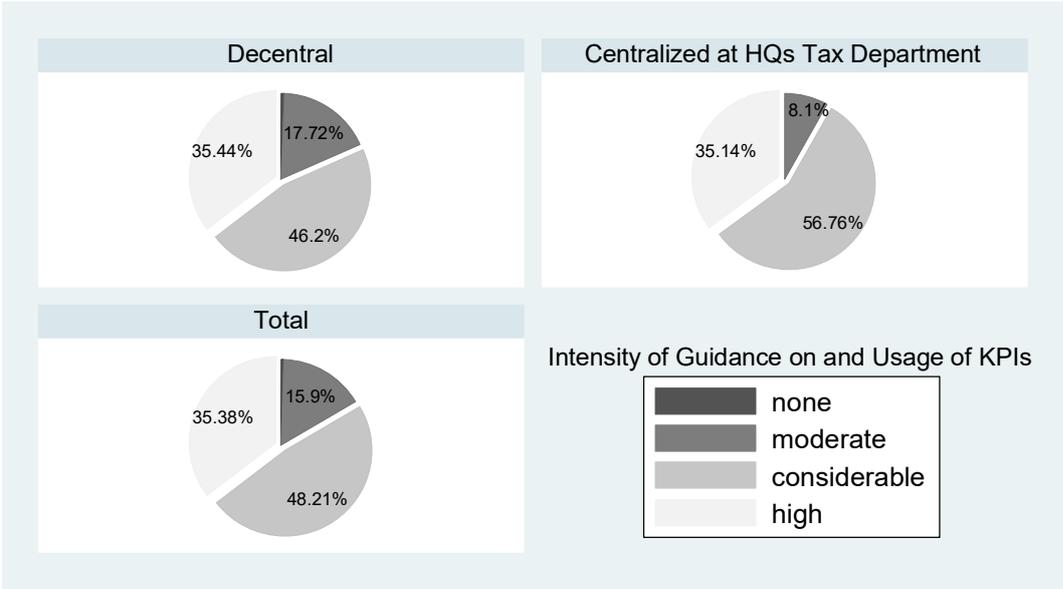
Notes: This chart depicts the fraction of firms in which transfer pricing decision-making is centralized at HQs tax department for each industry. Across industries, 18.55% of the survey firms employ a centralized decision-making structure.

Figure 3: Transfer Pricing Centralization and Supply Chain Decentralization across Industries



Notes: This chart depicts the average degree of supply chain decentralization (vertical integration) for firms with decentralized and centralized transfer pricing decision-making structures for each industry. Survey Question (regarding supply chain decentralization): How are the following operational units characterized within your firm? Operations/production: contract manufacturer vs. principal manufacturer, Sales: commissionaire vs. fully-fledged distributor, R&D: contract R&D vs. principal R&D. In this study, we construct the variable in a way that high (value of 3) indicates vertical integration in all three categories, considerable (2) in two categories, moderate (1) in one category and low (0, not depicted here) in no category at all.

Figure 4: Guidance on and Usage of KPIs



Notes: These graphs plot the average intensity of the usage of KPIs across firms with decentralized and centralized transfer pricing decision-making structures (and total). Survey Question: In terms of a distinctive management control system, to what extent are key performance indicators (KPIs) clearly defined?

Table 3: Descriptive Statistics and Sample Test for Centralized Transfer Pricing Decision-Making

	Decentralized transfer pricing decision-making					Centralized transfer pricing decision-making					Mean difference	
	(1)					(2)					(3)	
	N	mean	sd	min	max	N	mean	sd	min	max	Mean	t-statistic
<i>LOG_SALES</i>	155	21.82	1.88	17.24	26.01	32	22.39	1.55	19.61	25.53	-0.570	(-1.60)
<i>FOR_SALES</i>	125	0.60	0.24	0.01	0.99	29	0.70	0.20	0.24	0.97	-0.0966**	(-2.01)
<i>INTANGIBLES</i>	155	0.11	0.15	0.00	0.96	32	0.15	0.18	0.00	0.70	-0.0381	(-1.24)
<i>ROA</i>	147	0.06	0.06	-0.07	0.34	31	0.07	0.07	-0.05	0.30	-0.00659	(-0.53)
<i>SC_DECENTRAL</i>	145	3.28	0.89	1.00	4.00	31	3.48	0.89	1.00	4.00	-0.208	(-1.19)
<i>TP_INTENSE</i>	190	0.32	0.47	0.00	1.00	43	0.28	0.45	0.00	1.00	0.0367	(0.47)
<i>TWOBOOK</i>	169	0.07	0.25	0.00	1.00	43	0.19	0.39	0.00	1.00	-0.121**	(-2.50)
<i>TP_DEP</i>	202	0.51	0.50	0.00	1.00	46	0.57	0.50	0.00	1.00	-0.0553	(-0.68)
<i>INFO</i>	150	0.35	0.48	0.00	1.00	43	0.49	0.51	0.00	1.00	-0.142*	(-1.69)
<i>KPI</i>	158	3.16	0.73	1.00	4.00	37	3.27	0.61	2.00	4.00	-0.106	(-0.82)
<i>GOAL_CONTROL</i>	180	0.41	0.49	0.00	1.00	42	0.24	0.43	0.00	1.00	0.167**	(2.03)
<i>GOAL_COMPL</i>	184	0.58	0.49	0.00	1.00	43	0.70	0.46	0.00	1.00	-0.116	(-1.40)
<i>GOAL_TAX</i>	179	0.12	0.33	0.00	1.00	43	0.19	0.39	0.00	1.00	-0.0631	(-1.09)

Notes: This table includes descriptive statistics for observations used in the exploratory analysis of this paper. All financial variables are handcollected from consolidated financial statements with fiscal years ending in 2013. All transfer pricing variables are taken from the 2013 survey. All variables are defined in the Appendix.

Column (1) consists of the number of observations, mean values, standard deviations and minimum and maximum values of the variables for firms with a decentralized transfer pricing decision-making structure.

Column (2) presents the same statistics for firms with a centralized transfer pricing decision-making structure.

Column (3) presents the mean differences between firms with decentralized and centralized transfer pricing decision-making structures and the results of the statistical tests on the statistical significance of these differences with t statistics in parentheses. *, **, *** Denote two-tailed statistical significance at the 10, 5, and 1 percent levels, respectively.

