Macroeconomic Conditions and Corporate Tax Planning

Jaewoo Kim
Simon School of Business
University of Rochester

Sean McGuire
Mays Business School
Texas A&M University

Steven Savoy
University of Illinois at Chicago

Ryan Wilson
Lundquist College of Business
University of Oregon

Preliminary Draft – Please do not Circulate

September 2017

Abstract: This study investigates whether macroeconomic conditions are associated with corporate tax planning. We predict that changes in expectations about economic growth and market-wide discount rates are associated with the net present value of tax planning, thus affecting managers' incentives to engage in tax planning. Consistent with this prediction, we find that tax planning is associated with proxies for both expected economic growth and the discount rate. We conduct a series of cross-sectional analysis, and find the association between GDP growth forecasts (a proxy for expectations about economic growth) and tax planning is more pronounced for firms with highly cyclical operations, firms that are financially constrained, and firms facing greater competition. Finally, we show that the decline in corporate tax rates over the past twenty years for both U.S. domestic and multinational firms is explained largely by inter-temporal variation in macroeconomic conditions.

We appreciate helpful comments from Andrew Kitto, Allison Koester, Terry Shevlin, Milda Tylaite, and workshop participants at the Stockholm School of Economics and the 2017 UBCOW conference. McGuire acknowledges funding from the Mays Business School and the Ernst & Young Professorship.

Macroeconomic Conditions and Corporate Tax Planning

A substantial stream of accounting research examines the determinants of cross-sectional variation in firms' corporate tax planning activities. Recent research has begun to examine changes in corporate tax planning over time. Dyreng, Hanlon, Maydew, and Thornock (2017) find that corporate effective tax rates are decreasing over time and that the decline occurs in both multinational and domestic firms. They also find that neither changes in firm characteristics nor declining foreign statutory tax rates explain a significant portion of the decline in corporate effective tax rates (i.e., the increase in corporate tax avoidance). These findings raise the question as to what factors contribute to time-series variation in firms' tax planning activities.

Recent research in financial economics suggests variation in macroeconomic conditions influence corporate decisions (e.g. Pastor and Veronesi 2005; Haddad, Loualiche, and Plosser 2017), and Cochrane (2011) argues that variation in macroeconomic conditions is understudied and has implications for corporate finance and accounting. Macroeconomic conditions likely play an important role in corporate tax planning, an area of great interest to policymakers, because the net present value of tax planning activities is a function of expected future cash flows and the discount rate, both of which are directly affected by macroeconomic factors. This study develops a simple framework to provide structure for considering how macroeconomic conditions influence corporate tax planning. We then investigate whether variation in macroeconomic conditions influence firms' corporate tax planning activities over time.

Examining whether macroeconomic conditions influence inter-temporal variation in tax planning is important for both policymakers and academic researchers. From a policy perspective, evidence on the association between macroeconomic conditions and tax planning can help regulators understand the inter-temporal variation in firms' incentives to avoid taxes.

Corporate effective tax rates have declined over the last 25 years despite the fact that statutory tax rates in the U.S. have remained relatively constant (Dyreng et al. 2017). The declining trend in corporate effective tax rates is often cited as evidence that corporations are engaging in aggressive tax avoidance and the U.S. tax system needs to be reformed as a result. In order to make informed policy decisions, understanding the causes of temporal trends in effective tax rates is essential. From an academic perspective, there is a mature literature that examines cross-sectional determinants of tax avoidance; however, evidence on the determinants of time-series variation in tax avoidance is scarce. We seek to fill this void.

Economic intuition suggests that variation in macroeconomic conditions influences investments in tax planning. The net present value (NPV) of an investment in tax planning varies as a function of both the expected future tax savings and the rate used to discount the tax benefits, and macroeconomic conditions can impact both the magnitude of the tax benefits and the discount rate. We refer to these two effects as the numerator effect and denominator effect, respectively. Regarding the numerator effect, we assume a positive association between the benefits from implementing the next best tax planning strategy (i.e. the marginal tax strategy) and expected future pretax cash flows.[1] Under this assumption, the NPV of the marginal tax strategy increases with expectations about future pretax cash flows. As the economic outlook improves, tax strategies that were previously viewed as a negative NPV investment will become a positive NPV investment. Economic conditions can also have an indirect effect on tax planning through the need to finance investment opportunities. To the extent that firms use savings from

[1] We note that tax savings from a tax planning strategy may not always scale perfectly with increases in cash flows or income. For example, investing in a municipal bond provides a fixed tax benefit that will not change as the firms operating income increases. However, a tax strategy that shifts some portion of earnings into a low tax jurisdiction may scale proportionally with increases in future cash flows. Wilkie (1988) models ETRs as a function of pretax income and tax preferences, and he finds effective tax rates and income are positively correlated. This is consistent with tax preferences not scaling up in perfect proportion with income.

tax planning to fund investment opportunities, firms' willingness to engage in tax planning should also be a function of the NPV of firms' investment opportunities, which are generally increasing in the economic outlook. Consequently, we expect firms to engage in increased tax planning as expectations about future economic growth improve.

Despite the clarity of the above prediction, the influence of the discount rate on firms' investment in tax planning, the denominator effect, is more complex. A firm's overall tax planning strategy consists of permanent tax planning strategies and temporary tax planning strategies. Permanent tax planning strategies create a permanent difference between financial reporting income and taxable income and are similar to an annuity because they create a stream of future cash inflows in the form of reduced taxes. Consequently, the NPV of permanent tax planning strategies decreases as the discount rate increases. In contrast, temporary tax strategies create a temporary difference between financial reporting income and taxable income that will reverse in a future period. A temporary tax planning strategy can be thought of as an interest free loan from the government because it generates tax savings in the current period that are paid back to the government in future periods. As a result, the NPV of temporary tax avoidance strategies increases with the discount rate. Because a firm's overall level of tax avoidance is a combination of permanent and temporary tax planning strategies, the association between the discount rate and firms' overall level of tax planning is not clear. Accordingly, we do not make a directional prediction about the association between firms' investment in tax planning and variation in the discount rate.

To test our predictions, we use real GDP growth forecasts, the term spread (i.e., the difference in yields between the Aaa-rated corporate bond portfolio and the 1-month Treasury-Bill rate), and the constant maturity rate on 3-Year Treasury notes as proxies for aggregate

expected future cash flows, market risk premium, and the risk-free rate, respectively. We obtain consensus forecasts of GDP growth from the Survey of Professional Forecasters (SPF), the oldest and most widely followed economic survey in the U.S (see Konchitchki and Patatoukas 2014). Fama and French (1989) show that term spread captures risk premium in expected returns in the short-term. Thus, we select the term spread as firms can change their tax position relatively quickly.[2] The rate on 3-Year Treasury notes is also chosen as opposed to rates on other maturities to account for the average time horizon over which tax positions can be changed. We measure the level of tax planning using the cash effective tax rate because our predictions apply to tax planning generally and are not limited to the most aggressive forms of tax planning (Dyreng et al. 2008).

For a sample of 53,370 U.S. firm-years over the period 1988-2012,[3] we find that all three macroeconomic variables are significantly associated with the level of tax planning. We find that cash effective tax rates are negatively associated with GDP growth forecasts and positively associated with the term spread and the 3-Year Treasury rate. The results are robust to controlling for firm characteristics. Moreover, we find that macroeconomic conditions influence the tax planning activities of both U.S. multinationals (U.S. MNCs) and domestic firms.

Based on our earlier discussion, we expect discount rates have a differential effect on permanent versus temporary tax planning strategies. Accordingly, we also examine the influence of the term spread and the 3-Year Treasury rate on both permanent and temporary tax planning. Consistent with our expectations, we find the positive association between components of the

[2] Survey evidence in Hoopes, Mescall, and Pittman (2012) suggests that tax directors believe 69.2% (100%) of tax positions can be changed within one year (three to five years). Kim, McGuire, Savoy, and Wilson (2017) also find that firms are able to close approximately 70% of the gap between actual and estimated target effective tax rates in a three-year period.

[3] We examine this period to be comparable with Dyreng et al. (2017). However, our inferences remain similar when we extend the sample to 2016.

discount rate and cash effective tax rates is primarily attributable to permanent tax avoidance. Permanent tax avoidance is negatively associated with both the term spread and the risk-free rate, consistent with the value of permanent tax savings declining as the discount rate increases. We do not find a significant association between temporary tax avoidance and the term spread, and we only find a significant association between temporary tax avoidance and the risk-free rate in domestic firms. While higher risk-free rates increase the NPV of temporary tax planning, higher risk-free rates also reduce the NPV of projects that are potentially funded with the tax savings. As a result, it is reasonable that firms may reduce their investment in all types of tax planning in periods with high risk-free rates.

It is possible our main results reflect unrelated trends in cash effective tax rates and macroeconomic factors over the past 25 years. To address this concern and help validate our primary results, we conduct a series of cross-sectional analyses. For our cross-sectional tests, we focus on the association between expectations in economic growth and tax planning because there is a clear directional prediction. First, we examine whether the nature of the firm's business influences the association between variation in the GDP growth forecast and tax planning. We expect the association to be more pronounced for firms with operations that are more cyclical in nature (i.e., firms whose performance is more sensitive to the state of the economy). Consistent with expectations, we find the association between the GDP growth forecast and cash effective tax rates is more pronounced for firms with highly cyclical operations. Second, we examine whether a firm's financial constraints influence the association between the GDP growth forecast and tax planning. To the extent a firm generates free cash flow or has access to cheap external financing, the relationship between the GDP growth forecast and tax planning should be less pronounced because the firm does not need to use tax savings to fund investments. Indeed, we

find the relationship between GDP growth forecast and cash effective tax rates is weaker in firms that are not financially constrained.

