eJournal of Tax Research (2025) vol. 23, no. 2, pp. 216-242

Do statutory tax rates affect cost stickiness?

Yuxin Shan,* James (Yibo) Zhang** and Patrick L Hopkins***

Abstract

This study investigates the association between country-level statutory tax rates and cost stickiness using a sample of listed firms from 35 Organisation for Economic Co-operation and Development (OECD) countries from 1988 to 2017. Using a modified model proposed by Banker and Byzalov (2014), we find that statutory tax rates are positively associated with cost stickiness. These results are consistent with managers considering tax savings when deciding whether to maintain or release committed resources to maximise firm value. Thus, this study provides new insights that may explain determinants of cost stickiness and interest policymakers regarding the efficacy of tax laws.

Key words: asymmetric cost behaviour, cost stickiness, statutory tax rates

* Assistant Professor, Department of Accounting and Finance, College of Business, University of Wisconsin-Eau Claire. Email: shany@uwec.edu. We thank Co-Editor of this journal Youngdeok Lim and anonymous reviewers for their helpful comments and suggestions. We also thank workshop participants at the 2019 American Accounting Association Annual Meeting for helpful comments.
** Assistant Professor, Department of Accountancy, Farmer School Business, Miami University. Email: james.zhang@miamioh.edu.
*** Assistant Professor, Herbel Family School of Accountancy, College of Business Administration, Kansas State University. Email: plhopkins@ksu.edu.

1. INTRODUCTION

This study investigates the association between statutory tax rates and cost stickiness. Cost stickiness describes the asymmetric behaviour between costs and sales. In terms of selling, general, and administrative (SGA) costs, cost stickiness suggests that SGA costs decrease more slowly during sales decreases than SGA costs increase during sales increases (Anderson, Banker & Janakiraman, 2003). Anderson and co-authors suggest this asymmetric cost behaviour results from managers choosing the better scenario, in terms of net present value (NPV), of uncommitting unnecessary costs versus keeping the costs or from managers being reluctant to relinquish power. Due to the importance of accurate earnings predictions for policymakers and market participants alike, numerous studies explore the factors contributing to cost stickiness. Closest to our study, Banker, Byzalov and Threinen (2013) suggest and find that various country characteristics (i.e., judicial systems, degree of country development, and shareholder protection laws) are associated with cost stickiness. However, their study did not explore whether a country's statutory tax rate correlates with the degree of cost stickiness.

Scholes and Wolfson's (1992) tax planning framework suggests that managers should assess NPVs with after-tax cashflows when evaluating decisions. Along these lines, a rich literature documents that tax considerations significantly influence managers' real-world decisions involving investments, capital structuring, acquisitions, and compensation (Hanlon & Heitzman, 2010; Shackelford & Shevlin, 2001). Though this literature stream documents the pervasive nature of taxes in decision-making, cost stickiness studies omit tax rates as a potential factor of cost stickiness.[1]

Operating expenses incurred in support of generating revenues are generally deductible from taxable income, and as tax rates increase, tax savings also increase from deductions, reducing after-tax costs. When companies consider decreasing costs in response to the sales decreases, they should be aware that companies in high-tax jurisdictions can obtain fewer after-tax benefits from reducing costs as the reduced costs now become taxable income (released taxable income is subject to higher tax obligations). In other words, the tax savings incurred from the operating expenses decrease the after-tax costs of retaining resources. For the same amount of pre-tax operating expenses, it is less costly for companies in high-tax environments to keep underutilised resources. In this case, the adjustment costs are more likely to outweigh the NPV of the after-tax cost of retaining the underutilised resources, making retaining these resources an optional decision, which strengthens the cost stickiness. As such, we explore the possibility that statutory tax rates correlate with cost stickiness.

To explore the potential association between tax rates and cost stickiness, we utilise 248,093 observations from 35 Organisation for Economic Co-operation and Development (OECD) countries from 1988 to 2017. Using a modified version of the model proposed by Banker and Byzalov (2014), we find evidence consistent with higher statutory tax rates strengthening cost stickiness. Moreover, due to United States (US) firms constituting a large portion of our main sample, we exclude US firms in an

[1] For this study, we interview some tax executives regarding whether tax rates impact their companies' cost management behaviour. One interviewee stated, 'It is a factor … maybe not in the top 5, but they're in the top 10'.

additional test and continue to find support for the association between statutory tax rates and cost stickiness.

In our main analyses, we use statutory tax rates to estimate firms' marginal tax rates, the rate at which the next unit of taxable income is taxed. Marginal tax rates are often used in tax planning to determine after-tax values. However, marginal tax rates are unobservable and based on numerous factors, such as tax rate structures, the deductibility of expenses, and the availability of tax credits.[2] As such, we replace our proxy for marginal tax rates with the International Tax Competitive Index (ITCI) and the country's tax revenue to their gross domestic product (GDP) ratio as a robustness check. We find that the ITCI (a higher value suggests a lower corporate tax burden) is negatively associated with the degree of cost stickiness, and the ratio of tax revenue to GDP (a higher value suggests a higher corporate tax burden) is positively associated with the level of cost stickiness. These results are consistent with our main analyses.

Our findings regarding the association between statutory tax rates and cost stickiness are important for several reasons. First, this study contributes to the growing literature stream that examines cost stickiness (Anderson et al., 2007; Balakrishnan & Gruca, 2008; Balakrishnan, Labro & Soderstrom, 2014; Banker, Byzalov & Chen, 2013; Banker, Byzalov and Threinen, 2013; Blatter, Muehlemann & Schenker, 2012; Chen, Lu & Sougiannis, 2012; Dierynck, Landsman & Renders, 2012; Lee, Pittman & Saffar, 2020; Rouxelin, Wongsunwai & Yehuda, 2018). While these studies provide numerous insights into cost stickiness, they omit the possibility of marginal tax rates influencing cost stickiness, even with its importance in calculating NPVs. This article fills this gap and shows that marginal tax rates likely play a role in managers' optimal resource commitment decisions.

Second, this study provides some insights for policymakers. Governments use tax policies to accomplish many goals, such as encouraging investment, discouraging corporate expatriation, or decreasing unemployment. For example, to encourage companies to increase wages, the 2024 Japan Tax Reforms enable large companies that increase wages by 7% or greater to receive a corporate tax credit, which equals 25% of the increase (Ernst & Young, 2023). Our study can help policymakers understand the possible influence of tax policies on firm-level activity adjustment decisions. While policymakers who set higher statutory rates may target higher tax revenue, firms that face high tax rates may uncommit fewer resources during sales decreases, noticing the tax savings from deductible expenses. Our study can help policymakers understand the second-order effects of these policies. Policymakers may want to consider this potential second-order effect before implementing new tax rate structures.

The remainder of this study proceeds as follows. Section 2 provides technical details of the financial reporting and tax systems of countries utilised in this study and develops our main hypothesis. Section 3 describes our sample selection, multivariate methodology, and interview methodology. Section 4 provides our main empirical results. Section 5 provides results from our robustness tests. In section 6, we conclude.

[2] Table 6 (Appendix) lists the countries utilised in this study and their financial reporting and tax system characteristics. In general, all countries in this study allow tax deductions for expenses incurred generating income.

2. BACKGROUND AND HYPOTHESIS DEVELOPMENT

2.1 Accounting treatment for operating expenses

Accounting principles vary worldwide but fall into two broad classifications: Generally Accepted Accounting Principles (GAAP) and International Financial Reporting Standards (IFRS). GAAP is often viewed as a 'rules-based' system. In contrast, IFRS is viewed as a 'principles-based' system.[3] Though the underlying frameworks of these systems differ, numerous similarities exist between GAAP and IFRS due to their focus on ensuring consistency and comparability in financial reporting across diverse industries and geographic regions.

When detailing operating expense recognition, the conceptual frameworks of US GAAP and IFRS overlap significantly.[4] However, several differences exist between the two systems. Some key differences are:

(1) research and development costs: US GAAP requires companies to expense both research and development expenses (Accounting Standards Codification (ASC) 730, Research and Development), while IFRS allows capitalisation of development costs if they meet certain criteria (International Accounting Standard (IAS) 38, Intangible Assets);

(2) cost of goods sold: US GAAP allows companies to use the last-in, first-out method for valuing ending inventory (ASC 330, Inventory), which IFRS prohibits (IAS 2, Inventories);

(3) leases: US GAAP requires lessees to distinguish between operating and finance leases, which affects accounting treatments and disclosures (ASC 842, Leases). However, IFRS now requires that the balance sheet report almost all leases as lease liabilities (IFRS 16, Leases);

(4) Property, Plant, and Equipment (PP&E): US GAAP generally requires listed companies to use the historical cost approach for PP&E (ASC 360, Property, Plant and Equipment), while IFRS allows companies to also consider a revaluation approach (IAS 16 Property, Plant and Equipment).

