The Effect of Corporate Taxation on Total Factor Productivity Growth Rates in the U.S. Manufacturing Sector

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Abstract:

Corporate taxation is a powerful tool used by the United States government and a material portion of overall tax revenue. The goal of this paper is to understand how these taxes affect productivity growth rates in the United States manufacturing sector. Income statement and balance sheet data from the US Census Bureau, and productivity data from the Bureau of Labor Statistics was collected on 17 manufacturing sub-industries between 2006 and 2017. A multiple OLS regression model was used, yielding statistically significant evidence supporting the hypothesis that corporate tax rate increases decrease productivity growth rates. The findings and nuances of this study can be used by policymakers when determining the corporate tax rate, maximizing tax revenue while being sensitive to the operating conditions their actions create.

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Introduction

Corporate tax policy is not only complex, but heavily politicized. Liberals may suggest that corporations profit too much and should be subject to higher tax rates, bringing income to the federal government for distribution. Conservatives may call for lower taxes under the argument that government interference in private markets hurts efficiency and is outside the scope of the government's role. In either case, especially in America, corporations control a significant portion of the country's wealth. In 2014, The Hill (a Washington D.C. based news outlet) reported that 18 companies alone hold a third of the country's wealth (Needham). Because of the magnitude of corporate wealth, corporate taxation policy has the ability to profoundly impact government revenue.

In this paper, I analyze the effect of corporate taxation on private sector productivity growth rates in the U.S. manufacturing sector. Traditionally, the manufacturing sector is accepted as a strong proxy for macroeconomic conditions given its strong, positive relationship with the business cycle.

The channel of transmission of corporate taxation on private sector productivity growth is through research and development (R&D) incentives created by the tax environment. From an operational standpoint, R&D is nonessential to the short-term success of an entity, therefore, resources will be allocated to aspects of the business needed to function such as payroll and equipment. One can argue that R&D is essential in the long-run by way of the creative destruction argument whereby new technologies render old ones obsolete, meaning stagnant entities will eventually be replaced unless they conduct enough R&D to remain technologically relevant as industries progress. In either case, the relationship is the same, higher tax rates decrease profits and thereby the amount of money available for allocation. This means high tax rates incentivize entities to decrease R&D, while low tax rates incentivize the opposite. Successful R&D allows firms to increase productivity over time as more efficient practices are uncovered and implemented, yielding additional output per unit of input. The magnitude of the incentives created by corporate taxation depends mainly on a particular firm's position on the productivity spectrum within its industry, and the tax environment relative to competing geographic locations.

Productivity level disparity within industries suggests that there should consequently be productivity growth rate disparities. The marginal cost of increasing productivity for firms at the technological frontier of their industry is far higher than those whose practices and infrastructure is outdated. For this reason, relatively nonproductive firms should be able to improve productivity growth faster than more productive firms in high tax rate regimes because the cost of improvement is lower. In order for a highly productive firm to become even more efficient, it must conduct enough R&D to make a technological breakthrough. Conversely, a firm in the bottom 50 percent of productivity level may require no R&D to improve efficiency. Rather, they can adopt practices and technologies from their more advanced competitors.

Policymakers undoubtedly have a complex decision to make when determining corporate tax rates. High taxes increase the government's budget but dampen R&D spending and firm creation, while low taxes promote private sector growth but leave the government with fewer resources to distribute elsewhere (Bruhn, 2011). The goal of this paper is to understand how corporate tax rates affect productivity growth rates in the U.S. manufacturing sector, and use these findings to provide guidance to policymakers.

Literature Review

There has been considerable research in the field of private sector productivity growth rates as related to corporate taxation. While approaches differ, there is a consensus that high tax rates decrease productivity growth rates. Perhaps the most succinct explanation is offered by Cai, Jing, et al (2018) which states that “lower taxes can increase the after-tax profit of firms, so that they have a greater capacity to invest in new technologies or products,” promoting productivity growth over time.

