The Corporation Tax Elasticity of Charitable Donations

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A B S T R A C T

With the continued downward pressure on corporation tax rates, this paper analyses the corporation tax elasticity of donations. There is strong evidence of an inverted U-shape relationship between corporation tax rates and donations. Donations are initially increasing at a decreasing rate as a function of the corporation tax rate and are maximised at a rate of 27 percent. Between 2014 and 2018 the UK corporation tax rate decreased from 21 percent to 19 percent. Our results indicate that - ceteris paribus - this equates to a 34\% decrease in an average UK firm’s donations. As corporation tax rates continue to decline, the potential revenue implications for charities are increasing in importance. The evidence also supports the theory of management utility maximisation as a determinant of corporate giving.

Highlights

- The corporation tax rate (semi-) elasticity of donations is estimated.
- Fixed Effects and System GMM estimators are used.
- The relationship is an inverted U-shape.

\textit{Keywords:} Corporation Tax Rate, Charitable Donations, Management Utility

\textit{JEL classification:} H25, H32, L2

\textbf{Declarations of interest:} none

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1. Introduction

As in many countries (e.g. Australia, Canada, Germany, New Zealand, United States of America (US), Worldwide Tax Summaries, 2018) charitable donations are eligible for deduction for corporation tax purposes in the United Kingdom (UK). Accordingly, the price of corporate donations is equal to its after-tax cost and therefore, is inversely related to the corporation marginal tax rate. Over the last 25 years there has been a 14 percentage point decrease in the UK standard corporation tax rate (Figure 1). A similar trend is observable across the developed world. The mean corporation tax rate of OECD countries has decreased by 18 percentage points over the same period (Tax Foundation, 2013). The US has seen its federal corporation tax rate drop from 35 percent in 2017 to 21 percent in 2018 with the passage of the Tax Cuts and Jobs Act in 2017\(^1\). At issue is the corporation tax sensitivity of donations given this increase in their effective price.

The two most important sources of donations for UK charities are individuals and government (Figure 2). However, although individual donations also enjoy a tax benefit, personal tax rates in the UK have not experienced the same downward trend as corporation tax rates. The Higher Personal Tax Rate\(^2\) was unchanged at 40 percent over the same 25 year period and the Basic Personal Tax Rate decreased by only 5 percentage points from 25 to 20 percent (Figure 1). Furthermore, although corporate donations are less than individual and government contributions, they are not immaterial. In 2014 corporate donations amounted to £1.02 billion (National Council for Voluntary Organisations (NCVO), 2016). In the US, $17.77 billion was donated by corporations (Giving USA, 2015).

\(^1\) The details of this act are available at https://www.congress.gov/bill/115th-congress/house-bill/1/text

\(^2\) An Additional Rate of Personal Tax of 50 percent was introduced in 2010 for incomes above £150,000. This was decreased to 45 percent in 2013.
Despite its importance, the empirical literature on the corporation tax elasticity of donations is limited (Caroll and Joulfaian, 2005) and inconclusive. Previous estimates of the corporation tax effect range from a positive (Clotfelter, 1985), to a negative (Boatsman and Gupta, 1996), to no relationship (Navarro, 1988). There is also concern that restrictions on the previously available data will have led to aggregation bias (in studies restricted to macro-level data) and selection bias (in studies restricted to survey data of large donors) confounding the resulting estimates (Caroll and Joulfaian, 2005). Furthermore, the previous empirical work only estimates for a linear (in variables\(^3\)) relationship. This limits the resulting estimates to that of a constant elasticity of donations to the corporation tax rate. However, the analysis in this paper shows that the functional form of the model is critical to the estimated effect. By extending the model to its quadratic form, this paper shows that the elasticity of corporate donations to the corporation tax rate is nonlinear and non-monotonic, resulting in an inverted U-shape relationship. This result informs the policymaker’s estimate of the magnitude and direction of the effect of a proposed change in the corporation tax rate as it will be dependent upon its current level. Correcting for the functional form of the model also appears to explain the

\[^3\text{We are making this distinction as previous work includes the log transformation of corporate donations as the dependent variable. In that sense the previous work could also be referred to as estimating nonlinear models. However, such models do not allow for the same important characterisation of the relationship that we are making here.}\]
contradictory results in the previous literature. By specifying a quadratic model, the previous evidence of there being no relationship (Navarro, 1988) or a negative relationship (Boatsman and Gupta) between corporation tax rates and donations both resolve to the inverted U-shape relationship. This also contributes to the theory of the corporation tax effect on corporate donations as the findings support models in which managers value charitable giving and donate beyond the profit maximizing level.

Recognising the continued decrease in corporation tax rates and the availability of better data, this article undertakes the study of the corporation tax elasticity of charitable donations. By using the entire sample of 321 UK public companies available in Asset4, the sample is not restricted to only industry level observations nor only the highest level of firm donors as in previous work. Accordingly, this data overcomes the aggregation and selection bias concerns of previous articles. By using this data and introducing a quadratic specification to the model we find strong evidence of an inverted U-shape relationship: as the corporation tax rate initially increases, donations increase at a decreasing rate. More intuitively, as the effective price decreases, donations increase but at a diminishing rate. The model predicts that donations are maximised at a corporation tax rate of 27 percent before the relationship becomes negative. Between 2014 and 2018 the UK standard corporation tax rate decreased from 21 percent to 19 percent. The estimates\(^4\) indicate that \textit{ceteris paribus} - this equates to a 34% decrease in an average UK firm’s donations.

\(^4\) We wish to emphasise the microeconomic nature of this analysis. We thank an Anonymous Reviewer for making the important point that potential macroeconomic effects from a decrease in corporation tax rates could actually lead to an overall increase in charitable donations or at least mitigate the negative effect of a decrease in corporation tax rates, e.g. less corporation tax may lead to greater corporate investment and a larger economy with greater capacity to donate and / or less need for charitable services.
The remainder of this paper is organized as follows. The next section summarises the theory, the empirical literature and this paper’s contribution to it. The data and methods used in the analysis are then discussed and the results reported thereafter. The penultimate section presents a discussion of the evidence including policy implications and supplementary analysis, and the final section concludes.