Despite these differences and others, GAAP and IFRS recognise and measure most operating expenses similarly. Both principles require operating expenses to be deducted from revenue when calculating net income.

2.2 Tax treatment for operating expenses

Like accounting principles, tax environments vary worldwide. However, all of the countries in our study allow the deduction of most, if not all, operating expenses against taxable income. Often, an expense must meet two criteria to be deductible. First, the expense must be documented. Second, the expense must be necessary to gain or produce

[3] In our sample, 32 countries utilise IFRS, and three countries utilise country-specific GAAP. For more details, see Table 6 (Appendix).

[4] For a detailed discussion regarding these similarities and differences, see PwC, 'IFRS and US GAAP: Similarities and differences guide' (10 June 2025), https://viewpoint.pwc.com/dt/us/en/pwc/accounting_guides/ifrs_and_us_gaap_sim/ifrs_and_us_gaap_sim_US/About-this-guide.html.

taxable income. PricewaterhouseCoopers' World Tax Summaries (PwC, 2024) and Deloitte's (2024) International Tax Highlights suggest that most recognised operating expenses for financial purposes meet this criterion and are deductible under the associated country's tax system.[5] However, tax systems are complex and may limit the deductibility of some operating expenses. For example, by comparing the tax treatment on operating expenses between countries provided by PwC's World Tax Summaries (PwC, 2024), we observed the following differences in relation to the deductibility of operating expenses in general: (1) the depreciation method and depreciation rate for different types of assets; (2) limitation on the deductible amount of charitable contributions, and (3) whether amortisation of goodwill is allowed.[6]

As there are differences in the accounting treatment and tax treatment on specific kinds of operating expenses, the findings from our study may not generalise to countries that allow minimal deductions for operating expenses.

2.3 Hypothesis development

Anderson and co-authors (2003) document that SGA costs are sticky. Specifically, they document that these costs have a stronger positive correlation with sales during increasing sales than during decreasing sales. To explain this result, they suggest that costs are either engineered or committed. Engineered costs have a linear association with sales, while committed costs have no association with sales. Though engineered costs are exclusively variable, committed costs can consist of variable costs (i.e., additional sales force) and fixed costs (i.e., human resources department). They suggest that the variable component of committed costs drives this asymmetric cost behaviour. For example, managers may delay firing unnecessary employees in the sales department due to concerns about adjustment costs, such as severance costs for firing and searching and training costs for rehiring, and organisational costs, such as loss of morale and loss of knowledge, skills, and abilities of the workforce (Abel & Eberly, 1994; Anderson et al., 2003, Bentolila & Bertola, 1990). Banker, Byzalov and Chen (2013) suggest that managers may weigh the trade-offs of adjustment costs with the NPV of cashflows expected to be generated by the underutilised resources. In other words, managers will attempt to maximise firm value with their decisions.

Though not the focus of this study, prior research also suggests that cost stickiness may be the product of managerial expectations (Banker et al., 2014) or managerial incentives (Anderson et al., 2003). For example, optimistic managers may delay releasing unutilised committed resources during sales decreases in hopes of future sales increases (Banker et al., 2014), while imperialistic managers may be reluctant to relinquish committed resources they control during sales decreases (Anderson et al., 2003). Additionally, research shows that manager compensation arrangements are associated with cost stickiness. Specifically, when compensation is tied to financial targets, such as earning targets and profit ratios, managers are more likely to make resource decisions that benefit personal wealth instead of shareholder wealth (Banker & Chen, 2006; Dierynck et al., 2012; Kama & Weiss, 2013; Weiss, 2010).

[5] For more details regarding country-specific tax systems, see Table 6 (Appendix).
[6] Considering the complexity and variability of tax laws between different jurisdictions over time, the above discussion does not cover all kinds of operating expenses.

In this study, we suggest that managers consider tax savings when calculating the NPV of committed costs to optimise resource adjustment decisions. A rich literature stream exists theorising and demonstrating that managers consider taxes when making real decisions, such as decisions on investment, capital structure, acquisitions, and compensation.[7] For instance, Hite and Long (1982) theorise that the tax treatment of various compensation arrangements could influence the eventual form of a compensation arrangement. As such, they provide empirical evidence from 100 industrial firms supporting their theory. Harris and O'Brien (2018) theorise that repatriation taxes could deter managers from pursuing various domestic acquisitions when there is a small potential pre-tax NPV. Consistent with this theory, they document a decrease in domestic acquisitions after US firms established a 'Double Irish' structure, which tended to result in higher repatriation taxes.

Additionally, Berger (1993) documents a significant increase in research and development spending in the US after implementing the 1981 Research and Development tax credit, consistent with managers considering tax consequences when making real decisions. From interviews performed by our co-author team (see section 3.3 for interview methodology),[8] one interviewee states, 'We do a lot of things with low-income housing credits and R&D credits … One of the challenges [we face] is how do you continue to grow those tax credits at the same pace as your profitability?'

Managers' performance is often measured after tax to ensure they are maximising the company's wealth. Atwood, Omer and Shelley (1998) provide empirical results showing that companies with more tax planning opportunities often choose after-tax performance measures to ensure that executive managers recognise the tax obligations of their operating and planning decisions. Among their research sample, about 70% of companies use after-tax measures, and 30% of companies use before-tax measures (Atwood et al., 1998). In addition, mid-level managers react to bonus-driven incentives (Kahn & Sherer, 1990; Guidry, Leone & Rock, 1999). Phillips (2003) shows that both chief executive officers (CEOs) and business-unit managers consider tax consequences if their performance is measured on an after-tax basis. In their research sample, about 61% of corporations compensate CEOs on an after-tax basis, and about 32% measure business-unit managers' performance using an after-tax basis. Moreover, one interviewee states that their divisional managers are compensated on an after-tax basis and use after-tax numbers to guide their decisions.[9]

These findings are consistent with principles presented in Scholes and Wolfson's (1992) tax planning framework, which suggests that maximising firm value, not minimising taxes, is the primary objective of tax planning. As such, when evaluating whether to eliminate a cost, managers should consider the tax savings associated with the cost to arrive at its true NPV.

---

[7] For a comprehensive discussion of past research on taxes and real decisions, see Shackelford and Shevlin (2001) and Hanlon and Heitzman (2010).

[8] The interview questions were approved by the Institutional Review Board (IRB) for Human Participants at the university where administration of the study was completed.

[9] Specifically, the interviewee states, 'most often we would see [decision making] on an after-tax basis … On a divisional level, they are compensated on an after-tax basis … If you're sitting in the middle of Europe, and you have got a division in France, 30-something percent tax rate, or you have got the same person deciding to make an investment in France or in the UK. The rate in France is in the thirties and the rate in the UK is in the twenties. That could drive their decisions'.

As an illustrative example, consider a company experiencing a sales slump. The manager must decide whether to retain or dismiss an employee to save costs. The before-tax cost of the employee is $100,000. Suppose the manager does not consider tax savings provided by the company's salary deduction. In that case, the manager may determine that eliminating the employee will save the company $100,000, and it outweighs the risk of other costs of eliminating the employee (i.e., severance packages or wrongful termination suits) and terminating the employee. However, if the manager considers the tax savings, eliminating the employee will only save the company the difference between the before-tax cost of the employee and the tax savings, calculated as the before-tax cost times the company's marginal tax rate. Therefore, after-tax costs have an inverse association with the company's marginal tax rate; for example, the after-tax costs of the employee would be $90,000 when the marginal rate is 10% or $79,000 when the marginal rate is 21%.

As the marginal tax rate increases, it is more likely that the manager will determine that eliminating the employee does not outweigh the risk of other costs from eliminating the employee and retain the employee to maximise firm value. Consequently, retaining unnecessary employees or other resources when sales decrease increases cost stickiness. On the contrary, as the marginal tax rate decreases, the after-tax costs of employees are more likely to outweigh the risk of other costs (adjustment costs), which makes eliminating the employee the optimal resource adjustment decision. As a result, managers in low-tax jurisdictions are more likely to reduce costs when sales decrease, decreasing cost stickiness. In line with this reasoning, we state the following hypothesis in the alternative form:

H1: Marginal tax rates are positively associated with cost stickiness.