Billings, Glazunov, Houston et al (2001) analyze 231 US firms between 1992-1998 to determine the relationship between corporate tax rates and R&D spending, relying on the assumption that an increase in taxes raises the user-cost of R&D, thereby decreasing spending. The user-cost theory states that R&D is now more *expensive* to the user as an equal level of R&D now represents a larger portion of available resources. This study also discusses the Economic Recovery Tax Act, signed in 1981 (replaced in 1982) that offers tax credits should firms spend on specific types of R&D. Accounting for disparities on tax rates by geography, an effective tax rate is calculated and applied. Billings, Glazunov, Houston et al (2011) find that “a 1% increase in the user-cost of R&D reduces R&D spending of the sampled firms by a little over 2%,” and that “recipients of the credit spent approximately 2.6% more on R&D than non-recipients for a

1% increase in the user-cost of R&D" (466). Given that R&D spending is the vehicle for expediting productivity growth rates, it is concluded that higher taxes slow productivity growth.

Ernst et al (2014) employs a multinational model to understand the effect of interacting tax regimes on not only the quantity of R&D, but also the quality. Merging data on European multinational corporations' finances and patent applications, Ernst et al (2014) determine that both the quality and quantity of R&D migrated to areas with lower corporate taxation. R&D quality was determined by a "patent's forward citations, the size of the patent family and the number of industry classes," as these factors proxy earnings potential (Ernst et al, 3). It was determined that "an increase in the patent income tax rate by 10 percentage points is found to reduce patent quality by around 5.6 percent" (Ernst et al. 3). While this patent tax is narrower in scope than a general income tax, both reduce profits and consequently productivity growth rates.

Gemmell et al (2018) takes a similar approach to Billings, Glazunov, and Houston et al (2001). This study uses data from 54,787 firms in 11 European countries from 1995 to 2005, but asks a slightly different question: if "higher corporate tax rates, because they lower the after-tax returns to productivity-enhancing investments, reduce the speed with which small firms converge to the productivity frontier" (Gemmell et al. 372). In other words, productivity growth changes within firms may depend on the productivity of firms around them. Gemmell et al. (2018) claim that the mean firm in terms of profitability and taxation per their sample would realize an annualized productivity increase of 1.8 and 3.2 percent more than firms at the 85^{th} and 90^{th} percentile of productivity respectively. This phenomenon is commonly referred to as the *catching-up effect*. This means that changes in taxation non-uniformly affect productivity growth across firms within an industry. As discussed in the introduction, it is far easier for a relatively unproductive firm to make improvements than for a highly productive firm because the former can adopt the work of others while the latter must create new technologies or practices.

Moving to the indirect effects of corporate taxation on productivity growth rates, Bruhn (2011) enumerates the two primary players as tax evasion and firm creation. If firms are faced with higher taxes, the benefit to not paying is higher, thus, firms are willing to take on more risk to avoid complying, increasing rates of tax evasion. The same high tax rates also raise the barrier to entry for new firms that often times cannot afford to operate without retaining a higher proportion of their profits, leading to fewer firms being created than what would have otherwise been the case in a low tax rate environment.

Together, the research is unified and collectively corroborates that claim that taxation and productivity growth rates are inversely related. I expect my paper to yield consistent results to those mentioned and contribute to the existing body of work through affirmation and additional methods of explanation.

Data

The dataset is comprised of income statement and balance sheet data from the US Census Bureau and Multifactor Productivity data from the Bureau of Labor Statistics.

I. US Census Bureau Data

The US Census Bureau measures household and economic characteristics (US Census Bureau). This particular dataset is titled, "Quarterly Financial Report (QFR) Manufacturing, Mining, Trade, and Selected Service Industries," and has been released quarterly from Q3 2005 to Q1 2019. This dataset contains 16 variables related to the income statement and 30 variables related to the balance sheet.

The unit of observation is the North American Industry Classification System (NAICS) code-year. The NAICS was created to allow for detailed data collection among narrowly classified industries. Data is limited to the sub-industries within manufacturing.