2. Summary of Theory and Empirical Literature

2.1. Summary of Theory

In contrast to the empirical literature, the theory of the corporation tax effect on corporate giving is well developed. Here we briefly summarize the key contributions. Clotfelter (1985) formally develops two models of corporate giving. Under a model of profit maximization and consistent with Bénabou and Tirole’s (2010, pg. 9) “doing well by doing good” perspective of corporate social responsibility, firms make charitable donations toward increasing revenue and / or decreasing costs. The former would be expected through increased demand as driven by an increase in the public image of the firm. The latter may be obtained through lower wages where the donations cause the local environment to be a more desirable place for employees to live. More directly, workers may exert more effort for employers that donate (Kajackaite and Sliwka, 2017). Donations may also be seen as a way to increase a firm’s political capital toward decreasing regulatory costs. Regardless of the mechanism, the assumption is that where a firm’s charitable donations \(d\) are afforded the same tax deductible treatment as any other input (at tax rate, ‘\(t\)’), they will similarly enter the firm’s profit maximisation problem. Assuming a standard concave profit function with decreasing returns to input (including donations), a profit \(\pi\) maximising level can be solved for \(\frac{\partial \pi}{\partial d} > 0; \frac{\partial^2 \pi}{\partial d^2} < 0\). Importantly, it is easily shown that the profit maximising level of any input is independent of the corporation tax rate \(\frac{\partial d}{\partial t} = 0\).
Any change in the tax rate only affects the after-tax level of profits. It does not affect the levels or mix of the profit maximising inputs.

The alternative formal model developed in Clotfelter (1985) - and consistent with Bénabou and and Tirole’s (2010) management initiated corporate giving perspective of corporate social responsibility - is that of management utility maximization. The model is based on management’s utility being a function of both the firm’s profit and donations where donations continue to be an input to the firm’s profit maximization problem. In this set-up it is shown that it is utility maximizing for management to choose to donate at amounts greater than in the pure profit maximisation model. Furthermore, there will be a positive relationship between the tax rate and the utility maximizing amount of donations ($\frac{\partial d}{\partial t} > 0$). The negative income effect on profits from an increase in the tax rate ($\frac{\partial \pi}{\partial t} < 0$) is more than offset by the substitution effect as management is now faced with a utility trade-off between a marginal £1 donation and what is now a lower after-tax profit contribution to utility from that £1. In support of the management utility maximization model, Clotfelter (1985) - using aggregate level data of US corporate donations over the years 1936 – 1980 - finds evidence of the predicted positive relationship between the corporation tax rate and donations.

In a special case where profits are not included in the manager’s utility function, (such that there is only the negative income effect), Navarro (1988) draws on the work of Clotfelter (1985) to show that the predicted sign of the relationship between the corporation tax rate and donations would then be negative. Using a sample of 249 US firms pooled across the years 1978, 1981 and 1983, Navarro (1988) concludes that the lack of a statistically significant

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5 This model is developed from Williamson’s (1963, 1964) work on management discretionary behaviour.
relationship between the corporation tax rate and donations is evidence of profit rather than utility maximization as being the primary motive for corporate giving \( \frac{\partial d}{\partial t} = 0 \).

Boatsman and Gupta (1996) extend the work of Clotfelter (1985) and Navarro (1988) to show that a negative tax effect on donations \( \frac{\partial d}{\partial t} < 0 \) can be obtained in a model that retains the firm’s profits in the management utility maximization problem. Boatsman and Gupta (1996) focus on the separation of ownership from management and the presence of a minimum profit constraint above which profits are characterised as discretionary by management and therefore, eligible for donation. In this set-up, the positive relationship between the corporation tax rate and donations continues to hold for as long as the minimum profit constraint is not binding which is defined as there being sufficient discretionary profits to allow management to choose its utility maximizing level of donations. However, once the constraint is binding, an increase in the tax rate reduces after-tax profits and therefore, the amount of discretionary profits. Management must then reduce donations in order to continue to meet the minimum profit constraint \( \frac{\partial d}{\partial t} < 0 \). Boatsman and Gupta (1996) further recognise that the switch in sign from positive \( \frac{\partial d}{\partial t} > 0 \) to negative \( \frac{\partial d}{\partial t} < 0 \) is possible even without a binding profit constraint. This switch may present itself as the firm approaches its minimum profit constraint such that the positive substitution effect from the increase in the tax rate is no longer sufficient to offset the negative income effect on profits. Using a sample of 212 of the largest corporate donors in the US over the years 1984 to 1988, Boatsman and Gupta conclude that the statistically significant negative effect of the corporation tax rate on donations is evidence of donations being made in excess of the profit maximizing level subject to a binding profit constraint.
2.2. Empirical Literature

Although a significant literature exists with respect to the determinants (including price effects, Meer 2014) of individual giving, little work has been done on the estimation of the corporation tax effect on charitable giving (Carroll and Joulfaian, 2005). This is confirmed by Gautier and Pasche (2015) who survey 162 academic papers on corporate philanthropy but are only able to identify a few studies that investigate for a corporation tax effect.

Within this limited empirical literature, a convincing estimate of the corporation tax effect has yet to be estimated. Clotfelter (1985) surveys the literature to that date which relies on macro level data with the resulting estimates thereby considered to be suffering from aggregation bias (Carroll and Joulfaian, 2005). More recent empirical studies - Navarro (1988), Arulampalam and Stoneman (1995), Boatsman and Gupta (1996) - all use micro-level data. However, in each case the samples are limited to survey data of only the largest corporate donors and therefore, likely suffer from selection bias (Carroll and Joulfaian, 2005).

Furthermore, these studies do not lead to a conclusive estimate of the corporation tax effect on donations. Where Clotfelter (1985) estimates for a positive effect of corporation tax on a firm’s donations, Navarro (1988) is unable to find a statistically significant relationship and concludes that the corporation tax rate has no effect on donations. Similarly, Arulampalam and Stoneman (1995) are unable to find for a contemporaneous corporation tax effect on donations, however, they do find for a lagged positive effect of the corporation tax rate on donations. Finally, Boatsman and Gupta (1996) conclude that they find evidence of a negative corporation tax effect.
The most recent related article is the study by Carroll and Joulfaian, 2005. However, their article is not directly comparable to the previous literature as their study investigates for the combined corporation and personal tax effects on corporate donations. The perspective of the paper is from that of the shareholder. As Gautier and Pasche (2015) indicate, it is rare for shareholders to have input on a firm’s corporate donations decisions.