Finally, we examine whether the relation between GDP growth forecast and tax planning is more pronounced for firms that face stiffer competition. The intuition underlying this test is that, in the presence of agency conflicts between managers and shareholders, managers might not exploit all tax planning opportunities as expectations about the future economy fluctuate. However, competition should discipline managers to be more responsive to variation in economic conditions. We indeed find that the relation between the GDP growth forecast and tax planning is stronger for firms that face greater competition. Taken together, our cross-sectional analysis strengthens our inferences on the relation between macroeconomic conditions and tax planning. Specifically, our cross-sectional results help mitigate the concern that our main results are attributable to both macroeconomic factors and cash effective tax rates exhibiting similar but unrelated patterns over the sample period.

As a final set of analyses, we study the implications of our findings for the downward trend in corporate effective tax rates documented by Dyreng et al. (2017). We first successfully replicate the negative temporal trend in Dyreng et al. (2017) and then examine whether the trend is explained by the macroeconomic factors examined in this paper. To do so, we regress cash effective tax rates on the three macroeconomic factors to decompose cash effective tax rates into two components: a component that is explained by the macroeconomic factors (i.e. the predicted values) and a component that is not explained by the macroeconomic factors (i.e. the residuals). We find that the trend variable is negative and significant when we focus on the component of cash effective tax rates that is explained by the macroeconomic factors. However, when we use the unexplained component, the trend measure is no longer significant. This result holds across

subsamples of both MNCs and domestic firms. This finding indicates the declining trend in corporate tax rates documented by Dyreng et al. (2017) is explained mainly by the macroeconomic factors identified in this study.

Our findings have important implications for regulators, policymakers, and researchers. We show firms adjust their tax planning in response to changes in the economy. Our findings suggest managers go beyond comparing the explicit tax savings of a position against the non-tax costs. The firm's investment opportunities also influence tax planning decisions. When macroeconomic conditions improve, resulting in better investment opportunities, managers are more willing to avoid taxes in order to fund those opportunities. As expected, these results are more pronounced for firms whose performance is more highly correlated with macroeconomic conditions and for firms with limited financing alternatives. For regulators, our findings are useful from an enforcement perspective suggesting firms could be more willing to engage in questionable tax practices when macroeconomic conditions are strongest. For policymakers, it raises the question of whether this behavior is optimal from a societal perspective. Does the economy benefit when firms avoid more taxes to fund investment opportunities that may otherwise go unrealized? What is the cost of having a tax system where firms avoid more taxes when the economy is strongest?

Finally, our study makes several contributions to the tax literature. First, we contribute to recent research that examines corporate tax avoidance over time. Gaertner, Laplante, and Lynch (2016) examine aggregate data and find that aggregate book-tax differences are increasing over time. Dyreng et al. (2017) examine firm-level tax avoidance and find that both multinational and domestic firms exhibit comparable declines in their cash effective tax rates over time, suggesting that both types of firms are experiencing similar increases in tax avoidance. Our results extend

Dyreng et al. (2017) and provide new insight into their puzzling findings by providing evidence that changes in macroeconomic conditions over time explain trends in corporate tax rates for both multinational and domestic firms. Second, our study adds to recent research that investigates the association between corporate tax avoidance and macroeconomic conditions. Shevlin, Shivakumar, and Urcan (2017) examine the association between aggregate tax avoidance and macroeconomic growth. They find that in countries with higher levels of corruption, aggregate corporate tax avoidance is associated with greater future economic growth. We complement and extend Shevlin et al. (2017) by providing evidence that macroeconomic conditions are a determinant of firms' investment in tax avoidance activities. In addition, our study contributes to recent research on the association between tax avoidance and the cost of equity capital. Goh, Lee, Lim, and Shevlin (2016) find that firm tax planning influences the cost of equity capital. Our results suggest that the cost of equity capital also influences tax planning decisions.

2. Hypothesis Development

2.1 Investing in tax planning

Tax planning is like many other investments in that it requires an initial investment with benefits accruing in the future. In the case of tax planning, the return on investment comes in the form of tax savings in current and future periods. We assume that firms use tax savings to fund additional investment opportunities. Therefore, when the NPV of investment opportunities is low, the costs of implementing a particular strategy can exceed the benefits of engaging in tax planning to fund new investment. Consistent with prior research, we expect that firms will invest in additional tax planning opportunities if the NPV of the marginal future tax benefits

exceed the marginal costs of the tax planning (Armstrong, Blouin, Larker, and Jagolinzer 2015).[4] We argue that macroeconomic conditions can impact both the magnitude of the future tax benefits (i.e., numerator effect) and the rate used to discount future tax benefits (i.e., denominator effect) and develop a simple framework to consider how each factor influences the NPV of potential tax planning strategies.

A firm's overall tax planning strategy is made up of both permanent and temporary tax planning strategies. A permanent tax planning strategy either reduces taxable income without affecting financial reporting income or reduces the rate at which income is taxed. A common example of the former is an investment in municipal bonds because the interest income is not subject to income tax. An example of the latter is shifting income from a high tax rate jurisdiction to a low tax rate jurisdiction such as an offshore tax haven or a state tax haven (Dyreng and Lindsey 2009; Dyreng, Lindsey, and Thornock 2013).

A permanent tax planning strategy can be thought of as an annuity in that it provides a stream of future cash inflows in the form of reduced taxes. We denote the net present value of permanent tax avoidance as follows where PTI_t represents the firm's pretax cash flows in year t, $\Delta Cash\ ETR_t$ represents the reduction in cash effective tax rate caused by the tax planning in year t, and r represents the firm's discount rate:

$$NPV\ of\ permanent\ tax\ planning\ strategy = \sum_{n=1}^{\infty} \frac{PTI_{t+n} * \Delta Cash\ ETR_{t+n}}{(1+r)^{t+n}} \quad (1)$$

Temporary tax avoidance is the second type of tax planning strategy and creates a temporary difference between financial reporting income and taxable income. A temporary tax planning strategy causes an item of income (expense) to appear in taxable income in a period

[4] The initial costs to tax planning could include expanding the tax department, hiring outside tax or legal consultants, forming a new entity, filing an application for a change in tax accounting method with the IRS, and modifying existing or creating new reporting processes.

later (earlier) than when it appears in financial reporting income. In other words, temporary tax planning either delays revenue recognition or accelerates expense recognition for tax purposes. An example of expense acceleration under the U.S. federal tax code is the recurring item exception. The recurring item exception allows for the deduction of cash expenditures before economic performance as long as economic performance occurs before the filing of the tax return or eight and a half months after the tax year end, whichever is earlier.

A temporary tax planning strategy can be thought of as an interest free loan from the government because it generates tax savings in the current period that are paid back to the government in a future period. Below, we denote the net present value of temporary tax planning as follows where *Temp BTD* represents the temporary book-tax difference created by the tax planning strategy (i.e., the amount of revenue deferred or expenses accelerated for tax purposes), *mtr* represents the firm's marginal tax rate, *k* represents the number of years before the temporary difference reverses, and *r* represents the firm's discount rate:

$$NPV\ of\ temporary\ tax\ planning\ strategy = \frac{Temp\ BTD*mtr}{(1+r)^1} - \frac{Temp\ BTD*mtr}{(1+r)^{1+k}} \quad (2)$$

$$= (\ Temp\ BTD * mtr) * \frac{[(1+r)^k - 1]}{(1+r)^{1+k}} \quad (3)$$

2.2 Expectations of economic growth and tax planning

Equations (1) through (3) inform our hypotheses. A key assumption of Equations (1) through (3) is that the benefits of tax planning strategies increase with pretax income.[5] For permanent tax planning strategies, the numerator in Equation (1) suggests that the benefit of reducing the cash effective tax rate is increasing in pretax income. For temporary tax planning strategies, Equation (3) shows that net present value of temporary tax avoidance is increasing in

[5] Without a loss of generality, we also assume the future tax benefits continue in perpetuity. In practice, permanent tax avoidance strategies often have an expiration date due to changes in a firm's operations or changes in tax laws.

the magnitude and length of the deferral, *Temp BTD* and *k* respectively, which depend on the nature of the temporary difference.[6]

We acknowledge that not all tax planning strategies produce benefits that scale dollar-for-dollar with pretax income. However, most strategies do produce tax benefits that are increasing in pretax income. For example, tax benefits from income shifting may not increase proportionally with pretax income, but nonetheless, the tax benefits of income shifting are likely increasing in pretax income. To the extent this is true, the benefit of lowering effective tax rates using a permanent tax strategy or using a temporary tax strategy to defer income or accelerate expenses is increasing in the pretax income. As macroeconomic conditions improve, expectations about future pretax income and cash flows will also increase and the NPV of investment opportunities improves. Consequently, the cost of forgoing a particular marginal tax strategy increases. Accordingly, we expect firms to increase tax planning as expectations of future growth improve. Since we cannot observe firms' specific tax planning activities we focus on the relation between macroeconomic conditions and observed levels of tax avoidance. This leads to our first hypothesis:

H1*: The level of tax avoidance is increasing in expectations about economic growth.*

2.3 Discount rates and tax planning

Our first hypothesis focuses on the influence that macroeconomic conditions have on the magnitude of the future tax benefits. However, macroeconomic conditions also influence the rate used to discount the future tax benefits (i.e., denominator effect). In the context of a permanent tax planning strategy, Equation (1) demonstrates that the value of a permanent tax planning

[6] The net present value of temporary tax avoidance is also increasing in a firm's marginal tax rate. For simplicity, we assume the firm's marginal tax rate is constant across the period of deferral.

strategy is decreasing in the discount rate. Because a firm's discount rate is a function of both the market risk premium and the risk-free rate, the value of permanent tax planning strategies is expected to decrease as the market risk premium and the risk-free rate increase.