II. Bureau of Labor Statistics Data

The Bureau of Labor Statistics is responsible for collecting and analyzing data related to labor economics and distributing it to both the public and governmental agencies (U.S. Bureau of Labor Statistics). I gathered this data by selecting the "Multifactor Productivity" section and downloading the dataset containing 10 variables of annual frequency from 1987 to 2017 with information on outputs, inputs, and multifactor productivity. The unit of observation is NAICS-year.

III. Merged Dataset

The final dataset was created by merging both the US Census and Bureau of Labor Statistics datasets on the basis of NAICS index and year. Because the Census data was of quarterly frequency, I used the 4th quarter values for each year to merge with the annual values from the Bureau of Labor Statistics. There was significant overlap in represented industries so most of the data could be successfully merged and analyzed, but there were several NAICS numbers without a match in the other dataset that were subsequently dropped. The final dataset contains 18 NAICS codes, 64 variables (financial measured in millions of USD), and 166 observations between 2006 and 2017 (a NAICS key can be found in Appendix A).

"Tax_Pct" is a key regressor in the analysis as a proxy for the corporate tax rate. This variable was generated using the following equation:

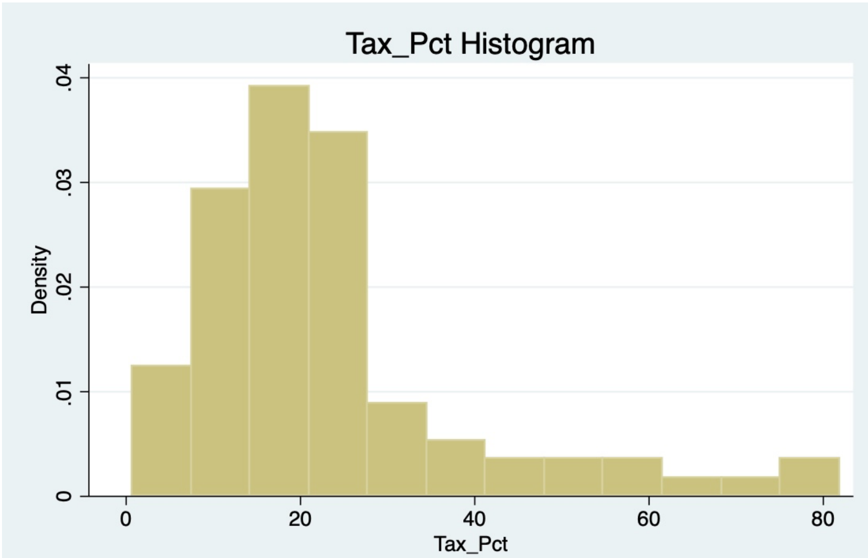
$$Tax\_Pct = ((Income\_PreTax - Income\_PostTax)/Income\_PreTax)*100.$$

31 observations for which the tax percentage was less than 0 and 7 for which the tax percentage was greater than 100 were dropped.

A negative Tax_Pct value happens when Income_PostTax has a larger absolute value than Income_PreTax. This is made possible because of tax and income provisions and deferral strategies. Given the complexity of the United States tax code, many individuals and entities spend money on tax experts each year to allow them to exploit the malleability if the system and shift income and tax liabilities to achieve their goals, whether that be to minimize the current year's exposure or front-load liabilities to hedge against a less profitable next accounting period. This malleability is what allows for income post-tax be higher than income pre-tax: a behavior very counter-intuitive on the surface. The alternative, when post-tax income is *more negative* than pre-tax income is far simpler. An entity with more expenses than revenue will have negative income pre-tax, and any tax obligation makes post-tax income *more negative*.

Tax_Pct values greater than 100 occur when the signs on Income_PreTax and Income_PostTax do not match. When one of Income_PostTax or Income_PreTax is negative, the numerator in the above equation is larger than the denominator, leading to a Tax_Pct value greater than 100. In reality, negative income before taxes and positive after may be the result of a subsidy, but the equation generates a Tax_Pct greater than 100. This is a downfall of this method, however, this only occurred twice among the original 204 observations.

