

Appendices

A Conceptual Framework

Let all subsidiaries have a common objective function of after-tax profit maximisation achieved by maximizing production across all plants and minimizing tax liabilities. The manager at the HQ is responsible for the tax planning strategy of the entire corporate group.³⁸ Let a firm have two subsidiaries, one in a high tax (with tax rate τ_H) and one in a low tax (with tax rate τ_L) location. The HQ manager wants to minimize its tax liabilities, by reallocating a share, $\alpha \in [0, 1]$, of profits from the high tax location to the low tax location. Moving profits is costly and we assume that the cost of profit shifting (c) increases in the amount of profits (π) that a firm makes and in the share of profits (α) that a firm shifts at an increasing rate, such that $\frac{\partial c}{\partial \pi} > 0$, $\frac{\partial c}{\partial \alpha} > 0$, and $\frac{\partial^2 c}{\partial \alpha^2} > 0$ (consistent with Hines and Rice (1994); Huizinga et al. (2008)).

We assume that profits are an increasing function of the quality of management (m), such that $\frac{\partial \pi(m)}{\partial m} > 0$ (consistent with Bloom, Sadun and Van Reenen (2012)). We propose that the cost function that the HQ manager faces takes the form $c(\alpha, m, \pi(m))$. In particular, we include an additional factor: the quality of management of the MNE ($m > 0$). Firms with better management face lower costs for shifting profits: $\frac{dc}{dm} = \frac{\partial c}{\partial m} + \frac{\partial c}{\partial \pi} \frac{\partial \pi(m)}{\partial m} < 0$. We assume that they have decreasing cost of shifting when the share of shifted profits increases, such that $\frac{\partial^2 c}{\partial \alpha \partial m} < 0$, and those that shift more profits in levels are also going to face decreasing costs, such that $\frac{\partial^2 c}{\partial \alpha \partial \pi} < 0$.

The firm is minimizing its tax liability:

$$\min_{\alpha \in [0,1]} \tau_H(1 - \alpha)\pi(m) + \tau_L\alpha\pi(m) + c(\alpha, m, \pi(m))$$

The first order condition for this problem is: $(\tau_L - \tau_H)\pi(m) + \frac{\partial c}{\partial \alpha} = 0$

We use this simple minimization problem to show how management affects the share of shifted profits; that is, the sign of $\frac{\partial \alpha^*}{\partial m}$. Thus, we differentiate the FOC with respect to m , which yields:

$$\frac{\partial \alpha^*}{\partial m} = \frac{-\frac{\partial^2 c}{\partial \alpha \partial m} + (\tau_H - \tau_L)\frac{\partial \pi(m)}{\partial m} - \frac{\partial^2 c}{\partial \alpha \partial \pi} \frac{\partial \pi(m)}{\partial m}}{\frac{\partial^2 c}{\partial \alpha^2}} > 0$$

Proposition: Better management increases share of shifted profits α .

³⁸While a subsidiary can also be involved in tax planning decisions, we assume it is always in conjunction with the HQ as tax planning across borders — profit shifting — involves at least two entities located in different jurisdictions and requires a certain level of coordination.

B Appendix Tables and Figures

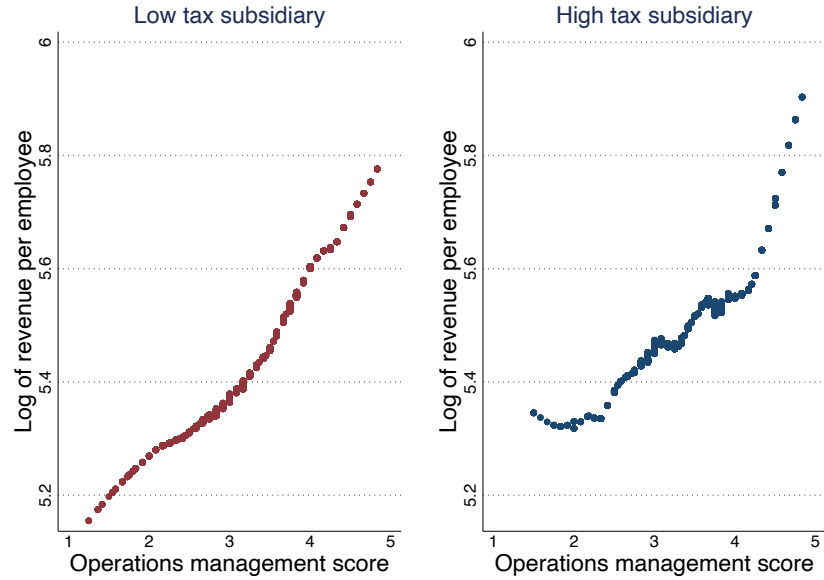
B.1 Additional baseline results

Table B1: Correlates of Management Practices.

	(1)	(2)	(3)	(4)
	z-management	z-management	Formal management	Formal management
Firm characteristics				
Ln(employment)	0.011 (0.007)	0.010 (0.007)	0.002 (0.003)	0.001 (0.003)
Ln(fixed assets)	0.005** (0.002)	0.005** (0.002)	0.002** (0.001)	0.002** (0.001)
Ln(# subsidiaries)	0.079*** (0.012)	0.051*** (0.014)	0.026*** (0.005)	0.011* (0.006)
Fixed asset growth	-0.001 (0.065)	-0.018 (0.064)	0.007 (0.031)	-0.001 (0.031)
z-centralization	-0.012 (0.023)	-0.012 (0.023)	0.010 (0.011)	0.010 (0.011)
Aggressiveness				
BTD > median	0.013 (0.059)	0.018 (0.059)	-0.004 (0.027)	-0.001 (0.027)
Effective Tax Rate	-0.106 (0.134)	-0.110 (0.133)	-0.052 (0.058)	-0.053 (0.058)
Book tax differences (median)	0.609 (0.513)	0.577 (0.506)	0.208 (0.221)	0.192 (0.216)
Has a tax haven subsidiary		0.300*** (0.061)		0.152*** (0.030)
Tax Rate				
Subsidiary Corp Tax (median)	0.535 (1.757)	0.287 (1.744)	0.901 (0.800)	0.776 (0.793)
Observations	1783	1783	1783	1783

Note: Data from Orbis and the World Management Survey. This table shows coefficients from a regression of management practices on a set of explanatory variables. In all columns we average the explanatory variables across all time periods, unless otherwise specified. In columns 1 and 2 the outcome variable is z-management, which is the continuous operations management score. In Columns 3 and 4, the outcome variable is an indicator that takes a value of 1 when the average for the WMS operations management questions (including lean management, monitoring and target-setting) is 3 or above, on a scale of 1 to 5. The WMS z-centralization measure is a score from 1 (most centralized) to 5 (most decentralized). BTD > median is a dummy equal to 1 when book-tax difference is above median. Effective tax rate is a ratio of tax liability to profit and loss before taxes. Subsidiary corp tax rate is the median statutory corporate tax rate in the country where a subsidiary is operating. All specifications include country and year fixed effects. Standard errors are robust in all columns.

Figure B1: Performance and Operations Management in Low- and High-tax Country-years.



Note: Data from the World Management Survey and Orbis. Baseline sample includes only firms that for which we observe management scores and were directly matched in both WMS and Orbis. On the horizontal axis we have operations management, which is the average for the WMS operations management questions (including lean management, monitoring and target-setting). On the vertical axis we have log of revenue (sales) per employee. Low tax subsidiary are firms located in countries with below median statutory corporate tax rate for a given year. High tax subsidiary are firms located in countries with above median statutory corporate tax rate for a given year. The graphs present coefficients from local linear regressions run with bandwidth 0.5.

