Designing Net Wealth Taxes – Challenges in Valuing Shares in Unlisted Companies

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Why?

- Accelerated wealth accumulation and inequality → Renewed academic and political debate about net wealth taxation
  - Piketty, Saez, Zucman and others
  - U.S. political campaigns
  - EU/OECD/G20 discussions

- Valuation is a fundamental challenge for taxing according to wealth, in particular when it comes to assets such as unlisted shareholdings
  - Use of (crude) standardized valuation methods

- A need to discuss and analyse valuation issues further (not neglect!)
  - Unequal treatment undermines the legitimacy of net wealth tax regimes and may be at odds with constitutional frameworks
  - Contribution: Improve the understanding of legal/practical challenges and possible solutions to valuing unlisted shares for wealth tax purposes
  - Interdisciplinairy method: Law, accounting, descriptive statistics, and regression analysis

How?

- Dataset provided by the Norwegian Tax Authorities
  - 10,504 unlisted companies where all shares were traded (2018-2021)
    - We know the reported sales prices
    - We know the values reported for Norwegian wealth tax purposes
    - We know the aggregated asset categories and taxable incomes

- Test the accuracy of the valuation rules applied under
  - The Norwegian wealth tax regime
  - The Swiss wealth tax regime (replica)
  - The Danish inheritance tax regime (replica)

- Together, the three methods represent key conceptual frameworks for constructing standardized valuation models

The legal/law perspective

- Our normative assessment standard: The principle of legal equality
  - ”The bedrock of the rule of law”
  - An ideal that is constitutionally protected and/or important for ensuring legitimacy
  - Plays an important role in tax law/policy → Ability to pay → Horizontal equity

- From a constitutional law perspective:
  - An ideal – not an absolute rule prohibiting all differential treatment
  - A flexible standard requiring that differential treatment can be justified and that the measure is proportional
  - Sometimes described as a prohibition against arbitrariness, or an obligation to act rationally

- Not our aim to assess in light of one specific constitutional definition
  - Instead we try to measure against the core of the principle of equality – constitutionally protected in some jurisdictions (Germany, France, and Spain) and in others regarded more as criterion for legislative legitimacy (Norway and Denmark)

Contribution?

- Contributing to the ongoing debate by discussing challenges and solutions related to valuing shareholdings in unlisted companies
- Previuous studies
  - Müller & Sureth (2011)
    - Examined the German inheritance valuation method from 2009 → Used data from listed companies as proxies → Median valuation around 40 % below MV
  - Müller (2014)
    - Studied the previous German ”Stuttgarter Verfahren” → Used data from listed companies as proxies → Average valuation around 31 % below MV and median valuation around 47% below MV
  - Gobel & Hestal (2015)
    - Compared reported net asset values for wealth tax purposes of 133 Norwegian companies listed on the OTC with the price→ Average valuation at only 31.9% of MV.
  - Andresen and Bø (2022)
    - Used statistical methods to estimate the price-to-book ratios for Norwegian listed companies 2004-2019 → Extrapolation suggest that unlisted companies as a group on average are valued at 52.6% of MV
- Our study (2025)
  - We use data on unlisted firms directly (their reported sales prices) and rely on their reported net wealth tax values. We do not only assess average valuation differences, but focus on disparities in differential treatment, evaluating these in light of the legal principle of equality. We compare different methods and examine what can be done to improve the robustness of these valuations.

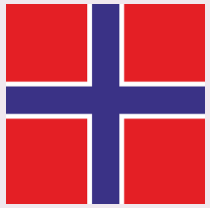
Explanation of sample selection

- The overall dataset included information on 10.504 unlisted companies where all shares had been traded (2018-2021)
  - Contained information
    - Reported sales prices, reported values for wealth tax purposes, and aggregated information on the companies' asset composition, debt, and net income
  - Filters applied by the tax authorities when extracting the data entailed exclusion of
    - Newly established companies
    - Companies with different classes of shares
    - Companies reporting changes in share capital (mergers and demergers)
    - Transactions disclosed as inheritance or gifts
    - Companies with a reported sales price below NOK 100.000 (EUR 9.000)

- Our own filters entailed the removal of:
    - 1.497 companies that held shares in other companies (including holding companies)
    - 1.206 companies that had not reported taxable income in the current or previous two fiscal years

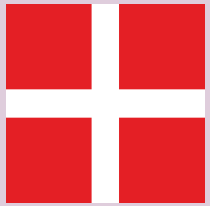
- Final sample: 7.801 companies

Main features of the valuation methods



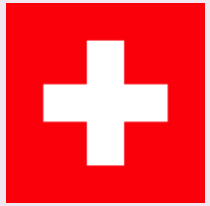
$$Value\ of\ unlisted\ company = Net\ asset\ value$$