Until 2018, the United States government imposed a federal corporate tax rate of 35% which then lowered to 21% thereafter (TradingEconomies). This tax is a *statutory* tax, meaning it is a fixed percentage set by law. Figure 1, however, shows that Tax_Pct used in this paper is centered around 20%. The histogram shows a distribution rather two bars at 35 and 21% because I am measuring the *effective* tax rate, equal the tax rate given the amount of taxes actually paid rather than the amount expected to be paid. These values differ because of the complex American tax system and presence of mechanics like the aforementioned provisions and deferral strategies. Additionally, the data comes from entities across the entire United States and while they all are subject to the same federal corporate tax rate, state and local tax differences attribute to the distribution as well. The mean value is 23.3, the standard deviation is 16.6, and the skew is 1.71.



Source: US Census Bureau

Figure 1

Methodology

The goal of this paper is to analyze the effect of corporate taxation on manufacturing sector multifactor productivity growth rates. My hypothesis is that corporate taxation decreases productivity growth. To test this, I estimate four OLS regressions. The baseline regression is of multifactor productivity growth rate on the tax rate and additional controls for the debt ratio, total assets, investment in intangibles, retained earnings, total cash and securities, total short term loans, and a lagged variable of tfp growth rates with year and NAICS fixed effects (a summary statistics can be seen in Appendix B). The regression equation is:

$$TFPGR_{i,t} = \beta_o + \beta_1 Tax\_Pct_{i,t} + \beta_2 Debt\_Ratio_{i,t} + \beta_3 Total\_Assets_{i,t} + \beta_4 Invest\_Intangibles_{i,t} + \beta_5 Retained\_Earnings_{i,t} + \beta_6 Total\_Cash\_DomGov\_OtherSec_{i,t} + \beta_7 Total\_Short\_Loans_{i,t} + \beta_8 ltfpgr_{i,t-1} + \delta year + \varepsilon naics + \mathcal{E}_{i,t}$$

My hypothesis will be supported if the coefficient on “Tax_Pct” is negative and statistically significant. This would indicate that the rate at which a sub-industry is taxed negatively affects its productivity growth. “Debt_Ratio” is equal to total liabilities divided by total assets, multiplied by 100. A high debt ratio indicates the entity will have to allocate cash to paying off debt rather than conducting R&D. For this reason, I expect this coefficient to be negative. “Total_Assets” is a measure of the size of an entity, therefore I expect this sign of the coefficient to be negative by way of the *catching-up effect* argument. Larger sub-industries face a higher cost to accelerate productivity because they must generate novel advancements in labor or capital efficiency, whereas smaller sub-industries are likely not as productive and can adopt existing technologies to accelerate productivity at a far lower cost, leading higher growth rates than their larger counterparts.

“Invest_Intangibles” represents investments made by a sub-industry on intangible assets, primarily patents, trademarks, and brand strength, often for the purpose of productivity enhancement. Specifically, patents are a sign of productivity acceleration as a successfully filed patent means that an entity has made a novel breakthrough, often in technology, that allows it to be more effective. The patent ensures that the filing entity is the sole beneficiary for a given amount of time, allowing it to become a more competitive player in its industry. Therefore, I expect the coefficient on “Invest_Intangibles” to be positive.

“Retained_Earnings” is the amount of money an entity has after any outflows such as taxes and dividends. Positive and large values of retained earnings indicate that the entity has ample financial resources that can be allocated however management decides. I expect the coefficient on retained earnings to be positive as more retained earnings means more opportunity to engage in additional projects such as R&D which will increase productivity growth.

"Total_Cash_DomGov_OtherSec" measures the amount of cash and securities, both US government and private. In order to conduct R&D, an entity must have cash or highly liquid securities. This variable measures the resources an entity has available to engage in R&D, consequently, I expect the sign to be positive.

