Why do some corporations pay too much tax?

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Firms donate extra taxes to gov't

- Several papers document underclaimed tax depreciation
  - see Kanniainen and Södersten (1994) for Finland, Sweden
  - Forsling (1996) for depreciation and other allowances in Sweden (about 10%)
  - Askildsen and Fjærli (1989) for Norway

- Aarbu and MacKie-Mason:
  Underutilisation of tax depreciation in Norway

Year	*1988*	*1991*	*1992*	*1993*
Sample size	1700	4400	4300	2400
Mean percent underutilisation	10	21	8	9
Percent of firms that do not use maximal tax depreciation	39	44	25	20

So?

- On tax grounds alone, firm should prefer to claim depreciation deductions earlier than later
- Postponement increases the present value of tax payments by:

$$F * (d^{allowed} - d^{claimed}) * \tau$$

$$i < F < 1$$

- Foregone deductions (Norway): US$500 MM in 1991; scaled by US/Norway GDP ratio: US$30 Billion
- Why do firms forego this much interest-free debt?

Why Scandinavia?

- Too cold?
- May be true elsewhere
- Accounting reconciliation requirements provide the evidence
- Unusual access to individual firm tax records

Isn't this just selection bias?

- Not allowed to report *more* than allowable tax depreciation
  - perhaps overreporting caught early in process and corrected, but underreporting not corrected
- Implausible: uniform reporting in Norway requires firms to explicitly write down both book and tax depreciation, and to reconcile differences
- hard to make error in government's favor!

Why else? Many possibilities!

- Competition with tax loss carryforwards
- Uniform accounting constrains dividends
- Accounting reconciliation imposes transaction costs
- Moral hazard monitoring cost favors private debt
- Desire to "windowdress" profits

- Summary: We find new and unique evidence that taxes interact with non-tax corporate behavior -- this time, in "nontraditional" ways

How?

- Unusually good opportunity…though not perfect
  - Access to all filed tax forms for corporations selected in annual surveys (1988, 1991, 1992, 1993)
    - small and large
    - privately and publicly held
  - Extensive reporting required
  - The 1992 tax reform offered a natural experiment for several of the stories
- Our theory is not articulate enough to tightly specify structural equations -- use reduced form tests

Pre-92 reform Norwegian corporate taxes

- Classical system (dual taxation of dividends)
- Dividends constrained to cumulated earnings and profits
- Uniform reporting: same depreciation for taxes and dividend constraint
- Account reconciliation required
- Misc. features:
  - muni tax 23%, nat'l tax 27.8%, different bases
  - tax-deferred "consolidation" (investment) fund, capital reserve fund

Pre-92 tax accounting identity

$$d^{\max} - d^{T} \equiv d^{\max} + rB - \Pi - \frac{1}{\tau_1}\left[\tau_2\Psi - D(1-\tau_3) - (\Omega + \Delta\Omega) - \Delta R\right]$$

under-utilization

interest

net income

tax loss carry-forwards

divs

free equity

reserve fund

- Higher dividends may require higher underutilization (higher net income)
- Higher tax loss carryforwards permit lower underutilization
  - lower consolidation fund permitted
  - and less tax payable
- But, "stale" TLCFs have opposite effect: expiration competition

Post-reform corporate tax system

- Lower rates (50.8 -> 28%), broader base (tax exempt funds abolished, depreciation rates decreased)
- Key: *separate reporting* replaced uniform
  - payable earnings still net of tax
    - but make an adjustment to replace tax with book depreciation
  - result: *no direct relation between tax depreciation and dividend constraint*
- Key: *account reconciliation* still required

Hypothesis 1: Dividend constraint

- Signaling theories and evidence support a corporate preference for dividends even when tax disfavored
- Pre-reform, direct tradeoff between allowed dividends and depreciation utilization
  - constraint: dT = -dDeduct - dDividends
  - \$1 after-tax in dividends = $(1-\kappa)/(1-\eta-\kappa)$, so $dT \geq r\ \eta\ /(1-\eta-\kappa)$
  - estimated cost of underutilization is about \$0.05 per \$1 of dividends
- Post-reform, no legal trade-off
  - but if firms equalize tax and book depreciation for other reasons, then a trade-off still (about \$0.02 per \$)

Hypothesis 2: Monitoring costs

- Kanniainen and Södersten (1994, 1995) made clever observation:
  - since unused depreciation can be claimed forever, underutilization is a zero-interest loan to corp
  - why are firms simultaneously borrowing at positive interest and foregoing zero-interest debt?
  - Appeal to capital structure theory: monitoring costs
- Suppose banks and private lenders provide a monitoring function -- positive externality to shareholders
- If firm has internal optimum total debt level, then may have optimal ratio of private to tax debt
  - interest savings on incremental tax debt may be outweighed by foregone monitoring

Hypothesis 3: Crowding out

- If loss carryforwards likely to expire, may be better to defer depreciation
  - Unused depreciation carries forward indefinitely
- Fresh carryforwards may have different effect:
  - dividend constraint loosened because
    - lower consolidation deferral
    - lower taxes payable
  - so, may utilize more depreciation

Hypothesis 4: Administrative costs

- Even with uniform reporting, firm may calculate separate tax and book depreciation, and keep two sets of accounts
  - "uniformity" maintained with an adjusting entry
- However, both before and after reform, firms with separate accounts must file reconciliation forms
- If there is an administrative cost to keeping two sets of books (including reconciliation cost), then might expect some firms to forego accelerated tax depreciation
- Since the accounting cost is likely to be relatively fixed, we should expect to see more equalization by small firms, which appears to be the case