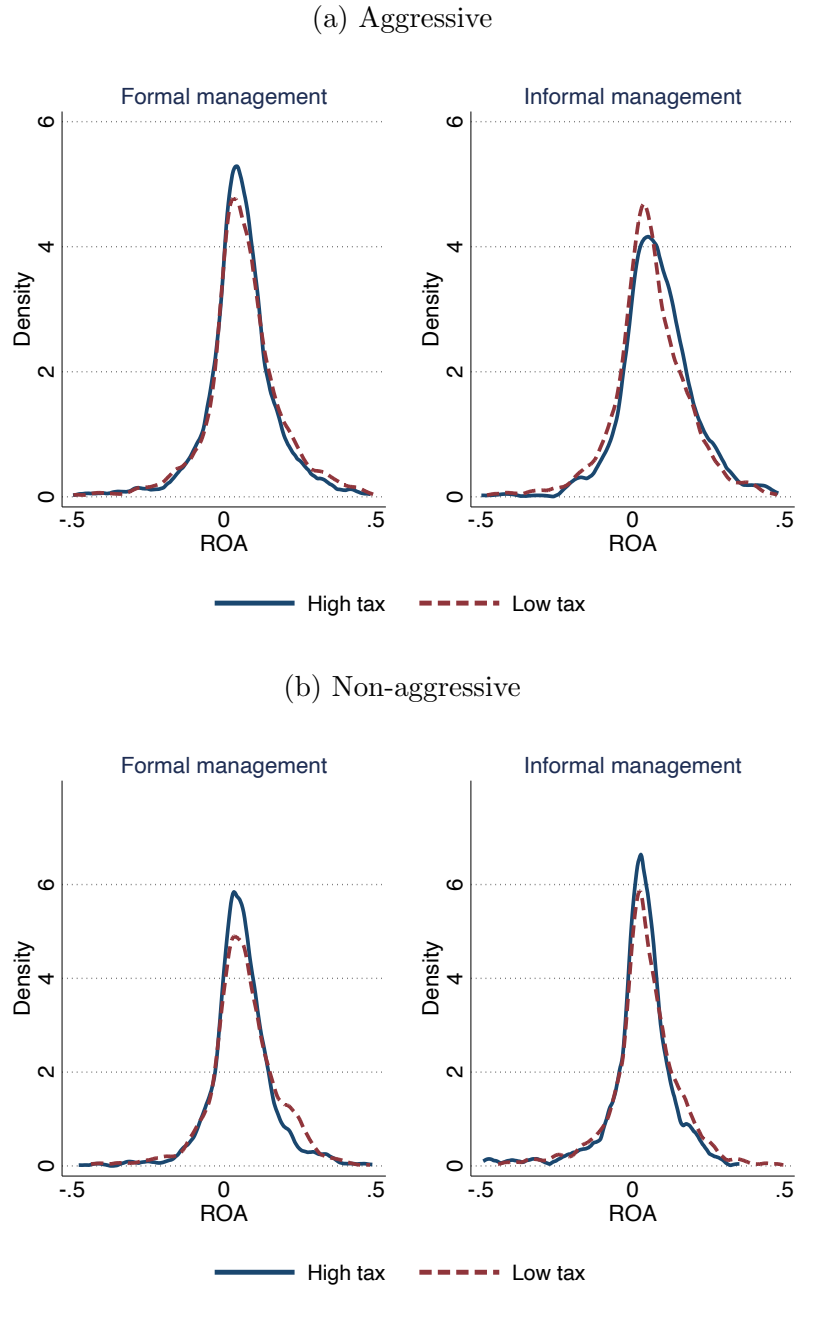
A simple comparison of ROA with EBIT can shed some light on the use of debt shifting by MNEs. Again with the caveat that data is extremely limited for this exercise, we compare firms that have made data on both their ROA (from profit and loss statement) and EBIT (from income statement) available to shed some light on the use of interest deductability by MNEs (Table B2). For this selected sample of firms, there is limited evidence that interest deductability plays a role. Magnitude-size, the interaction coefficient for EBIT as an outcome variable in Column 4 is smaller than the coefficient for ROA in Column 3, but not statistically significant.

Table B2: Understanding the Channels: Alternative Measures of Profitability.

	(1) ROA	(2) ROA*	(3) ROA	(4) EBIT	(5) EBITDA	(6) Depreciation	(7) ETR
Formal management=1	0.041*** (0.015)	0.040*** (0.016)	0.084** (0.036)	0.074** (0.033)	0.071** (0.032)	-0.008 (0.007)	0.059* (0.035)
Subsidiary corp tax rate	-0.236*** (0.075)	-0.221*** (0.079)	0.221 (0.156)	0.121 (0.138)	0.072 (0.133)	-0.067** (0.032)	0.848*** (0.216)
Formal management=1 × Subsidiary corp tax rate	-0.121** (0.054)	-0.117** (0.056)	-0.208* (0.122)	-0.182 (0.112)	-0.159 (0.107)	0.043* (0.024)	-0.296** (0.131)
Country FE	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓
Firm controls	✓	✓	✓	✓	✓	✓	✓
Observations	16076	14129	4741	4741	4741	4741	15216
# firms	1783	1783	517	517	517	517	1750
Dependent Variable Mean	0.058	0.055	0.059	0.061	0.103	0.042	0.187

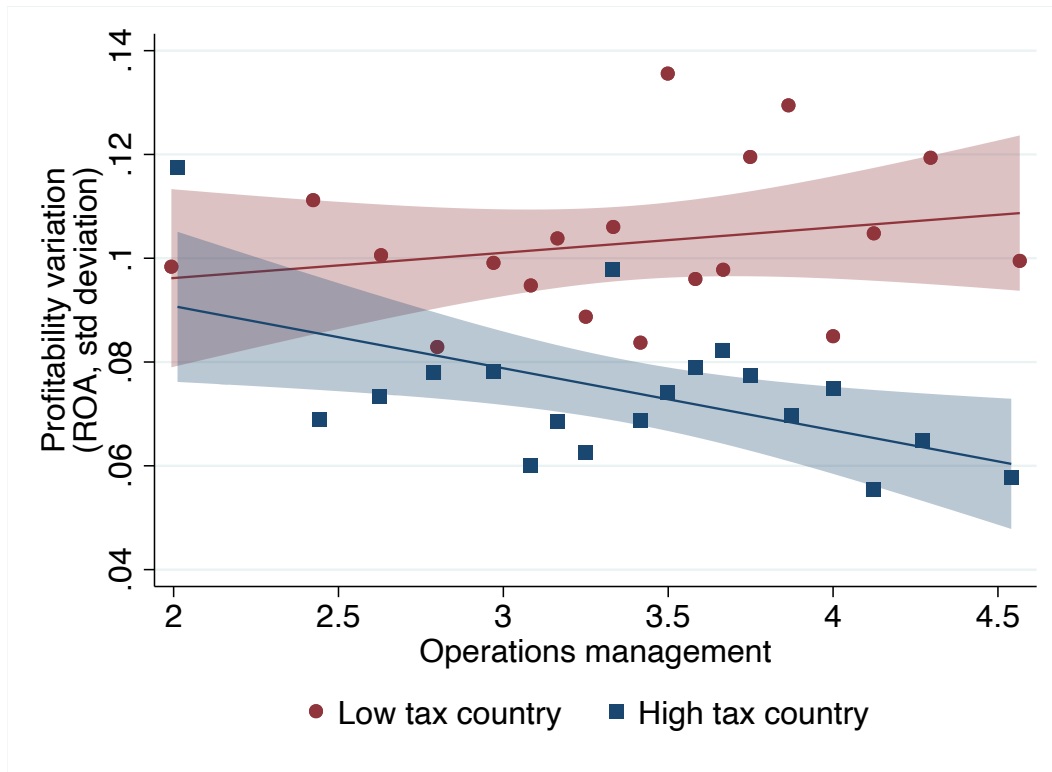
Note: Data from Orbis and the World Management Survey. WMS sample includes only firms for which we observe management scores and were directly matched in both WMS and Orbis. Formal management = 1 is a dummy equal to one when the average for the WMS operations management questions (including lean management, monitoring and target-setting) is 3 or above, on a scale of 1 to 5. Subsidiary corp tax rate is the annual statutory corporate tax rate in the country where a firm is operating. The outcome variable in Columns (1)-(3) is Returns on Assets (ROA) which is the ratio of profit and loss before taxes and total assets. ROA in Columns (1) and (3) is calculated using contemporaneous profit and loss before taxes and assets, while Column (2) uses lagged assets in the denominator. In Column (4) outcome variable is EBIT, defined as earnings before interest and tax. Column (5) outcome is EBITDA, defined as earnings before interest, tax and depreciation. Column (6) outcome variable is depreciation, calculated as the difference between EBITA and EBIT. Column (7) outcome is Effective Tax Rate (ETR), calculated as the ratio of tax liability to profit and loss before taxes. In Column (3), we limit the sample to only firms for which we observe both EBIT and EBITDA as a reference point. All specifications include country and year fixed effects. Firm controls include log of employment, log of fixed assets and log of number of subsidiaries in the MNE. Standard errors are robust in all columns.