3. RESEARCH METHODOLOGY

3.1 Sample selection

This study uses a sample of listed companies from non-financial industries in 35 OECD countries from 1988-2017. We exclude financial industries (SIC codes 6000 through 6999) due to their regulated environments and differences in financial characteristics. We collect financial data for US companies from Compustat North America and financial data for other countries from Compustat Global. Following Anderson and co-authors (2003), Banker, Byzalov and Chen (2013), and Kama and Weiss (2013), we exclude firm-years with:

(1) missing or negative values of sales or operating costs in the current or prior two years;

(2) negative or missing values of total assets;

(3) operating costs that are more than 200% or less than 50% of sales during the current or prior two years;

(4) sales increases of more than 50% or decreases of more than 33% in the current or prior year, or

(5) financial data in a non-native currency.

Furthermore, to reduce bias from extreme outliers, we truncate the top and bottom 1% of changes in sales, changes in operating costs, and asset-to-sales ratios. The final sample includes 248,093 observations for 34,776 listed firms in 35 OECD countries from 1988 to 2017.[10] Variable descriptions are summarised in Table 5 (Appendix).

3.2 Variable and model design

Anderson and co-authors (2003) first propose the empirical model in their study to evaluate the percentage changes in expenses in response to the percentage changes in sales. They provide additional empirical evidence showing that asset intensity, employee intensity, successive sales decreases, and GDP growth are four factors that affect the level of cost stickiness when sales decrease. While successive sales decreases weaken the cost stickiness, asset intensity, employee intensity, and GDP growth strengthen the cost stickiness. Follow-up studies extend this model and posit that the effects of these factors should be considered both when sales increase and sales decrease (Kama & Weiss, 2013; Banker & Byzalov, 2014). The modified model is as follows:

$$\Delta lnXOPR_{i,t} = \beta_0 + \delta_0^X X_{i,t} + (\beta_1 + \delta_1^X X_{i,t})\Delta lnSALE_{i,t} + \left(\beta_2 + \delta_2^X X_{i,t}\right) DEC_{i,t}\Delta lnSALE_{i,t} + \varepsilon_{i,t}$$

where the dependent variable $\Delta lnXOPR_{i,t}$ is the log-change in operating costs, the independent variable $\Delta lnSALE_{i,t}$ is the log-change in sales revenue, $DEC_{i,t}$ is the decrease dummy which takes 1 for firm years when sales decrease and zero otherwise, $\varepsilon_{i,t}$ is the error term with a mean of zero and is independent of explanatory variables; and $X_{i,t}$ is the vector of observable determinants of cost asymmetry.

In addition to the four control variables (asset intensity, employee intensity, successive sales decrease, and GDP growth) identified by Anderson and co-authors (2003), our study includes regular and temporal employment legislation protection indexes, origin of law (Banker, Byzalov & Chen, 2013), and indicators of loss carryforward (Bauer, 2016) as additional control variables. The sum of the coefficient estimates β_1 and δ_1^X measures the percentage increase in operating costs when sales increase by 1%. The sum of the coefficient estimates, β_2 and δ_2^X evaluates the resource adjustment difference between rising and falling sales. Hence, the sum of β_1, δ_1^X, β_1, and δ_1^X captures the percentage decrease in operating costs when sales decrease by 1%. The assumption of the asymmetric cost behaviour, conditional on $(\beta_2 + \delta_2^X X_{i,t})$ < zero. According to prior studies (Banker, Byzalov & Chen, 2013), the standard errors of all empirical regression models in this study are clustered by country and year (Petersen, 2009) to exclude random shocks from countries and years in these linear models. All empirical regression models in our study are robust to autocorrelation and heteroscedasticity.

The hypothesis investigates the relationship between firm-level cost stickiness and the country-level statutory tax rates. In addition to the abovementioned control variables, the statutory tax rates of each country were added to the regression model for measures of both upward resource adjustment and downward resource adjustment. The extended regression model (1) is:

[10] We obtain data from 1986–2017 to accommodate variable creation. The lag values for two preceding years were required to calculate log-change ratios in empirical models, so the final sample for regression starts in 1988 instead of 1986.

$$\begin{aligned}\Delta lnXOPR_{n,i.t} = {} & \beta_0 \\ & + \big(\beta_1 + \theta_1 TAX_{n,t} + \upsilon_1 LossCF_{n,i,t} + \rho_1 REGEPL_{n,t} \\ & + \delta_1 TEMPEPL_{n,t} + \omega_1 LAW_{n,t} + \lambda_1 AINT_{n,i,t} + \mu_1 GDP_{n,t} \\ & + \varphi_1 EINT_{n,t}\big)\Delta lnSALE_{n,i,t} \\ & + \big(\beta_2 + \theta_2 TAX_{n,t} + \upsilon_2 LossCF_{n,i,t} + \rho_2 REGEPL_{n,t} \\ & + \delta_2 TEMPEPL_{n,t} + \omega_2 LAW_{n,t} + \lambda_2 AINT_{n,i,t} + \mu_2 GDP_{n,t} \\ & + \sigma_2 SUC_{n,i,t} + \varphi_2 EINT_{n,t}\big) DEC_{n,i,t}\Delta lnSALE_{n,i,t} + \theta_3 TAX_{n,t} \\ & + \upsilon_3 LossCF_{n,i,t} + \rho_3 REGEPL_{n,t} + \delta_3 TEMPEPL_{n,t} + \omega_3 LAW_{n,t} \\ & + \lambda_3 AINT_{n,i,t} + \mu_3 GDP_{n,t} + \varphi_3 EINT_{n,t} + \varepsilon_{n,i,t}\end{aligned}$$

where $TAX_{n,t}$ is the statutory tax rate of country *n* in year *t*; $LossCF_{n,i,t}$ is the dummy variable for loss carryforward, which equals 1 if the sum of net income of year *t* and year *t*-1 is smaller than zero, and zero otherwise; $REGEPL_{n,t}$ is the index of employment protection legislation (EPL) for regular employees in country *n* (OECD, 2018); $REGEPL_{n,t}$ ranges from zero to 6, and higher values correspond to stricter employment legislation protection for employees with regular contracts; $TEMPEPL_{n,t}$ is the index of employment protection legislation for temporary employees in country *n* (OECD, 2018); $TEMPEPL_{n,t}$ ranges from zero to 6, and higher values correspond to stricter employment legislation protection for employees with temporal contracts; $LAW_{n,t}$ is the law origin dummy, which equals 1 if the law origin of country *n* is common law, and 0 otherwise; asset intensity ($AINT_{i,t}$, the log ratio of total assets to sales), GDP growth (GDP_t, the real GDP growth of year *t*), employee intensity ($EINT_{i,t}$, the log ratio of employees to sales) and a successive sales decrease dummy (SUC, equals 1 if sales decrease both in year *t* and year *t*-1, and zero otherwise) are control variables proposed by Anderson and co-authors (2003); and $\varepsilon_{i,t}$ is the error term with the mean of zero and independent to explanatory variables. The hypothesis, which proposes that the level of cost stickiness is positively associated with statutory tax rates, is conditional on $\theta_2<$ zero.

Instead of using corporate income tax alone, the robustness check uses the ITCI as a proxy for the overall tax burden of a country. The ITCI was developed by the Tax Foundation organisation to evaluate the extent to which a country's tax system adheres to two important aspects of tax policy: competitiveness and neutrality. The competitive tax code means governments intend to keep marginal tax rates low to attract worldwide investments. The neutral tax code means governments aim to maximise income while minimising economic distortions. The ITCI measures more than 40 tax policy variables to determine whether a nation's tax system is neutral and competitive. Both tax rates and the structure of taxes are measured by these variables. Specifically, the ITCI considers a country's corporate taxes, individual income taxes, consumption taxes, property taxes, and the treatment of overseas income. A higher ITCI score represents a more tax-friendly environment (lower tax burden). Consistent with our hypothesis, we speculate that a lower tax burden (higher ITCI) is positively associated with a greater level of cost stickiness.