However, Equations (2) and (3) demonstrate that the discount rate influences temporary tax planning strategies differently. As discussed above, temporary tax planning can be thought of as an interest free loan from the government in that it reduces current cash taxes but the cash tax reduction must be paid back in the future. Consequently, the NPV of temporary tax planning is increasing in a firm's discount rate. Consistent with this notion, Edwards, Schwab, and Shevlin (2016) find that firms facing higher costs of external financing use temporary tax planning strategies to lower their cash effective tax rates. Zwick and Mahon (2017) also find that investment decisions of small firms are 95% more responsive to bonus depreciation provisions (i.e., a temporary tax planning strategy) than investment decisions of big firms. To the extent small firms face higher discount rates than big firms, this finding is consistent with temporary tax planning being more valuable to firms with high discount rates.

In sum, the above line of reasoning suggests that the discount rate influences permanent and temporary tax planning strategies differently. Because a firm's overall level of tax avoidance is a combination of permanent and temporary tax planning strategies, the association between the discount rate and firms' overall level of tax planning is not clear. Accordingly, we do not make a prediction for the relation between the components of the discount rate and tax planning. Our second hypothesis is as follows:

H2a*: The level of tax avoidance is unrelated to the market risk premium.*

H2b*: The level of tax avoidance is unrelated to the risk-free rate.*

2.4 Cross-sectional predictions

Our first two hypotheses focus on the primary association between macroeconomic conditions and tax planning. However, the influence of macroeconomic conditions on firms' investment in tax planning likely varies with firm characteristics. Accordingly, we investigate cross-sectional variation in the influence of macroeconomic conditions on firms' tax planning activities. We focus on cross-sectional variation in the influence of expectations about economic growth (i.e., GDP growth forecast) because our expectation about the association between expectations about economic growth and firms' investment in tax planning is unambiguous.

As discussed above, the predicted relation between tax planning activity and expectations about economic growth is based on the assumption that the benefits of tax planning are increasing with the level of firms' pretax income and, that expectations about future pretax income, are related to future economic outlook. For this reason, we expect the relation between the observed level of tax planning activity and expectations about economic growth to be strongest for firms with operations that are highly positively correlated with the strength of the economy. This leads to our third hypothesis:

> ***H3****: The relation between expectations about economic growth and tax avoidance is more positive for highly cyclical firms.*

Edwards et al. (2016) find evidence that financially constrained firms have lower cash effective tax rates. Law and Mills (2015) find a similar relation and also find that financially constrained firms have higher UTB reserves.[7] Edwards et al. (2016) argue that firms use tax planning as a source of internal financing. They note that prior to becoming financially

[7] We note another recent paper (Dyreng and Markle 2016) finds constrained firms shift less of their earnings out of the U.S., a result consistent with constrained firms paying more tax. However, Dyreng and Markle argue that the findings in Edwards et al. (2016) and Law and Mills (2015) reflect temporary tax avoidance rather than the more permanent avoidance that results from income shifting.

constrained firms should already be exhausting the best tax planning strategies. As a result, any marginal tax planning opportunities would be expected to have higher costs and only become attractive when there is no available cheaper source of financing. We extend this line of reasoning by examining whether the relation between expected economic growth and tax avoidance is stronger for financially constrained firms. We expect that as expectations about economic growth improve, managers' beliefs about the potential profitability of investment opportunities will also increase. As a result, the cost for financially constrained firms to forgo these investment opportunities due to a lack of available financing is also expected to increase. For this reason, we expect the link between expectations about economic growth and tax planning to be more pronounced for firms that are financially constrained. This leads to our fourth hypothesis:

> ***H4****: The relation between expectations about economic growth and tax avoidance is more positive for firms that are financially constrained.*

Our final cross-sectional prediction examines whether the tax planning activities are more responsive to changes in expectations about future profitability when firms operate more competitive industries. The economic rationale underlying this hypothesis is that, in the presence of agency conflicts between managers and shareholders, managers might not capitalize on all tax planning opportunities as macroeconomic conditions change. Prior work finds that product market competition disciplines self-interested managers to make better operating and financing decisions (e.g., Giroud and Muller 2010). In an extremely competitive environment, managers who make decisions for their own benefit (e.g., enjoying the quiet life) will risk the survival of their firm. Consequently, we expect managers in highly competitive industries to be more responsive to changes in expectations about economic growth that are related to changes in the value of marginal tax planning opportunities. This leads to our final hypothesis:

H5*: The relation between expectations about economic growth and tax avoidance is more positive for firms facing higher competition.*

3. Research Design

Our first two hypotheses examine the association between macroeconomic conditions and tax avoidance. Consistent with prior research, our primary measure of firms' tax avoidance activities is the cash effective tax rate (*CASHETR*) (Dyreng, Hanlon, and Maydew 2008). Following prior research, we calculate a firm's cash ETR by dividing cash taxes paid by pretax book income in a given year:[8]

$$CASHETR_{it} = \frac{Cash\ Taxes\ Paid_{it}}{Pretax\ Book\ Income_{it}} \quad (4)$$

where lower levels of *CASHETR* represents higher levels of tax avoidance. We focus on cash ETRs instead of GAAP ETRs for three reasons. First, cash ETR is a measure of overall tax avoidance that reflects both permanent and temporary tax avoidance strategies whereas GAAP ETRs only reflect permanent tax avoidance strategies (Hanlon and Heitzman 2010). Second, unlike GAAP ETRs, cash ETRs are not confounded by tax accruals such as valuation allowances and reserves for uncertain tax positions. Finally, cash ETR is a general measure of tax avoidance that captures a broad range of tax avoidance activities (Lisowsky, Robinson, and Schmidt 2013), allowing us to examine the association between macroeconomic conditions and tax avoidance generally.

To proxy for expectations of future economic growth, we use macroeconomists' forecasts of growth in the gross domestic product (*GDP FORECAST)*. We obtain consensus mean

[8] To mimic the research design in Dyreng et al. (2017), we include special items in the denominator of *CASHETR*, which creates a potential mismatch between cash taxes and the recognition of special items in book income. Similar to Dyreng et al. (2017), we include current and lagged special items in our analysis to control for this potential mismatch.

forecasts from the Survey of Professional Forecasters made available by the Federal Reserve Bank of Philadelphia. We calculate the averages of quarterly four-quarter-ahead (annualized) GDP growth forecasts in calendar year *t*. To examine the relationship between discount rates and tax avoidance, we focus on the two components of discount rates: the market risk premium and the risk-free rate. To proxy for the market risk premium, we use the difference in yields between the Aaa-rated corporate bond portfolio and the 1-month Treasury-Bill rate (*TERM SPREAD*). We select the term spread as firm can change their tax positions relatively quickly. Fama and French (1989) find that term spreads capture the risk premium that covaries with the shorter-term business cycle, whereas defaults spreads related to long-term business fluctuations (see Fama and French 1989). We obtain term spread data are provided by the Federal Reserve Bank of St. Louis, and calculate the averages of quarterly term spreads in calendar year *t*. To proxy for the risk free rate, we use the 3-Year Treasury constant maturity rate (*TBILL 3YR*). Our choice of three years relative to other maturities is designed to account for the average time horizon over which tax positions can be altered. We also obtain the data from the St. Louis Federal Reserve Bank of St. Louis and compute the averages of daily rates in calendar *t*. We focus on macroeconomic factors as opposed to firm-level forecasts because we expect that growth in GDP, the market risk premium, and the risk-free rate are all critical inputs into firms' future expectations and firm-specific discounts rates.

In our tests of H1 and H2, we regress cash ETRs on the aforementioned macroeconomic variables and a set of controls as follows:

$$\begin{aligned} CASHETR_{i,t} = {} & \alpha + \beta_1 GDP\ FORECAST_t + \beta_2 TERM\ SPREAD_t + \beta_3 TBILL\ 3YR_t + \\ & \beta_4 MNE_{i,t} + \beta_5 LOG\ ASSETS_{i,t} + \beta_6 RD_{i,t} + \beta_7 PP\&E_{i,t} + \beta_8 INTAN_{i,t} + \beta_9 LEV_{i,t} + \\ & \beta_{10} CAPEX_{i,t} + \beta_{11} ADV_{i,t} + \beta_{12} SP_{i,t} + \beta_{13} LAG\ SP_{i,t-1} + \beta_{14} NOL_{i,t-1} + \\ & \beta_{15} \Delta NOL_{i,t} + \beta_k Industry_i + \varepsilon_{i,t} \end{aligned} \quad (5)$$

where *CASHETR* is as described above. *GDP FORECAST*, *TERM SPREAD*, and *TBILL 3YR* are also as defined above. Note that we measure these macroeconomic variables contemporaneously with *CASHETR* to allow managers to observe changes in these variables throughout the year and thus implement or exit tax positions. To test our first hypothesis, we examine the coefficient on *GDP FORECAST*. As discussed above, H1 predicts that greater expected future pretax income (or cash flows) is associated with higher levels of tax planning. Accordingly, we expect a negative and significant coefficient on *GDP FORECAST*. To test our second hypothesis, we analyze the coefficients on *TERM SPREAD* and *TBILL 3YR*. Because of the conflicting effect of the discount rate on permanent and temporary tax planning strategies, we do not have a prediction for H2. Thus, we examine whether the coefficients on *TERM SPREAD* and *TBILL 3YR* are significantly different from zero.

In addition to our variables of interest, we also control for factors that prior research finds are associated with firms' tax avoidance activities (e.g., Chen, Chen, Cheng, and Shevlin 2010; Dyreng et al. 2017). We include an indicator variable equal to one if a firm has foreign operations (*MNE*) because foreign income is taxed at different statutory rates than U.S. sourced income. We include the natural log of total assets (*LOG ASSETS*) because large firms enjoy economies of scale when tax planning (Rego 2003). The U.S. tax code provides for a research and development tax credit which reduces the effective tax rates of firms that conduct R&D activities. Research and development also generates intellectual property which can facilitate the shifting of income from high-tax to low-tax jurisdictions (Gruber 1993). Accordingly, we include research and development expense and intangible assets as controls (*RD* and *INTAN*). We also include advertising expense (*ADV*) as firms with valuable brands have greater incentives to shift income.