A related but separate literature also investigates for corporate giving as an indicator of agency issues within a firm (Duquette and Ohrn, 2018). In this case the authors exploit the presence of corporate charity as a signal of management self-interest, although they are unable to conclude whether this is necessarily at the expense of shareholders in the long run. However, this literature is distinguished from the research agenda here as it is not estimating for a price effect on corporate charity.

In contrast to earlier work, the study presented here has a number of important advantages. The sample used in the empirical analysis is from the United Kingdom (UK), where no limit is imposed on the amount of donations eligible for corporation tax deduction. With the exception of the Arulampalam and Stoneman (1995) paper, the previous empirical work uses data from the United States (US) where firms have a limit on the amount of donations eligible for tax deduction purposes. Other than Carroll and Joulfaian (2005), an effort to address this potential truncation of the data is not evident in the previous work. The Arulampalam and Stoneman (1995) study uses UK data. However, during the period analysed (1979 – 1986) only covenanted donations - pledged for a minimum of three years, (Charity Tax Group, 2018) - were deductible for tax purposes. This will have restricted the variation in donations across

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6 Firms’ donations deductions were limited to 5% of an adjusted taxable income figure which was increased to 10% after 1980, (Carroll and Joulfaian, 2005).
time and may explain why the researchers were unable to find a contemporaneous relationship between the corporation tax rate and donations. In contrast, the sample used in this paper is from the years 2003 – 2014 which is subsequent to the removal of the covenanted donation requirement in 1990 and therefore, allows firms’ donations to respond to changes in the corporation tax rate.

Additionally, the functional form of the model proves to be important to the research question. As the theoretical and empirical literature has shown, corporation taxes can have opposing effects on donations and that these effects may not be linear. This raises the possibility that the relationship between corporation taxes and donations is not monotonic. As a starting point, a simple plot of our sample (see Section 3.1 Data for full details) of donations as a function of the corporation tax rate reveals an inverted U-shape relationship. See Figure 3. As discussed in Section 2.1, the previous theory emphasises the importance of the sign of the relationship between the corporation tax rate and corporate donations and whether it is positive, zero, or negative. However, the related empirical work does not provide for the possibility that the relationship is not constant across corporation tax rates and therefore, may even switch signs. Such a non-monotonic relationship would be entirely consistent with Boatsman and Gupta’s (1996) theory that the presence of a profit constraint can cause a positive relationship between the corporation tax rate and donations to become negative. However, by not specifying a quadratic model, the related empirical work has not tested for this possibility. More generally, non-monotonicity may be expected by reference to the reciprocity (gift exchange) argument derived from the ‘fair wage-effort’ hypothesis in labor markets (Akerlof, 1982; Akerlof and Yellen, 1990). This argument is detailed in the Appendix, however, to briefly summarize it here: as the corporation tax rate increases, the price of donations falls, leading to an increase in a firm’s donations. However, as the corporation tax rate continues to increase, the perceived
Figure 3: Unconditional relationship between corporation tax rate and corporate donations
Binned scatterplot, which plots the mean value of the inverse hyperbolic sine transformed (ihs) Real Donations for each discrete value of the effective marginal tax rate (EMTR) for the sample of 295 firms over the years 2003 – 2014. Complete details of the sample are explained in Section 3.1. Data. Overlaid is the estimated linear and quadratic relationships.

(un)fairness of the firm’s ‘fair share’ of tax increases in importance and the firm compensates by increasing the amount of donations by less than it otherwise would have made and may even reduce them. The net result is a non-monotonic relationship between the corporation tax rate and the donations that a firm makes.

By making a simple extension to the model, the evidence shows that there is an inverted U-shape relationship between the corporation tax rate and firm donations. This has two important implications. Firstly, for countries - such as the UK - that are already below their donation-maximising corporation tax rate, the continued downward pressure on tax rates will have an increasingly negative effect on corporate donations. This result is directly relevant to policy makers as discussed in Section 5.1. Policy Implications. Secondly, the adjustment to the
functional form of the model provides an explanation to the contradictory results in the previous empirical literature. In our main Results (Section 4), a simple linear (in variables) model is first estimated in which there is no evidence of a relationship between the corporation tax rate and donations. This is consistent with Navarro (1988). The model is then extended to a quadratic specification so as to allow for nonlinearity and non-monotonicity. This results in strong evidence of an inverted U-shape relationship between corporation tax rates and donations. In Section 5.2 Supplementary Analysis, a linear model consistent with that used in Boatsman and Gupta (1996) is estimated. The evidence is of the same negative relationship between corporation tax rates and donations as found in Boatsman and Gupta (1996). By correcting for the functional form to its quadratic specification, the relationship again switches to being an inverted U-shape as a function of the corporation tax rate. This consistency in our findings has direct implications for the theory of corporate giving as a function of corporation tax rates, which revolves around the sign of the relationship and a potential switch in it.

With the availability of better data and providing for a potential nonlinear, non-monotonic relationship, we now turn to estimating the effect of corporation tax rates on corporate donations.

3. Empirical Strategy

3.1. Data

Firm variables are collected from Asset4 and Datastream. Corporation tax rates are from the Institute of Fiscal Studies (IFS, 2016). Given generous loss carryover provisions in the UK, loss firms - defined as pre-tax income before donations less than zero - are excluded as their
Real Donations and Real NI before Donations are in constant year 2000 British pounds sterling. Assets are measured as the firm’s total assets; Leverage as the firm’s debt-to-equity ratio; Ownership as the percentage of firm shares held by insiders; Margin as the firm’s profit margin. Assets and Real NI before Donations are in £000. (ihs) refers to the inverse hyperbolic sine transformation of the variable.

effective marginal tax rate becomes indeterminate\(^7\). Only 7\% of the sample falls into this category. This leaves 295 firms over the period 2003 – 2014 for 2,189 firm-year observations once data availability is accounted for. See Table 1 for descriptive statistics\(^8\).

Whilst the main focus of this paper is the corporation tax elasticity of charitable donations, we also recognize in our subsequent empirical strategy that donations are likely to be dynamic in nature. As is consistent with Clotfelter’s (1985) ‘Rules of Thumb’ model, a firm’s donation behaviour at time \( t \) can be thought of as a function of that same attitude at time \( t - 1 \) as modified by any new information. To analyze how donations at the intensive margin in the previous period affect the probability distribution of current donations, we consider the following Markov Chain where the distribution of current real donations is partitioned into quintiles:

\[
P = \begin{array}{ccccc}
1 & 2 & 3 & 4 & 5 \\
1 & 72.45 & 23.72 & 3.06 & 0.77 & 0.00 \\
2 & 12.18 & 62.18 & 23.58 & 1.81 & 0.26 \\
3 & 1.33 & 11.97 & 61.70 & 23.14 & 1.86 \\
4 & 0.53 & 0.53 & 11.50 & 73.53 & 13.90 \\
5 & 0.00 & 0.00 & 0.27 & 6.28 & 93.44 \\
\end{array}
\]

\(^7\) Trading losses incurred before April 2017 – as is the case with this dataset – can be carried forward for as long as the trading activity continues, for use against future trading profits.