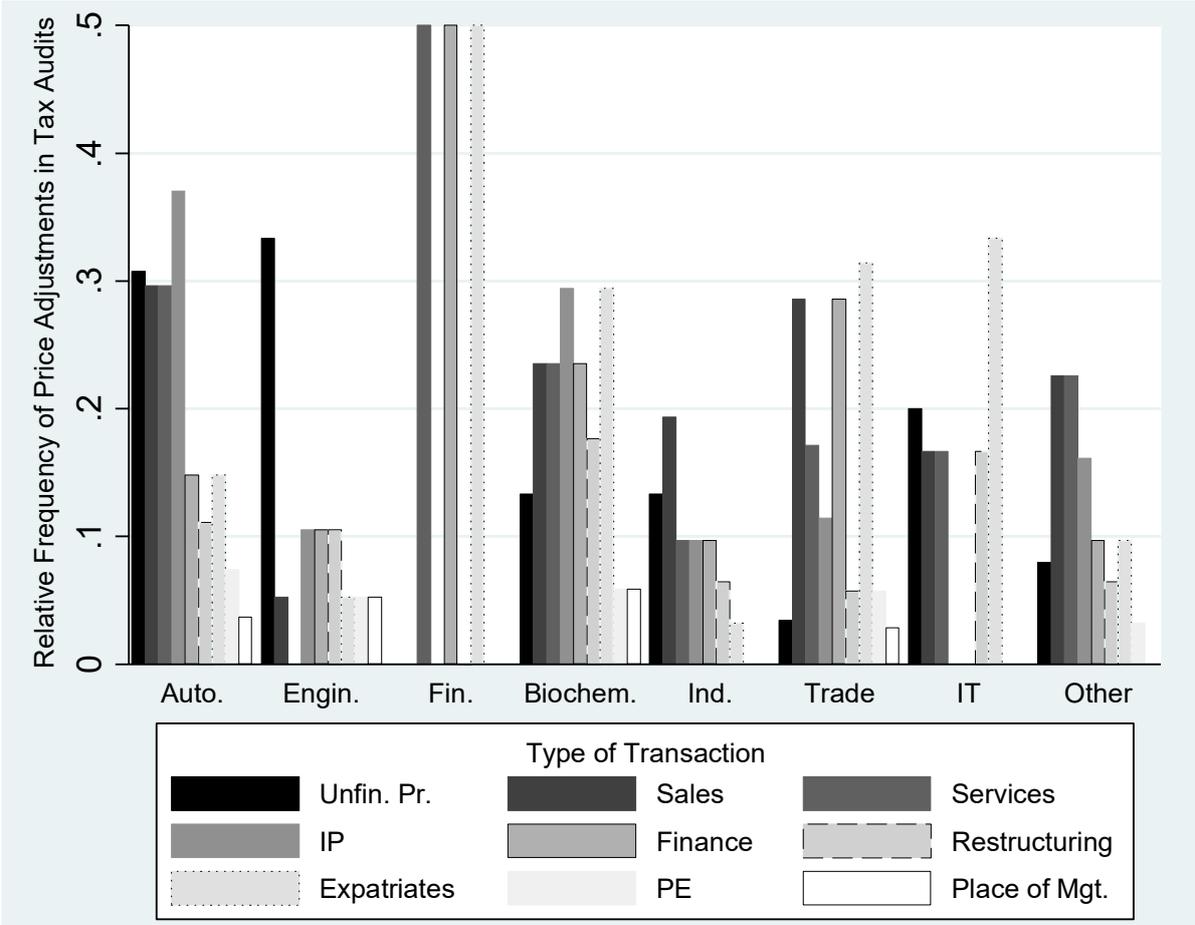
Table 4: Application of Transfer Pricing Methods across Transaction Types and Industries

Industry	TP Method	Relative importance	Unfin. Products	Sales	Services	IP
Automotive N=32	<i>COSTPLUS</i>	52.8%	0.72	0.44	0.72	0.31
	<i>RESALE</i>	8.9%	0.03	0.31	0.03	0.00
	<i>COMPUNCPRI</i>	17.6%	0.16	0.19	0.16	0.22
	<i>COMPPROFIT</i>	2.9%	0.00	0.03	0.03	0.06
	<i>TNMM</i>	8.2%	0.06	0.28	0.00	0.00
	<i>PROFITSPLIT</i>	9.6%	0.03	0.25	0.06	0.06
Engineering N=23	<i>COSTPLUS</i>	45.9%	0.57	0.48	0.70	0.13
	<i>RESALE</i>	17.1%	0.09	0.52	0.09	0.00
	<i>COMPUNCPRI</i>	16.8%	0.30	0.22	0.13	0.04
	<i>COMPPROFIT</i>	0.0%	0.00	0.00	0.00	0.00
	<i>TNMM</i>	11.7%	0.13	0.22	0.04	0.09
	<i>PROFITSPLIT</i>	8.5%	0.09	0.22	0.04	0.00
Financial Services N=8	<i>COSTPLUS</i>	52.6%	0.00	0.13	1.00	0.00
	<i>RESALE</i>	0.0%	0.00	0.00	0.00	0.00
	<i>COMPUNCPRI</i>	29.3%	0.00	0.13	0.50	0.00
	<i>COMPPROFIT</i>	0.0%	0.00	0.00	0.00	0.00
	<i>TNMM</i>	12.1%	0.00	0.13	0.13	0.00
	<i>PROFITSPLIT</i>	6.0%	0.00	0.00	0.13	0.00
Biochemicals/ Pharma N=27	<i>COSTPLUS</i>	49.0%	0.70	0.44	0.70	0.11
	<i>RESALE</i>	9.3%	0.00	0.37	0.00	0.00
	<i>COMPUNCPRI</i>	19.3%	0.15	0.33	0.07	0.22
	<i>COMPPROFIT</i>	2.8%	0.00	0.07	0.04	0.00
	<i>TNMM</i>	8.5%	0.04	0.30	0.00	0.00
	<i>PROFITSPLIT</i>	11.1%	0.11	0.11	0.07	0.15
Industrials/ Energy N=40	<i>COSTPLUS</i>	50.5%	0.40	0.35	0.65	0.13
	<i>RESALE</i>	14.9%	0.05	0.25	0.10	0.05
	<i>COMPUNCPRI</i>	15.2%	0.13	0.20	0.13	0.00
	<i>COMPPROFIT</i>	2.0%	0.00	0.03	0.00	0.03
	<i>TNMM</i>	11.9%	0.05	0.15	0.13	0.03
	<i>PROFITSPLIT</i>	5.6%	0.07	0.07	0.03	0.00

Industry	TP Method	Relative importance	Unfin. Products	Sales	Services	IP
Wholesale/Retail /Logistics N=40	<i>COSTPLUS</i>	48.3%	0.38	0.28	0.75	0.17
	<i>RESALE</i>	11.6%	0.05	0.30	0.00	0.03
	<i>COMPUNCPRI</i>	15.9%	0.03	0.13	0.23	0.13
	<i>COMPPROFIT</i>	1.8%	0.00	0.03	0.03	0.00
	<i>TNMM</i>	16.8%	0.03	0.38	0.07	0.07
	<i>PROFITSPLIT</i>	5.5%	0.03	0.07	0.05	0.03
IT/ Telecommunica- tion N=9	<i>COSTPLUS</i>	56.7%	0.44	0.22	0.67	0.11
	<i>RESALE</i>	17.3%	0.00	0.33	0.11	0.00
	<i>COMPUNCPRI</i>	13.0%	0.00	0.00	0.22	0.11
	<i>COMPPROFIT</i>	0.0%	0.00	0.00	0.00	0.00
	<i>TNMM</i>	13.0%	0.11	0.00	0.11	0.11
	<i>PROFITSPLIT</i>	0.0%	0.00	0.00	0.00	0.00
Others N=40	<i>COSTPLUS</i>	55.8%	0.38	0.47	0.80	0.13
	<i>RESALE</i>	10.3%	0.00	0.23	0.10	0.00
	<i>COMPUNCPRI</i>	16.6%	0.07	0.28	0.13	0.05
	<i>COMPPROFIT</i>	0.9%	0.00	0.00	0.03	0.00
	<i>TNMM</i>	8.2%	0.03	0.10	0.13	0.00
	<i>PROFITSPLIT</i>	8.2%	0.03	0.13	0.05	0.05
Total N=219	<i>COSTPLUS</i>	51.5%	0.48	0.38	0.73	0.16
	<i>RESALE</i>	11.5%	0.03	0.30	0.05	0.01
	<i>COMPUNCPRI</i>	17.1%	0.11	0.21	0.16	0.10
	<i>COMPPROFIT</i>	1.5%	0.00	0.02	0.02	0.01
	<i>TNMM</i>	10.9%	0.05	0.22	0.07	0.03
	<i>PROFITSPLIT</i>	7.6%	0.05	0.12	0.05	0.04