Interest payments on debt are typically deductible for tax purposes so we include the ratio of total debt to assets (*LEV)* to control for the tax benefits of debt (Graham 2000).

The U.S. tax code allows for accelerated depreciation which lowers (raises) cash effective tax rates in the early (later) years of an asset's useful life. Thus, we include net property plant and equipment (*PP&E*) as well as current year capital expenditures (*CAPEX*) to control for the effect of accelerated depreciation on cash ETRs. As mentioned earlier, we include current and lagged special items (*SP* and *LAG_SP*) to control for the possibility that the cash tax effect of special items may lag the recognition of special items in book income. Net operating losses can offset future year taxable income so we include an indicator variable equal to one if the firm had a tax loss carryforward at the end of the previous fiscal year (*NOL).* We also include the change in tax loss carryforward during the current fiscal year (Δ*NOL*) to control for the utilization of net operating losses. Because tax planning opportunities vary by industry, we also include industry fixed effects based on a firm's 2-digit SIC code. Appendix A provides detailed definitions for each variable.

Cross-sectional analyses

Hypotheses 3 through 5 focus on cross-sectional variation in the association between expectations about future economic growth and tax planning. To test these hypotheses, we partition our sample based on the variable of interest for each hypothesis. We then estimate Equation (5) separately for each of the partitioned subsamples and test whether the coefficient on *GDP FORECAST* differs across the subsamples.

H3 examines whether the association between expected future economic growth and tax planning is influenced by the extent to which firms' performance is more sensitive to the state of the economy (i.e., cyclical firms). We measure cyclicality in a similar manner as Hutton, Lee,

and Shu (2012).[9] Specifically, we examine the correlation between a firm's return-on-assets and nominal GDP over the prior 16 quarters as well as the correlation between income before extraordinary items (unscaled) and nominal GDP over the same period. We decompose the sample into the high (low) cyclicality subsample if their correlation is in the top (bottom) quartile of the sample.[10] Consistent with H3, we expect the coefficient on *GDP FORECAST* to be significantly more pronounced for highly cyclical firms relative to less cyclical firms.

H4 examines whether the association between expected future economic growth and tax planning varies with the financial constraints of the firm. To determine which firms are financially constrained in our tests of H4, we utilize two commonly used measures of financial constraints, the Whited-Wu Index (Whited and Wu 2006) and the Size-Age index (Hadlock and Pierce 2010). Higher values of both indices signal greater financial constraints. We classify firms as financially constrained (unconstrained) if their index score is above (below) the sample median. Consistent with H4, we expect the coefficient on *GDP FORECAST* to be significantly more pronounced for financially constrained firms relative to unconstrained firms.

H5 examines whether the association between expected future economic growth and tax avoidance varies with the extent to which firms face greater competition. To determine which firms face more intense competition, we use both an industry-level measure of competition and a firm-level measure of competition. For the industry-level measure, we employ the Herfindahl-Hirschman Index ("HHI") where higher values of the HHI correspond to more concentrated industries with *less* competition. We classify firms whose HHI is below (above) the sample

[9] The cyclicality measure in Hutton et al. (2012) was intended to identify both highly cyclical and highly counter cyclical firms. Hence, they focused on the r-squared from a regression of a firm's earnings on GDP with higher values indicating either highly cyclical or highly counter cyclical firms. Because we are interested in identifying only highly cyclical firms and not highly counter cyclical firms, we focus on the raw correlation between a firm's earnings and GDP.

[10] We construct quartiles each year for this test and other cross-sectional tests.

median as facing high (low) competition. For the firm-level measure of competition, we employ a measure of product market fluidity developed by Hoberg, Phillips, and Prabhala (2014). They use business descriptions in 10-Ks to determine the extent to which a firm's products are subject to competition from rival firms. Higher values of product market fluidity indicate a firm faces *more* competition. We classify firms with product market fluidity above (below) the sample median as operating in a more competitive environment. Consistent with H5, we expect the coefficient on *GDP FORECAST* to be significantly more pronounced for firms that face greater competition relative to those that face less competition.

4. Results

4.1 Sample selection and descriptive statistics

Our initial sample includes U.S. incorporated firms in the Compustat Annual Industrial file from 1988 to 2012 that have greater than $10 million of total assets. Consistent with Dyreng et al. (2017), we begin our sample in 1988 because it is after the enactment of the last significant tax reform, the 1986 Tax Reform Act, which took place in the middle of 1987. We exclude financial institutions (SIC codes 6000 – 6999) and utilities (SIC codes 4900 – 4999) as firms in regulated industries face different tax planning incentives. We also exclude firm-years with negative pretax income because cash ETRs are less meaningful and difficult to interpret during loss years. To be consistent with the sample selection procedures in Dyreng et al. (2017), we require each firm to have five years of data to be included in the sample. The above sample selection procedures result in 53,370 firm-year observations.

Table 1, Panel A presents the descriptive statistics for our sample. The mean (median) *CASHETR* is 29.1% (27.5%), which is consistent with prior research. There is considerable time-series variation in cash ETRs as the mean by fiscal year ranges from a low of 21.7% in 2004 to a

high of 35.3% in 1991 to (untabulated). The mean GDP growth forecasts (*GDP FORECAST*) is 2.769% during our sample period. The mean term spread is 1.375%, and the mean yield on three-year Treasury bills is 4.740%. The means and medians of the control variables are very similar to those reported in prior research.

[INSERT TABLE 1]

Table 1, Panel B presents the univariate correlations among the variables. Consistent with our prediction, *CASHETR* is negatively correlated with *GDP FORECAST* indicating firms engage in more tax avoidance when economic growth is expected to be high. Interestingly, cash ETRs have opposite correlations with the two components of discount rates. Specifically, *CASHETR* is negatively correlated with term spreads but positively correlated with yields on three-year Treasury bill rates. We observe significant correlations among the macroeconomic variables, as the financial economics literature show macroeconomic variables varies with business cycles (see Fama and French 1989). *GDP FORECAST* has correlations of 0.48 and -0.45 with *TERM SPREAD* and *TBILL 3YR*. A correlation between *TERM SPREAD* and *TBILL 3YR* is -0.58. These high correlations illustrate the need for a multivariate analysis to properly test our hypotheses.

4.2 GDP growth forecasts, discount rates, and tax planning

Table 2, Panel A presents our tests of our first and second hypotheses. Column (1) presents the results of regressing cash ETRs on the three macroeconomic variables without controls and industry fixed effects while Column (2) presents the results of estimating Equation (5) with the full set of controls. In all tables, the standard errors are clustered by firm and year.

Focusing first on Column (1), the coefficient on *GDP FORECAST* is negative, -0.031, and significant at the 1% level, which is consistent with H1. The negative association between

cash ETRs and forecasts of GDP growth indicates firms avoid more taxes when expectations about future economic growth are higher. The coefficient estimate suggests that a one percentage point increase in forecasted GDP growth translates to a reduction in cash ETRs of 3.1%. We interpret this result as evidence that managers are more willing to incur the costs of tax planning when expected future growth is higher because the benefits of tax planning are increasing in economic growth.

Turning to the discount rate components, we find positive and significant coefficients on both *TERM SPREAD* and *TBILL 3YR*. Thus, we reject the null hypotheses for H2a and H2b. The coefficient on *TERM SPREAD* (*TBILL 3YR*) suggests that a one percentage point increase in term spreads (3-Year Treasury rates) translates to an increase in cash ETRs of 1.1% (1.3%). This result implies firms avoid less taxes when discount rates are higher.[11] As discussed above, the value of permanent tax planning strategies decreases with the discount rate because the NPV of future tax savings is reduced as the discount rate increases. The results in Column (2) indicate that the magnitude and significance of the coefficients on the three macroeconomic variables remain relatively unchanged once we control for firm and industry characteristics. These findings indicate that neither time-varying firm characteristics nor industry membership subsume the association between tax planning and time-varying macroeconomic conditions.

Our results suggest that macroeconomic conditions influence tax avoidance. To provide further insight into our findings, we examine whether the influence of macroeconomic conditions on tax planning varies across multinational and domestic firms. Specifically, we estimate

[11] Feldstein and Summers (1979) argue that in the presence of inflation the use of a historical cost method of depreciation substantially increases effective tax rates on capital. In our sample period, it is unlikely that declining inflation is leading to the reduction in effective tax rates because inflation rates have been relatively low since 1988. But to mitigate this concern, we include the GDP deflator as an additional control variable in Equation (5) and our results (not tabulated) are consistent with our main analysis.

Equation (5) separately for subsamples of multinational and domestic firms after removing the multinational control variable (*MNE*) from Equation (5). We present the results of this analysis in Columns (3) and (4) of Table 2, Panel A. Consistent with our primary results, we find that the sensitivity of cash effective tax rates to the macroeconomic conditions is present for both multinational and domestic firms. However, it does appear that the influence of macroeconomic conditions on tax planning is more pronounced for multinational firms. Taken together, the results in Table 2, Panel A suggest that macroeconomic conditions are a significant determinant of firms' overall level of tax planning.

[INSERT TABLE 2]

Our primary analysis focuses on overall tax avoidance. However, as discussed above, we expect that the discount rate will influence permanent and temporary tax planning differently. Accordingly, we decompose our overall measure of tax planning, *CASHETR*, into its permanent and temporary components and re-estimate Equation (5) to better understand the influence of macroeconomic factors on different types of tax planning strategies. Consistent with Ayers, Call, and Schwab (2017), we measure permanent tax planning activities, *PERM*, as the difference between the U.S. statutory rate (35%) and the firm's GAAP effective tax rate. We measure temporary tax planning activities, *TEMP*, as the ratio of deferred tax expense to pre-tax income. We multiply both *PERM* and *TEMP* by negative one so that larger values represent lower levels of tax avoidance.