Figure B2: Bunching of ROA around Zero for Firms in Tax Havens by Management Type.



Note: Data from the World Management Survey and Orbis. Static sample includes only firms that for which we observe management scores and were directly matched in both WMS and Orbis. We plot the distribution of ROA, which is the ratio of profit and loss to total assets. ROA restricted between -1 and 1. Structured management is a dummy equal to one when the average for the WMS operations management questions (including lean management, monitoring and target-setting) is 3 or above, on a scale of 5. High tax is a dummy equal to 1 when the firm is located in a country with above median statutory corporate tax rate. Hence, blue solid lines show the distribution of ROA for subsidiaries in high tax countries, while red dashed lines for subsidiaries in low tax countries. In Panel A we show the ROA distributions for aggressive firms and in Panel B for non-aggressive. Non-aggressive are firms that have no subsidiary or headquarters located in a tax-haven and Aggressive are firms that have at least one subsidiary or headquarter located in a tax haven. Out of 1325 MNEs, 50.61% have at least one subsidiary in a tax haven.

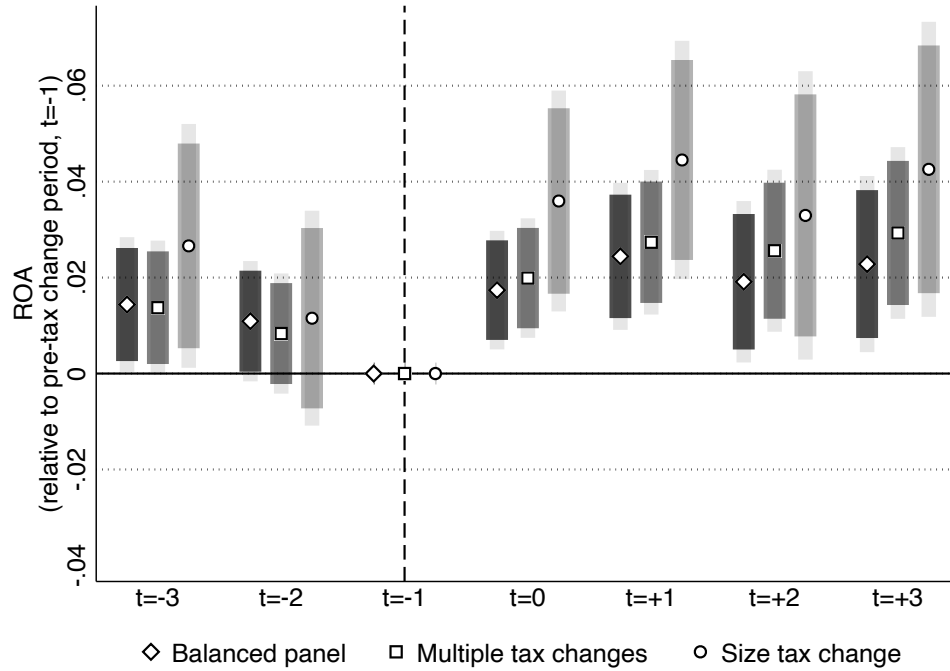
Figure B3: Profit variability and management in high and low tax countries



Note: Data from Orbis and the World Management Survey. This figure shows the binned scatterplot of the standard deviation of profitability (ROA) across 2004-2018 at the subsidiary level across 20 bins of the operations management measure (average of lean operations, monitoring and target-setting from the WMS). The line depicts the fitted line of best fit (OLS) and the shaded areas are the 95 percent confidence intervals. Squares represent subsidiaries in high tax countries. Circles represent subsidiaries in low tax countries.

B.2 Additional event study results

Figure B4: Event Study Sensitivity Analysis.



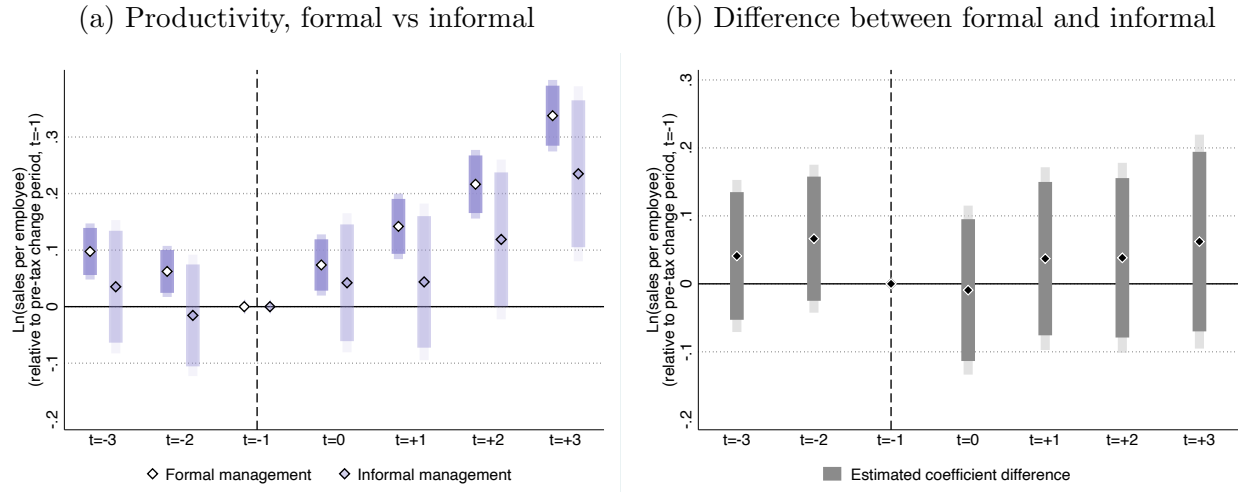
Note: Data from the World Management Survey and Orbis. In this figure we plot yearly coefficients from event study estimation of the difference between formal and informal management firms. Darker bars with diamond markers correspond to the event study run only on the observations belonging to a balanced panel. Mid-dark bars with square uses a sample that includes multiple tax changes. Lighter bars with circle markers include controls for the size of the tax change.

Table B3: Pre-post Summary Table, Event Study Sample, Sales per Employee.

Dependent variable:	All firms			Aggressive firms			Non-Aggressive firms		
ln(sales per employee)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Formal management=1	0.060 (0.142)	0.051 (0.111)		0.052 (0.157)	0.045 (0.121)		0.063 (0.125)	0.078 (0.110)	
POST tax cut=1	0.183 (0.111)	0.157* (0.088)	0.071 (0.054)	0.247** (0.125)	0.222** (0.101)	0.119** (0.060)	-0.180** (0.083)	-0.305*** (0.108)	-0.293*** (0.096)
Formal management=1 × POST tax cut=1	-0.021 (0.136)	-0.028 (0.117)	0.074 (0.057)	-0.068 (0.150)	-0.062 (0.128)	0.044 (0.062)	0.094 (0.110)	0.086 (0.112)	0.154 (0.112)
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Firm controls		✓	✓		✓	✓		✓	✓
Macro controls		✓	✓		✓	✓		✓	✓
MNE FE			✓			✓			✓
Observations	65131	55803	55803	61622	52939	52939	3509	2864	2864
# firms	11047	11047	11047	10490	10490	10490	557	557	557
Dependent Variable Mean	12.811	12.811	12.811	12.819	12.819	12.819	12.671	12.671	12.671