As the ITCI estimates the general tax burden of a country, in this robustness test, we also introduce governments' corporate tax revenue as a proxy for the corporate-level tax burden (Desai, Foley & Hines, 2006). Our hypothesis implies that cost stickiness is positively associated with governments' corporate tax income. The modified regression model (2) is:

$$
\begin{aligned}
\Delta lnXOPR_{n,i.t} = {} & \beta_0 \\
& + \big(\beta_1 + \theta_1 Tax\_Competitive_{n,t} + \nu_1 Tax\_Corporate_{n,t} \\
& + \upsilon_1 LossCF_{n,i,t} + \rho_1 REGEPL_{n,t} + \delta_1 TEMPEPL_{n,t} + \omega_1 LAW_{n,t} \\
& + \lambda_1 AINT_{n,i,t} + \mu_1 GDP_{n,t} + \varphi_1 EINT_{n,t}\big)\Delta lnSALE_{n,i,t} \\
& + \big(\beta_2 + \theta_2 Tax\_Competitive_{n,t} + \nu_2 Tax\_Corporate_{n,t} \\
& + \upsilon_2 LossCF_{n,i,t} + \rho_2 REGEPL_{n,t} + \delta_2 TEMPEPL_{n,t} + \omega_2 LAW_{n,t} \\
& + \lambda_2 AINT_{n,i,t} + \mu_2 GDP_{n,t} + \sigma_2 SUC_{n,i,t} \\
& + \varphi_2 EINT_{n,t}\big) DEC_{n,i,t}\Delta lnSALE_{n,i,t} + \theta_2 Tax\_Competitive_{n,t} \\
& + \nu_2 Tax\_Corporate_{n,t} + \upsilon_3 LossCF_{n,i,t} + \rho_3 REGEPL_{n,t} \\
& + \delta_3 TEMPEPL_{n,t} + \omega_3 LAW_{n,t} + \lambda_3 AINT_{n,i,t} + \mu_3 GDP_{n,t} \\
& + \varphi_3 EINT_{n,t} + \varepsilon_{n,i,t}
\end{aligned}
$$

where $Tax\_Competitive_{n,t}$ is the ITCI collected from the 7 ITCI report (Pomerleau, 2017). The ITCI ranges from zero to 100. A higher index indicates a lower tax burden. Following the study of Desai and co-authors (2006), $Tax\_Corporate_{n,t}$ is the annual country-level taxes on corporations and other enterprises as a percentage of GDP, collected from Pomerleau (2017); $LossCF_{n,i,t}$ is the dummy variable for loss carryforward, which equals 1 if the sum of net income of year *t* and year *t*-1 is smaller than zero, and 0 otherwise; $REGEPL_{n,t}$ is the index of employment protection legislation (EPL) for regular employees in country *n* (OECD, 2018); $REGEPL_{n,t}$ ranges from zero to 6, and higher values correspond to stricter employment legislation protection for employees with regular contracts; $TEMPEPL_{n,t}$ is the index of employment protection legislation for temporary employees in country *n* (OECD, 2018); $TEMPEPL_{n,t}$ ranges from zero to 6, and higher values correspond to stricter employment legislation protection for employees with temporal contracts; $LAW_{n,t}$ is the law origin dummy, which equals 1 if the law origin of country *n* is common law, and zero otherwise; $AINT_{i,t}$, $GDP_{n,t}$, $EINT_{i,t}$, and $SUC_{n,i,t}$ are control variables proposed by Anderson and co-authors (2003); and $\varepsilon_{i,t}$ is the error term with the mean of zero and independent to explanatory variables.

The main parameters of interest in the estimation are θ_2 and ν_2. The coefficient of θ_2 captures the relationship between the ITCI and cost stickiness. If a higher ITCI (lower tax burden) is associated with a lower degree of cost stickiness, the estimates of θ_2 should be significantly positive. The coefficient of ν_2 captures the relationship between country-level taxes on corporations and cost stickiness. If country-level taxes on corporations and other enterprises are positively associated with cost stickiness, the estimates of ν_2 should be significant and negative.

3.3 Interview methodology

In addition to our empirical analyses, we interviewed a couple of tax executives regarding whether tax rates impact their companies' cost management behaviour. Specifically, two members of our co-author team interviewed tax executives via Zoom. Interviewees received a list of interview questions prior to the interview. At the start of each interview, both authors confirmed that the interviewees agreed to be recorded. On average, the interviews were 28 minutes.

On average, the interviewees have 20.5 years of corporate-tax-related experience and work for consumer product companies with over USD 20 billion in sales. They represent the titles equivalent to a Vice President and oversee tax operations of their associated

divisions. The interviews focus on corporate leaders' perceptions regarding tax considerations in cost management and adjustments. Table 7 (Appendix) sets out a list of the interview questions.

4. EMPIRICAL RESULTS

4.1 Descriptive statistics

Table 1 (Appendix) provides descriptive statistics for all variables in our analyses. We find sample means of 0.036 and 0.038 for Δ*lnSALE* and Δ*lnXOPR*, respectively, which is consistent with values found in Banker, Byzalov and Chen (2013).[11] Furthermore, the mean on *DEC* suggests that approximately 37.9% of annual observations include a sales decrease in our sample. Lastly, the mean (median) on *TAX* indicates that the average (median) statutory tax rate in our sample is 0.364 (0.391). Though the mean and median are close in value for *TAX*, we find significant variation in tax rates among the 35 OECD countries in our sample. For example, the highest statutory tax rate in 2017 is 44% in Germany, while the lowest is 9% in Hungary. We also provide correlations in Table 2 (Appendix) but do not discuss them for brevity. However, the numerous significant univariate correlations between variables highlight the need to explore cost stickiness in a multivariate setting.

4.2 Multivariate results

Columns 1 and 2 of Table 3 (Appendix) provide the coefficients and t-statistics of our results that examine the association between statutory tax rates and cost stickiness using our full sample. We find a positive coefficient on Δ*lnSALE* (β_1 = 0.852, p-value < 0.01) and a negative coefficient on the interaction of Δ*lnSALE* and *DEC* (β_2 = -0.273, p-value < 0.05). These associations are consistent with firms releasing costs more slowly than committing costs. More specifically, costs exhibit a positive association with sales, but this association weakens when sales decrease. We suggest that firms' marginal tax rates will increase cost stickiness as they increase. The negative coefficient on the triple interaction of Δ*lnSALE, DEC,* and *TAX* supports this conjecture (θ_2 = -0.352, p-value < 0.01). We interpret this finding as managers considering the after-tax cost instead of the before-tax cost when deciding whether to eliminate a cost. Because of the inverse association between marginal tax rates and after-tax costs, all else equal, managers will likely eliminate costs in lower-tax jurisdictions before eliminating costs in higher-tax jurisdictions. As for the associations on control variables, coefficients align with expectations and past research. Specifically, we show that successive sales decreases weaken the level of cost stickiness, while asset intensity, employee intensity, and GDP growth strengthen the level of cost stickiness.

US firms account for 56.21% of all firm-year observations in our full sample. To ensure that our results are not due to the large presence of US firms, we eliminate all US firms and provide these results in columns 3 and 4 of Table 3. Eliminating US firms results in 108,640 firm-year observations from 16,686 firms in 34 countries. Providing comfort that our results are not due to including US firms, we continue to find evidence of cost

[11] Though Banker, Byzalov and Chen (2013) do not report sample averages for Δ*lnSALE* and Δ*lnXOPR*, they report averages by country. Their averages range from 0.022 (Japan) to 0.051 (Sweden) for Δ*lnSALE* and 0.030 (Germany) to 0.053 (Ireland) for Δ*lnXOPR*. Our sample means fall within these ranges.

stickiness (β_2 = -0.129, p-values < 0.01). Furthermore, we continue to see evidence of marginal tax rates increasing cost stickiness (θ_2 = -0.172, p-value < 0.05).

5. ADDITIONAL ANALYSIS

To ensure our results are robust to various design choices, we replace *TAX* with the ITCI to proxy for firms' marginal tax rates. The ITCI, $Tax\_Competitive_{n,t}$, reflects the Tax Foundation's assessment of the competitiveness and neutrality of a country's tax system after considering 40 different tax-related aspects of the country (Pomerleau, 2017). A competitive tax system attempts to keep marginal tax rates low for corporations to attract worldwide investments. In contrast, a neutral system aims to maximise taxation while minimising economic distortions. Due to ITCI scores having an inverse association with marginal tax rates (i.e., higher ITCI scores represent friendlier tax environments with lower tax burdens), we expect a positive association on the triple interaction of Δ*lnSALE*, *DEC*, and *Tax_Competitive*.[12] In addition to replacing *TAX*, we include a proxy for the country's reliance on corporate tax revenue (Desai et al., 2006). Specifically, we include *Tax_Corporate* as an additional control and measure it as the annual country-level taxes on corporations and other enterprises as a percentage of country *n*'s GDP. Similar to earlier expectations, we expect that a country's reliance on corporate taxes will increase cost stickiness, a negative coefficient of Δ*lnSALE*, *DEC*, and *Tax_Corporate*.