Table 2, Panel B presents the results of our analysis. Columns (1) and (2) provide the results of regressing the permanent and temporary components of effective tax rates on macroeconomic factors for our full sample of firms. We find that the coefficient on *GDP FORECAST* is not statistically significant when *PERM* serves as the dependent variable, but is

marginally significant ($p < 0.10$) when *TEMP* serves as the dependent variable. Turning to the influence of the discount rate components, we find that the coefficients on *TERM SPREAD* and *TBILL 3YR* are both positive and significant ($p < 0.05$) when *PERM* serves as the dependent variable, suggesting that firms invest in less permanent tax planning as the discount rate increases. This result is consistent with the prediction in Equation (1) that the value of tax savings declines as the discount rate increases.

When *TEMP* serves as the dependent variable, we find that the coefficient on *TERM SPREAD* is not statistically different from zero while the coefficient on *TBILL 3YR* is positive and significant ($p < 0.01$), suggesting that an increase in the risk-free rate is associated with less investment in temporary tax planning strategies. While Equation (2) suggests the NPV of temporary tax planning increases with the discount rate, higher discount rates also reduce the NPV of investment projects. The declining value of investment opportunities reduces the need to use tax savings as a source of financing, and as a result, it is reasonable that firms may reduce their investment in temporary tax planning when the discount rate is high. In combination, the results in Columns (1) and (2) suggest that the negative relation between overall tax avoidance and the discount rate is primarily attributable to permanent tax planning strategies.[12]

Finally, we also examine whether the influence of macroeconomic conditions on permanent and temporary tax planning varies across multinational and domestic firms. We present the results of this analysis in Columns (3) through (6) of Table 2, Panel B. Consistent with our results using the full sample, we find that both multinational and domestic firms'

[12] In untabulated analysis, we find that the coefficient on *TERM SPREAD* is significantly more pronounced when *PERM* is the dependent variable instead of *TEMP* ($p < 0.05$). Likewise, the coefficient on *TBILL 3YR* is significantly more pronounced when *PERM* is the dependent variable ($p < 0.01$).

investments in permanent and temporary tax planning is influenced by macroeconomic conditions. The influence of macroeconomic conditions on permanent tax planning is more pronounced for multinational firms while the influence of the 3-Year Treasury rate is only significant for domestic firms.

4.3 Cross-sectional variation in the relationship between expectations about economic growth and cash ETRs

Our main analysis provides evidence that suggests that, on average, macroeconomic conditions influence tax planning. To provide further insight into our main result, we examine whether the influence of macroeconomic conditions on tax planning varies in the cross-section. Table 3 presents the results of the test of H3, which predicts that the association between expected future growth and tax planning is more pronounced for highly cyclical firms. Columns (1) and (2) of Table 3 present the results for highly cyclical and less cyclical firms, respectively, when the correlation between return-on-assets and GDP is used to measure cyclicality. We find that that the coefficient on *GDP FORECAST* is -0.033 (p-value < 0.01) for highly cyclical firms and is not statistically different from zero for less cyclical firms (p-value > 0.10). In addition, we find that the coefficients are significantly different (p-value = 0.05, two-tailed test). Columns (3) and (4) present the results for highly cyclical and less cyclical firms when we proxy for cyclicality using the correlation between income before extraordinary items and GDP. We find that the coefficient on *GDP FORECAST* is -0.033 (p-value < 0.01) for highly cyclical firms and not statistically different from zero for less cyclical firms (p-value > 0.10). Further, we find that the coefficients are significantly different (p-value < 0.01, two-tailed test). In combination, these results are consistent with H3 and suggest that the macroeconomic conditions have a greater influence on tax planning among highly cyclical firms.

[INSERT TABLE 3]

Table 4 presents the results of the test of H4, which predicts that the association between expected future economic growth and tax planning is more pronounced for financially constrained firms. Columns (1) and (2) presents the results for constrained and unconstrained firms using the Whited-Wu (WW) index. We find that the coefficient on *GDP FORECAST* is -0.035 (p-value < 0.01) for highly constrained firms and -0.019 (p-value < 0.05) for less constrained firms. We also find that the coefficients are statistically different (p-value < 0.05, two-tailed test). Columns (3) and (4) present the results for highly constrained and less constrained firms using the Size-Age (SA) index. We find that the coefficient on *GDP FORECAST* is -0.048 (p-value < 0.01) for highly constrained firms and -0.016 (p-value < 0.10) for less constrained firms. Further, we find that the coefficients are statistically different (p-value < 0.01, two-tailed test). Combined, the results in Table 4 are consistent with H4 and indicate the influence of expected future economic growth on tax planning is more pronounced among financially constrained firms. This result suggests that the tax planning activities of financially constrained firms are more sensitive to changes in expectations about future economic growth presumably because financially constrained firms need to use tax savings to fund additional investments.

[INSERT TABLE 4]

Finally, Table 5 presents the results of the test of H5, which predicts that the association between expected future growth and tax planning is more pronounced for firms that face greater competition. Columns (1) and (2) present the results for firms that have high and low levels of the Herfindahl-Hirschman Index ("HHI"), an industry-based measure of competition. As discussed above, low levels of HHI represent higher levels of competition. We find that the coefficient on *GDP FORECAST* is -0.013 (p-value > 0.10) for firms with high levels of HHI

(i.e., those that face low levels of competition) while the coefficient on *GDP FORECAST* is -0.033 (*p*-value < 0.01) for firms with low levels of HHI (i.e., those that face high levels of competition). In addition, we find that the coefficients are significantly different across high and low levels of HHI (*p*-value < 0.01, two-tailed test). Columns (3) and (4) present the results for firms that face higher and lower levels of competition when product market fluidity (Hoberg, Phillips, and Prabhala 2014) serves as our proxy for competition. We find that the coefficient on *GDP FORECAST* is -0.049 (*p*-value < 0.01) for firms that face high levels of competition and -0.030 (*p*-value < 0.01) for firms that face low levels of competition. Further, we find that the coefficients are significantly different (*p*-value < 0.05, two-tailed test). Overall, these results are consistent with H5 and suggest that the influence of expected future economic growth on tax planning is more pronounced among firms that face higher levels of competition.

In combination, the results for H3 through H5 suggest that the influence of macroeconomic factors on tax planning varies considerably in the cross-section. These findings are important for two reasons. First, they provide additional insight into our primary analysis by demonstrating instances where the influence of macroeconomic factors on tax avoidance is more or less pronounced. Second, it is possible that our primary findings are attributable to both macroeconomic factors and cash effective tax rates exhibiting similar trends over time as opposed to a relation between the two constructs. However, our results suggest that there is predicable cross-sectional variation in the association between macroeconomic factors and tax avoidance, which suggests that our primary findings are not attributable to parallel time trends in macroeconomic factors and cash effective tax rates.

[INSERT TABLE 5]

5. Re-examining the Negative Time Trend in Cash ETRs

Dyreng et al. (2017) find that cash ETRs are decreasing over the period 1988-2012, and they surprisingly find that both multinational and domestic firms exhibit this downward trend in cash ETRs. This result suggests that the increase in corporate tax avoidance over time is not isolated to multinational firms as popularly believed. We examine whether variation in macroeconomic conditions helps explain the downward time trend in cash ETRs.

To examine whether the downward trend in cash ETRs is attributable, at least in part, to variation in macroeconomic conditions, we follow a two stage process. First, we regress *CASHETR* on *GDP FORECAST*, *TERM SPREAD*, and *TBILL 3YR* as in Column (1) of Table 2. The predicted value from this regression (*CASHETR_EX*) represents the portion of tax avoidance that is explained by variation in macroeconomic conditions while the residual from the regression (*CASHETR_UN*) represents the portion of tax avoidance that is not explained by macroeconomic conditions. Second, we regress both *CASHETR_EX* and *CASHETR_UN* on *TREND* and the firm-level control variable and industry fixed effects included in Equation (5). Following Dyreng et al. (2017), *TREND* is a count variable that increases for each year in the sample and is scaled to range between zero and one.[13] To the extent that variation in macroeconomic conditions explains the downward trend in cash ETRs, we expect that the coefficient on *TREND* will not be statistically different from zero when *CASHETR_UN* serves as the dependent variable. In contrast, we expect the *TREND* will be significantly associated with the portion of tax avoidance that is attributable to macroeconomic conditions, *CASHETR_EX*.

[INSERT TABLE 6]

[13] For example, *TREND* equals zero for observations in year 1988, the first year of the sample, and one for observations in 2012, the final year of the sample.

Table 6 presents the results of this analysis for the full sample as well as for multinational and domestic firms. Columns (1) through (3) present the results for the full sample of firms. Column (1) replicates Dyreng et al. (2017) and, consistent with their results, finds that the coefficient on *TREND* is negative and significant (p-value < 0.01). Column (2) presents the results when the portion of cash effective tax rates that is not explained by variation in macroeconomic conditions, *CASHETR_UN*, serves as the dependent variable. Consistent with expectations, the coefficient on *TREND* is not statistically different from zero (p-value > 0.10), suggesting that *TREND* is not associated with the portion of cash ETRs that is unrelated to macroeconomic conditions. Column (3) presents the results when the portion of cash ETRs that is attributable to macroeconomic conditions, *CASHETR_EX*, serves as the dependent variable. Consistent with expectations, we find that the coefficient on *TREND* is negative and significant (p-value < 0.01), which is consistent with the downward trend being concentrated in the portion of cash ETRs that is explained by variation in macroeconomic conditions.