- Net assets value: All the company's tangible and other clearly identified assets minus all liabilities (tax values)
- Goodwill and IP excluded



$$Value\ of\ unlisted\ company = Net\ asset\ value + Estimated\ goodwill\ value$$

- Net asset value: Book value according to latest annual report (some exceptions)
- Estimated goodwill value: Adjusted financial results before tax for the last three years. A weighted average is calculated (greatest weight on the last year). Adjustment for any consistent positive/negative trend. Deduction of a standard return rate and capitalization according to expected life span (typically 7 years).



$$Value\ of\ unlisted\ company = \frac{[(Capitalized\ earnings\ value \times 2) + Net\ asset\ value]}{3}$$

- Capitalized earnings value: Average net profit of the last two to three years capitalized with a uniform rate.
- Net asset value: Book value of the company's net assets (with certain exceptions)

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Notation

$$Wealth\ to\ price\ ratio = \frac{Wealth\ value}{Sale\ price}$$

$$Undervalued = Wealth\ to\ price\ ratio < 1$$

$$Overvalued = Wealth\ to\ price\ ratio > 1$$

Findings – Norwegian method

$$Value\ of\ unlisted\ company = Net\ asset\ value$$

Panel A. Decile distribution of Norwegian *Wealth to price ratio*

Decile	N	Mean	Median	SD	Classification
D1	1,285	0.000	0.000	0.000	Undervalued
D2	276	0.024	0.025	0.015	Undervalued
D3	780	0.125	0.123	0.046	Undervalued
D4	780	0.294	0.291	0.056	Undervalued
D5	780	0.502	0.503	0.062	Undervalued
D6	780	0.708	0.708	0.055	Undervalued
D7	780	0.891	0.891	0.052	Undervalued
D8	780	1.046	1.040	0.043	Wealth ≈ price
D9	780	1.346	1.317	0.151	Overvalued
D10	780	5.952	3.055	5.981	Overvalued
Total	7,801	1.087	0.612	2.528	

Findings – Norwegian method

$$Value\ of\ unlisted\ company = Net\ asset\ value$$

- The Norwegian method leads to widespread undervaluation
  - 50 % of sample (median): Reported wealth value ≤ 61 % of sales price
  - 25 % of sample: Reported wealth value ≤ 12 % of sales price
  - 20 % of sample: Clearly overvalued
    - Potential sources of error include undisclosed gift transfers and cases where compensation for future work is misreported

- The standard discount (currently 20 percent) is excluded

Findings – Norwegian method

$$Value\ of\ unlisted\ company = Net\ asset\ value$$

Panel B. Company characteristics by deciles of Norwegian *Wealth to price ratio*

Decile	N	Wealth value	Sale price	Cash & receivables	Inventory	Fixed assets*	Real estate	Debt	Past income
D1	1,285	0.000	12.485	3.666	0.899	0.765	4.677	14.561	-0.284
D2	276	0.765	28.824	4.996	0.951	0.699	1.955	7.380	1.099
D3	780	4.028	27.866	7.111	0.978	0.882	5.236	10.968	1.520
D4	780	7.609	23.717	6.024	0.938	0.669	11.397	11.777	1.128
D5	780	15.673	30.959	5.365	0.911	0.413	22.997	14.139	1.077
D6	780	19.398	28.499	4.100	0.502	0.295	27.013	12.378	1.050
D7	780	18.618	22.139	3.447	0.529	0.227	24.996	10.159	0.910
D8	780	16.508	16.757	3.566	0.444	0.211	21.276	8.546	0.838
D9	780	13.780	10.941	3.358	0.499	0.234	18.893	8.859	0.649
D10	780	11.053	3.081	4.423	0.768	0.516	14.373	9.324	0.688
Total	7,801	10.692	19.470	4.520	0.739	0.495	15.456	11.274	0.778

Findings – Norwegian method

$$Value\ of\ unlisted\ company = Net\ asset\ value$$

- The most undervalued companies
  - Own less real estate compared to other companies
  - Hold more value in operating equipment and inventory
- Moderately to accurately valued companies
  - Show somewhat lower income and profitability than the most undervalued companies
  - Are more heavily invested in real estate
- Companies with the most overvalued wealth figures
  - Are generally less profitable than the rest of the sample
  - May indicate that the wealth values are overstated relative to earnings capacity, but perhaps also that "distressed sales" occur