Table 4 (Appendix) provides the results of this robustness test for our full sample and non-US firms subsample. Inferences are consistent with the conclusions of our main analysis. Specifically, we find that the triple interactions between Δ*lnSALE*, *DEC*, and *Tax_Competitive* are positive and significant in both specifications (full sample: θ_2 = 0.002, p-values < 0.01; excluding US firms: θ_2 = 0.002, p-values < 0.01). These results are consistent with firms operating in tax-friendly environments (i.e., lower tax burdens) exhibiting less cost stickiness. In other words, companies operating in tax-friendly environments are more likely to release committed resources as sales decrease. Additionally, we find that the triple interactions between Δ*lnSALE*, *DEC*, and *Tax_Corporate* are negative and significant (full sample: ν_2 = -0.008, p-values < 0.10; excluding US firms: ν_2 = -0.004, p-values < 0.10), which are consistent with higher tax reliance (possibly due to higher tax rates) being associated with greater cost stickiness.

Lastly, we consider whether endogeneity from omitted variables influences our results. In untabulated tests, we repeat our main analyses with year and country fixed effects and inferences remain the same. Therefore, we conclude that our results are not solely the product of unmodelled year or time-invariant country characteristics.

6. CONCLUSION

This study examines the association between statutory tax rates and cost stickiness. Prior literature widely discusses cost stickiness factors but omits the possibility of taxation playing any role. Our findings suggest that marginal tax rates, proxied by statutory tax rates, contribute to cost stickiness. Specifically, we find that cost stickiness increases as tax rates rise. The documented influence of tax on cost stickiness is economically significant and robust to alternative model specifications. This finding is likely the

[12] Table 1 (Appendix) supports the inverse association by showing a correlation of -0.469 between *TAX* and *Tax_Competitive.*

product of managers using after-tax values in NPV calculations. Specifically, due to the inverse nature of after-tax costs with marginal tax rates, managers are more likely to retain unnecessary costs in high-tax environments due to the minimal benefits of releasing said costs; we provide anecdotal evidence from interviews with tax executives supporting this view.

Following the call of prior literature, this study provides further insights into the effects of tax policy on real corporate decisions. Prior research documents that resource adjustments are comprehensive decisions affected by numerous factors, such as potential adjustment costs, sales expectations, and managerial incentives. In addition to these factors, we propose and find that tax savings play an important role in optional resource adjustment decisions. Policymakers may want to consider this second-order effect when considering changes to their countries' tax structures.

Going forward, studies could examine the interaction between resource adjustment decisions and taxation in specific situations, such as financial constraints and acquisitions. Furthermore, studies could investigate the effect of corporate governance on the documented association between cost stickiness and tax obligations.

7. REFERENCES

Abel, A B & Eberly, J C 1994, 'A unified model of investment under uncertainty', *American Economic Review*, vol. 84, no. 5, pp. 1369-1384.

Anderson, M, Banker, R, Huang, R & Janakiraman, S 2007, 'Cost behavior and fundamental analysis of SG&A costs', *Journal of Accounting, Auditing and Finance*, vol. 22, no. 1, pp. 1-28.

Anderson, M C, Banker, R D & Janakiraman, S N 2003, 'Are selling, general, and administrative costs "sticky"?', *Journal of Accounting Research*, vol. 41, no. 1, pp. 47-63.

Atwood, T J, Omer, T C & Shelley, M K 1998, 'Before-tax versus after-tax earnings as performance measures in compensation contracts', *Managerial Finance*, vol. 24, no. 11, pp. 29-43.

Balakrishnan, R & Gruca, T S 2008, 'Cost stickiness and core competency: A note', *Contemporary Accounting Research*, vol. 25, no. 4, pp. 993-1006.

Balakrishnan, R, Labro, E & Soderstrom, N S 2014, 'Cost structure and sticky costs', *Journal of Management Accounting Research*, vol. 26, no. 2, pp. 91-116.

Banker, R D & Byzalov, D 2014, 'Asymmetric cost behavior', *Journal of Management Accounting Research*, vol. 26, no. 2, pp. 43-79.

Banker, R D, Byzalov, D & Chen, L (T) 2013, 'Employment protection legislation, adjustment costs and cross-country differences in cost behavior', *Journal of Accounting and Economics*, vol. 55, no. 1, pp. 111-127.

Banker, R D, Byzalov, D, Ciftci, M & Mashruwala, R 2014, 'The moderating effect of prior sales changes on asymmetric cost behavior', *Journal of Management Accounting Research*, vol. 26, no. 2, pp. 221-242.

Banker, R D, Byzalov, D & Threinen, L 2013, 'Determinants of international differences in asymmetric cost behavior'. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2312772.

Banker, R D & Chen, L (T) 2006, 'Predicting earnings using a model based on cost variability and cost stickiness', *The Accounting Review*, vol. 81, no. 2, pp. 285-307.

Bauer, A M 2016, 'Tax avoidance and the implications of weak internal controls', *Contemporary Accounting Research*, vol. 33, no. 2, pp. 449-486.

Bentolila, S & Bertola, G 1990, 'Firing costs and labour demand: How bad is Eurosclerosis?', *Review of Economic Studies*, vol. 57, no. 3, pp. 381-402.

Berger, P G 1993, 'Explicit and implicit tax effects of the R&D tax credit', *Journal of Accounting Research*, vol. 31, no. 2, pp. 131-171.

Blatter, M, Muehlemann, S & Schenker, S 2012, 'The costs of hiring skilled workers', *European Economic Review*, vol. 56, no. 1, pp. 20-35.

Chen, C X, Lu, H & Sougiannis, T 2012, 'The agency problem, corporate governance, and the asymmetrical behavior of selling, general, and administrative costs', *Contemporary Accounting Research*, vol. 29, no. 1, pp. 252-282.

Deloitte 2024, 'International tax highlights'. Available at: https://dits.deloitte.com/TaxGuides.

Desai, M A, Foley, C F & Hines, J R, Jr 2006, 'The demand for tax haven operations', *Journal of Public Economics*, vol. 90, no. 3, pp. 513-531.

Dierynck, B, Landsman, W R & Renders, A 2012, 'Do managerial incentives drive cost behavior? Evidence about the role of the zero earnings benchmark for labor cost behavior in private Belgian firms", *The Accounting Review*, vol. 87, no. 4, pp. 1219-1246.

Ernst & Young 2023, 'The impact of the 2024 Japan tax reforms for inbound businesses', 27 December. Available at: https://www.ey.com/en_jp/ey-japan-tax-library/tax-alerts/2023/tax-alerts-12-27.

Guidry, F, Leone, A J & Rock, S 1999, 'Earnings-based bonus plans and earnings management by business-unit managers', *Journal of Accounting and Economics*, vol. 26, no. 1-3, pp. 113-142.

Hanlon, M & Heitzman, S 2010, 'A review of tax research', *Journal of Accounting and Economics*, vol. 50, no. 2-3, pp. 127-178.

Harris, J & O'Brien, W 2018, 'US worldwide taxation and domestic mergers and acquisitions', *Journal of Accounting and Economics*, vol. 66, no. 2-3, pp. 419-438.

Hite, G L & Long, M S 1982, 'Taxes and executive stock options', *Journal of Accounting and Economics*, vol. 4, no. 1, pp. 3-14.

Kahn, L M & Sherer, P D 1990, 'Contingent pay and managerial performance', *Industrial and Labor Relations Review*, vol. 43, no. 3 (special issue), pp. 107S-120S.

Kama, I & Weiss, D 2013, 'Do earnings targets and managerial incentives affect sticky costs?', *Journal of Accounting Research*, vol. 51, no. 1, pp. 201-224.

Lee, W-J, Pittman, J & Saffar, W 2020, 'Political uncertainty and cost stickiness: Evidence from national elections around the world', *Contemporary Accounting Research*, vol. 37, no. 2, pp. 1107-1139.

Organisation for Economic Co-operation and Development (OECD) 2018, 'OECD indicators of employment protection'. Available at: http://www.oecd.org/els/emp/oecdindicatorsofemploymentprotection.htm.

Petersen, M A 2009, 'Estimating standard errors in finance panel data sets: Comparing approaches', *Review of Financial Studies*, vol. 22, no. 1, pp. 435-480.

Phillips, J D 2003, 'Corporate tax-planning effectiveness: The role of compensation-based incentives', *The Accounting Review*, vol. 78, no. 3, pp. 847-874.

Pomerleau, K 2017, *International tax competitiveness index 2016*, Tax Foundation, Washington, DC. Available at: https://taxfoundation.org/research/all/global/2016-international-tax-competitiveness-index/.

PricewaterhouseCoopers (PwC) (2024), 'Worldwide tax summaries'. Available at: https://taxsummaries.pwc.com/.