Columns (4) through (6) presents the results of this analysis for the subsample of multinational firms while Columns (7) through (9) present the results for the subsample of domestic firms. The results in both subsamples are consistent with the results for the full sample of firms. Specifically, we find that, for both multinational and domestic firms, *TREND* is not different from zero (statistically significant) when *CASHETR_UN* (*CASHETR_EX*) serves as the dependent variable. Interestingly, the association between *TREND* and *CASHETR_EX* is significantly more pronounced for domestic firms relative to multinational firms (Column (9) relative to Column (6)), which suggests that, relative to multinational firms, the tax planning activities of domestic firms are more sensitive to expected future growth in the U.S. In

combination, these results suggest that the downward trend in cash ETRs over the past 25 years is attributable to variation in macro-economic conditions.

6. Conclusion

Recent research suggests variations in macroeconomic conditions over time influence corporate decisions (Haddad et al. 2017; Pastor Veronesi 2005). Macroeconomic conditions likely play an important role is corporate tax planning because the net present value of additional tax planning activities is a function of expected future cash flows and the discount rate. This study examines whether intertemporal variation in macroeconomic conditions influence firms' investment in corporate tax planning over time.

Using a sample of 53,370 U.S. firm-years over the period 1988-2012, we find that cash effective tax rates are negatively associated with GDP growth forecasts and positively associated with the term spread and the 3-Year Treasury rate. The influence of macroeconomic conditions remains after controlling for firm characteristics. Moreover, we find that macroeconomic conditions influence both domestic firms and U.S. multinationals (U.S. MNCs) when we examine them separately.

It is possible our main results reflect unrelated trends in tax rates and macroeconomic factors over the past 25 years. To address this concern and help validate our primary results, we examine cross-sectional variation in the influence of expectations about future growth on tax planning. We find that the influence of expectation about future growth on tax planning is more pronounced for firms whose performance is more sensitive to the state of the economy (i.e., cyclical firms). Second, we find that the association between expectations about future growth and tax planning are more pronounced for firms that face financing constraints. This result

suggests that the tax planning activities of financially constrained firms are more sensitive to changes in expectations about future economic growth presumably because financially constrained firms need to use tax savings to fund additional investments. Finally, we find that the influence of the expectation of future growth on tax planning is more pronounced among firms that face high levels of competition. In combination, our cross-sectional analyses reinforce the core relation between macroeconomic conditions and tax planning by mitigating, at least partially, concerns that our main results are due to correlated omitted variables that have similar patterns with cash effective tax rates over the sample period.

Finally, we study the implications of our findings for recent research that finds a downward trend in cash ETRs over time (Dyreng et al. 2017). Our results suggest that the downward trend in corporate tax rates is explained by the macroeconomic factors identified in this study, which implies that firms are modifying their tax planning strategies in response to variation in macroeconomic conditions.

Our findings have important implications for regulators, policymakers, and researchers. We show firms adjust their tax planning in response to changes in the macroeconomy. For regulators, our findings are useful from an enforcement perspective suggesting firms could be more willing to engage in questionable tax practices when macroeconomic conditions are strongest. For policymakers, it raises the question of whether this behavior is optimal from a societal perspective. Does the economy benefit when firms avoid more taxes to fund investment opportunities that may otherwise go unrealized? What is the cost of having a tax system where firms avoid more taxes when the economy is strongest? Finally, for researchers, our results provide new insight into the puzzling finding from Dyreng et al. (2017) that domestic firms have experienced declining tax rates at a similar rate to multinational firms. Our results show that

changes in macroeconomic conditions over this time period explain this trend in corporate tax rates for both multinational and domestic firms. Also of interest to researchers, Goh et al. (2016) find that firm tax planning influences the cost of equity capital. Our results show that causation can also run in the opposite direction: the cost of equity capital influences tax planning decisions.

Our study creates additional opportunities for future research. Our study provides structure for understanding the association between macroeconomic conditions and tax avoidance. Because our focus is on macroeconomic conditions, we do not consider whether tax avoidance is influenced by expectations about future growth or discount rates at the firm-level. Future research could extend our framework to examine the influence of firm-specific expectations and firm-level cost of capital on tax avoidance. In addition, our results document the average influence of macroeconomic conditions. However, it is not clear whether uncertainty over future macroeconomic conditions influences corporate tax planning. We look forward to future research that furthers our understanding of these topics.

References

Ayers, B., A. Call, and C. Schwab. (2017). Do analysts' cash flow forecasts encourage managers to enhance real cash flows? Evidence from tax planning. *Contemporary Accounting Research* (forthcoming).

Armstrong, C. S., Blouin, J. L., Jagolinzer, A. D., & Larcker, D. F. (2015). Corporate governance, incentives, and tax avoidance. *Journal of Accounting and Economics*, *60*(1), 1-17.

Cochrane, J. H. (2011). Presidential address: Discount rates. *The Journal of Finance*, *66*(4), 1047-1108.

Desai, M. A., & Dharmapala, D. (2006). Corporate tax avoidance and high-powered incentives. *Journal of Financial Economics*, *79*(1), 145-179.

Dyreng, S. D., Hanlon, M., & Maydew, E. L. (2008). Long-run corporate tax avoidance. *The Accounting Review*, *83*(1), 61-82.

Dyreng, S. D., Hanlon, M., Maydew, E. L., & Thornock, J. R. (2017). Changes in corporate effective tax rates over the past 25 years. *Journal of Financial Economics*, *124*(3), 441-463.

Dyreng, S. D., & Lindsey, B. P. (2009). Using financial accounting data to examine the effect of foreign operations located in tax havens and other countries on US multinational firms' tax rates. *Journal of Accounting Research*, *47*(5), 1283-1316.

Dyreng, S. D., Lindsey, B. P., & Thornock, J. R. (2013). Exploring the role Delaware plays as a domestic tax haven. *Journal of Financial Economics*, *108*(3), 751-772.

Dyreng, S. D., & Markle, K. S. (2016). The effect of financial constraints on income shifting by US multinationals. *The Accounting Review*, *91*(6), 1601-1627.

Edwards, A., Schwab, C., & Shevlin, T. (2015). Financial constraints and cash tax savings. *The Accounting Review*, *91*(3), 859-881.

Fama, E.F., & French, K. R. (1989). Business conditions and expected returns on stocks and bonds. *Journal of Financial Economics* 25, 23-49.

Feldstein, M. & L. Summers (1979) Inflation and taxation of capital income in the corporate sector, *National Tax Journal* 41, 219–233.

Frank, M. M., Lynch, L. J., & Rego, S. O. (2009). Tax reporting aggressiveness and its relation to aggressive financial reporting. *The Accounting Review*, 84(2), 467-496.

Gaertner, F., S. Laplante, and D. Lynch. (2016). Trends in the sources of permanent and temporary book-tax differences during the Schedule M-3 era. *National Tax Journal*, 69(4), 785-808.

Giroud, X. and Muller, H. Does corporate governance matter in competitive industries? *Journal of Financial Economics*, 95(3):312-331, 2010.

Graham, J. R. (2000). How big are the tax benefits of debt? *The Journal of Finance*, *55*(5), 1901-1941.

Grubert, H. (2003). Intangible income, intercompany transactions, income shifting, and the choice of location. *National Tax Journal*, 221-242.

Haddad, V., Loualiche, E., & Plosser, M. (2017). Buyout activity: The impact of aggregate discount rates. *The Journal of Finance*, *72*(1), 371-414.

Hadlock, C. J. & Pierce, J. R. (2010). New evidence on measuring financial constraints: moving beyond the KZ index. *Review of Financial Studies*, 23, 1909-1940.

Hanlon, M., & Heitzman, S. (2010). A review of tax research. *Journal of Accounting and Economics*, *50*(2), 127-178.

Hoberg, G., Phillips, G., & Prabhala, N. (2014). Product market threats, payouts, and financial flexibility. *The Journal of Finance*, *69*(1), 293-324.

Hoopes, J. L., Mescall, D., & Pittman, J. A. (2012). Do IRS audits deter corporate tax avoidance? *The Accounting Review*, *87*(5), 1603-1639.

Hutton, A. P., Lee, L. F., & Shu, S. Z. (2012). Do managers always know better? The relative accuracy of management and analyst forecasts. *Journal of Accounting Research*, *50*(5), 1217-1244.

Kim, J., McGuire, S., Savoy, S., & Wilson, R. (2015). How Quickly Do Firms Adjust to Target Levels of Tax Avoidance? *Working paper.*

Konchitchki, Y., & Patatoukas, P, N. (2014). Accounting earnings and gross domestic product. *Journal of Accounting and Economics*, 57, 76-88.

Law, K. K., & Mills, L. F. (2015). Taxes and financial constraints: Evidence from linguistic cues. *Journal of Accounting Research*, *53*(4), 777-819.

Lisowsky, P., Robinson, L., & Schmidt, A. (2013). Do publicly disclosed tax reserves tell us about privately disclosed tax shelter activity? *Journal of Accounting Research*, *51*(3), 583-629.

Pástor, Ľ., & Veronesi, P. (2005). Rational IPO waves. *The Journal of Finance*, *60*(4), 1713-1757.

Rego, S. O. (2003). Tax- avoidance activities of US multinational corporations. *Contemporary Accounting Research*, *20*(4), 805-833.

Whited, T. M., & Wu, G. (2006). Financial constraints risk. *The Review of Financial Studies*, *19*(2), 531-559.

Wilson, R. J. (2009). An examination of corporate tax shelter participants. *The Accounting Review*, *84*(3), 969-999.

Zwick, E., & Mahon, J. (2017). Tax policy and heterogeneous investment behavior. *The American Economic Review*, *107*(1), 217-248.