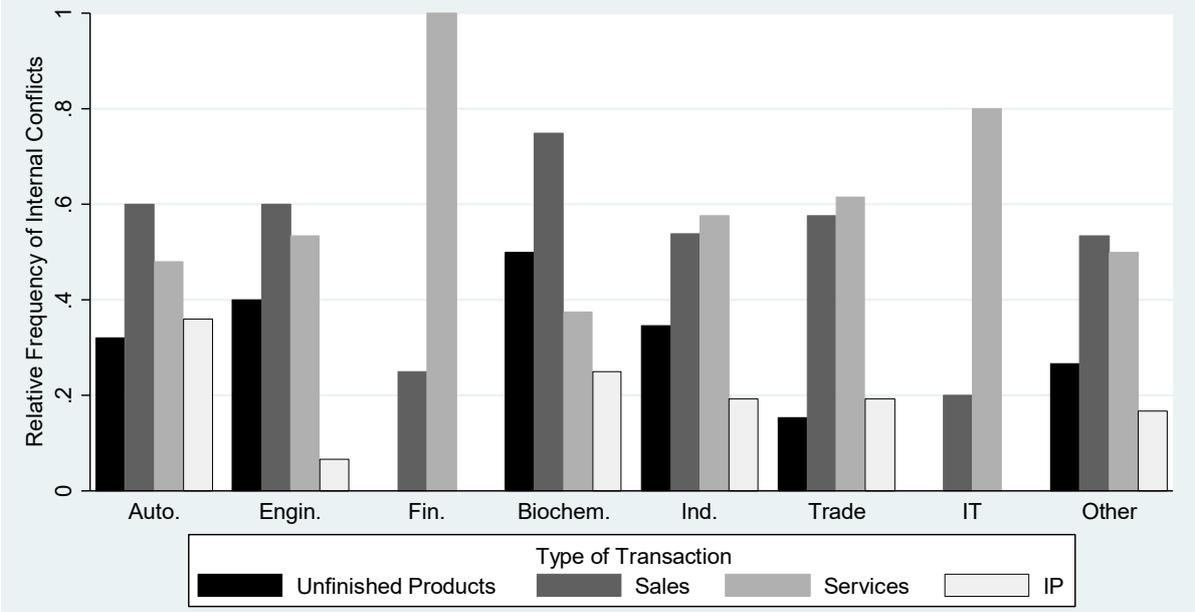
Notes: This table presents the fraction of firms that apply a specific transfer pricing method (TP method) for a specific type of transactions. Variables are defined in the Appendix. The relative importance is calculated as the sum of the fraction of firms applying the respective method for the four transactions over the sum of the fraction of firms within the same industry indicating to apply any of the methods. For instance, 6 (31) percent of survey respondents in the automotive industry indicate that they apply apply the profit split method (cost plus method) for intrafirm transactions involving intellectual property. Overall, the relative frequency of the use of the profit split method (cost plus method) amounts to 9.6 (52.8) percent in the automotive industry. Survey Question: Which transfer pricing method is used for the following type of intrafirm transaction in your company? (Unfinished products, finished physical products/sales, services, intellectual property).

Figure 5: External Transfer Pricing Conflicts across Industries



Notes: This chart describes the relative frequency of price adjustments by the tax authorities in the course of an audit across transactions and industries. Survey Question: For which transfer pricing topic did you face scrutiny during the last tax audit? Did the scrutiny result in price adjustments?

Figure 6: Internal Transfer Pricing Conflicts across Industries



Notes: This chart describes the relative frequency of internal transfer pricing conflicts in terms of coordination issues between different management units and/or legal entities. Survey Question: Did you experience internal conflicts when determining transfer prices within you company?

Table 5: Regression Results of the Association between Centralized Decision-Making and the Transfer Pricing Environment

Dep. Var.:	Pred. Sign	(1) Baseline	(2) Detail	(3) Detail	(4) Logit	(5) Financials	(6) Financials
<i>TP_CENTRAL</i>							
<i>CAT_SALES</i>	+	0.155*** (0.049)	0.131** (0.064)	0.147** (0.067)	1.325** (0.569)		
<i>LOG_SALES</i>	+					0.036* (0.019)	0.039** (0.016)
<i>SC_DECENTRAL</i>	+	0.074** (0.037)	0.080* (0.043)	0.085* (0.044)	0.877* (0.480)	0.083** (0.035)	0.091*** (0.030)
<i>TP_INTENSE</i>			-0.051 (0.072)	-0.038 (0.072)		-0.084 (0.059)	-0.068 (0.046)
<i>TWOBOOK</i>			0.207 (0.156)	0.181 (0.167)	1.232 (0.878)	0.231* (0.123)	0.254** (0.117)
<i>TP_DEP</i>			0.014 (0.080)	0.029 (0.081)	0.371 (0.628)	-0.026 (0.066)	-0.032 (0.053)
<i>INFO</i>	+		0.118 (0.085)	0.121 (0.087)	0.866 (0.611)	0.003 (0.070)	0.043 (0.057)
<i>KPI</i>			-0.006 (0.048)	0.005 (0.051)	0.111 (0.383)	0.038 (0.040)	0.036 (0.037)
<i>GOAL_CONTROL</i>	-	-0.080 (0.072)	-0.089 (0.074)	-0.078 (0.080)	-0.501 (0.575)	-0.137** (0.068)	-0.192*** (0.058)
<i>GOAL_TAX</i>	+	0.157 (0.131)	0.078 (0.150)	0.030 (0.135)	0.198 (0.847)	-0.003 (0.097)	0.004 (0.085)
<i>GOAL_COMPL</i>	-	0.011 (0.075)	-0.032 (0.077)	-0.056 (0.081)	-0.341 (0.572)	-0.114* (0.064)	-0.130** (0.053)
<i>SALES_VOLA</i>						0.330*** (0.123)	0.393*** (0.113)
<i>FORSALES</i>						0.062 (0.108)	
<i>INTAN</i>						0.002*** (0.000)	0.002*** (0.000)
Constant		-0.354* (0.189)	-0.319 (0.246)	-0.375 (0.259)	-7.697*** (2.931)	-0.880* (0.477)	-0.912** (0.399)
Observations		137	125	125	121	289	356
R-squared		0.112	0.145	0.175		0.172	0.194
Industry Dummies		No	No	Yes	Yes	Yes	Yes
Pseudo R-squared					0.204		
Year Dummies						Yes	Yes

Notes: This table reports regression results on the determinants of centralizing transfer pricing decision-making. All variables are defined in the Appendix. Columns (1)-(3) report results based on an OLS model using robust standard errors. Column (4) reports results of a logit regression. Columns (5)-(6) report results based on a pooled OLS model including financial firm date over the period 2008-2013 using robust standard errors and including year dummies. Standard errors are reported in parentheses. The average marginal effects based on the reported coefficients of the logit model are economically very similar to the coefficients reported in the OLS models. *, **, *** Denote two-tailed statistical significance at the 10, 5, and 1 percent levels, respectively.