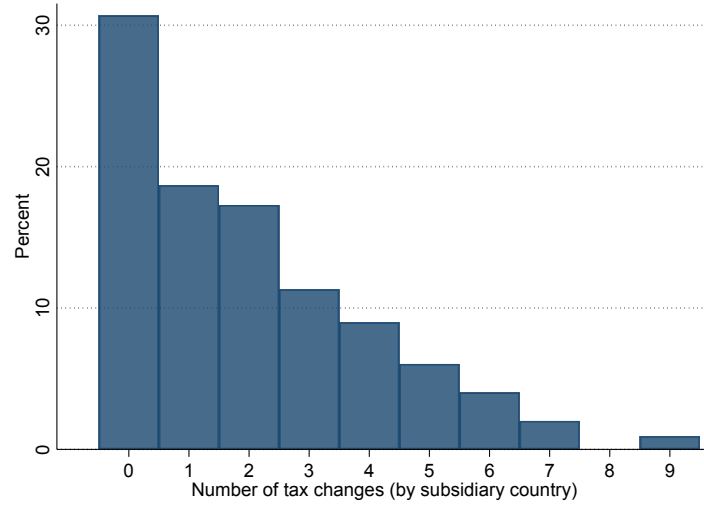
Note: Data from Orbis and the World Management Survey. This table includes only the firms in the Event Study sample, which includes all subsidiaries belonging to an MNE that has at least one plant observed in the WMS. Management data is then averaged across all subsidiaries within an MNE. Aggressive firms are defined as having a subsidiary in a tax haven. Non-aggressive firms are defined as not having any subsidiaries in a tax haven. The event considered here is firms that experienced one tax rate cut during the sample period. POST is a dummy equal to 1 in the years after the tax rate cut. The outcome variable in all columns is ROA (returns on assets) which is the ratio of profit and loss before taxes and total assets. Firm controls include log of employment, log of fixed assets and log of number of subsidiaries in the MNE. Standard errors are clustered at the MNE level in Columns 3, 6 and 9 and robust otherwise.

Figure B5: Event Study: Tax Cuts and Productivity.

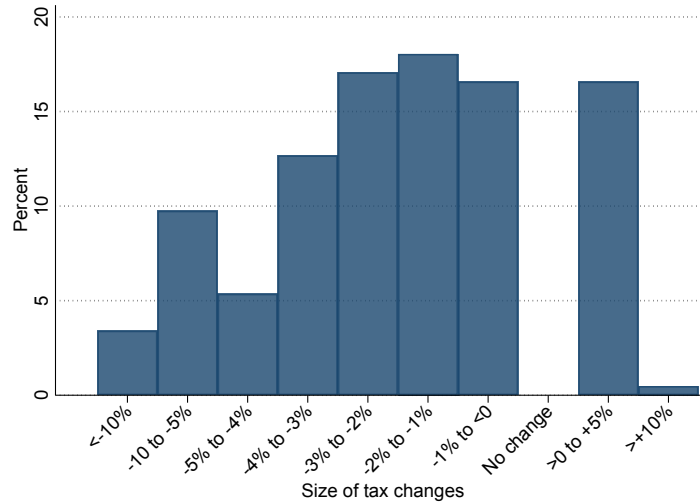


Note: Data from the World Management Survey and Orbis. This figure plots yearly coefficients from event study estimation, where the outcome variable is performance (log of sales per employee). White diamonds in Panel A correspond to coefficients for firms with formal management practices in place, where formal management is defined as a dummy equal to one when the average for the WMS operations management questions (including lean management, monitoring and target-setting) is 3 or above, on a scale of 1 to 5. Shaded diamonds in Panel A correspond to coefficients for firms with informal management (scores below 3 on the 1 to 5 scale). In Panel B, we plot the coefficients for the estimated difference between formal and informal management firms.

Figure B6: Number and scale of tax changes between 2004 and 2016



(a) Number of tax changes



(b) Scale of tax changes

Note: Data from the World Management Survey and Centre for Business Taxation at the University of Oxford. In Panel A we plot the distribution of statutory corporate tax rate changes for firms in our sample. 30% of firms in our sample is located in countries with no statutory corporate tax rate changes. 8% of firms are located in countries with 4 statutory tax rate changes during the sample period. In Panel B we plot the distribution of the size of tax rate changes. 17% of firms in our sample experienced a tax rate decrease between 0 and 1%. 5% of firms experiences a tax rate decrease of 4-5%. Financial data comes from Orbis and the statutory corporate tax rates data comes from Oxford Centre for Business Taxation.

B.3 Additional mechanism results

Table B4: Individual Management Practices and Tax Rate: Interaction Coefficients.

Table of coefficients: each cell is a unique regression.						
	All		Aggressive		Non-Aggressive	
	ROA		ROA		ROA	
	(1)	(2)	(3)	(4)	(5)	(6)
Z-Index: Lean ops \times Tax Rate	-0.015 (0.022)	-0.007 (0.022)	-0.056** (0.024)	-0.089*** (0.026)	0.220*** (0.050)	0.076** (0.031)
Q1: Lean adoption \times Tax Rate	-0.001 (0.021)	0.006 (0.021)	-0.042* (0.024)	-0.065** (0.026)	0.201*** (0.051)	0.067** (0.029)
Q2: Rationale for Lean \times Tax Rate	-0.030 (0.021)	-0.022 (0.021)	-0.063*** (0.022)	-0.097*** (0.025)	0.169*** (0.049)	0.067** (0.029)
Z-Index: Monitoring \times Tax Rate	-0.074*** (0.022)	-0.068*** (0.022)	-0.107*** (0.025)	-0.121*** (0.027)	0.041 (0.056)	-0.003 (0.029)
Q1: Process Doc \times Tax Rate	-0.045** (0.022)	-0.037 (0.023)	-0.077*** (0.025)	-0.028 (0.025)	0.107** (0.055)	0.002 (0.028)
Q2: Perf tracking \times Tax Rate	-0.059** (0.024)	-0.053** (0.024)	-0.092*** (0.026)	-0.125*** (0.026)	0.004 (0.065)	0.053* (0.032)
Q3: Perf review \times Tax Rate	-0.100*** (0.023)	-0.096*** (0.022)	-0.132*** (0.025)	-0.123*** (0.027)	-0.019 (0.059)	-0.076** (0.032)
Q4: Perf dialogue \times Tax Rate	-0.048** (0.024)	-0.045* (0.024)	-0.063** (0.028)	-0.152*** (0.029)	0.006 (0.040)	0.070** (0.032)
Q5: Consequence mgmt \times Tax Rate	-0.048** (0.023)	-0.040* (0.023)	-0.065** (0.026)	-0.056** (0.028)	0.040 (0.056)	-0.054* (0.028)
Z-Index: Targets \times Tax Rate	-0.011 (0.025)	-0.006 (0.025)	-0.048* (0.028)	-0.110*** (0.031)	0.107** (0.054)	0.051 (0.034)
Q1: Type of targets \times Tax Rate	-0.065*** (0.022)	-0.062*** (0.022)	-0.086*** (0.024)	-0.070*** (0.026)	-0.001 (0.058)	-0.047 (0.029)
Q2: Interconnection \times Tax Rate	-0.007 (0.020)	-0.001 (0.020)	-0.044* (0.023)	-0.043 (0.026)	0.045 (0.043)	0.029 (0.025)
Q3: Time horizon \times Tax Rate	-0.001 (0.022)	0.004 (0.021)	-0.020 (0.024)	-0.091*** (0.026)	0.106** (0.045)	0.045 (0.030)
Q4: Stretch goals \times Tax Rate	0.047* (0.028)	0.050* (0.027)	0.019 (0.030)	-0.076** (0.030)	0.065 (0.065)	0.094*** (0.036)
Q5: Clarity of goals \times Tax Rate	-0.010 (0.022)	-0.007 (0.022)	-0.009 (0.025)	-0.063** (0.028)	0.049 (0.057)	0.030 (0.030)
<i>Observations</i>	<i>16057</i>	<i>16057</i>	<i>11752</i>	<i>6737</i>	<i>4305</i>	<i>8465</i>
<i># firms</i>	<i>1781</i>	<i>1781</i>	<i>1261</i>	<i>1512</i>	<i>520</i>	<i>1588</i>
<i>Dependent Variable Mean</i>	<i>0.058</i>	<i>0.058</i>	<i>0.063</i>	<i>0.122</i>	<i>0.044</i>	<i>0.017</i>
Aggressiveness measure			Tax Haven	BTD	Tax Haven	BTD
Country FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
Firm controls		✓	✓	✓	✓	✓

Note: Data from Orbis and the World Management Survey. Tax rate is the statutory corporate tax rate in the country where a firm is operating. The definition of each management practice is in Table B8. The outcome variable in all columns is ROA (returns on assets) which is the ratio of profit and loss before taxes and total assets. In columns 3 and 4 aggressive firms are those with tax haven as part of their ownership structure or those with above median book tax difference (BTD) respectively. In columns 5 and 6 non-aggressive firms are those without tax havens as part of their ownership structure or those with below median book tax difference (BTD) respectively. Firm controls include log of employment, log of fixed assets and log of number of subsidiaries in the MNE. Standard errors are robust in all columns.