\(^8\) (ihs) refers to a variable that has been transformed using the inverse hyperbolic sine. This is the appropriate alternative to a log transformation as described in detail in Section 3.2. Econometric Strategy.
The elements of the first row provide information on the conditional distribution of real donations at time $t$, given a firm’s real donations were within the first quintile (the lowest quintile of real donations) at time $t - 1$. Persistent donation behavior is observable by considering the relative size of the diagonal elements of the Markov Chain with those elements furthest from the diagonal. For the most extreme cases it is clear that the probabilities of transitions to the highest quintile from the lowest quintile of donations, or the reverse, are small. Consequently, firms are more likely to remain close to their prior quintile than adjust significantly from it.

3.2. Econometric Strategy

The following panel model is estimated ($i$ and $t$ denote the cross-sectional (firm) and time-series dimensions respectively):

$$
Don_{it} = \sum_{j=1}^{2} \theta_j EMTR_{it}^j + \beta'X_{it} + u_t + \epsilon_{it} \tag{1}
$$

$Don_{it}$ are real corporate donations\textsuperscript{9}. As donations can be zero or positive they are transformed using the inverse hyperbolic sine (IHS). The IHS transformation allows for non-positive amounts while affording the same interpretation as the natural log transformation except for very small amounts (Burbidge, Magee, and Robb 1988; Pence 2006).

$EMTR$ represents the effective marginal tax rate which is estimated as a function of a firm’s pre-tax income before donations – and therefore exogenous with respect to the amount of donations to be made (Carroll and Joulfaian, 2005) - and its fiscal year end\textsuperscript{10}. The estimate is

\textsuperscript{9} Measured in constant year 2000 British Pound Sterling.

\textsuperscript{10} e.g.: In 2014, the main corporation tax rate was 21 percent for firms with £1,500,000 or more in taxable profits, a small profits rate of 20 percent for firms with less than £300,000 in taxable profits and a marginal rate
of a current year “next pound” reduction (Plesko, 2003) in the taxes from making a donation. The relationship between donations and EMTR is allowed to take a quadratic form in order to investigate for the possibility of nonlinearity and non-monotonicity in the estimated elasticity as discussed in Section 2.2. Empirical Literature. As tax return data for the sample of firms is not publicly available, the estimate of EMTR is derived using financial statement information. This leads to the concern that accounting profits are not necessarily the same as taxable profits with the latter being the actual determinant of the firm’s tax rate(s)\textsuperscript{11}. However, by computing marginal tax rates (MTRs) based on firms’ accounting information and then comparing those to MTRs computed from the firms’ tax return information, Plesko (2003) shows that the MTR derived from a firm’s financial statements is a reasonable proxy for the actual MTR that the firm is facing. This finding is confirmed in Graham and Mills (2008) who conclude that MTRs calculated from financial statements provide a reasonable proxy for the actual tax incentives faced by firms. Finally, any measurement error that is introduced from the use of a financial statement-based MTR would lead to attenuation bias in the estimated coefficients (Greene, 2008). Any such measurement error - induced attenuation bias would mean that our results represent lower bound estimates which only serves to increase the importance of our findings.

\textsuperscript{11} The discrepancy between the two profit calculations may be characterised as timing (and therefore, temporary) differences due to income and expense recognition criteria for accounting as compared to tax purposes (e.g. depreciation for accounting purposes versus capital allowances for tax purposes). Other discrepancies may be characterised as permanent differences such as accounting expenditures that are not deductible for tax purposes (e.g. fines and penalties). The matter may be further complicated by the absence of consolidation of associated entities provided for in the UK corporation tax system as compared to that which may be required under International Financial Reporting Standards. There are also differences with respect to the treatment of foreign income (e.g. dividends received from a foreign subsidiary are exempt from taxation to the UK parent).
$X_{it}$ represents a vector of firm characteristics. In order to estimate the income elasticity of corporate donations, the variable $(ihs)\text{Real Net Income before Donations}$ is included and measured as the after-tax real\(^9\) net income adjusted to a pre-donations basis (Clotfelter, 1985). The other control variables are drawn from Adams and Hardwick (1998) who investigate four company-specific determinants of donations. The authors hypothesize that a firm’s donations will be increasing in its size due to greater visibility and public scrutiny. Adams and Hardwick (1998) also predict that corporate donations will be decreasing in leverage due to higher contracting costs and therefore, the firm is less able to make contributions. As management will be subjected to greater scrutiny in closely-held firms, discretion over corporate donations will be relatively more restricted. Therefore, Adams and Hardwick (1998) hypothesize that corporate donations will be decreasing in the firm’s concentration of ownership. Finally, the authors predict that the firm’s donations will be increasing in profitability as such firms will have greater financial capacity. These four determinants are measured respectively as a firm’s total assets ($ihs \text{ Assets}$), debt to equity ratio ($ihs \text{ Leverage}$), percentage of closely held shares defined as shares held by insiders\(^{12}\) of the firm ($\text{Ownership}$), and profit margin ($ihs \text{ Margin}$). Although the corporation tax rate is expected to be exogenous, these control variables serve as a reference toward the economic significance of the estimates.

Lastly, in Equation (1) the variables $u_t$ and $\epsilon_{it}$ represent firm fixed effects and the disturbance term respectively.