Table 6: Pearson Correlation Coefficients

Variables		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
AVG_PADJUST	1	1																				
AVG_PAUDIT	2	0.6***	1																			
AVG_INTCONFLICT	3	0.3***	0.3***	1																		
GAAP ETR	4	0.02	-0.02	-0.06	1																	
TP_CENTRAL	5	0.1	0.2**	0.10	-0.05	1																
LOG_SALES	6	0.09	0.1	-0.07	0.10	0.1*	1															
SC_DECENTRAL	7	-0.2**	-0.2**	0.06	-0.02	0.09	-0.3***	1														
TP_INTENSE	8	-0.09	-0.2*	-0.04	-0.10	-0.03	-0.1	-0.1*	1													
TWOBOOK	9	0.09	0.10	-0.09	-0.05	0.2**	0.08	-0.04	0.02	1												
TP_DEP	10	0.09	0.1	0.04	0.06	0.04	0.3***	-0.1*	-0.08	-0.06	1											
INFO	11	0.08	0.03	0.06	-0.05	0.1*	0.1	-0.1	-0.03	0.1*	0.08	1										
KPI	12	-0.1	-0.2*	-0.05	-0.02	0.06	0.06	-0.07	0.2**	0.1	0.1	0.3***	1									
FORSALES	13	0.06	0.1	0.1	-0.03	0.1*	0.2**	-0.1	-0.04	-0.03	0.10	0.1	0.09	1								
INTAN	14	0.02	0.1	-0.03	-0.001	0.09	0.2**	-0.01	0.01	-0.04	-0.06	0.06	0.2**	0.2***	1							
ROA	15	0.04	0.09	0.05	-0.06	0.04	-0.2**	0.2*	-0.04	-0.03	-0.003	0.08	0.03	-0.001	0.04	1						
PROF	16	-0.01	0.01	-0.03	-0.06	0.1	0.07	0.02	-0.09	0.05	0.009	0.2*	-0.03	0.08	0.007	0.6***	1					
SALES_VOLA	17	-0.03	0.03	-0.1	-0.02	-0.05	-0.1	-0.01	0.05	0.1	-0.1	-0.00	-0.08	-0.09	0.02	-0.06	0.004	1				
GOAL_CONTROL	18	-0.06	-0.04	-0.009	-0.1	-0.1**	-0.2***	0.04	0.1*	0.04	0.009	-0.08	0.003	0.03	-0.09	0.03	-0.04	0.2**	1			
GOAL_COMPL	19	0.03	-0.04	0.1*	0.06	0.09	0.03	-0.05	-0.02	-0.05	0.09	0.09	0.1*	-0.04	0.001	-0.04	0.09	-0.10	-0.2***	1		
GOAL_TAX	20	0.1	0.09	0.04	-0.02	0.07	-0.07	-0.03	-0.09	0.09	-0.04	0.1*	0.1**	-0.02	0.1*	0.06	0.02	-0.009	-0.00	0.2***	1	

Notes: This table reports the Pearson correlation coefficients between all variables used in the empirical analysis. All variables are defined in the Appendix. The number of observations depend on the survey answers and the availability of consolidated financial statements for the financial variables, respectively. *, **, *** Denote two-tailed statistical significance at the 10, 5, and 1 percent levels, respectively.

Table 7: Summary Statistics for Regressions of Transfer Pricing Conflicts

Variables	N	mean	sd	min	max
<i>PRICE_ADJUST</i>	957	0.15	0.3608	0.00	1.00
<i>PRICE_SCRUTINY</i>	957	0.29	0.4533	0.00	1.00
<i>INTERNAL_CONFLICT</i>	336	0.45	0.4979	0.00	1.00
<i>TP_CENTRAL</i>	957	0.20	0.3975	0.00	1.00
<i>CAT_SALES</i>	957	2.03	0.6966	1.00	3.00
<i>SC_DECENTRAL</i>	957	3.20	0.9811	1.00	4.00
<i>TP_INTENSE</i>	957	0.37	0.4839	0.00	1.00
<i>TWOBOOK</i>	957	0.07	0.2605	0.00	1.00
<i>TP_DEP</i>	957	0.54	0.4987	0.00	1.00
<i>INFO</i>	957	0.40	0.4902	0.00	1.00
<i>KPI</i>	957	3.19	0.6588	2.00	4.00
<i>GOAL_CONTROL</i>	957	0.42	0.4938	0.00	1.00
<i>GOAL_COMPL</i>	957	0.56	0.4965	0.00	1.00
<i>GOAL_TAX</i>	957	0.13	0.3372	0.00	1.00
<i>LOG_SALES</i>	786	21.59	1.6505	18.33	25.71
<i>FORSALES</i>	678	0.66	0.2248	0.00	0.99
<i>INTAN</i>	786	0.12	0.1571	0.00	0.85
<i>ROA</i>	732	0.08	0.0629	-0.05	0.30
<i>PROF</i>	732	0.06	0.0640	-0.24	0.30
<i>SALES_VOLA</i>	768	0.10	0.1454	0.00	0.95
<i>COSTPLUS</i>	418	0.49	0.5005	0.00	1.00
<i>RESALE</i>	418	0.11	0.3103	0.00	1.00
<i>COMPUNCPRI</i>	418	0.14	0.3510	0.00	1.00
<i>COMPPROFIT</i>	418	0.01	0.1088	0.00	1.00
<i>TNMM</i>	418	0.10	0.3042	0.00	1.00
<i>PROFITSPLIT</i>	418	0.07	0.2544	0.00	1.00

Notes: This table presents distributional statistics including the mean, standard deviation, minimum and maximum value. All variables are defined in the Appendix. The summary statistics are based on the baseline regression of external conflicts (*PRICE_ADJUST*) (Column (1) in Table 9). The financial firm data refers to fiscal year 2013.