Rouxelin, F, Wongsunwai, W & Yehuda, N 2018, 'Aggregate cost stickiness in GAAP financial statements and future unemployment rate', *The Accounting Review*, vol. 93, no. 3, pp. 299-325.

Scholes, M A & Wolfson, M A 1992, *Taxes and business strategy: A planning approach*, Prentice-Hall, Englewood Cliffs, NJ.

Shackelford, D A & Shevlin, T 2001, 'Empirical tax research in accounting', *Journal of Accounting and Economics*, vol. 31, no. 1-3, pp. 321-387.

Weiss, D 2010, 'Cost behavior and analysts' earnings forecasts', *The Accounting Review*, vol. 85, no. 4, pp. 1441-1471.

8. APPENDICES

Table 1: Descriptive Statistics

Variable	N	Mean	Std. Dev.	Q1	Median	Q3
$\Delta lnSALE_{n,i,t}$	248,093	0.036	0.143	-0.044	0.034	0.121
$\Delta lnXOPR_{n,i,t}$	248,093	0.038	0.146	-0.043	0.035	0.121
$DEC_{n,i,t}$	248,093	0.379	0.485	0.000	0.000	1.000
$TAX_{n,t}$	248,093	0.364	0.068	0.325	0.391	0.395
$LossCF_{n,i,t}$	248,093	0.191	0.393	0.000	0.000	0.000
$Tax\_Competitive_{n,t}$	248,093	59.500	8.937	53.700	53.700	61.400
$Tax\_Corporate_{n,t}$	248,093	11.370	2.900	9.754	11.430	12.780
$LAW_{n,t}$	248,093	0.591	0.492	0.000	1.000	1.000
$AINT_{n,i,t}$	248,093	0.174	0.859	-0.369	0.026	0.509
$GDP_{n,t}$	248,093	2.227	2.019	1.420	2.532	3.675
$EINT_{n,i,t}$	248,093	-6.544	2.220	-7.137	-5.700	-5.110
$REGEPL_{n,t}$	248,093	1.171	0.994	0.260	1.100	1.700
$TEMPEPL_{n,t}$	248,093	1.236	1.412	0.250	0.250	1.690

This Table presents the descriptive statistics for all the variables included in the main sample. The variable definitions are presented in Table 5 (Appendix).

Table 2: Pearson Correlations

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1)	$\Delta lnSALE_{n,i,t}$	1.000												
(2)	$\Delta lnXOPR_{n,i,t}$	**0.850**	1.000											
(3)	$DEC_{n,i,t}$	**-0.755**	**-0.649**	1.000										
(4)	$TAX_{n,t}$	0.003	0.001	**-0.012**	1.000									
(5)	$LossCF_{n,i,t}$	**-0.195**	**-0.185**	**0.193**	**-0.006**	1.000								
(6)	$Tax\_Competitive_{n,t}$	**-0.019**	**-0.020**	**0.013**	**-0.469**	**-0.051**	1.000							
(7)	$Tax\_Corporate_{n,t}$	**0.045**	**0.056**	**-0.027**	**-0.009**	**-0.008**	**0.173**	1.000						
(8)	$LAW_{n,t}$	**0.046**	**0.050**	**-0.016**	**0.169**	**0.076**	**-0.298**	**0.361**	1.000					
(9)	$AINT_{n,i,t}$	**-0.025**	**-0.013**	**0.031**	**0.049**	**-0.051**	**-0.139**	**0.019**	**0.146**	1.000				
(10)	$GDP_{n,t}$	**0.178**	**0.173**	**-0.161**	**-0.061**	**-0.053**	**0.014**	**0.159**	**0.226**	**0.010**	1.000			
(11)	$EINT_{n,i,t}$	**0.017**	**0.029**	**0.016**	**-0.098**	**0.077**	**-0.177**	**0.379**	**0.684**	**0.064**	**0.262**	1.000		
(12)	$REGEPL_{n,t}$	**-0.038**	**-0.039**	**0.019**	**-0.433**	**-0.078**	**0.448**	**-0.257**	**-0.868**	**-0.151**	**-0.143**	**-0.447**	1.000	
(13)	$TEMPEPL_{n,t}$	**-0.033**	**-0.034**	**0.017**	**-0.237**	**-0.057**	**0.271**	**-0.172**	**-0.798**	**-0.102**	**-0.145**	**-0.357**	**0.848**	1.000

This Table presents the Pearson correlations of select variables used in this study. Correlations in bold are significant at the 1% level. The variable definitions are described in Table 5 (Appendix).

Table 3: The Association Between Statutory Tax Rates and Cost Stickiness

		Full Sample		Excluding US Firms	
		(1)	(2)	(3)	(4)
	Exp.	Coef.	t-stat	Coef.	t-stat
$\Delta lnSALE_{n,i,t}$	+	0.852***	(21.48)	0.858***	(19.42)
$\Delta lnSALE_{n,i,t} * TAX_{n,t}$		0.178***	(2.88)	0.110	(1.47)
$\Delta lnSALE_{n,i,t} * LossCF_{n,i,t}$		-0.138***	(-13.28)	-0.131***	(-3.24)
$\Delta lnSALE_{n,i,t} * REGEPL_{n,t}$		0.021**	(2.01)	0.019*	(1.86)
$\Delta lnSALE_{n,i,t} * TEMPEPL_{n,t}$		-0.007	(-1.22)	-0.001	(-0.20)
$\Delta lnSALE_{n,i,t} * LAW_{n,t}$		-0.011	(-0.40)	0.009	(0.36)
$\Delta lnSALE_{n,i,t} * AINT_{n,i,t}$		0.004	(0.26)	-0.071***	(-5.12)
$\Delta lnSALE_{n,i,t} * GDP_{n,t}$		0.006***	(2.62)	0.002	(0.51)
$\Delta lnSALE_{n,i,t} * EINT_{n,i,t}$		0.003	(0.98)	0.001	(0.51)
$\Delta lnSALE_{n,i,t} * DEC_{n,i,t}$	-	**-0.273****	**(-2.22)**	**-0.129*****	**(-2.73)**
$\Delta lnSALE_{n,i,t} * DEC_{n,i,t} * TAX_{n,t}$	-	**-0.352*****	**(-2.61)**	**-0.172****	**(-2.58)**
$\Delta lnSALE_{n,i,t} * DEC_{n,i,t} * LossCF_{n,i,t}$		0.029**	(2.58)	0.045	(1.17)
$\Delta lnSALE_{n,i,t} * DEC_{n,i,t} * REGEPL_{n,t}$		0.006	(0.41)	-0.007	(-0.58)
$\Delta lnSALE_{n,i,t} * DEC_{n,i,t} * TEMPEPL_{n,t}$		0.011	(0.85)	-0.003	(-0.42)
$\Delta lnSALE_{n,i,t} * DEC_{n,i,t} * LAW_{n,t}$		0.108	(1.50)	0.013	(0.64)
$\Delta lnSALE_{n,i,t} * DEC_{n,i,t} * AINT_{n,i,t}$	-	-0.111***	(-8.49)	-0.054**	(-2.38)
$\Delta lnSALE_{n,i,t} * DEC_{n,i,t} * GDP_{n,t}$	-	-0.012***	(-6.92)	-0.006	(-1.47)
$\Delta lnSALE_{n,i,t} * DEC_{n,i,t} * SUC_{n,i,t}$	+	0.164***	(7.33)	0.114***	(17.49)
$\Delta lnSALE_{n,i,t} * DEC_{n,i,t} * EINT_{n,i,t}$	-	-0.030***	(-2.60)	-0.015***	(-5.53)
Main Effects on Controls		Yes		Yes	
Constant		Yes		Yes	
Observations		248,093		108,640	
Adj. R-Square		0.740		0.807	

The sample covers listed firms in 35 OECD countries from 1988 to 2017. The variable definitions are presented in Table 5 (Appendix). The t-statistics are computed using two-way clustering by country and year. *, ** and *** indicate significance at 10%, 5% and 1% levels, respectively, based on two-tailed tests. Model (1) is as follows:

$$\begin{aligned}\Delta lnXOPR_{n,i.t} = {} & \beta_0 \\ & + \left(\beta_1 + \theta_1 TAX_{n,t} + \upsilon_1 LossCF_{n,i,t} + \rho_1 REGEPL_{n,t} + \delta_1 TEMPEPL_{n,t} + \omega_1 LAW_{n,t} + \lambda_1 AINT_{n,i,t}\right. \\ & \left. + \mu_1 GDP_{n,t} + \varphi_1 EINT_{n,t}\right)\Delta lnSALE_{n,i,t} \\ & + \left(\beta_2 + \theta_2 TAX_{n,t} + \upsilon_2 LossCF_{n,i,t} + \rho_2 REGEPL_{n,t} + \delta_2 TEMPEPL_{n,t} + \omega_2 LAW_{n,t} + \lambda_2 AINT_{n,i,t}\right. \\ & \left. + \mu_2 GDP_{n,t} + \sigma_2 SUC_{n,i,t} + \varphi_2 EINT_{n,t}\right)DEC_{n,i,t}\Delta lnSALE_{n,i,t} + \theta_3 TAX_{n,t} + \upsilon_3 LossCF_{n,i,t} + \rho_3 REGEPL_{n,t} \\ & + \delta_3 TEMPEPL_{n,t} + \omega_3 LAW_{n,t} + \lambda_3 AINT_{n,i,t} + \mu_3 GDP_{n,t} + \varphi_3 EINT_{n,t} + \varepsilon_{n,i,t}\end{aligned}$$