Table B5: Individual Management Practices and Tax Rate: Interaction Coefficients.

Table of coefficients: each cell is a unique regression						
	All		Aggressive		Non-Aggressive	
	ROA		ROA		ROA	
	(1)	(2)	(3)	(4)	(5)	(6)
Z-Index: People \times Tax Rate	-0.039*	-0.038*	-0.099***	-0.101***	0.096*	0.044
	(0.023)	(0.023)	(0.026)	(0.031)	(0.053)	(0.029)
Q1: Talent recruitment \times Tax Rate	-0.054**	-0.051**	-0.089***	-0.096***	0.017	0.009
	(0.021)	(0.021)	(0.023)	(0.027)	(0.059)	(0.028)
Q2: Rewarding perf \times Tax Rate	-0.024	-0.022	-0.063**	-0.103***	0.073	0.075**
	(0.025)	(0.024)	(0.028)	(0.031)	(0.052)	(0.032)
Q3: Addressing underperf \times Tax Rate	-0.027	-0.017	-0.033	-0.028	-0.019	-0.014
	(0.022)	(0.022)	(0.024)	(0.026)	(0.051)	(0.029)
Q4: Promotions \times Tax Rate	-0.041*	-0.038*	-0.094***	-0.084***	0.109**	0.023
	(0.023)	(0.023)	(0.026)	(0.028)	(0.046)	(0.032)
Q5: Distinctive workplace \times Tax Rate	-0.069***	-0.073***	-0.116***	-0.097***	-0.013	0.008
	(0.022)	(0.022)	(0.024)	(0.027)	(0.051)	(0.029)
Q6: Talent retention \times Tax Rate	0.007	0.006	-0.046*	-0.066**	0.209***	0.061**
	(0.024)	(0.024)	(0.026)	(0.030)	(0.062)	(0.031)
<i>Observations</i>	16053	16053	11756	6728	4297	8467
<i># firms</i>	1781	1781	1262	1511	519	1588
<i>Dependent Variable Mean</i>	0.058	0.058	0.063	0.122	0.044	0.017
Bonus size \times Tax Rate	-0.415***	-0.472***	-0.311*	-0.236	-1.915***	-0.127
	(0.158)	(0.161)	(0.177)	(0.207)	(0.384)	(0.202)
Bonus share: sub perf \times Tax Rate	-0.146	-0.137	-0.022	0.074	-0.681*	-0.270
	(0.151)	(0.150)	(0.166)	(0.235)	(0.353)	(0.173)
Bonus share: MNE perf \times Tax Rate	-0.321***	-0.304***	-0.237**	-0.266***	-0.297	-0.098
	(0.090)	(0.090)	(0.109)	(0.091)	(0.221)	(0.140)
<i>Observations</i>	8112	8112	6048	3428	2064	4139
<i># firms</i>	894	894	649	761	245	793
<i>Dependent Variable Mean</i>	0.060	0.060	0.067	0.128	0.038	0.017
Aggressive measure			Tax Haven	BTD	Tax Haven	BTD
Country FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
Firm controls		✓	✓	✓	✓	✓

Note: Data from Orbis and the World Management Survey. Tax rate is the statutory corporate tax rate in the country where a firm is operating. The definition of each management practice is in Table B8. The outcome variable in all columns is ROA (returns on assets) which is the ratio of profit and loss before taxes and total assets. In columns 3 and 4 aggressive firms are those with tax haven as part of their ownership structure or those with above median book tax difference (BTD) respectively. In columns 5 and 6 non-aggressive firms are those without tax havens as part of their ownership structure or those with below median book tax difference (BTD) respectively. Firm controls include log of employment, log of fixed assets and log of number of subsidiaries in the MNE. Standard errors are robust in all columns.

Figure B7: Mechanisms: Management Practices and Firm Productivity for Aggressive and Non-aggressive Firms.



Note: Data from the World Management Survey and Orbis. This figure plots the interaction coefficients from a regression of performance (log of sales per employee) on each of the 18 individual management topics, subsidiary corporate tax rates and controls for firm size (log of fixed assets, log of employment, log of number of subsidiaries) as well as year and industry fixed effects. We classify firms as “aggressive” if they have a subsidiary in a tax haven. Darker color markers indicate statistically significant coefficients (at the 5 percent level), and light gray markers indicate coefficients that are not significantly different from zero (at the 5 percent level).

Table B6: Table of Coefficients: Interaction Between Individual Management Practices and Tax Rate.

	All		Aggressive		Non-Aggressive	
	ln(sales per employee) (1)	ln(sales per employee) (2)	ln(sales per employee) (3)	ln(sales per employee) (4)	ln(sales per employee) (5)	ln(sales per employee) (6)
Z-Index: Lean ops \times Tax Rate	0.749*** (0.216)	0.547*** (0.170)	0.663*** (0.194)	-0.101 (0.217)	-0.248 (0.299)	1.240*** (0.261)
Q1: Lean adoption \times Tax Rate	0.560*** (0.206)	0.480*** (0.162)	0.577*** (0.186)	-0.080 (0.214)	-0.117 (0.278)	1.129*** (0.236)
Q2: Rationale for Lean \times Tax Rate	0.762*** (0.202)	0.480*** (0.161)	0.616*** (0.185)	-0.101 (0.200)	-0.264 (0.275)	1.055*** (0.257)
Z-Index: Monitoring \times Tax Rate	0.373* (0.216)	0.493*** (0.178)	0.492** (0.207)	0.113 (0.229)	-0.392 (0.269)	0.794*** (0.261)
Q1: Process Doc \times Tax Rate	0.182 (0.201)	0.418** (0.167)	0.230 (0.198)	0.017 (0.227)	0.520** (0.251)	0.742*** (0.234)
Q2: Perf tracking \times Tax Rate	0.737*** (0.208)	0.854*** (0.169)	0.764*** (0.197)	0.267 (0.208)	0.749*** (0.278)	1.139*** (0.249)
Q3: Perf review \times Tax Rate	0.075 (0.210)	0.164 (0.170)	0.184 (0.200)	-0.162 (0.211)	-0.565** (0.281)	0.580** (0.251)
Q4: Perf dialogue \times Tax Rate	0.504** (0.240)	0.476** (0.195)	0.769*** (0.238)	0.249 (0.233)	-0.996*** (0.254)	0.681** (0.307)
Q5: Consequence mgmt \times Tax Rate	-0.101 (0.193)	-0.029 (0.157)	0.023 (0.182)	0.010 (0.206)	-0.883*** (0.328)	-0.042 (0.221)
Z-Index: Targets \times Tax Rate	0.804*** (0.245)	0.652*** (0.203)	0.638*** (0.238)	0.262 (0.244)	0.224 (0.301)	1.165*** (0.310)
Q1: Type of targets \times Tax Rate	0.922*** (0.188)	0.582*** (0.153)	0.702*** (0.171)	0.191 (0.208)	-0.137 (0.296)	0.845*** (0.210)
Q2: Interconnection \times Tax Rate	0.757*** (0.208)	0.571*** (0.169)	0.502** (0.202)	0.282 (0.216)	0.104 (0.234)	0.963*** (0.243)
Q3: Time horizon \times Tax Rate	0.553*** (0.203)	0.429** (0.168)	0.487** (0.193)	0.151 (0.213)	-0.180 (0.274)	0.830*** (0.252)
Q4: Stretch goals \times Tax Rate	-0.266 (0.257)	0.183 (0.216)	0.001 (0.266)	0.230 (0.242)	0.425 (0.294)	0.321 (0.350)
Q5: Clarity of goals \times Tax Rate	-0.021 (0.192)	-0.118 (0.155)	-0.112 (0.179)	-0.315 (0.206)	-0.128 (0.298)	0.141 (0.219)
<i>Observations</i>	<i>15601</i>	<i>15601</i>	<i>11394</i>	<i>6600</i>	<i>4207</i>	<i>8275</i>
<i># firms</i>	<i>1757</i>	<i>1757</i>	<i>1246</i>	<i>1494</i>	<i>511</i>	<i>1570</i>
<i>Dependent Variable Mean</i>	<i>12.370</i>	<i>12.370</i>	<i>12.400</i>	<i>12.416</i>	<i>12.288</i>	<i>12.377</i>
Aggressive measure			Tax Haven	BTD	Tax Haven	BTD
Country FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
Firm controls		✓	✓	✓	✓	✓

Note: Data from Orbis and the World Management Survey. Tax rate is the statutory corporate tax rate in the country where a firm is operating. The definition of each management practice is in Table B8. The outcome variable in all columns is ROA (returns on assets) which is the ratio of profit and loss before taxes and total assets. In columns 3 and 4 aggressive firms are those with tax haven as part of their ownership structure or those with above median book tax difference (BTD) respectively. In columns 5 and 6 non-aggressive firms are those without tax havens as part of their ownership structure or those with below median book tax difference (BTD) respectively. Firm controls include log of employment, log of fixed assets and log of number of subsidiaries in the MNE. Standard errors are robust in all columns.