Appendix A
Variable Definitions

Variable	Definition
CASHETR	Current-year cash taxes paid (TXPD) divided by current year pretax income (PI) (Data source: Compustat)
PERM	The U.S. statutory tax rate less the ratio of total tax expense (TXT) to pre-tax income (PI). We multiply *PERM* by negative one so that higher values represent lower levels of permanent tax avoidance.
TEMP	The ratio of deferred tax expense (TXFED + TXDFO) to pre-tax income (PI). If federal or foreign deferred tax expense is missing, we use total deferred tax expense in the numerator (TXDI). We multiply *TEMP* by negative one so that higher values represent lower levels of temporary tax avoidance.
GDP FORECAST	The averages of quarterly four-quarter-ahead (annualized) GDP growth forecast in calendar year *t (*Data source: the Survey of Professional Forecasters made available by the Federal Reserve Bank of Philadelphia)
TERM SPREAD	The averages of quarterly term spreads in calendar year *t*, where quarterly term spreads are defined as the difference in yields between the Aaa-rated corporate bond portfolio and the 1-month Treasury-Bill rate (Data source: the Federal Reserve Bank of St. Louis)
TBILL 3YR	The averages of daily 3-Year Treasury constant maturity rates in calendar *t* (Data source: the Federal Reserve Bank of St. Louis)
MNE	An indicator variable that is equal one if the current-year pretax foreign income (PIFO) > zero or if the absolute value of foreign tax expense (TXFO) > zero (Data source: Compustat).
LOG_ASSETS	Natural log of total assets (Data source: Compustat).
RD	Research and Development expense (XRD) divided by sales (SALE) , where XRD is set to zero if missing (Data source: Compustat)
PP&E	Net property, plant and equipment (PPENT) divided by total assets (AT) (Data source: Compustat).
INTAN	Intangible assets (INTAN) divided by total assets (AT)
LEV	The current-year amount of total debt plus long-term debt (DLTT+DLC) scaled by total assets (AT) (Data source: Compustat).
CAPEX	Capital expenditures (CAPX) divided by total assets (AT) (Data source: Compustat).
ADV	Advertising expense (XAD; if missing, it is set to zero) divided sales (SALE), where XAD is set to zero if missing (Data source: Compustat)
SP	Special items (SPI) divided by average total assets, where SPI is set to zero if missing (Data source: Compustat)
LAG_SP	Lagged *SP* (Data source: Compustat)
NOL	An indicator variable that is equal to one if the firm has a positive tax loss carryforward (TLCF) at year t-1 (Data source: Compustat).
CNOL	The difference between the current and lagged tax loss carryforward (TLCF), divided by lagged total assets (AT) (Data source: Compustat).
CASHETR_UN	The residual of regressions of cash effective tax rates (*CASHETR*) on the three macroeconomic factors (*GDP FORECAST*, *TERM SPREAD*, and *TBILL 3TR*) over 1988-2012. We then use the residual from this regression as a measure of the component of the cash effective tax rate that is unexplained by the macroeconomic factors, and we use a predicted value from the regression for the explained portion. Next, we repl
CASHETR_EX	The predicted value of regressions of cash effective tax rates (*CASHETR*) on the three macroeconomic factors (*GDP FORECAST*, *TERM SPREAD*, and *TBILL 3TR*) over 1988-2012.

Table 1
Descriptive Statistics

This table reports descriptive statistics (Panel A) and correlations (Panel B) for the variables used in our analyses. The sample runs over the period 1988 – 2012.

Panel A: Descriptive statistics

	N	MEAN	STD	Q1	MEDIAN	Q3
CASHETR	53370	0.291	0.228	0.124	0.275	0.386
GDP FORECAST	53370	2.769	0.506	2.335	2.838	3.054
TERM SPREAD	53370	1.375	1.043	0.558	1.195	2.438
TBILL 3YR	53370	4.740	2.157	3.100	5.138	6.221
MNE	53370	0.498	0.500	0.000	0.000	1.000
LOG_ASSETS	53370	5.925	1.882	4.491	5.795	7.203
RD	53370	0.025	0.050	0.000	0.000	0.025
PP&E	53370	0.299	0.227	0.119	0.238	0.424
INTAN	53370	0.117	0.163	0.000	0.039	0.178
LEV	53370	0.220	0.193	0.043	0.195	0.339
CAPEX	53370	0.256	0.169	0.135	0.211	0.334
ADV	53370	0.010	0.024	0.000	0.000	0.009
SP	53370	-0.003	0.018	-0.004	0.000	0.000
LAG_SP	53370	-0.009	0.032	-0.005	0.000	0.000
NOL	53370	0.269	0.443	0.000	0.000	1.000
CNOL	53370	-0.002	0.034	0.000	0.000	0.000

Table 1 (cont.)
Descriptive Statistics

Panel B: Correlations

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	*CASHETR*	1.00															
2	*GDP FORECAST*	**-0.10**	1.00														
3	*TERM SPREAD*	**-0.05**	**0.48**	1.00													
4	*TBILL 3YR*	**0.13**	**-0.45**	**-0.58**	1.00												
5	*MNE*	**0.03**	**0.05**	**0.03**	**-0.16**	1.00											
6	*LOG_ASSETS*	0.00	**0.07**	**0.04**	**-0.23**	**0.35**	1.00										
7	*RD*	**-0.06**	**0.03**	0.01	**-0.06**	**0.26**	**-0.04**	1.00									
8	*PP&E*	**-0.07**	**-0.06**	**-0.02**	**0.14**	**-0.21**	**0.16**	**-0.30**	1.00								
9	*INTAN*	0.00	**0.12**	**0.06**	**-0.29**	**0.17**	**0.25**	**-0.01**	**-0.33**	1.00							
10	*LEV*	**-0.02**	**-0.03**	**-0.03**	**0.06**	**-0.06**	**0.21**	**-0.28**	**0.26**	**0.17**	1.00						
11	*CAPEX*	**-0.01**	**-0.06**	**-0.10**	**0.06**	**0.01**	**-0.20**	**0.26**	**-0.31**	**-0.04**	**-0.26**	1.00					
12	*ADV*	**0.03**	**0.02**	**0.03**	-0.01	**0.04**	**0.06**	**-0.02**	**-0.07**	**0.06**	0.00	**0.05**	1.00				
13	*SP*	**-0.22**	0.00	-0.01	**0.05**	**-0.08**	**-0.08**	**-0.08**	**0.05**	**-0.07**	0.01	**-0.04**	**-0.03**	1.00			
14	*LAG_SP*	**0.08**	**-0.02**	**-0.05**	**0.07**	**-0.06**	**-0.01**	**-0.10**	**0.07**	**-0.05**	**-0.02**	**0.02**	0.00	**0.02**	1.00		
15	*NOL*	**-0.14**	**0.07**	**0.06**	**-0.23**	**0.17**	**0.09**	**0.11**	**-0.11**	**0.16**	**0.04**	0.00	**-0.01**	0.00	**-0.08**	1.00	
16	*CNOL*	**0.09**	**0.02**	**0.01**	**-0.02**	**0.03**	**0.10**	**-0.04**	**0.05**	**0.04**	**0.04**	**-0.04**	0.00	**-0.05**	0.00	**-0.15**	1.00

Bold text denotes significance at the 5% level

Table 2
Macroeconomic Conditions and Tax Avoidance

This table presents results of OLS estimation of Equation 5 using cash effective tax rates (*CASHETR*) as the dependent variable. The sample runs over the period 1988 – 2012. Variable definitions are provided in Appendix A. In Columns 2 through 4, industry fixed effects are included and standard errors are clustered by firm. *, **, and *** indicate significance (two-sided) at the 10%, 5% and 1% levels, respectively.

Panel A: Overall Tax Avoidance

Dep var. = CASHETR	(1)	(2)	(3)	(4)
Sample	ALL	ALL	MNE	DOM
Intercept	0.301***	0.301***	0.374***	0.248***
	(40.02)	(6.42)	(8.78)	(4.31)
GDP FORECAST	-0.031***	-0.032***	-0.038***	-0.023**
	(-13.77)	(-3.76)	(-4.88)	(-2.31)
TERM SPREAD	0.011***	0.011**	0.013***	0.008*
	(8.83)	(2.52)	(2.91)	(1.68)
TBILL 3YR	0.013***	0.013***	0.014***	0.013***
	(22.57)	(6.38)	(5.92)	(6.12)
MNE		0.029***	-	-
		(6.98)		
LOG_ASSETS		0.000	-0.004***	0.003
		(0.17)	(-2.60)	(1.59)
RD		-0.340***	-0.289***	-0.271***
		(-8.82)	(-6.38)	(-3.97)
PP&E		-0.080***	-0.079***	-0.079***
		(-6.06)	(-4.18)	(-5.19)
INTAN		0.003	0.028*	-0.021
		(0.23)	(1.84)	(-0.98)
LEV		-0.042***	0.011	-0.074***
		(-4.44)	(0.89)	(-5.60)
CAPEX		-0.051***	-0.099***	-0.010
		(-5.62)	(-8.23)	(-0.96)
ADV		0.031	0.018	0.123
		(0.59)	(0.27)	(1.44)
SP		-2.754***	-2.934***	-2.500***
		(-22.51)	(-21.21)	(-15.42)
LAG_SP		0.555***	0.454***	0.685***
		(9.03)	(6.06)	(12.14)
NOL		-0.047***	-0.025***	-0.078***
		(-10.39)	(-6.12)	(-12.42)
CNOL		0.450***	0.436***	0.429***
		(13.93)	(9.30)	(8.45)
Industry FE	No	YES	YES	YES
N	53,370	53,370	26,598	26,772
R^2	0.020	0.128	0.126	0.153

Table 2
Macroeconomic Conditions and Tax Avoidance

This table presents results of OLS estimation of Equation 5 using permanent (*PERM*) and temporary (*TEMP*) tax avoidance as the dependent variables (both are multiplied by negative one so larger values reflect lower levels of tax avoidance). The sample covers the period from 1988 – 2012. Variable definitions are provided in Appendix A. Fixed effects are included and standard errors are clustered by firm. *, **, and *** indicate significance (two-sided) at the 10%, 5% and 1% levels, respectively.