To the extent to which donation behaviour at time $t$ is a function of that same attitude at time $t - 1$ as modified by any new information, we specify a model with the inclusion of a lagged dependent variable in order to control for such dynamic decision-making. The inclusion of the

\(^{12}\) Insiders include corporate directors, officers, their immediate family, etc.
lagged dependent variable leads to methodological challenges which are addressed below. The starting point is a dynamic panel model as follows:

$$Don_{it} = \sigma Don_{it-1} + \sum_{j=1}^{2} \theta_j EMTR_{it}^j + \beta' X_{it} + u_i + \varepsilon_{it}, \quad (i = 1, \ldots, N; \ t = 2, \ldots, T_i)$$

(2)

The ordinary least squares (OLS) estimate of dynamic models with fixed-effects may be significantly biased as the lagged values of the dependent variable may be correlated with the error term (Nickell, 1981). Therefore, we estimate equation (2) using a dynamic GMM panel estimator to circumvent this concern. This estimator was introduced by Holtz-Eakin, Newey, and Rosen (1988) and Arellano and Bond (1991), and further developed in a series of papers including Arellano and Bover (1995) and Blundell and Bond (1998). The basic estimation procedure consists of two steps. First, we write the dynamic model from equation (2) in first-differenced form which removes the firm-specific effect from the model:

$$\Delta Don_{it} = Don_{it} - Don_{it-1} = \sigma \Delta Don_{it-1} + \sum_{j=1}^{2} \theta_j \Delta EMTR_{it}^j + \beta' \Delta X_{it} + \Delta \varepsilon_{it} \quad (i = 1, \ldots, N; \ t = 3, \ldots, T_i)$$

(3)

After first-differencing, lagged donations ($\Delta Don_{it-1} = Don_{it-1} - Don_{it-2}$) will still be correlated with the error term ($\Delta \varepsilon_{it} = \varepsilon_{it} - \varepsilon_{it-1}$). However, estimating equation (3) via GMM allows us to use lagged values of donations as instruments for the first-differenced lagged dependent variable using the following moment conditions: $E(Don_{it-s}\Delta \varepsilon_{it}) = 0$ for $s \geq 2; \ t = 3, \ldots, T_i$.

Whilst equation (3) deals with unobserved heterogeneity and dynamics in the decision making process, it assumes that the vector of control variables, $X_{it}$, are exogenously determined.
Therefore, Equation (3) may suffer from the general limitation of simultaneity where
\( E(\varepsilon_{it}|X_{it}) \neq 0 \). If corporate giving is value enhancing, then while corporate giving may be
affected by the contemporary characteristics of the firm (e.g. size, profit margin), the reverse
may also hold true. Therefore, in the same manner as the lagged dependent variable, we can
also use lagged values of all the other potentially endogenous explanatory regressors as
instruments for the explanatory variables using the following moment conditions
\( E(X_{it-s}\Delta \varepsilon_{it}) = 0 \) for \( s \geq 2; t = 3, \ldots , T_i \). This approach is generally referred to as the
Difference-GMM estimator. Arellano and Bover (1995) suggest that lagged levels may be
weak instruments for first-differenced variables. Following Arellano and Bover (1995) and
Blundell and Bond (1998) we use a System-GMM approach which builds a system of two
equations that includes the difference equation (3) and level equation (2). In addition to the
previous instruments, the System-GMM estimator uses the lagged differences of donations and
the other potentially endogenous explanatory regressors as instruments for the level equation,
exploiting the following moment conditions: \( E(\varepsilon_{it}\Delta Don_{it-1}) = 0 \) and \( E(\varepsilon_{it}\Delta X_{it-1}) = 0 \) for
\( t = 3, \ldots , T_i \). The System-GMM estimator has been shown to be more efficient and increases
the precision in the estimates compared with the Difference-GMM by reducing the finite
sample bias (Baltagi, 2008).

4. Results
4.1. Table 2

All control variable estimates have the expected sign except for a firm’s leverage. (ihs) Assets
and (ihs) Margin are highly statistically and economically significant across all estimations.
The statistical significance is less consistent with respect to a firm’s ownership structure

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13 All results are robust to winsorizing the real donations variable at 1%, 2% and 2.5%. The results are also
robust to using the natural log transformation of real donations, either by dropping the 42 observations who
recorded zero real donations or by inputting values of 0.001 prior to the conversion of real donations into log
form.
Table 2
Results for the corporation tax and income elasticity of donations

<table>
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<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
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<td>0.858 ***</td>
<td>0.829 ***</td>
<td>0.777 ***</td>
<td>0.759 ***</td>
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<td>(0.167)</td>
<td>(0.205)</td>
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<td>-0.016 ***</td>
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<td>(0.003)</td>
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<tr>
<td>(ihs) Real NI before Donations</td>
<td>0.086 **</td>
<td>0.072 **</td>
<td>0.059 *</td>
<td>0.081</td>
<td>0.086</td>
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<tr>
<td></td>
<td>(0.035)</td>
<td>(0.031)</td>
<td>(0.034)</td>
<td>(0.051)</td>
<td>(0.056)</td>
</tr>
<tr>
<td>Forward EMTR</td>
<td>-0.005</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>(0.006)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>(ihs) Real Donations,1</td>
<td></td>
<td></td>
<td></td>
<td>0.497 ***</td>
<td>0.501 ***</td>
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<td></td>
<td></td>
<td>(0.080)</td>
<td>(0.081)</td>
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<tr>
<td>(ihs) Assets</td>
<td>0.861 ***</td>
<td>0.641 ***</td>
<td>0.512 ***</td>
<td>0.349 ***</td>
<td>0.335 ***</td>
</tr>
<tr>
<td></td>
<td>(0.152)</td>
<td>(0.140)</td>
<td>(0.116)</td>
<td>(0.120)</td>
<td>(0.112)</td>
</tr>
<tr>
<td>(ihs) Leverage</td>
<td>-0.013</td>
<td>0.005</td>
<td>-0.043</td>
<td>-0.016</td>
<td>-0.004</td>
</tr>
<tr>
<td></td>
<td>(0.034)</td>
<td>(0.035)</td>
<td>(0.035)</td>
<td>(0.112)</td>
<td>(0.108)</td>
</tr>
<tr>
<td>Ownership</td>
<td>-0.011 *</td>
<td>-0.010 *</td>
<td>-0.009</td>
<td>-0.010</td>
<td>-0.011</td>
</tr>
<tr>
<td></td>
<td>(0.006)</td>
<td>(0.006)</td>
<td>(0.006)</td>
<td>(0.007)</td>
<td>(0.008)</td>
</tr>
<tr>
<td>(ihs) Margin</td>
<td>1.381 ***</td>
<td>1.268 ***</td>
<td>1.358 ***</td>
<td>0.553 ***</td>
<td>0.531 ***</td>
</tr>
<tr>
<td></td>
<td>(0.142)</td>
<td>(0.133)</td>
<td>(0.115)</td>
<td>(0.112)</td>
<td>(0.113)</td>
</tr>
</tbody>
</table>