Table 8: Regression Results of the Association between External Transfer Pricing Conflicts with Tax Authorities and Centralized Decision-Making

Dep. Var.:	TP_ADJUST				TP_SCRUTINY		
	Pred. Sign	(1) Baseline	(2) Financials	(3) Baseline	(4) Financials	(5) Baseline	(6) Financials
TP_CENTRAL	+	0.094*** (0.034)	0.074** (0.036)	0.137** (0.055)	0.109* (0.061)	0.139*** (0.040)	0.128*** (0.045)
*GOAL_CONTROL	-			-0.224*** (0.067)	-0.176** (0.075)		
*GOAL_COMPL	-			0.044 (0.066)	0.100 (0.079)		
*GOAL_TAX	?			0.017 (0.086)	-0.226** (0.088)		
CAT_SALES		-0.039** (0.019)		-0.039** (0.019)		-0.039* (0.023)	
LOG_SALES			-0.007 (0.012)		-0.011 (0.012)		-0.024 (0.015)
SC_DECENTRAL	?	-0.045*** (0.014)	-0.053*** (0.019)	-0.043*** (0.014)	-0.062*** (0.019)	-0.069*** (0.015)	-0.084*** (0.023)
TP_INTENSE	?	-0.027 (0.023)	-0.020 (0.027)	-0.031 (0.024)	-0.042 (0.029)	-0.075** (0.030)	-0.080** (0.037)
TWOBOOK	?	0.107** (0.054)	0.055 (0.058)	0.115** (0.053)	0.064 (0.059)	0.008 (0.059)	0.034 (0.071)
TP_DEP		0.039 (0.027)	-0.031 (0.037)	0.045 (0.028)	-0.018 (0.037)	0.028 (0.032)	-0.021 (0.043)
INFO		0.055** (0.027)	0.037 (0.032)	0.057** (0.027)	0.020 (0.034)	0.020 (0.032)	0.011 (0.041)
KPI		-0.055** (0.022)	-0.030 (0.028)	-0.067*** (0.022)	-0.047 (0.029)	-0.059** (0.025)	-0.058* (0.034)
GOAL_CONTROL	+	0.020 (0.025)	0.023 (0.029)	0.063** (0.029)	0.067** (0.034)	0.037 (0.032)	-0.002 (0.040)
GOAL_COMPL	-	0.015 (0.027)	0.023 (0.032)	0.030 (0.031)	0.010 (0.041)	-0.032 (0.032)	-0.008 (0.040)
GOAL_TAX	+	0.011 (0.036)	-0.036 (0.051)	0.003 (0.040)	0.026 (0.061)	0.054 (0.045)	0.005 (0.062)
FORSALES	+		-0.012 (0.059)		-0.000 (0.059)		0.037 (0.069)
INTAN	+		0.078 (0.096)		0.030 (0.093)		0.070 (0.121)
PROFIT	+		0.489* (0.277)		0.721** (0.290)		1.005** (0.413)
SALES_VOLA	?		-0.229** (0.104)		-0.218* (0.118)		-0.182 (0.117)
Constant		0.552*** (0.098)	0.564* (0.298)	0.560*** (0.100)	0.706** (0.308)	0.875*** (0.119)	1.345*** (0.383)
Observations		957	660	957	660	957	660
R-squared		0.100	0.112	0.112	0.128	0.152	0.184
Industry Dummies		Yes	Yes	Yes	Yes	Yes	Yes
Transaction Dummies		Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports regression results of centralizing transfer pricing decision making on transfer pricing conflicts. All variables are defined in the Appendix. The regressions are based on a pooled OLS model on the level of intrafirm transaction types using robust standard errors. Columns (1)-(4) report results when *PRICE_ADJUST* is the dependent variable taking on the value of 1 if a price for a specific type of transaction was adjusted in a tax audit and 0 otherwise. Columns (5)-(6) report results when *PRICE_SCRUTINY* is the dependent variable taking on the value of 1 if a specific type of transaction was subject to increased scrutiny in a tax audit and 0 otherwise. Financial firm data refer to fiscal year 2013. Standard errors are reported in parentheses. *, **, *** Denote two-tailed statistical significance at the 10, 5, and 1 percent levels, respectively.

Table 9: Regression Results of the Association between GAAP ETR and Centralized Decision-Making

Dep. Var.: <i>GAAP_ETR</i>	Pred. Sign	Cross-sectional tests				
		(1) Baseline	(2) SALES_ VOLA	(3) Goals	(4) Size	(5) Industries
<i>TP_CENTRAL</i>	-	-0.0227** (0.0110)	-0.0228** (0.0111)	-0.0283 (0.0249)	-0.4284*** (0.1554)	-0.0621*** (0.0227)
* <i>GOAL_CONTROL</i>				-0.0375 (0.0273)		
* <i>GOAL_COMPL</i>				0.0133 (0.0257)		
* <i>GOAL_TAX</i>				0.0230 (0.0369)		
* <i>LOG_SALES</i>	+				0.0180*** (0.0068)	
<i>LOG_SALES</i>		-0.0076*** (0.0026)	-0.0083*** (0.0025)	-0.0072*** (0.0026)	-0.0112*** (0.0032)	-0.0072*** (0.0028)
<i>GOAL_CONTROL</i>		0.0076 (0.0112)	0.0009 (0.0116)	0.0166 (0.0126)	0.0020 (0.0112)	0.0008 (0.0119)
<i>GOAL_COMPL</i>	+	0.0074 (0.0103)	0.0092 (0.0099)	0.0051 (0.0110)	0.0021 (0.0102)	0.0122 (0.0103)
<i>GOAL_TAX</i>	-	-0.0011 (0.0159)	-0.0072 (0.0158)	-0.0038 (0.0185)	0.0068 (0.0162)	0.0009 (0.0168)
<i>FORSALES</i>	-	-0.0370* (0.0209)	-0.0219 (0.0214)	-0.0320 (0.0215)	-0.0283 (0.0223)	-0.0371* (0.0219)
<i>INTANGIBLES</i>	-	0.1266*** (0.0376)	0.1309*** (0.0370)	0.1153*** (0.0385)	0.1172*** (0.0371)	0.1256*** (0.0415)
<i>ROA</i>		-0.2809*** (0.1018)	-0.2676*** (0.1017)	-0.3113*** (0.1002)	-0.3020*** (0.0973)	-0.3022** (0.1196)
<i>LEV</i>	-	-0.0080*** (0.0026)	-0.0087*** (0.0027)	-0.0080*** (0.0026)	-0.0086*** (0.0025)	-0.0071*** (0.0027)
<i>FOREIGN</i>	-	-0.0530** (0.0210)	-0.0509** (0.0210)	-0.0597** (0.0236)	-0.0514** (0.0205)	-0.0612** (0.0268)
<i>SALES_VOLA</i>			0.0181*** (0.0052)			
Constant		0.5155*** (0.0694)	0.5152*** (0.0677)	0.5101*** (0.0667)	0.6005*** (0.0792)	0.5225*** (0.0674)
Observations		261	261	261	261	261
R-squared		0.2675	0.2886	0.2765	0.2860	0.2921
Industry Dummies		Yes	Yes	Yes	Yes	Yes
Year Dummies		Yes	Yes	Yes	Yes	Yes

Notes: This table reports regression results of centralizing transfer pricing decision-making on *GAAP_ETR*. The regressions are based on a cross-sectional pooled OLS model using robust standard errors (Klassen et al. 2017, Hoopes et al. 2012). Column 1 reports the baseline results without the variables of transfer pricing goals interacted with our measure of centralization. Columns (2) reports results including sales volatility as a measure of uncertainty. In the cross-sectional tests, *TP_CENTRAL* is interacted with each transfer pricing goal (management control, tax compliance, tax optimization) (Column (3)), *LOG_SALES* (Column (4)), and each industry dummy with “other” industries being the baseline category (Column (5)). Observations with *ROA* below -1 and above 1, and *GAAP_ETR* below 0 and above 0.5 are excluded. Standard errors are reported in parentheses. *, **, *** Denote two-tailed statistical significance at the 10, 5, and 1 percent levels, respectively.