"Total_Short_Loans" measures the dollar-amount of short-term loans an entity has taken. R&D requires an allocation of short-term resources in hopes of long-term benefits. Should an entity have short-term liabilities such as loans, they must divert their liquid assets to pay these off rather than conducting R&D so I believe this coefficient will be negative.

The final regressor is a lagged variable of productivity growth rate, "ltfpgr." I expect the coefficient on this term to be positive. Resources permitting, the decision to conduct R&D is a conscious choice by management to invest in the future, potentially at the expense of the present. This is a cultural decision by the entity and for that reason I believe that previous growth indicates this commitment and will lead to future growth.

Additionally, this study uses panel data on various sub-industries over time, therefore, fixed effects for both NAICS # and year are included. NAICS # fixed effects correct for differences in productivity growth rates attributable to the uniqueness of individual sub-industries rather than the tax imposed. Similarly, time fixed effects control for differences in productivity growth rates due to characteristics of individual years instead of tax percentages.

Specification 2 is the same as the baseline regression, but includes a control for “l.MultifactorProductivity” as a way to account for the *catching-up effect.* I argue that productivity growth is easier to achieve when the previous level of productivity is low. Entities with low levels of productivity can adopt existing technologies employed by others in the industry whereas those who are highly productive must create new tools to enhance productivity growth: a far larger burden than adopting the work already done by peers. For this reason, I expect the coefficient on this control to be negative.

Specifications 3 and 4 are the same as specifications 1 and 2 respectively, but without year and NAICS # fixed effects. These serve as robustness checks and should behave similarly to specifications 1 and 2.

Results

VARIABLES	(1) tfpgr	(2) tfpgr	(3) tfpgr	(4) tfpgr
Tax_Pct	-0.06*	-0.06*	-0.05*	-0.05*
	(0.03)	(0.03)	(0.03)	(0.03)
L.MultifactorProductivity		-0.35**		-0.07
		(0.14)		(0.08)
Debt_Ratio	-0.30*	-0.34**	-0.08	-0.07
	(0.17)	(0.16)	(0.06)	(0.06)
Total_Assets	0.00*	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Invest_Intangibles	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Retained_Earnings	-0.00	-0.00**	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Total_Cash_DomGov_OtherSec	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Total_Short_Loans	0.00	0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
ltfpgr	-0.02	0.14	0.10	0.13
	(0.13)	(0.14)	(0.10)	(0.11)
Year fixed effects	**Yes**	**Yes**	**No**	**No**
NAICS fixed effects	**Yes**	**Yes**	**No**	**No**
Constant	15.31*	52.73***	4.75	11.62
	(8.93)	(16.91)	(3.35)	(8.34)
Observations	92	92	92	92
R-squared	0.37	0.43	0.12	0.13
Standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

The regression results support the hypothesis that an increase in the corporate tax rate decreases productivity growth rates. The analysis on this section will focus on the baseline results and will be followed by relevant commentary on specifications two, three, and four. In comparing regressions 1 and 2 to 3 and 4, it's clear that the regression benefits from the inclusion of year and NAICS # fixed effects. The "R-squared" value represents the proportion of the variation in the dependent variable explained by the regression, and this value in specifications 1 and 2 are both more than double those of specifications 3 and 4. Additionally, because effects of dependent variables are measured in terms of the standard deviation change they create in the dependent variable, it is important to remember that the mean value of tfpgr is -0.280 and the standard deviation is 3.82.

In the baseline regression, the coefficient on Tax_Pct is -0.056 with a p-value of 0.098. This suggests that a 10% decrease in the effective tax rate leads to a 5.6% increase in the productivity growth rate. In other terms, a 1 standard deviation increase in Tax_Pct leads to a 0.26 standard deviation decrease in the productivity growth rate. Regressions 2, 3, and 4 validate these results by yielding similar coefficients and significance at the 0.1 level. As the control of interest, the consistent, negative, and significant coefficient on Tax_Pct garners robust support of the hypothesis and is consistent with existing literature.