Instruments 267 225
Hansen $J$-test ($p$-value) 0.450 0.086
AR(1) ($p$-value) 0.004 0.004
AR(2) ($p$-value) 0.820 0.818
N 2189 2189 1760 1760 1760
Firms 295 275 275 275 275
Adjusted $R^2$ 0.29 0.31 0.30

Standard errors (s.e.’s) appear in parenthesis. * significant at the 10% level; ** at the 5% level; *** at the 1% level. (1)-(2): Hausman and Robust Hausman test reject random effects in favour of fixed effects. (1) - (3) Heteroskedasticity and cluster (by firm) robust s.e.’s are used. Time indicators not included due to collinearity with the EMTR variable. (4) - (5): GMM regressions use robust s.e.’s and treat the lagged real donations measure as predetermined. All other variables are treated as endogenous other than the effective marginal tax rate. Following Roodman (2009a,b) the lag limit in (4) and (5) is restricted to 5 lags and 4 lags respectively to reduce the number of instruments to below the number of firms in the sample.

(Ownership). There is no evidence that a firm’s leverage ((ihs) Leverage) has any effect on a firm’s donations.

Beginning with the standard fixed effects estimation, the variable EMTR is introduced in Column (1) to estimate a simple linear model consistent with previous literature. (ihs) Real Net Income before Donations is also included. Initially, there does not appear to be any effect of the effective marginal tax rate on a firm’s donations. It is not until the introduction in Column
(2) of the quadratic – $EMTR^2$ – that there is significant evidence of a nonlinear relationship for donations as a function of the effective marginal tax rate$^{14}$. The evidence of a statistically significant relationship between the tax rate and a firm’s donations supports the management utility maximization model and theory of corporate giving. Importantly for policy implications, these estimates indicate that not only are decreases in the corporation tax rate to the potential disadvantage of UK charities’ revenue, but that the marginal effect is greater as the corporation tax rate continues to decline$^{15}$. The robustness of this key result is confirmed by the additional estimations discussed below. There is also strong evidence of a positive but small income elasticity effect as is consistent with previous work (Boatsman and Gupta 1996). A 1% increase in income is correlated with a 0.07% increase in donations.

Column (3) of Table 2 investigates the interesting possibility that the tax effect in Column (2) may not result from firms’ reactions to changes in the contemporary price of giving but from firms moving donations into that year from other years with lower tax rates. To investigate for this possibility - where a firm increases its donations today in anticipation of a decrease in the tax rate - Column (3) introduces the Forward EMTR. However, it is not statistically or economically significant. This result is consistent with an interpretation of management not wanting to risk making donations in anticipation of future profits before they are known.

To control for the possibility that donations are likely to be dynamic in nature, Columns (4) and (5) of Table 2 estimates the dynamic panel model in Equation (3) using the System-GMM

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$^{14}$ We investigated for a further higher order effect but found no economic or statistical evidence for it.

$^{15}$ As will be shown in Section 5. Discussion and Analysis of Results, firm donations are maximised at a corporation tax rate of approximately 27 percent. The current UK corporation tax rate of 19 percent is already below this maximum such that further decreases in the tax rate will – ceteris paribus - have an increasingly negative effect on corporate donations.
estimator\textsuperscript{16,17}. All System-GMM regressions use robust standard errors and treat the lagged real donations measure as predetermined. All other regressors except for the effective marginal tax rate are treated as endogenous. Following Roodman (2009\textsuperscript{a,b}), in order to reduce the instrument count below the number of firms in the sample, column (4) restricts the lag structure of the instrument set to include up to the 5\textsuperscript{th} lag of the endogenous variable and column (5) to include up to the 4\textsuperscript{th} lag of the endogenous variable. The row for the Hansen (1982) $J$-test reports the $p$-values for the null hypothesis of the validity of the over-identifying restrictions. The values reported for AR(1) and AR(2) are the $p$-values for first and second order autocorrelation. Both tests of no second-order serial correlation and of over-identification are passed at the 5\% level of confidence or better. To summarise, our test statistics indicate an appropriate model specification. The nonlinear corporation tax semi-elasticity result is qualitatively the same as all previous estimations. The income elasticity estimate loses statistical significance. However, this appears to be from a significant increase in the estimated standard error and may be explained by the loss of observations.

5. Discussion and Analysis of Results

Figure 4 plots the estimated relationship between the corporation tax rate and donations from the preferred System-GMM estimator, (Table 2 Column (4)). The plot reveals the inverted U-shape nature of the corporation tax semi-elasticity. The upper part of the plot illustrates how the predicted values of donations vary with the effective marginal tax rate. In the lower part

\textsuperscript{16} For robustness, we also estimate an equivalent dynamic model of corporation donations (Equation (2)) using a Dynamic Correlated Random Effects estimator. The results are qualitatively unchanged. The System-GMM estimator remains our preferred estimator as it enables us to treat the control variables as endogenous.

\textsuperscript{17} The coefficients $\theta_1$ and $\theta_2$ (Equation 3 above) are our primary parameters of interest in estimating the transitory effect of a change in the corporation tax rate on firm donations. An estimate of the long-run effect can be derived as $(\theta_1 + (2 \times \theta_2 \times EMTR))/(1 – \sigma)$. 

21
Figure 4: System GMM estimated semi-elasticity between corporation tax rate and corporate donations. Error bars are 95% confidence intervals for the estimated slope of the quadratic prediction. The turning of the quadratic prediction is 27.23, with a 95% confidence interval = [26.74, 27.73]. This turning point and the respective 95% confidence intervals lie comfortably within the range of observable values in the data.

of the plot, the slope of the donations function with respect to the effective marginal tax rate is plotted with associated confidence intervals. We see that the point estimate for an EMTR of 15 percent is 0.349, implying that a one percentage point increase in the EMTR increases corporate donations by approximately 35%. Similarly, the plot shows that the point estimates for an EMTR of 20 percent, 25 percent and 35 percent are 0.206, 0.064 and -0.222 respectively. The current UK corporation tax rate is 19 percent. Here the point estimate is 0.235, implying that a one percentage point decrease in the EMTR decreases corporate donations by approximately 24%. In addition, to further test whether the relationship between the corporation tax rate and corporate donations is non-monotonic, the 95% confidence intervals for the turning point of the quadratic formulation are computed. These intervals are well within the observed range of
Figures 5: System GMM estimated elasticity between corporate tax rate and corporate donations. Error bars are 95% confidence intervals for the estimated slope of the quadratic prediction.

corporation tax rates in our data. In Figure 4 we see that the turning point of the quadratic prediction is 27.23, with a 95% confidence interval = [26.74, 27.73]. We can therefore be confident that moderate rates of corporation tax are associated with the highest level of corporate donations. In the UK, between 2014 and 2018, the standard corporation tax rate fell from 21 percent to 19 percent (HMRC, 2020). From our estimates, this move represents a fall in donations from the average UK firm of approximately £46,938 (from £138,775 to £91,837).