Figure 7: Marginal Effects of Centralized Decision-Making on the ETR

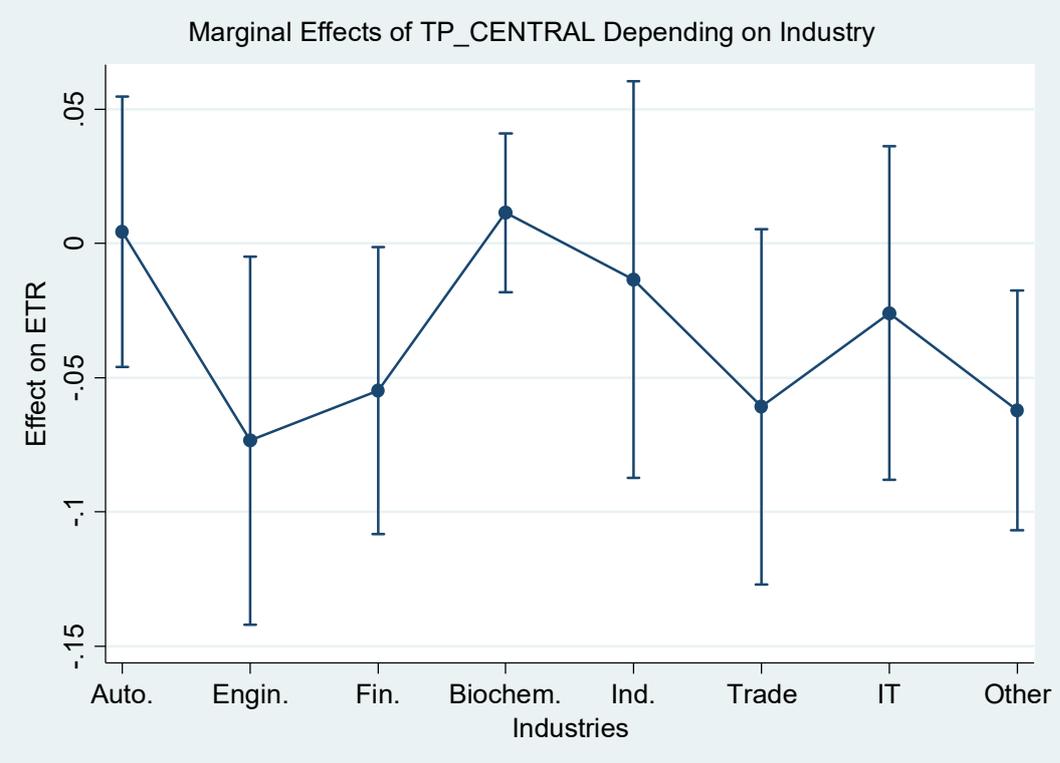
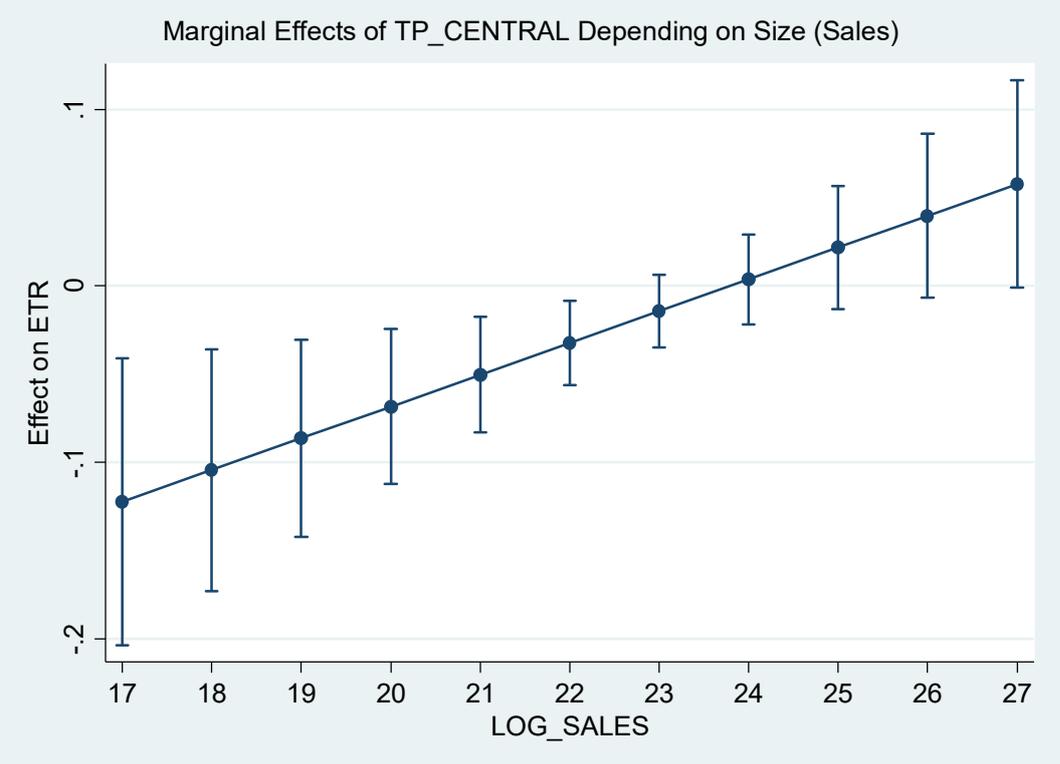


Table 10: Regression Results of the Association between Internal Coordination Conflicts and Centralized Decision-Making