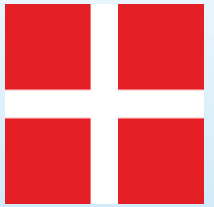
Findings – (replica) of Danish method

$$Value\ of\ unlisted\ company = Net\ asset\ value + Estimated\ goodwill\ value$$

Panel A. Decile distribution of Danish *Wealth to price ratio*

Decile	N	Mean	Median	SD	Classification
D1	781	0.000	0.000	0.001	Undervalued
D2	780	0.131	0.127	0.070	Undervalued
D3	780	0.368	0.367	0.067	Undervalued
D4	780	0.588	0.590	0.063	Undervalued
D5	780	0.780	0.777	0.050	Undervalued
D6	780	0.956	0.961	0.048	Wealth ≈ price
D7	780	1.117	1.110	0.054	Overvalued
D8	780	1.431	1.403	0.145	Overvalued
D9	780	2.428	2.342	0.490	Overvalued
D10	780	12.992	7.575	11.796	Overvalued
Total	7,801	2.079	0.865	5.254	

Findings – (replica) of Danish method



$$Value\ of\ unlisted\ company = Net\ asset\ value + Estimated\ goodwill\ value$$

- Fewer undervaluations than under the Norwegian method
  - 50 % of sample (median): Reported wealth value at ≤ 87 % of sales price (NO 61 %)
  - Still: 25 % valued at ≤ 37% of sale price (NO 13 %)

- Significantly more overvaluation compared to Norwegian method
  - 30% of companies clearly overvalued (NO 20 % and less extreme)
  - Particularly driven by owner-dependent income, as the method captures company income generated by the owner's labor that are not withdrawn as salary—even though this value does not carry over in a sale
  - Note: Our testing is based on a replica of the standardized method (not the full method including individual adjustments) in use in the years of our sample

- Concerning company characteristics (Panel B – not included in slides):
  - Quite similar pattern as the Norwegian method
  - But by incorporating earnings, the Danish method reduces the likelihood of undervaluing highly profitable firms, while increasing the risk of overvaluing them

Findings – (replica) of Swiss method

$$Value\ of\ unlisted\ company = \frac{[(Capitalized\ earnings\ value \times 2) + Net\ asset\ value]}{3}$$

Panel A. Decile distribution of Swiss *Wealth to price ratio*

Decile	N	Mean	Median	SD	Classification
D1	593	0.000	0.000	0.000	Undervalued
D2	175	0.017	0.016	0.012	Undervalued
D3	383	0.126	0.120	0.057	Undervalued
D4	384	0.323	0.328	0.049	Undervalued
D5	383	0.604	0.599	0.126	Undervalued
D6	384	1.065	1.067	0.137	Wealth ≈ price
D7	384	1.645	1.628	0.215	Overvalued
D8	383	2.671	2.621	0.395	Overvalued
D9	384	5.153	4.848	1.203	Overvalued
D10	383	25.821	14.357	24.575	Overvalued
Total	3,836	3.738	0.833	10.805	

Findings – (replica) of Swiss method

$$Value\ of\ unlisted\ company = \frac{[(Capitalized\ earnings\ value \times 2) + Net\ asset\ value]}{3}$$

- Not applied to real estate companies (restricted sample)
  - Norwegian and Danish methods re-tested on same sample for comparability
- Performs worse than Danish method on both dimensions
  - Even though median is close to the (re-calculated) Danish median
  - More undervaluations (but less than NO)
  - More overvaluations – both frequency and severity (also compared to NO)
- Concerning company characteristics (Panel B – not included in slides):
  - Responds strongly to profitability
  - Leads to inflated values when historical income is strong but future prospects are weak

Conclusions – Descriptive statistics

- None of the approaches reliably reflect actual sales prices
  - Norwegian method: Pronounced undervaluations (half of sample valued ≤ 60 % of sales prices) but also some overvaluations (20 % clearly overvalued)
  - Replica of Danish method: Less tendency to undervaluation (but still half of sample valued ≤ 87 % of sales prices) but more prone to (extreme) overvaluation (30 % clearly overvalued)
  - Replica of Swiss method (restricted sample): More prone to undervaluation than the Danish method and more prone to overvaluation than both the Danish and the Norwegian methods
  - Danish method appears to be best, even though only 23 % of the sample companies are valued within +-20 % of the sales price, and even though it works better for some companies (high values of real estate) than others (active businesses)

Conclusions – Legitimacy/Constitutionality

1. Substantial unequal treatment with all three methods

- Unequal treatment of shareholders in unlisted companies vis-à-vis shareholders in listed companies (and holders of other kinds of assets)
- Unequal treatment of shareholders in certain types of unlisted companies vis-à-vis other types of unlisted companies

2. Constitutional perspective

- Could be problematic in some jurisdictions (e.g., Germany) under equality principles
- However, the paper also show how difficult it is to design valuation methods that are both workable and precise — which may justify simplified approaches based on administrative needs
- Courts may show greater tolerance over time, given political and practical realities

3. Legitimacy perspective

- Valuation differences may appear arbitrary and undermine perceived fairness
- Still, transparency about why valuation is so difficult.