Table B7: Table of Coefficients: Interaction Between Individual Management Practices and Tax Rate.

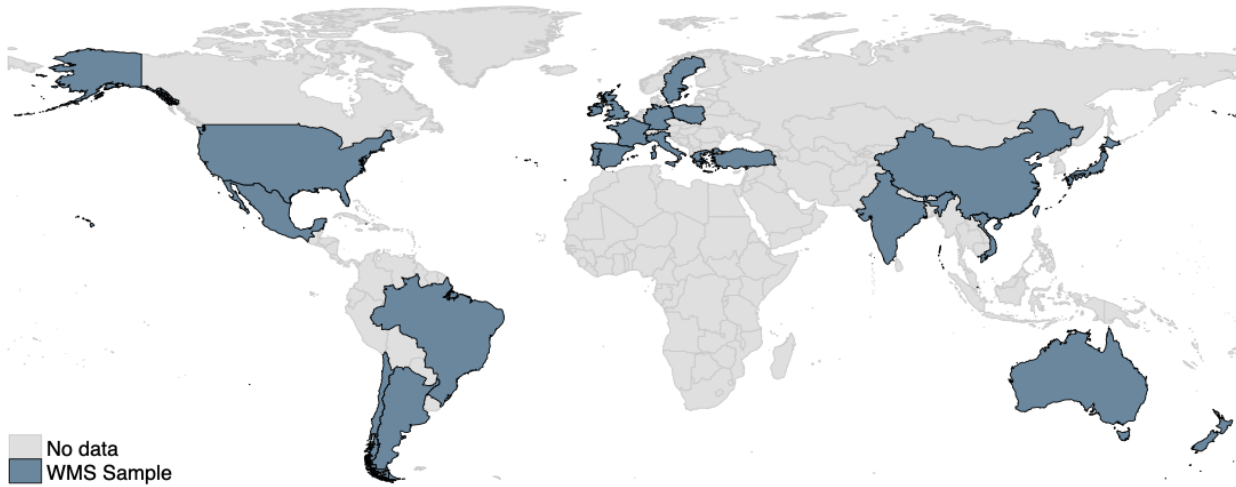
	All		Aggressive		Non-Aggressive	
	ln(sales per employee)	ln(sales per employee)	ln(sales per employee)	ln(sales per employee)	ln(sales per employee)	ln(sales per employee)
	(1)	(2)	(3)	(4)	(5)	(6)
Z-Index: People \times Tax Rate	-0.074 (0.196)	0.133 (0.160)	0.167 (0.188)	-0.085 (0.214)	-0.637** (0.260)	0.447* (0.231)
Q1: Talent recruitment \times Tax Rate	0.058 (0.201)	0.080 (0.159)	0.178 (0.183)	-0.111 (0.205)	-0.662** (0.303)	0.488** (0.222)
Q2: Rewarding perf \times Tax Rate	-0.190 (0.182)	-0.190 (0.154)	-0.142 (0.185)	-0.613*** (0.204)	-0.478* (0.284)	0.035 (0.204)
Q3: Addressing underperf \times Tax Rate	0.107 (0.175)	-0.019 (0.144)	-0.033 (0.167)	0.294 (0.189)	-0.637** (0.251)	-0.414** (0.205)
Q4: Promotions \times Tax Rate	-0.318* (0.185)	-0.125 (0.153)	-0.033 (0.181)	-0.380* (0.202)	-0.678*** (0.259)	0.185 (0.218)
Q5: Distinctive workplace \times Tax Rate	-0.400* (0.216)	-0.020 (0.169)	-0.017 (0.197)	-0.152 (0.224)	-0.665** (0.291)	0.553** (0.241)
Q6: Talent retention \times Tax Rate	0.047 (0.186)	0.488*** (0.152)	0.385** (0.170)	0.181 (0.193)	0.987*** (0.367)	0.682*** (0.212)
<i>Observations</i>	<i>15597</i>	<i>15597</i>	<i>11398</i>	<i>6591</i>	<i>4199</i>	<i>8277</i>
<i># firms</i>	<i>1757</i>	<i>1757</i>	<i>1247</i>	<i>1493</i>	<i>510</i>	<i>1570</i>
<i>Dependent Variable Mean</i>	<i>12.369</i>	<i>12.369</i>	<i>12.400</i>	<i>12.415</i>	<i>12.287</i>	<i>12.377</i>
Bonus size \times Tax Rate	1.677 (1.468)	0.929 (0.960)	0.800 (1.037)	-0.314 (1.310)	0.128 (2.341)	3.041** (1.391)
Bonus share: sub perf \times Tax Rate	-3.783*** (1.168)	-3.068*** (0.995)	-3.802*** (1.154)	-0.170 (1.570)	-2.930 (2.800)	-3.068** (1.259)
Bonus share: MNE perf \times Tax Rate	-0.986 (0.755)	-1.055* (0.592)	-2.258*** (0.726)	-1.329* (0.733)	1.650 (1.073)	0.328 (0.978)
<i>Observations</i>	<i>7803</i>	<i>7803</i>	<i>5813</i>	<i>3327</i>	<i>1990</i>	<i>4021</i>
<i># firms</i>	<i>877</i>	<i>877</i>	<i>638</i>	<i>751</i>	<i>239</i>	<i>780</i>
<i>Dependent Variable Mean</i>	<i>12.336</i>	<i>12.336</i>	<i>12.349</i>	<i>12.393</i>	<i>12.298</i>	<i>12.347</i>
Aggressive measure			Tax Haven	BTD	Tax Haven	BTD
Country FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
Firm controls		✓	✓	✓	✓	✓

Note: Data from Orbis and the World Management Survey. Tax rate is the statutory corporate tax rate in the country where a firm is operating. The definition of each management practice is in Table B8. The outcome variable in all columns is ROA (returns on assets) which is the ratio of profit and loss before taxes and total assets. In columns 3 and 4 aggressive firms are those with tax haven as part of their ownership structure or those with above median book tax difference (BTD) respectively. In columns 5 and 6 non-aggressive firms are those without tax havens as part of their ownership structure or those with below median book tax difference (BTD) respectively. Firm controls include log of employment, log of fixed assets and log of number of subsidiaries in the MNE. Standard errors are robust in all columns.

B.4 Survey questions and coverage map

Figure B8: Sample Coverage Maps.