Hypothesis 5: Windowdressing

- Might firms want to forego depreciation to report higher net income (lower losses)?
  - Substantial finance and accounting literature suggesting information asymmetries between providers and users of funds
  - Myers and Majluf (1984), Stiglitz and Weiss (1981) &c. show that some firms in difficulty might bear extra costs to obtain access to funds
  - Watts and Zimmerman, &c., show information is costly to obtain, shareholders systematically fooled (e.g., LIFO v. FIFO)
- Further, Norwegian rule: if firm loses 2/3 of book value there are costly and restrictive interventions to protect shareholders

Data

- Data from mandatory gov't surveys
  - Stratified sample of about 6000 firms
  - Profit and loss account
  - Balance sheet with starting and closing balances
  - Income tax return statement
  - Tax depreciation statement for each asset group
  - Reconciliation forms
- We exclude firms with different tax rules (e.g. hydro power plants) and incomplete data
- Sample:
  - 1988 1700
  - 1991 4400
  - 1992 4300
  - 1993 2300

Econometric method

- Tax depreciation claimed is doubly censored:

$$0 \leq d^{T} \leq d^{\max}$$

- Therefore, we assume normally distributed errors and estimate a doubly-censored Tobit model using maximum likelihood
- Lagged variables (for exogeneity); scaling by SIZE
- Separate regressions for each year, for each of 4 firm-size groups (to control unobserved heterogeneity)

Explanatory variables

- Pre-reform dividend constraint (with no free equity):

$$DIVC = \begin{cases} 1, \text{if eqn (5) satisfied} \\ 0, \text{otherwise} \end{cases}$$

- Post-reform: constrained only if firm equalizes tax and book depreciation so define DIVC in terms of book depreciation (exogenous)
- Also reform itself is an experiment: if firms are not equalizing depreciation, then dividends should not matter post-reform

Explanatory variables 2

- Monitoring costs: substitution between private and tax debt
  - measure both in levels and changes:
    - TDEBT = tax debt / total assets: if high, expect underutilization
    - ΔLDEBT = increase in private long term debt: if private debt increasing, expect more tax debt (less underutilization)

Explanatory variables 3

- Administrative costs
  - Firms can equalize to have single set of accounts two ways:
    - underutilize tax depreciation (tax cost)
    - or, overreport book depreciation (planning and financial costs)
  - We define INFO = 1 if accumulated tax debt is zero (corp has been equalizing)
  - If firm overreports book depreciation, then coefficient will be negative (less underutilization of tax depreciation)
  - If firm underutilizes tax depreciation, coefficient will be positive

Explanatory variables 4

- Windowdressing
  - DIVP is profit after tax assuming full utilization (to exogenize utilization decision)
  - ZPROB is Altman's predictor of the firm's economic health (weighted average of start-of-year financial ratios)
- Tax loss carryforwards
  - Expiring TLCFs compete: LCARRY1 are carryforwards expiring within 2 years
  - Fresh TLCFs loosen dividend constraint: LCARRY is accumulated TLCF

Results: What worked?
1. Windowdressing

- DIVP strongly confirmed pre-reform
- Significant post-reform for small, not medium/large firms
  - reporting conventions less important for small firms: tend to equalize regardless

Year/ Group	1	2	3	4
1988	-0.080	-0.027	-0.266	-0.405
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
1991	-0.384	-0.154	-0.059	-0.097
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
1992	-0.051	-0.008	-0.012	-0.047
	(0.0001)	(0.2980)	(0.0980)	(0.0006)
1993	-0.060	-0.013	-0.017	-0.014
	(0.0001)	(0.2460)	(0.3150)	(0.3790)

(p-values in parentheses)

Results: What worked?
2. Administrative costs

- 40%-70% of small firms equalize (INFO=1); 2%-40% of large firms
- Coefficient always positive ==> equalizing by underutilizing
- Coefficient larger for small firms: the incremental accounting cost is more significant for them

Year/ Group	1	2	3	4
1988	0.056	0.027	0.016	0.052
	(0.0050)	(0.0001)	(0.1780)	(0.0001)
1991	0.043	0.026	0.016	0.023
	(0.1267)	(0.0001)	(0.0001)	(0.0020)
1992	0.024	0.014	0.00	0.002
	(0.0020)	(0.0002)	(0.0660)	(0.2900)
1993	0.035	0.005	0.004	0.009
	(0.0140)	(0.1320)	(0.1680)	(0.0083)

Results: What worked?
3. Loss crowd-out

- Tax loss carryforwards (results in paper)
  - no effect (negative expected) for fresh TLCFs
  - no consistent effect for stale TLCFs
    - positive expected
    - the 3/16 significant estimates were positive
  - collinearity problem? Underutilization increases in magnitude of potential depreciation
- Tax position (new results)
  - Cross-tab shows firms with zero depreciation overwhelmingly have loss carryforwards
  - Dummy variable for positive tax base (assuming full utilization): more underutilization when in loss position (always significant)

Results: What didn't work?

- Dividend constraint hypothesis
  - no consistent or significant relationship between firms facing dividend constraint and underutilization
- Monitoring cost hypothesis
  - No significant or consistent relationship between accumulated tax debt and underutilization
  - ΔLDEBT effect unclear
    - half of the coefficients are statistically insignificant
    - of those significant, split on sign
    - possibly confounded with tax substitution (interest deductions crowding out depreciation)?

Closing observations

- Many firms (20-40% in Norway, 1988-93), in at least several countries, significantly and knowingly underutilize allowable deductions
- "Non-tax" explanations important:
  - windowdressing
  - avoiding administrative costs
  - but, also loss crowd-out (tax substitution)
- Tax code and asymmetric information hypotheses have little or no support at this point
  - dividend constraint
  - monitoring costs
- New and unique evidence that taxes interact with non-tax corporate behavior