Panel B: Permanent and Temporary Tax Avoidance

	ALL		MNE		DOM	
	(1)	(2)	(3)	(4)	(5)	(6)
Sample	PERM	TEMP	PERM	TEMP	PERM	TEMP
Intercept	-0.189***	0.120***	-0.163***	0.123***	-0.197***	0.125*
	(-4.07)	(2.80)	(-3.85)	(3.78)	(-2.86)	(1.91)
GDP FORECAST	-0.009	-0.012*	-0.014*	-0.011*	-0.007	-0.009
	(-1.43)	(-1.81)	(-1.71)	(-1.78)	(-1.31)	(-1.14)
TERM SPREAD	0.010**	0.004	0.013***	0.000	0.007**	0.006
	(2.57)	(0.77)	(2.73)	(0.01)	(2.28)	(1.20)
TBILL 3YR	0.014***	0.005***	0.018***	0.002	0.010***	0.009***
	(10.01)	(2.62)	(9.76)	(0.96)	(6.39)	(3.57)
MNE	0.016***	0.025***	-	-	-	-
	(4.12)	(6.23)				
LOG_ASSETS	0.006***	-0.003***	0.002	-0.002*	0.010***	-0.006**
	(3.83)	(-2.79)	(1.51)	(-1.66)	(4.54)	(-2.46)
RD	-0.387***	0.336***	-0.328***	0.312***	-0.415***	0.380***
	(-8.71)	(7.41)	(-6.22)	(6.02)	(-4.85)	(4.34)
PP&E	0.024*	-0.157***	0.016	-0.174***	0.036**	-0.152***
	(1.69)	(-9.58)	(0.91)	(-7.93)	(2.24)	(-8.42)
INTAN	0.106***	-0.105***	0.091***	-0.090***	0.137***	-0.135***
	(7.31)	(-6.25)	(5.39)	(-4.53)	(7.93)	(-6.34)
LEV	-0.020	-0.023**	0.020	-0.000	-0.050***	-0.034***
	(-1.61)	(-2.36)	(1.38)	(-0.02)	(-3.11)	(-2.68)
CAPEX	0.030***	-0.059***	-0.007	-0.041**	0.057***	-0.068***
	(3.09)	(-4.32)	(-0.50)	(-2.51)	(5.15)	(-3.83)
ADV	-0.005	0.097*	-0.019	0.079	0.059	0.142
	(-0.09)	(1.87)	(-0.27)	(1.11)	(0.72)	(1.64)
SP	-1.052***	-2.430***	-1.214***	-2.718***	-0.826***	-2.026***
	(-9.52)	(-14.17)	(-8.64)	(-13.63)	(-7.47)	(-9.82)
LAG_SP	0.158***	0.363***	0.095	0.366***	0.250***	0.349***
	(2.64)	(5.93)	(1.38)	(4.38)	(3.78)	(4.65)
NOL	-0.034***	-0.006*	-0.018***	-0.001	-0.053***	-0.018***
	(-8.46)	(-1.71)	(-3.47)	(-0.23)	(-7.95)	(-2.97)
CNOL	0.433***	-0.076	0.462***	-0.001	0.378***	-0.184***
	(9.45)	(-1.43)	(5.97)	(-0.01)	(7.47)	(-2.78)
Industry FE	YES	YES	YES	YES	YES	YES
N	53,370	53,370	26,598	26,598	26,772	26,772
R^2	0.066	0.052	0.066	0.052	0.083	0.058

Table 3
Macroeconomic Conditions, Tax Avoidance, and Cyclicality

This table presents results of OLS estimation of Equation 5 using cash effective tax rates (*CASHETR*) as the dependent variable separately for high versus low cyclical firms. The sample runs over the period 1988 – 2012. Variable definitions are provided in Appendix A. As indicated, industry fixed effects are included. *, **, and *** indicate significance (two-sided) at the 10%, 5% and 1% levels, respectively, where standard errors are clustered by firm. Firm-level control variables are included but the results are suppressed for brevity.

Dep var. = *CASHETR*	(1)	(2)	(3)	(4)
Partitioning Variable	Cov (ROA, GDP)		Cov (IB, GDP)	
	High	Low	High	Low
Intercept	0.224***	0.471***	0.283***	0.293***
	(4.60)	(6.10)	(14.35)	(3.58)
GDP FORECAST	-0.033***	-0.020	-0.033***	-0.010
	(-3.76)	(-1.47)	(-5.43)	(-0.60)
TERM SPREAD	0.002**	0.002	0.002***	0.002
	(2.51)	(1.23)	(3.39)	(1.59)
TBILL 3YR	0.005***	0.013***	0.005***	0.016***
	(3.01)	(6.06)	(4.10)	(5.35)
Test of difference in *GDP FORECAST* coefficient two-tailed p-value	0.050		0.001	
Industry FE	YES	YES	YES	YES
Firm controls	YES	YES	YES	YES
N	11,834	11,829	11,834	11,829
R^2	0.149	0.154	0.191	0.155

Table 4
Macroeconomic Conditions, Tax Avoidance, and Financial Constraints

This table presents results of OLS estimation of Equation 5 using cash effective tax rates (*CASHETR*) as the dependent variable separately for high versus low financially constrained firms. The sample runs over the period 1988 – 2012. Variable definitions are provided in Appendix A. As indicated, industry fixed effects are included. *, **, and *** indicate significance (two-sided) at the 10%, 5% and 1% levels, respectively, where standard errors are clustered by firm. Firm-level control variables are included but the results are suppressed for brevity.

Dep var. = *CASHETR*	(1)	(2)	(3)	(4)
Partitioning Variable	The Whited-Wu Index		The Size-Age Index	
	High	Low	High	Low
Intercept	0.295***	0.288***	0.250***	0.355***
	(7.36)	(5.45)	(4.06)	(5.68)
GDP FORECAST	-0.035***	-0.019**	-0.048***	-0.016*
	(-3.66)	(-2.21)	(-4.52)	(-1.68)
TERM SPREAD	0.008	0.013*	0.011**	0.012**
	(1.43)	(1.94)	(2.18)	(1.98)
TBILL 3YR	0.010***	0.018***	0.009***	0.017***
	(4.05)	(5.88)	(4.89)	(4.97)
Test of difference in *GDP FORECAST* coefficient two-tailed p-value	0.025		0.000	
Industry FE	YES	YES	YES	YES
Firm controls	YES	YES	YES	YES
N	11,910	11,904	11,910	11,904
R^2	0.113	0.177	0.123	0.154

Table 5
Macroeconomic Conditions, Tax Avoidance, and Competition

This table presents results of OLS estimation of Equation 5 using cash effective tax rates (*CASHETR*) as the dependent variable separately for high versus low competition firms. The sample runs over the period 1988 – 2012. Variable definitions are provided in Appendix A. As indicated, industry fixed effects are included. *, **, and *** indicate significance (two-sided) at the 10%, 5% and 1% levels, respectively, where standard errors are clustered by firm. Firm-level control variables are included but the results are suppressed for brevity.

Dep var. = *CASHETR*	(1)	(2)	(3)	(4)
Partitioning Variable	HHI		Product Market Fluidity	
	High	Low	High	Low
Intercept	0.255***	0.362	0.530***	0.367***
	(5.13)	(.)	(4.59)	(6.37)
GDP FORECAST	-0.013	-0.033***	-0.049***	-0.030***
	(-1.17)	(-4.16)	(-6.01)	(-4.42)
TERM SPREAD	0.001	0.007	-0.002	-0.010**
	(0.29)	(1.46)	(-0.34)	(-2.22)
TBILL 3YR	0.012***	0.010***	0.005	0.005
	(4.58)	(3.72)	(1.31)	(1.64)
Test of difference in *GDP FORECAST* coefficient two-tailed p-value	0.004		0.011	
Industry FE	YES	YES	YES	YES
Firm controls	YES	YES	YES	YES
N	13,395	13,031	7,481	7,478
R^2	0.140	0.132	0.145	0.129

Table 6
Macroeconomic Conditions and Trend in Cash Effective Tax Rates

This table presents results of OLS estimation of Equation 5 using cash effective tax rates (*CASHETR*), unexplained cash effective tax rates (*CASHETR_UN*), and explained cash effective tax rates (*CASHETR_EX*) as the dependent variable for all firms and separately for multinational and domestic firms. The sample runs over the period 1988 – 2012. Variable definitions are provided in Appendix A. As indicated, industry fixed effects are included. *, **, and *** indicate significance (two-sided) at the 10%, 5% and 1% levels, respectively, where standard errors are clustered by firm. Firm-level control variables are included but the results are suppressed for brevity.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dep var.	*CASHETR*	*CASHETR_UN*	*CASHETR_EX*	*CASHETR*	*CASHETR_UN*	*CASHETR_EX*	*CASHETR*	*CASHETR_UN*	*CASHETR_EX*
Sample		*ALL*			*MNE*			*DOM*	
Intercept	0.335***	0.003	0.333***	0.396***	0.052*	0.344***	0.303***	-0.026	0.329***
	(11.30)	(0.08)	(54.03)	(13.55)	(1.74)	(46.93)	(7.03)	(-0.59)	(59.05)
TREND	-0.104***	-0.007	-0.097***	-0.106***	-0.011	-0.095***	-0.100***	0.015	-0.115***
	(-7.56)	(-0.57)	(-9.39)	(-6.78)	(-0.88)	(-7.44)	(-6.88)	(1.19)	(-12.70)
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Firm controls	YES	YES	YES	YES	YES	YES	YES	YES	YES
N	53,370	53,370	53,370	26,598	26,598	26,598	26,772	26,772	26,772
R^2	0.124	0.111	0.739	0.120	0.106	0.654	0.150	0.133	0.827