Dep. Var.:	Pred. Sign	Cross-sectional tests				
		(1) Baseline	(2) Financials	(3) Goals	(4) Industries	(5) Supply Chain
<i>INTERNAL_CONFLICT</i>						
<i>TP_CENTRAL</i>	?	0.058 (0.068)	0.071 (0.077)	0.034 (0.115)	0.391** (0.181)	-0.470** (0.210)
* <i>GOAL_CONTROL</i>				-0.111 (0.148)		
* <i>GOAL_COMPL</i>				0.184 (0.140)		
* <i>GOAL_TAX</i>				-0.310 (0.220)		
<i>CAT_SALES</i>		0.012 (0.038)		0.001 (0.039)	0.002 (0.038)	0.015 (0.038)
<i>LOG_SALES</i>			0.007 (0.023)			
<i>SC_DECENTRAL</i>		0.020 (0.029)	0.029 (0.042)	0.012 (0.030)	0.014 (0.029)	
<i>TP_INTENSE</i>		-0.050 (0.055)	-0.070 (0.066)	-0.067 (0.056)	-0.027 (0.055)	-0.041 (0.055)
<i>TWOBOOK</i>	-	-0.170 (0.109)	-0.063 (0.149)	-0.150 (0.109)	-0.224** (0.110)	-0.239** (0.109)
<i>TP_DEP</i>		-0.037 (0.053)	-0.093 (0.079)	-0.041 (0.055)	-0.030 (0.054)	-0.050 (0.054)
<i>INFO</i>		0.049 (0.055)	0.096 (0.072)	0.047 (0.054)	0.040 (0.055)	0.025 (0.055)
<i>KPI</i>	-	-0.009 (0.039)	0.049 (0.052)	-0.012 (0.041)	-0.009 (0.041)	-0.016 (0.040)
<i>GOAL_CONTROL</i>	-	0.023 (0.052)	0.018 (0.067)	0.032 (0.058)	0.025 (0.052)	0.033 (0.052)
<i>GOAL_COMPL</i>	+	0.107** (0.051)	0.060 (0.063)	0.069 (0.060)	0.102* (0.055)	0.100* (0.051)
<i>GOAL_TAX</i>	+	0.042 (0.091)	-0.222 (0.142)	0.098 (0.100)	0.065 (0.092)	0.080 (0.093)
Constant		0.321* (0.177)	0.054 (0.566)	0.411** (0.185)	0.272 (0.193)	0.684*** (0.199)
Observations		388	264	388	388	388
R-squared		0.176	0.231	0.184	0.206	0.204
Industry Dummies		Yes	Yes	Yes	Yes	Yes
Transaction Dummies		Yes	Yes	Yes	Yes	Yes
Other financial controls			Yes			

Notes: This table reports regression results of centralizing transfer pricing decision making on transfer pricing conflicts. All variables are defined in the Appendix. The regressions are based on a pooled OLS model on the level of intrafirm transaction types using robust standard errors. Column (1) reports results of the baseline regression. In Column (2), financial firm data of fiscal year 2013 are included. In the cross-sectional tests, *TP_CENTRAL* is interacted with each transfer pricing goal (management control, tax compliance, tax optimization) (Column (3)), each industry dummy with “other” industries being the baseline category (Column (4)), and *SC_DECENTRAL* (Column (5)). Financial firm data refer to fiscal year 2013. Standard errors are reported in parentheses. *, **, *** Denote two-tailed statistical significance at the 10, 5, and 1 percent levels, respectively

Figure 8: Marginal Effects of Centralized Decision-Making on Internal Coordination Conflicts

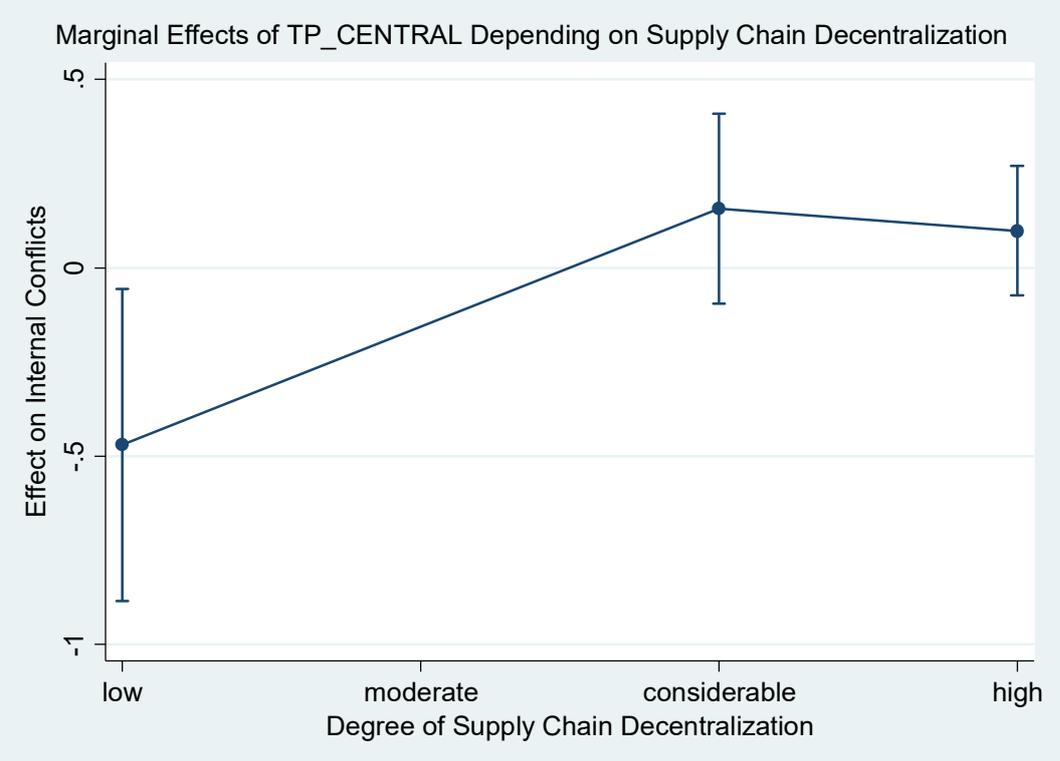
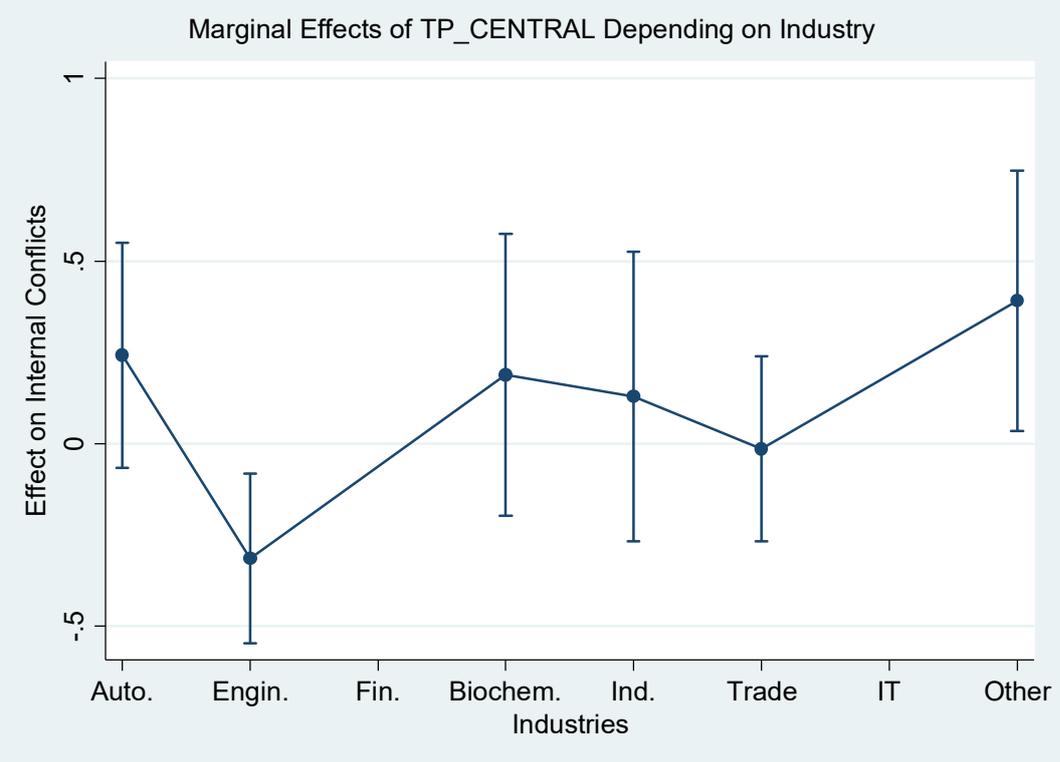