5.1. Policy Implications

For ease of exposition of the policy implications of our findings (i.e. by now discussing the results as elasticities rather than semi-elasticities), the preferred System-GMM model (Column (4) in Table 2) has been re-estimated using the IHS transformed corporation tax rate in addition to the IHS transformed corporate donations. The resulting elasticities are plotted in Figure 5.
using the same exposition as the semi-elasticities plotted in Figure 4. As expected, the non-monotonic relationship is clearly evident and transitions from an economically significant positive elasticity of donations \( \varepsilon(d) \) to a negative one. To illustrate, we see that the point estimate for an \((ihs)EMTR\) of 3.6 (equivalent to an \(EMTR\) of 18.28 percent) is 5.86 donations. The price coefficient of 5.86 implies that firms respond more than proportionately to a change in the price. For example, a 10% decrease in the price of corporate donations (i.e. as measured by a 10% increase in the \((ihs)EMTR\)) leads to an approximate 59% increase in corporate charitable donations. Similarly, the point estimates for an \((ihs)EMTR\) of 3.3 (equivalent to an \(EMTR\) of 13.54 percent) and 3.9 (equivalent to an \(EMTR\) of 24.69 percent) are 10.49 and 1.24 respectively, which highlights the importance of the non-constant effect of changes in the corporation tax rate on firm donations.

A simple model of the corporate contribution to finances for the public benefit (hereafter referred to as the public fund (PF)) can be described as follows:

\[
PF = T + d = [(\pi - d)t] + [(\pi)(mpd)]
\]

Where \(T\) = corporate tax revenue, \(mpd\) is a firm’s marginal propensity to donate and the remaining variables continue as described above. In the following discussion, it is assumed that \(0 < t < 1\) and \(0 \leq mpd < 1\).

Where the policymaker has a preference for corporation tax revenues over corporate donations given the lack of public policy discretion over the latter\(^{18}\), if the \(\varepsilon(d) > 0\) then an increase in

\(^{18}\) Despite the preference, donations are assumed to continue to be deductible for corporation tax purposes due to political capital considerations.
the tax rate will only be efficient – where efficient is defined as a net increase in the corporation tax revenue contribution to the public fund - if:

\[
[(\varepsilon(d))(mpd)(\Pi)(t)] < [(\Delta t)(1 - mpd)(\Pi)]
\]

In other words, the marginal increase in corporate tax revenues must more than offset the marginal tax loss from the increase in donations. For example, assume a firm has £100 in profits, a marginal propensity to donate of 0.10 and the marginal corporation tax rate is 20 percent with an estimated point elasticity of donations of 5%:1%. If the policymaker increases the corporation tax rate by 10% to 22 percent, there will be a corresponding increase in donations of 50% and therefore, a decrease in net corporate taxable profits. However, this will still be efficient. The marginal increase of £1.80 in tax revenue more than offsets the £1.10 tax loss from the increase in donations. If, however, the estimated point elasticity of donations is 10%:1%, the donations response to changes in the tax rate is strong enough to be tax revenue inefficient: a marginal increase of tax revenue of £1.80 is less than the marginal loss in tax revenue of £2.20. If \(\varepsilon(d) < 0\), then an increase in the corporation tax rate is always efficient as it triggers a shift away from what would otherwise be donations toward taxable profits.

Where the policymaker has no preference over the form of the corporate contribution to the public fund - donations and corporation tax revenue are valued equally - then for any \(\varepsilon(d) > 0\) an increase in the corporation tax rate will always be efficient, where efficiency is defined as a net increase in the public fund. Despite the loss in tax revenue from the shift in taxable profits

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19 The relation can be further simplified, including the elimination of profits. However, the current exposition lends itself better to the intuition of the trade-off being made by the policymaker.

20 \([(0.02)(0.90)(100)] = £1.80; [(0.50)(0.10)(100)(0.22)] = £1.10; [(1.00)(0.10)(100)(0.22)] = £2.20;\]

21 The corporation tax rate will of course be bounded by other considerations such as the risk of capital flight.
to donations, the net change in the public fund is always positive because \( d > (d)(t) \) regardless of the relative elasticity of donations. However, if \( \varepsilon (d) < 0 \), then an increase in the corporation tax rate is only efficient if the loss in donations to the public fund is more than offset by the marginal increase in tax revenue contributions to the public fund:

\[
\left[ ((\pi)(mpd)(\varepsilon (d))) \right] < \left[ (\Delta t)(1 - mpd)(\pi) + (\varepsilon (d))(mpd)(\pi)(t) \right].
\]

Continuing with the previous example and now assuming an elasticity of corporate donations of -5%:1%, an increase in the corporation tax rate will be inefficient as it leads to a net loss in the public fund: £5.00 marginal loss\(^{22}\) in donations is greater than the £2.90 marginal increase in tax revenue\(^{22}\). However, if the elasticity of donations is sufficiently low, e.g. -1%:1%, then the public fund will enjoy a net increase: £1.00 marginal loss in donations\(^{22}\) is less than the £2.02 marginal increase in tax revenue\(^{22}\).

Turning to the UK as an example, the current 19 percent corporation tax rate is estimated to have a point elasticity to donate of approximately 5.3. The marginal propensity to donate \((mpd)\) can be estimated from the income elasticity \((\text{ihs Real NI before Donations})\) point estimate of approximately 8% (Table 2, Column (4)). Assume that the policymaker is considering a 5% increase in the corporation tax rate to approximately 20 percent and the representative firm has profits of £100. If the UK policymaker has no preference for tax revenues over corporate donations, then the increase in the corporation tax rate will be efficient as \( \varepsilon (d) > 0 \). If the UK policymaker has a preference for corporation tax revenues over corporate donations, the change in tax rate will still be efficient as the marginal increase in tax revenues over corporate donations, the change in tax rate will still be efficient as the marginal increase in tax

\(^{22}\)[\((100)(0.10)(0.50)] = £5.00; [(0.02)(0.90)(100) + (0.5)(0.10)(100)(0.22)] = £2.90; [(100)(0.10)(0.10)] = £1.00; [(0.02)(0.90)(100) + (0.10)(0.10)(100)(0.22)] = £2.02
revenues\textsuperscript{23} of £0.92 will more than offset the £0.42 in lost tax revenue\textsuperscript{23} from the marginal increase in donations.