Moving on to the other controls, Debt_Ratio has a coefficient of -0.30 with a p-value of 0.077. This means that a 1 standard deviation increase in Debt_Ratio results in a 0.68 standard deviation decrease in the productivity growth rate, significant at the 0.1 level. Specification two yielded even stronger results for this phenomenon which is surprising considering that a higher debt ratio indicates more liabilities relative to assets. While there may be no succinct explanation, it's possible that entities take loans to invest in R&D which raises the debt ratio in the intermediary period before this investment yields an asset, causing the debt ratio to increase. Total_Assets provides a snapshot of a business and per the accounting equation, is equal to total liabilities plus stockholder's equity. A large value of Total_Assets suggests the business is strong and presumably healthy enough to conduct R&D. The coefficient on this term is 0.00009 with a p-value of 0.091. This result is statistically significant at the 0.1 level and positive as expected, indicating that a 1 standard deviation increase in Total_Assets is associated with a 1.28 standard deviation increase in the productivity growth rate, an effect only present in the baseline regression. Invest_Intangibles represents money allocated to assets like patents and trademarks. I expected this coefficient to be positive, but each regression shows no effect. With a coefficient of -0.000096 and a p-value of .125, I cannot claim that investment in intangible assets affects productivity growth rates. Retained_Earnings is a balance sheet metric that is equal to the sum of profits over the lifetime of the entity. This regressor only shows significance at the 0.1 level in regression 2. This specification suggests that a 1 standard deviation increase in Retianed_Earnings leads to a 3.33 standard deviation decrease in the productivity growth rate. Should a subject have high retained earnings it means they have ample resources to invest in R&D if they so choose. This means that one would expect high retained earnings to lead to an increase in productivity growth rate, however, the only significant affect is seen in regression 2 and is the opposite of my expectation. Total_Cash_DomGov_OtherSec are the short-term assets needed to conduct R&D. The coefficient is -0.00017 and is insignificant at the 0.1 level in each regression, therefore, it cannot be determined that these assets have any effect. Similarly, Total_Short_Loans is insignificant with a coefficient near 0 across all regressions.

Lagged productivity growth rate (ltfpgr) has a coefficient of -0.0193 in regression 1 and a positive coefficient in the others, but is insignificant at the 0.1 level in each regression. This means that the growth rate of productivity in the previous year does not affect the growth rate in the active year, suggesting that growth rates year over year are independent of each other.

Lagged multifactor productivity is included in specifications 2 and 4. Its inclusion was to provide support for the *catching-up effect*. Regression 2 supports this phenomenon as a 1 standard deviation increase in l.MultifactorProductivity leads to a 0.56 standard deviation decrease in the productivity growth rate, significant at the 0.05 level. This means that there is a negative correlation between productivity level and growth rate and is evidence of the *catching-up effect*. The results are insignificant in regression 4, but as noted earlier, the omission of year and NAICS # fixed effects produces a less reliable regression, as indicated by the low r-squared values compared to specifications 1 and 2 with fixed effects included.

The fixed effects for both year and NAICS # prove to be largely insignificant. No individual year was significant, and only NAICS codes 324 and 325 (Petroleum and Coal Products, and Chemical Products) were significant (both negative) at the 0.1 level. Because these two subindustries are closely related and demonstrate similar effects, it can be concluded that petroleum and other chemical manufacturers experienced a deceleration of growth between 2006 and 2017. Anecdotally, this makes sense as demand for coal has shifted to natural gas and renewable sources like wind and solar. Forbes published an article this February stating that over five hundred coal plants closed in the past 10 years, “almost a dozen” coal mining companies have filed for bankruptcy in the past five years,” and that “over eighty-five percent of existing coal plants will be uneconomic compared to local renewables by 2025” (Rhodes).

Conclusion

While not every aspect of the results carries statistical significance or signs on coefficients as expected, the hypothesis was supported by the consistent and significant negative coefficient on "Tax_Pct." Additionally, the *catching-up effect* was supported by the significant and negative coefficient on lagged multifactor productivity in regression 2.