Table 4: The Association Between Tax System Competitiveness and Cost Stickiness

		Full Sample		Excluding US Firms	
		(1)	(2)	(3)	(4)
	Exp.	Coef.	t-stat	Coef.	t-stat.
$\Delta lnSALE_{n,i,t}$	+	0.978***	(21.89)	1.024***	(16.74)
$\Delta lnSALE_{n,i,t}$ * $Tax\_Competitive_{n,t}$		-0.001***	(-2.92)	-0.002***	(-3.08)
$\Delta lnSALE_{n,i,t}$ * $Tax\_Corporate_{n,t}$		0.002	(0.98)	-0.000	(-0.05)
$\Delta lnSALE_{n,i,t}$ * $LossCF_{n,i,t}$		-0.141***	(-13.15)	-0.134***	(-3.13)
$\Delta lnSALE_{n,i,t}$ * $REGEPL_{n,t}$		0.017**	(2.32)	0.009	(1.03)
$\Delta lnSALE_{n,i,t}$ * $TEMPEPL_{n,t}$		-0.008	(-1.44)	-0.001	(-0.21)
$\Delta lnSALE_{n,i,t}$ * $LAW_{n,t}$		-0.026	(-0.91)	0.001	(0.06)
$\Delta lnSALE_{n,i,t}$ * $AINT_{n,i,t}$		0.004	(0.27)	-0.073***	(-5.34)
$\Delta lnSALE_{n,i,t}$ * $GDP_{n,t}$		0.006***	(2.61)	0.002	(0.59)
$\Delta lnSALE_{n,i,t}$ * $EINT_{n,i,t}$		0.003	(1.03)	0.003	(1.04)
$\Delta lnSALE_{n,i,t}$ * $DEC_{n,i,t}$	-	-0.416***	(-3.44)	-0.267***	(-3.79)
$\Delta lnSALE_{n,i,t}$ * $DEC_{n,i,t}$ * $Tax\_Competitive_{n,t}$	+	**0.002*** **	**(3.90)**	**0.002*** **	**(3.58)**
$\Delta lnSALE_{n,i,t}$ * $DEC_{n,i,t}$ * $Tax\_Corporate_{n,t}$	**-**	**-0.008***	**(-1.89)**	**-0.004***	**(-1.94)**
$\Delta lnSALE_{n,i,t}$ * $DEC_{n,i,t}$ * $LossCF_{n,i,t}$		0.035***	(3.18)	0.051	(1.27)
$\Delta lnSALE_{n,i,t}$ * $DEC_{n,i,t}$ * $REGEPL_{n,t}$		0.016	(1.00)	0.005	(0.70)
$\Delta lnSALE_{n,i,t}$ * $DEC_{n,i,t}$ * $TEMPEPL_{n,t}$		0.007	(0.65)	-0.005***	(-23.45)
$\Delta lnSALE_{n,i,t}$ * $DEC_{n,i,t}$ * $LAW_{n,t}$		0.120	(1.40)	0.016	(1.00)
$\Delta lnSALE_{n,i,t}$ * $DEC_{n,i,t}$ * $AINT_{n,i,t}$	-	-0.112***	(-8.40)	-0.053**	(-2.44)
$\Delta lnSALE_{n,i,t}$ * $DEC_{n,i,t}$ * $GDP_{n,t}$	-	-0.010***	(-5.63)	-0.006	(-1.40)
$\Delta lnSALE_{n,i,t}$ * $DEC_{n,i,t}$ * $SUC_{n,i,t}$	+	0.162***	(7.38)	0.112***	(14.80)
$\Delta lnSALE_{n,i,t}$ * $DEC_{n,i,t}$ * $EINT_{n,i,t}$	-	-0.025**	(-2.17)	-0.013***	(-5.72)
Main Effects on Controls		Yes		Yes	
Constant		Yes		Yes	
Observations		248,093		108,640	

Adj. R-Square	0.741	0.810

The sample covers listed firms in 35 OECD countries from 1988 to 2017. The variable definitions are presented in Table 5 (Appendix). The t-statistics are computed using two-way clustering by country and year. *, ** and *** indicate significance at 10%, 5% and 1% levels, respectively, based on two-tailed tests. Model (2) is as follows:

$$
\begin{aligned}
\Delta lnXOPR_{n,i.t} = {} & \beta_0 \\
& + \big(\beta_1 + \theta_1 Tax\_Competitive_{n,t} + \nu_1 Tax\_Corporate_{n,t} + \upsilon_1 LossCF_{n,i,t} + \rho_1 REGEPL_{n,t} + \delta_1 TEMPEPL_{n,t} \\
& + \omega_1 LAW_{n,t} + \lambda_1 AINT_{n,i,t} + \mu_1 GDP_{n,t} + \varphi_1 EINT_{n,t}\big)\Delta lnSALE_{n,i,t} \\
& + \big(\beta_2 + \theta_2 Tax\_Competitive_{n,t} + \nu_2 Tax\_Corporate_{n,t} + \upsilon_2 LossCF_{n,i,t} + \rho_2 REGEPL_{n,t} \\
& + \delta_2 TEMPEPL_{n,t} + \omega_2 LAW_{n,t} + \lambda_2 AINT_{n,i,t} + \mu_2 GDP_{n,t} + \sigma_2 SUC_{n,i,t} + \varphi_2 EINT_{n,t}\big) DEC_{n,i,t}\Delta lnSALE_{n,i,t} \\
& + \theta_2 Tax\_Competitive_{n,t} + \nu_2 Tax\_Corporate_{n,t} + \upsilon_3 LossCF_{n,i,t} + \rho_3 REGEPL_{n,t} + \delta_3 TEMPEPL_{n,t} \\
& + \omega_3 LAW_{n,t} + \lambda_3 AINT_{n,i,t} + \mu_3 GDP_{n,t} + \varphi_3 EINT_{n,t} + \varepsilon_{n,i,t}
\end{aligned}
$$

Table 5: Variable Descriptions

Variable	Definition
$SALE_{n,i,t}$	sales revenue for firm *i* in country *n* in year *t*, deflated to control for inflation
$XOPR_{n,i,t}$	operating costs for firm *i* in country *n* in year *t*, deflated to control for inflation
$DEC_{n,i,t}$	dummy variable equal to one for sales decreases from year *t*-1
$TAX_{n,,t}$	the statutory tax rate in country n in year *t*
$Tax\_Competitive_{n,t}$	is the international tax competitive index, collected from the 2016 international tax competitive index report (Pomerleau, 2017). The international tax competitive index ranges from 0 to 100. A higher index indicates a lower level of tax burden
$Tax\_Corporate_{n,t}$	is the annual country-level taxes on corporations and other enterprises as a percentage of GDP, collected from Pomerleau (2017)
$LossCF_{n,i,t}$	is the dummy variable for loss carryforward, which equals one if the sum of net income of year *t* and year *t*-1 is smaller than zero, and 0 otherwise
$REGEPL_{n,t}$	index of employment protection legislation (EPL) for regular employees in country *n* (OECD, 2018). $REGEPL_n$ ranges from 0 to 6, and higher values correspond to stricter employment legislation protection for employees with regular contracts
$TEMPEPL_{n,t}$	index of employment protection legislation for temporary employees in country *n* (OECD, 2018). $TEMPEPL_n$ ranges from 0 to 6, and higher values correspond to stricter employment legislation protection for employees with temporal contracts
$LAW_{n,t}$	is the law origin dummy, which equals 1 if the law origin of country *n* is common law, and 0 otherwise
$AINT_{n,i,t}$	log-ratio of total assets to sales
$GDP_{n.i.t}$	percentage growth in real gross national product (GDP) during year *t*
$EINT_{n,i,t}$	log-ratio of total number of employees to sales
$SUC_{n,i,t}$	successive decrease dummy that takes 1 if $REV_{i,t-1}<REV_{i,t-2}$, and 0 otherwise