5.2. Supplementary Analysis

To further investigate the importance of the inverted U-shape relationship between donations and the corporation tax rate, column (1) of Table 3 reports the results from estimating the model used in previous literature (e.g. Boatsman and Gupta 1996). Donations are regressed on the \textit{EMTR} and a firm’s income \textit{before} taxes and donations ((\textit{ihs}) \textit{EBT and Donations}). The corporation tax semi-elasticity estimate continues to be statistically significant but, is now negative which is consistent with Boatsman and Gupta (1996). Once the quadratic is provided for in estimation (2) the relationship changes to the inverted U-shape. This finding is important for three reasons. The previous evidence of an inverse relationship leads a policymaker to the conclusion that downward pressure on corporation tax rates is to the benefit of charity revenue. By allowing for non-monotonicity in the model the evidence shows that the effect will depend on whether the corporation tax rate is above or below its donations maximising level. If it is

\textsuperscript{23} \[(0.01)(0.92)(100)\] = £0.92; \[(0.265)(0.08)(100)(0.20)\] = £0.42
below, then the reverse holds true. Secondly, this evidence is important for theory where the direction of the relationship between corporation tax rates and donations is used to interpret motivations for corporate giving. Finally, this exercise also speaks to the robustness of our results to a different model specification as used in previous empirical work (e.g. Arulampalam and Stoneman 1995, Boatsman and Gupta 1996).

To formally illustrate the linear and quadratic nature of the corporation tax semi-elasticity, Figure 6 plots the estimated relationships presented in Table 3. The upper plots illustrate how the predicted values of donations vary with the effective marginal tax rate. In the lower part of the plots, the slope of the quadratic donations function with respect to the effective marginal tax rate is plotted with associated confidence intervals.
6. Conclusion

Over the last 25 years, downward pressure on corporation tax rates has been observed across numerous countries. The average corporation tax rate in OECD countries has decreased by 18 percentage points (Tax Foundation, 2013). For corporation tax systems that provide for the deductibility of charitable donations, the effective price of corporate donations is equal to its after tax cost and as such is inversely related to the corporation marginal tax rate. Therefore, the cost of corporate donations has been increasing and at issue is the price sensitivity of corporations’ charitable giving. Previous literature (e.g. Arulampalam and Stoneman (1995), Boatsman and Gupta (1996)) has sought to estimate the corporation tax elasticity of donations. However, this literature has been restricted in its ability to be conclusive and convincing due to important data limitations and modelling misspecification.

With the availability of better and more current data this paper investigates for the sensitivity of corporate donations to changes in corporation tax rates. This approach not only informs the responsiveness of donations to corporate tax policy but also sheds light on whether corporate philanthropy is a function of managerial utility or conversely value enhancing.

This paper investigates for the shape of the relationship and finds significant evidence that it is not only nonlinear, but also non-monotonic. The effect of the corporation tax rate on firm donations is characterised as an inverted U-shape. Using UK data, our model predicts that – ceteris paribus - corporate donations are maximised at a corporation tax rate of 27 percent as compared to the current rate of 19 percentage points (HMRC 2020). Our work also shows that the introduction of the quadratic to the model contributes to the theory of corporate giving. Boatsman and Gupta (1996) previously estimate a negative relationship between the corporation tax rate and interpret this as evidence of management donating corporate funds.
beyond a profit maximising level. However, we find that by allowing for non-monotonicity in the Boatsman and Gupta (1996) model, the relationship switches to the inverted U-shape. Therefore, inference of corporate giving motivation will depend on the corporation tax rate being faced by the firm and its management.

References


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Worldwide Tax Summaries, pwc Worldwide Tax Summaries Online. Available at http://taxsummaries.pwc.com/ID/tax-summaries-home


Appendix

Reciprocity argument and the expectation of an inverted U-shape relationship between the corporation tax rate and corporate donations

An inverted U-shape relationship may be expected by reference to the reciprocity (gift exchange) argument derived from the ‘fair wage-effort’ hypothesis in labor markets (Akerlof, 1982; Akerlof and Yellen, 1990). This work is based upon a gift exchange model where “On the worker’s side, the ‘gift’ given is work in excess of the minimum work standard; and on the firm’s side the ‘gift’ given is wages in excess of what these women could receive if they left their current jobs” (Akerlof (1982, p. 544)). Here, workers should withdraw effort if their actual wage falls short of what they consider a fair wage, or reciprocate with higher, uncontractable effort if the wage is considered above the fair level. Extending this argument to the current corporation tax - donations setting, suppose that firms set expectations about corporation tax rates with the belief that $x$ represents a fair level of taxation. Here, firms set $x$ based upon what the firm would have to pay in corporation tax if they moved their operations to an observationally equivalent economy. On the firm side, the ‘gift’ given are charitable donations in excess of a minimum standard requirement with reference to society's expectation of a firm’s corporate social responsibility. On the government’s side, the ‘gift’ given is a corporation tax rate below what firms would have to pay if they moved their operations. When corporation tax rates are greater than $x$, whilst the price of corporate charitable donations is falling and thereby otherwise increasing donations, tax rates are viewed to be above the fair rate. Firms then respond by reducing the level of charitable donations that they would otherwise give as a function of their lower price to compensate for the higher taxes being paid. This simple framework therefore predicts an inverted U-shape relationship between corporation tax rates and firms’ donations to charity. As the corporation tax rate increases, the price of donations falls, leading to an increase in a firm’s donations. However, as the corporation tax rate
approaches $x$, the perceived (un)fairness of the firm’s ‘fair share’ of tax increases in importance and the firm compensates by reducing the amount of donations it otherwise would have made. A turning point would then emerge if corporation tax rates are set high enough so that they are deemed sufficiently unfair. Meer and Rosen (2018) provide evidence of reciprocity as a motive for charitable giving.