(a) Countries with at least one firm in the WMS sample



(b) Countries with at least one firm in the Event Study sample

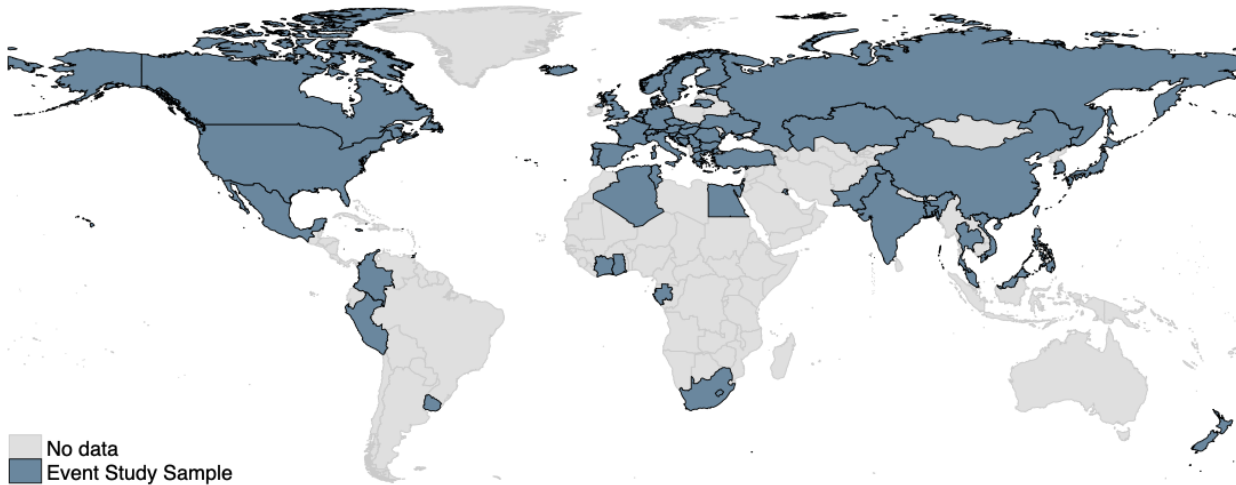


Table B8: World Management Survey Questions: Operations management

Q	Question topic	Explanation of scoring
O1	Adoption of modern practices (Lean operations sub-index)	What aspects of manufacturing have been formally introduced, including just-in-time delivery from suppliers, automation, flexible manpower, support systems, attitudes, and behavior?
O2	Rationale for adoption (Lean operations sub-index)	Were modern manufacturing techniques adopted just because others were using them, or are they linked to meeting business objectives like reducing costs and improving quality?
O3	Process problem documentation (Monitoring sub-index)	Are process improvements made only when problems arise, or are they actively sought out for continuous improvement as part of normal business processes?
O4	Performance tracking (Monitoring sub-index)	Is tracking ad hoc and incomplete, or is performance continually tracked and communicated to all staff?
O5	Performance review (Monitoring sub-index)	Is performance reviewed infrequently and only on a success/failure scale, or is performance reviewed continually with an expectation of continuous improvement?
O6	Performance dialogue (Monitoring sub-index)	In review/performance conversations, to what extent are the purpose, data, agenda, and follow-up steps (like coaching) clear to all parties?
O7	Consequence management (Monitoring sub-index)	To what extent does failure to achieve agreed objectives carry consequences, which can include retraining or re-assignment to other jobs?
O8	Target balance (Target setting sub-index)	Are the goals exclusively financial, or is there a balance of financial and non-financial targets?
O9	Target interconnection (Target setting sub-index)	Are goals based on accounting value, or are they based on shareholder value in a way that works through business units and ultimately is connected to individual performance expectations?
O10	Target time horizon (Target setting sub-index)	Does top management focus mainly on the short term, or does it visualize short-term targets as a “staircase” toward the main focus on long-term goals?
O11	Target stretching (Target setting sub-index)	Are goals too easy to achieve, especially for some “protected/special” areas of the firm, or are goals demanding but attainable for all parts of the firm?
O12	Performance clarity (Target setting sub-index)	Are performance measures ill-defined, poorly understood, and private, or are they well-defined, clearly communicated, and made public?

Notes: Table contents from [Scur et al. \(2021\)](#). The Q column refers to the question numbers as we have defined the indices in this paper (operations and people management). The main difference between our categorization and the WMS is that we bundle the operations sub-practices into one, so we can effectively compare people and non-people practices. The last column includes a more detailed explanation of the types of follow-up questions that are asked of the manager to garner the information required for scoring.

Table B9: World Management Survey Questions: People management

Q	Question topic	Explanation of scoring
P1	Managing human capital (People management sub-index, survey Q13)	To what extent are senior managers evaluated and held accountable for attracting, retaining, and developing talent throughout the organization?
P2	Rewarding high performance (People management sub-index, survey Q14)	To what extent are people in the firm rewarded equally irrespective of performance level, or is performance clearly related to accountability and rewards?
P3	Fixing poor performers (People management sub-index, survey Q15)	Are poor performers rarely removed, or are they re-trained and/or moved into different roles or out of the company as soon as the weakness is identified?
P4	Promoting high performers (People management sub-index, survey Q16)	Are people promoted mainly on the basis of tenure, or does the firm actively identify, develop, and promote its top performers?
P5	Attracting human capital (People management sub-index, survey Q17)	Do competitors offer stronger reasons for talented people to join their companies, or does a firm provide a wide range of reasons to encourage talented people to join?
P6	Retaining human capital (People management sub-index, survey Q18)	Does the firm do relatively little to retain top talent, or does it do whatever it takes to retain top talent when they look likely to leave?
B1	What is a manager's bonus as a percentage of salary?	A value between 0 and 1.
B2	What is the % of the bonus that is based on individual performance?	A value between 0 and 1.
B3	What is the % of the bonus that is based on company performance?	A value between 0 and 1.
DC	Decentralization	Where are decisions taken on new product introductions—at the plant, at the CHQ or both? How much of sales and marketing is carried out at the plant level (rather than at the CHQ)? Score 1: All decisions are taken at HQ. Score 3: Decisions are jointly determined. Score 5: All decisions are taken at the plant level. Decentralization score is the average of the two questions.

Notes: Table contents from [Scur et al. \(2021\)](#). The Q column refers to the question numbers as we have defined the indices in this paper (operations and people management). The main difference between our categorization and the WMS is that we bundle the operations sub-practices into one, so we can effectively compare people and non-people practices. The last column includes a more detailed explanation of the types of follow-up questions that are asked of the manager to garner the information required for scoring.

C Extended Sample

While the “main analysis” sample provides the sharpest distinction and most accurate measurement of management practices across firms, it severely limits the analysis sample relative to the large availability of financial data. The WMS collects data for a random sample of manufacturing plants and we match the financial data from Orbis at the establishment level, which allows us to directly observe management for only 2% of our full financial sample. However, [Bloom, Brynjolfsson, Foster, Jarmin, Patnaik, Saporta-Eksten and Van Reenen \(2019\)](#) show that the largest variation in management practices is attributed to the differences between firms, rather than across establishments within firms. This suggests the average management score for a subsidiary in our sample is a reasonable proxy for all other subsidiaries within that MNE. In [Figure C1](#) we show that for 95% of firms in our sample the standard deviation of management practices within MNEs is less than a point in the WMS scale and about 60% have less than 0.5 a point.

Using ownership data from Orbis, we build the ownership tree for each global ultimate owner (HQ) of the firms in the WMS sample. For all firms interviewed at least once in the WMS, we determine their HQs and build a dataset of their entire corporate structure — including all majority owned subsidiaries³⁹ that belong to that parent (e.g. [Aminadav and Papaioannou; 2020; Belenzon et al.; 2018](#)). We match 79,949 unique subsidiaries to our 1,388 in the WMS data yielding over 537,000 firm-year observations. [Table C1](#) reports summary statistics for the firm-years in the extended and baseline samples. Panel A reports the statistics for the extended sample. Panel B reports the statistics for the sample used in the baseline analysis, including only firms that have a “directly-measured” management score. The extended sample is quite similar to the baseline sample in terms of gross profits, management practices (both scores and formal management share), and fairly similar in terms of profitability. Likely as a result of the much larger number of subsidiaries and country coverage, the Effective Tax Rate and measures of aggressiveness are not as similar.

Results We repeat the analysis using our preferred specification with the Extended Sample in [Table C2](#). Columns (1) to (3) include all subsidiaries in this sample, starting with the raw relationship in Column (1), adding the interaction between management and the tax rate in Column (2) and controls in Column (3). The interaction coefficient on the fully specified regression is qualitatively similar to the results in the baseline regression.