It must also be noted that these results imply correlation, not causation. Because policymakers decide how to tax corporations and industries differently, these taxes are not randomly distributed and thus one cannot claim a causal relationship. Additionally, there is a potential reverse causality problem between tax rates and productivity growth. This study assumes that policymakers create corporate tax rates, and private sector productivity growth reacts accordingly. It may be the case, however, that policymakers consider the productivity growth of an industry when determining the tax rate. Should policymakers see a particular industry thriving, for example, they may be inclined to raise taxes to increase tax revenue. In this case, my coefficient estimate would be biased and overstate the effect of corporate taxation on productivity growth rates.

The policy implications are clear: higher tax rates decrease the rate of productivity growth for sub-industries within the manufacturing sector in the United States. This does not simply mean the government should not tax corporations and promote maximum productivity growth. This approach would leave the government without valuable tax revenue that can be allocated to improve welfare. It also does not mean governments should tax corporations at exceedingly high rates as this would disincentivize R&D and decrease productivity growth. There is no universal optimal tax rate, rather, governments must balance tax revenue generation with promotion of private growth, and this research provides policymakers with additional information to consider when determining what tax rate aligns with their objectives, whatever those may be.

Finally, because this study considers only entities in the United States, generalizability and room for future research warrant discussion. Each country has unique operating conditions for firms which may lead to differences in outcomes. I expect corporate taxation to decrease productivity growth rates in all circumstances, but the strength of this relationship may differ country to country. The most salient threat is patent law differences across countries. The *catching-up effect* mentioned throughout the paper is an explanation for why different entities see varying levels of productivity growth rate changes under the same tax environment. Presented with a tax increase, the productivity growth rate may not decelerate as much for an unproductive entity compared to a productive entity. As stated, this is because it is far cheaper for the unproductive entity to adopt existing practices than for the productive entity create new ones. How much cheaper, though, determines the strength of the advantage these unproductive entities have. This is where patent laws come become relevant. According to the Global Innovation Policy Center, as of 2018, the United States has the strongest patent laws in the world. This means intellectual property is well protected and the cost of adoption is higher than in other countries (GIPC IP Index). Therefore, in another country we would expect the effect of taxes to be lower on productivity growth because practices are more easily adopted, creating an operating environment more advantageous for productivity growth controlling for corporate taxation. For this reason, I would like to see this study replicated in different countries with varying degrees of patent law strength to determine the relevance of this phenomenon.

Appendix

Appendix A:

NAICS KEY	
311	Food and Beverage and Tobacco Products
313	Textile Mills and Textile Product Mills
315	Apparel and Leather and Applied Products
321	Wood Products
322	Paper Products
323	Printing and Related Support Activities
324	Petroleum and Coal Products
325	Chemical Products
326	Plastics and Rubber Products
327	Nonmetallic Mineral Products
331	Primary Metal Products
332	Fabricated Metal Products
333	Machinery
334	Computer and Electronic Products
335	Electrical Equipment, Appliances, and Components
336	Transportation Equipment
337	Furniture and Related Products
339	Miscellaneous Manufacturing

Appendix A
Source: Bureau of Labor Statistics

Appendix B:

Summary Statistics					
Variable	**Obs**	**Mean**	**Std Dev.**	**Min**	**Max**
tfpgr	125	-0.28	3.82	-15.60	16.08
Tax_Pct	166	23.32	16.62	0.70	81.85
l.MulticactorProductivity	125	99.05	6.12	76.13	115.28
Debt Ratio	166	56.50	8.64	41.55	78.29
Total Assets	166	433854.00	525550.00	28201.00	2413775.00
Invest_Intangibles	166	242438.70	343944.20	7814.00	1636482.00
Retained_Earnings	166	123774.80	165021.80	2919.00	715713.00
Total_Cash_DomGov_OtherSec	166	29530.82	35518.81	1829.00	148715.00
Total_Short_Loans	166	9176.47	12867.07	422.00	71462.00
ltfpgr	92	-0.12	3.88	-15.60	16.08

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