Various Theoretical Proposals

- Catch-up clauses" – retrospective adjustment)
  - Combine a formula-based approach with a "catch-up clause" using later market transactions.
- Differentiation between small and large companies
  - Require certified appraisals or more advanced methods for larger firms,
- Baseball-style arbitration
  - Both sides submit valuations, arbitrator picks the one closest to correct value.
- Rebuttable presumption:
  - The standardized value applies unless proven to deviate significantly (e.g., >40%) from market value — balancing simplicity and fairness.

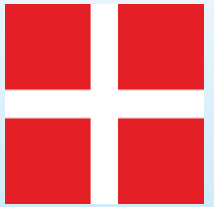
Recommendations

- Take valuation challenges seriously when considering the pros and cons of introducing a wealth tax

- We suggest an adjusted Danish-style approach:
  - We suggest the use of an adjusted Danish method
  - Adjustments intended to reduce wrong/arbitrary outcome of the schematic method, and to document legislative diligence, while in most cases still avoiding costly individual assessments
    - Deduction for a reasonable owner-operator salary
    - A general discount to mitigate overvaluations
    - Allow adjustments where inaccuracy > 40 % can be demonstrated
    - Dedicated appeals tribunal for valuation disputes

Discussion

Findings – (replica) of Danish method



$$Value\ of\ unlisted\ company = Net\ asset\ value + Estimated\ goodwill\ value$$

Panel B. Company characteristics by deciles of Danish *Wealth to price ratio*

Decile	N	Wealth value	Sale price	Cash & receivables	Inventory	Fixed assets*	Real estate	Debt	Past income
D1	781	0.012	15.116	3.483	1.107	0.770	6.434	16.687	-0.700
D2	780	3.243	23.664	4.363	0.758	0.755	7.580	12.075	0.150
D3	780	10.625	28.399	5.630	0.607	0.591	13.061	12.100	0.920
D4	780	17.912	30.205	5.650	0.857	0.468	20.450	14.173	1.221
D5	780	22.322	29.142	4.188	0.528	0.378	25.802	12.221	1.162
D6	780	20.954	22.715	4.321	0.544	0.308	22.519	10.049	1.075
D7	780	19.632	18.466	3.835	0.511	0.243	21.572	9.522	1.035
D8	780	17.445	14.210	4.215	0.672	0.411	18.764	9.741	1.000
D9	780	13.726	10.090	4.429	0.886	0.478	9.750	7.383	0.980
D10	780	12.954	2.699	5.082	0.915	0.551	8.640	8.778	0.939
Total	7,801	13.881	19.470	4.519	0.739	0.495	15.456	11.274	0.778

Findings – (replica) of Swiss method

$$Value\ of\ unlisted\ company = \frac{[(Capitalized\ earnings\ value \times 2) + Net\ asset\ value]}{3}$$

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Decile	N	Wealth value	Sale price	Cash & receivables	Inventory	Fixed assets*	Real estate	Debt	Past income
D1	593	0.000	10.172	4.015	1.441	0.963	0.000	11.573	-0.881
D2	175	0.299	20.157	3.121	1.410	0.907	0.000	6.572	-0.405
D3	383	2.078	15.965	6.382	1.165	0.915	0.000	8.123	-0.379
D4	384	4.059	12.500	5.208	1.073	0.574	0.000	5.039	0.050
D5	383	10.940	17.532	6.791	1.574	0.827	0.000	6.647	0.992
D6	384	18.162	18.019	7.755	1.315	0.963	0.000	5.693	1.843
D7	384	22.490	15.858	7.761	1.858	0.766	0.000	6.688	2.208
D8	383	18.252	9.806	7.085	1.128	0.645	0.000	7.362	1.809
D9	384	11.069	3.194	4.594	1.094	0.482	0.000	4.268	1.157
D10	383	15.649	1.438	5.600	1.219	0.583	0.000	5.039	1.554
Total	3,836	10.282	11.921	5.879	1.330	0.766	0.000	6.973	0.769