Table 11: Regression Results of the Association between Transaction Type-Specific External Transfer Pricing Conflicts and Centralized Decision-Making

Panel A: Dependent Variable: Price Adjustment in Tax Audit (<i>PRICE_ADJUST</i>)									
	Unfin. Pr.	Sales	Services	IP	Finance	Restruct.	Expat.	PE	Place of Mgmt.
<i>TP_CENTRAL</i>	0.03 (0.10)	-0.10 (0.10)	0.24** (0.10)	0.19* (0.11)	0.34*** (0.12)	0.07 (0.07)	0.13 (0.12)	-0.07 (0.04)	-0.01 (0.04)
Observations	101	107	107	107	107	107	107	107	107
R-squared	0.19	0.23	0.24	0.24	0.28	0.10	0.17	0.21	0.10
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: Dependent Variable: Increased Scrutiny in Tax Audit (<i>PRICE_SCRUTINY</i>)									
	Unfin. Pr.	Sales	Services	IP	Finance	Restruct.	Expat.	PE	Place of Mgt.
<i>TP_CENTRAL</i>	0.11 (0.11)	-0.08 (0.13)	0.40*** (0.13)	0.27** (0.11)	0.29** (0.12)	0.11 (0.12)	0.22 (0.15)	-0.06 (0.07)	-0.01 (0.05)
Observations	101	107	107	107	107	107	107	107	107
R-squared	0.26	0.14	0.14	0.28	0.29	0.11	0.14	0.11	0.15
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports regression results of centralizing transfer pricing decision making on external transfer pricing conflicts for the subsamples of each specific transaction type. All variables are defined in the Appendix. The regressions are based on an OLS model using robust standard errors. The same control variables as in the baseline regression (Table 8, Column (1)) are included and suppressed for purposes of comprehensibility. Panel A reports results when *PRICE_ADJUST* is the dependent variable. Panel B reports results when *PRICE_SCRUTINY* is the dependent variable, taking on the value of 1 if a transaction was under high scrutiny in the course of a tax audit, 0 otherwise. Standard errors are reported in parentheses. *, **, *** Denote two-tailed statistical significance at the 10, 5, and 1 percent levels, respectively.

Table 12: Regression Results of the Association between Transaction Type-Specific Transfer Pricing Conflicts and Centralized Decision-Making and the Choice of Transfer Pricing Methods

Dep. Variable	Price Adjustment in Tax Audit (<i>PRICE_ADJUST</i>)				Increased Scrutiny in Tax Audit (<i>PRICE_SCRUTINY</i>)				<i>INTERNAL_CONFLICT</i>			
	(1) Unfin. Pr.	(2) Sales	(3) Services	(4) IP	(5) Unfin. Pr.	(6) Sales	(7) Services	(8) IP	(9) Unfin. Pr.	(10) Sales	(11) Services	(12) IP
<i>TP_CENTRAL</i>	0.03 (0.10)	-0.10 (0.10)	0.21* (0.11)	0.21* (0.12)	0.07 (0.12)	-0.10 (0.14)	0.40** (0.15)	0.29** (0.11)	0.02 (0.13)	-0.27* (0.15)	0.16 (0.13)	0.13 (0.13)
<i>COSTPLUS</i>	0.07 (0.10)	0.07 (0.11)	0.15* (0.08)	0.21* (0.12)	0.21* (0.11)	0.04 (0.13)	0.13 (0.11)	0.15 (0.13)	0.43*** (0.10)	0.14 (0.11)	0.39*** (0.11)	-0.15 (0.11)
<i>RESALE</i>	-0.12 (0.19)	0.21* (0.11)	-0.30* (0.17)	0.19 (0.12)	0.07 (0.22)	0.08 (0.11)	-0.65*** (0.20)	1.00*** (0.18)	0.16 (0.12)	0.13 (0.12)	0.26 (0.19)	
<i>COMPUNCPRI</i>	0.06 (0.17)	0.10 (0.13)	-0.16 (0.10)	0.11 (0.14)	0.00 (0.18)	0.13 (0.16)	-0.23* (0.13)	0.27* (0.14)	0.03 (0.14)	-0.00 (0.11)	0.39** (0.16)	-0.01 (0.18)
<i>COMPPROFIT</i>		0.17 (0.38)	-0.32 (0.20)	-0.28 (0.19)		0.38* (0.20)	-0.38* (0.21)	0.77*** (0.19)		0.01 (0.32)	0.53** (0.21)	-0.38* (0.22)
<i>TNMM</i>	0.03 (0.20)	0.06 (0.10)	-0.07 (0.13)	-0.10 (0.16)	0.11 (0.25)	0.31** (0.14)	-0.09 (0.22)	0.02 (0.33)	0.39** (0.15)	0.28** (0.13)	1.09*** (0.34)	0.63* (0.33)
<i>PROFITSPLIT</i>	-0.22* (0.11)	0.05 (0.12)	0.29 (0.19)	-0.07 (0.19)	-0.11 (0.21)	-0.12 (0.17)	0.25 (0.25)	0.09 (0.14)	-0.03 (0.11)	0.29** (0.12)	0.58** (0.23)	0.29 (0.34)
Constant	0.36 (0.32)	1.03*** (0.34)	0.95*** (0.30)	0.41 (0.29)	1.08*** (0.38)	0.92** (0.36)	0.83** (0.37)	0.92*** (0.34)	-0.12 (0.34)	0.13 (0.33)	-0.13 (0.41)	0.57* (0.30)
Observations	100	106	106	106	100	106	106	106	96	96	96	96
R-squared	0.22	0.28	0.32	0.29	0.30	0.24	0.23	0.37	0.44	0.29	0.37	0.28
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports regression results of centralizing transfer pricing decision making on transfer pricing conflicts for the subsamples of each specific transaction type when the applied transfer pricing method is explicitly accounted for. All variables are defined in the Appendix. The regressions are based on an OLS model using robust standard errors. The same control variables as in the baseline regression (Table 8, Column (1)) are included and suppressed for purposes of comprehensibility. Columns (1)-(3) report results when *PRICE_ADJUST* is the dependent variable. Columns (4)-(8) report results when *PRICE_SCRUTINY* is the dependent variable. Columns (9)-(12) report results when *INTERNAL_CONFLICT* is the dependent variable. Standard errors are reported in parentheses. *, **, *** Denote two-tailed statistical significance at the 10, 5, and 1 percent levels, respectively.