In Columns (4) through (9), we include additional sub-sample analysis that is feasible with this larger sample. Column (4) restricts the sample to only subsidiaries that are not in a financial sector (SIC codes 60 to 67). Column (5), in turn, includes only these subsidiaries. The interaction coefficients are similar across these two sub-samples as well as the full sample, suggesting the relationship is remarkably consistent. Columns (6) restricts the sample to only firms classified as

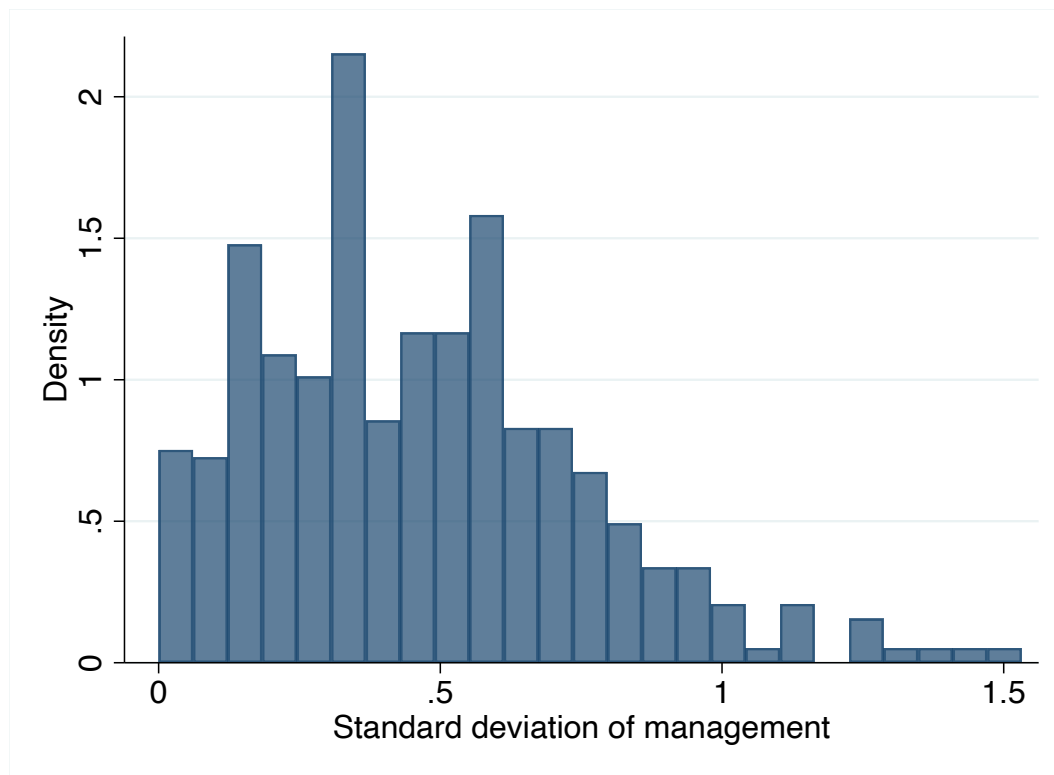
³⁹Majority ownership means that the the parent company owns 50% of the shares of the subsidiary.

aggressive (have at least one subsidiary in a tax haven), and Column (7) includes only non-aggressive firms. Again, the results are consistent with the baseline results where the patterns we observe in the aggregate are driven by aggressive firms. Column (8) repeats the exercise including only subsidiaries located away from the headquarters, and the interaction coefficient remains similar to the “reference” result in Column (3). Column (9) includes only HQ locations and uses consolidated data (instead of the unconsolidated data used throughout the paper). The coefficient on the interaction terms is not significantly different from zero, suggesting that better managed MNEs are not less profitable in higher tax countries *in the aggregate*, but rather the pattern is consistent with reallocation within-MNE, across tax jurisdictions.

Table C1: Summary statistics: extended sample and baseline sample

Panel A: Extended sample	Mean	SD	25pct	Median	75pct	N
Employment	756.49	2388.22	45.00	227.00	683.00	537459
Profit & Loss before tax (PLBT)	18170.43	84806.05	-13.00	548.00	4967.00	537508
Return on Assets (ROA)	0.04	0.25	-0.00	0.04	0.12	537508
Effective Tax Rate	0.17	0.44	0.00	0.19	0.29	480230
Management (MNE avg)	3.39	0.53	3.00	3.42	3.75	537508
Formal mgmt (MNE avg) = 1	0.77	0.42	1.00	1.00	1.00	537508
Aggressiveness (BTD > median) = 1	0.39	0.49	0.00	0.00	1.00	485594
Aggressiveness (tax haven) = 1	0.96	0.20	1.00	1.00	1.00	537508
Subsidiary in high tax country-year = 1	0.36	0.48	0.00	0.00	1.00	537508
Subsidiary in financial sector	0.15	0.36	0.00	0.00	0.00	537508
Panel B: Baseline sample						
Employment	1272.30	3379.49	149.00	300.00	786.00	16076
Profit & Loss before tax (PLBT)	17619.87	61955.66	81.00	3431.00	13573.00	16076
Return on Assets (ROA)	0.06	0.17	0.00	0.05	0.12	16076
Effective Tax Rate	0.19	0.45	0.03	0.20	0.30	15216
Management	3.35	0.62	3.00	3.42	3.75	16076
Formal mgmt = 1	0.76	0.43	1.00	1.00	1.00	16076
Aggressiveness (BTD > median) = 1	0.44	0.50	0.00	0.00	1.00	15218
Aggressiveness (tax haven) = 1	0.73	0.44	0.00	1.00	1.00	16076
Subsidiary in high tax country-year = 1	0.33	0.47	0.00	0.00	1.00	16076

Figure C1: Standard deviation of management



Note: Data from the World Management Survey. Graph includes only multinationals with more than one subsidiary in the sample. Management scores residualized of country fixed effects.

Table C2: Extended sample

	(1) ROA	(2) ROA	(3) ROA	(4) ROA	(5) ROA	(6) ROA	(7) ROA	(8) ROA	(9) ROA
Formal management=1	0.006*** (0.002)	0.059*** (0.007)	0.059*** (0.007)	0.057*** (0.007)	0.044*** (0.017)	0.059*** (0.007)	0.016 (0.025)	0.063*** (0.007)	0.007 (0.019)
Subsidiary Corp Tax	-0.206*** (0.021)	-0.050* (0.028)	-0.050* (0.028)	-0.077** (0.030)	0.028 (0.071)	-0.050* (0.029)	0.035 (0.105)	-0.073** (0.030)	
Formal management=1 × Subsidiary Corp Tax		-0.193*** (0.024)	-0.195*** (0.023)	-0.182*** (0.025)	-0.173*** (0.058)	-0.201*** (0.024)	-0.020 (0.085)	-0.209*** (0.025)	
HQ Corp Tax									0.091 (0.066)
Formal management=1 × HQ Corp Tax									-0.023 (0.059)
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Firm controls			✓	✓	✓	✓	✓	✓	✓
MNE controls			✓	✓	✓	✓	✓	✓	✓
Observations	537508	537508	537508	455649	81859	516010	21498	490461	6950
# firms	79949	79949	79949	67500	12449	76948	3001	73489	833
Mean	0.036	0.036	0.036	0.039	0.018	0.035	0.047	0.035	0.058
Sample	All	All	All	Non-fin	Fin only	Agg	Non-Agg	Subs	Cons HQ

Note: Data from Orbis and the World Management Survey. The sample in this table includes all subsidiaries belonging to MNEs for which we observe at least one management score in the baseline sample of the WMS. For each MNE, we average across all subsidiaries for which we have at least one management measure in the WMS. Formal management = 1 is a dummy equal to one when the MNE average for the WMS operations management questions (including lean management, monitoring and target-setting) is 3 or above, on a scale of 1 to 5. Subsidiary corp tax rate is the annual statutory corporate tax rate in the country where a subsidiary is operating. The outcome variable in all columns is Returns on Assets (ROA) which is the ratio of profit and loss before taxes and total assets. All specifications include country and year fixed effects. Firm controls include log of employment, log of fixed assets and log of number of subsidiaries in the MNE. Standard errors are clustered at the subsidiary level. Columns (1) - (3) include all subsidiaries in the “extended” sample. Column (4) includes all subsidiaries that are not in a financial sector (excluding SIC codes 60 to 67). Column (5) includes only subsidiaries in the financial sector. Column (6) includes subsidiaries belonging to MNEs classified as aggressive, defined as having at least one subsidiary in a tax haven. Column (7) includes subsidiaries belonging to MNEs classified as non-aggressive, defined as not having any subsidiaries in a tax haven. Column (8) includes only non-HQ subsidiary locations. Column (9) includes only HQ locations and uses consolidated ROA data.