Table 6: Financial Reporting and Tax System Characteristics

Countries	Accounting Principles	Country Specific Deduction Treatment – Excerpts from Deloitte and PwC Guides
Australia	IFRS	'Business expenses are tax deductible if they are necessarily incurred in gaining or producing assessable income' (Deloitte, 2024).
Austria	IFRS	'Normal business expenses may be deducted in computing taxable income' (Deloitte, 2024).
Belgium	IFRS	'Companies may deduct all business expenses when calculating taxable income, subject to the general conditions that they relate to the taxable period, sufficient documentation is available, and the expenses are "legitimate" (i.e., incurred or borne to obtain or retain taxable income), and at arm's length' (Deloitte, 2024).
Canada	IFRS	'Business expenses that are reasonable and paid out to earn income are deductible for income tax purposes unless disallowed by a specific provision in the Income Tax Act. Some expenses are deductible subject to limitation (e.g., charitable donations, entertainment expenses, the cost of providing an automobile to employees). Deduction of capital expenditures is specifically prohibited, but special provisions may allow depreciation or amortization of these expenditures' (PwC, 2024).
Chile	IFRS	'Direct costs of goods and services and the necessary expenses incurred in earning that income are deductible' (Deloitte, 2024).
Czech Republic	IFRS	'All expenses incurred to generate, ensure, and maintain taxable income are deductible if documented by the taxpayer, subject to limits specified in the corporate income tax law and in specific legislation' (Deloitte, 2024). 'There are special rules regarding tax deductibility of special types of expenses (e.g., tax depreciation and amortization, interest expenses)' (PwC, 2024).
Denmark	IFRS	'Normal business expenses may be deducted when computing taxable income' (Deloitte, 2024).
Estonia	IFRS	'Distributable profits are determined based on financial statements drawn up in accordance with Estonian GAAP or IAS/IFRS, and there are no adjustments to accounting profits for tax purposes (e.g., tax depreciation, tax loss carryforward or carryback)' (PwC, 2024).
Finland	IFRS	'Normal business expenses may be deducted in computing taxable income' (Deloitte, 2024).

Countries	Accounting Principles	Country Specific Deduction Treatment – Excerpts from Deloitte and PwC Guides
France	IFRS	'Normal business expenses may be deducted in computing taxable income' (Deloitte, 2024).
Germany	IFRS	'Business expenses may be deducted in computing taxable income' (Deloitte, 2024).
Greece	IFRS	'Normal business expenses are deductible for tax purposes, provided they are not included on a list of nondeductible expenses, are incurred for the benefit of the entity, reflect real transactions that are recorded in the books in the year incurred, and are supported by the necessary tax records and sufficient documentation' (Deloitte, 2024).
Hungary	IFRS	'In general, costs and expenses incurred in relation to the taxpayer's income-generating business activity are deductible for corporate income tax purposes' (PwC, 2024).
Iceland	IFRS	'Deductible operating expenses are comprised of all the expenses and costs needed to provide, insure, and maintain income (e.g., interest expense, employee expense, travel expense, insurance expense)' (PwC, 2024).
Ireland	IFRS	'In general, arm's-length expenses that are incurred wholly and exclusively for the purposes of the trade are tax-deductible' (PwC, 2024).
Israel	IFRS	'Costs incurred by a branch or a company are deductible as a business expense for tax purposes where they are incurred "wholly and exclusively" in the production of income' (PwC, 2024).
Italy	IFRS	'Expenses reported in the statutory financial statement are deductible' (PwC, 2024)
Japan	GAAP (Japanese)	'The taxable income in each accounting period is the excess of gross taxable revenue over total deductible business expenses' (Deloitte, 2024).
Korea	IFRS	'In general, expenses incurred in the ordinary course of business are deductible, subject to the requirements for the maintenance of support documents' (PwC, 2024).
Latvia	IFRS	'Distributable profits are measured according to financial statements drawn up in accordance with Latvian GAAP or IAS/IFRS, and there are no adjustments to accounting profits for tax purposes (e.g., tax depreciation/capital allowances, tax loss carryforward/carryback)' (PwC, 2024).
Luxembourg	IFRS	'Business expenses are deductible, exemption under certain conditions' (Deloitte, 2024).
Mexico	IFRS	'Normal business expenses may be deducted in computing taxable income' (Deloitte, 2024). 'However, deductions for certain business expenses are limited (e.g., business meals, use of company-owned cars)' (PwC, 2024).

Countries	Accounting Principles	Country Specific Deduction Treatment – Excerpts from Deloitte and PwC Guides
Netherlands	IFRS	'In principle, all costs relating to the business are deductible' (Deloitte, 2024).
New Zealand	IFRS	'Assessable income from carrying on a business normally includes gross income from the sale of goods, the provision of services, most dividends, interest, and royalties. Deductions generally are allowed for expenses or losses incurred in deriving assessable income or in the course of carrying on a business for the purpose of deriving assessable income for any income year. Deductions (including interest) in relation to residential rental properties may be limited' (Deloitte, 2024).
Norway	IFRS	'Normal business expenses may be deducted in computing taxable income' (Deloitte, 2024).
Poland	IFRS	'Normal business expenses (including interest and other financing costs) may be deducted in computing taxable income with some limitations' (Deloitte, 2024).
Portugal	IFRS	'Expenses are deductible to the extent they are necessary for the purpose of generating taxable income and are properly documented' (Deloitte, 2024).
Slovak Republic	IFRS	'Normal business expenses may be deducted in computing the tax base' (Deloitte, 2024).
Slovenia	IFRS	'Taxable income comprises all income and profits from a company's activities, reduced by expenses related to those activities (provided the expenses are properly documented)' (Deloitte, 2024).
Spain	IFRS	'Taxable income includes worldwide profits (with no distinction made between ordinary business income and any other type of income) less deductible expenses and is based on the income disclosed in the individual company's financial statements. Some expenses are not considered deductible for tax purposes (e.g., restrictions may apply to the deductibility of financing expenses, certain provisions, certain employee benefits, penalties, etc.)' (Deloitte, 2024).
Sweden	IFRS	'Expenses incurred in obtaining or safeguarding income subject to tax normally are deductible' (Deloitte, 2024).
Switzerland	GAAP (Swiss)	'Generally, all business expenses that are booked in the statutory accounts are tax deductible, assuming they are economically/commercially justified from a tax perspective' (PwC, 2024).
Türkiye	IFRS	'Turkish Corporate income tax legislation allows a deduction for all the "ordinary and necessary" expenses paid or incurred for the generation and sustenance of income during the taxable year in carrying on any trade or business' (PwC, 2024).

Countries	Accounting Principles	Country Specific Deduction Treatment – Excerpts from Deloitte and PwC Guides
United Kingdom	IFRS	'Normal business expenses may be deducted in computing taxable income, provided these are not capital expenditure' (Deloitte, 2024).
United States	GAAP (US)	'Domestic corporations are taxed on nearly all gross income (including, e.g., income from a business, compensation for services, dividends, interest, royalties, rents, fees and commissions, gains from dealings in property, income from a partnership), from whatever source derived (unless a specific exemption or exclusion applies), less allowable deductions for depreciation, amortization, expenses, losses, and certain other items' (Deloitte, 2024).

Notes: country and tax characteristics used in this Table were obtained from https://www.dits.deloitte.com/#TaxGuides and https://taxsummaries.pwc.com/.

Table 7: Interview Questions

Demographics

1. What is your job title?
2. How many years of corporate-tax related experience do you have?
3. What size is the company you currently work for (e.g., international, national, regional, local)?
4. What is the industry of your company?

Tax-related Questions

5. Could different statutory tax rates impact your company in terms of cost management? If so, how do different statutory tax rates impact cost stickiness?*
6. From a decision-making point of view, how would a higher or lower statutory tax rate change the decision rule for the optimal level of cost stickiness for your company?
7. Are the operational decisions resulting in asymmetric cost behaviour (e.g., cost stickiness) made at the corporate level or at the divisional level for your company?
8. If statutory tax rates affect your company's cost adjustments, do you approach this issue from the accounting treatment angle or the tax treatment angle? What are your major considerations (e.g., stable earnings or tax savings)?
9. Could you list the top three types of costs that are the most sensitive to changes in the levels of statutory tax rate?

* Cost stickiness describes the asymmetric behaviour between costs and activities, demonstrating that companies decrease costs slower when sales decrease as compared to increasing costs in response to an increase in sales.