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

21 July 2025

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

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This article investigates challenges of valuing unlisted shares for wealth tax purposes in light of the legal principle of equality. Using a dataset of Norwegian companies sold between 2018 and 2021, we assess the accuracy of valuation methods used in Norway, Denmark, and Switzerland by comparing estimated values with sales prices. None of the methods reliably reflect market values, though their shortcomings differ. The Norwegian method, based solely on net asset value, leads to widespread undervaluation. The Danish and Swiss methods attempt to capture goodwill by incorporating historical earnings, resulting in fewer undervaluations but more overvaluation. In countries with constitutional equality principles, such disparities may pose challenges if a wealth tax is introduced. While the Norwegian method may be more defensible in some respects, its failure to account for goodwill remains a key weakness. We consider whether a refined version of the Danish model—with certain adjustments—could offer a more balanced alternative, while acknowledging administrative complexity. Ultimately, our findings underscore the need to address valuation issues if a wealth tax—especially a global one—is to be legally defensible.

1. Introduction

In recent years, (net) wealth taxes have once again become an important topic of discussion in academic and political fora around the world. Prompted by mounting evidence that wealth accumulation has accelerated significantly over recent decades, economists such as Piketty, Saez, and Zucman have proposed the introduction of a global wealth tax.[2] Moreover, wealth

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[2] Thomas Piketty, *Capital in the Twenty-First Century* (Cambridge, MA: Harvard University Press, 2014), 515ff., 572–73; Thomas Piketty, *Capital and Ideology* (Cambridge, MA: Harvard University Press, 2020),

taxes have featured in American political campaigns and have been actively discussed within the EU, the OECD, as well as the G20.[3] With respect to the latter, G20 finance ministers have initiated discussions on international coordination for a global minimum tax on wealthy individuals, and the Brazilian presidency commissioned a report on the topic, which was delivered by Zucman in June 2024.[4]

While proposing a net wealth tax for dollar billionaires in the report, Zucman does acknowledge that one of the main implementation challenges will be to measure the tax base, i.e. valuating the taxpayers' assets and liabilities.[5] This challenge, however, is by no means specific for the tax proposed in the report. On the contrary, it is a fundamental challenge to taxing with reference to wealth,[6] as such taxation inevitably demands recurring, periodic valuation (typically every single year). Such valuations can become very complicated if they are to be accurate, and if much control over the valuations is left to the taxpayers themselves or their own appraisers, strategies to (artificially) deflate the valuation may emerge.[7] Consequently, the uncertainties and the administrative costs associated with the appropriate valuation of the taxpayers' assets and liabilities on a recurrent basis may be substantial.[8]

558ff., 975ff.; Emmanuel Saez and Gabriel Zucman, "Progressive Wealth Taxation," *Brookings Papers on Economic Activity* (Fall 2019): 437–533, at 503; Emmanuel Saez and Gabriel Zucman, *The Triumph of Injustice: How the Rich Dodge Taxes and How to Make Them Pay* (New York: W. W. Norton, 2020), 145ff.

[3] For a short description of some of the proposals debated in the United States see e.g. Florian Scheuer and Joel Slemrod, "Taxing Our Wealth," *Journal of Economic Perspectives* 35, no. 1 (2021): 207–30, at 214–15. The idea of introducing wealth taxes on a coordinated EU level is mentioned in European Parliament, *Report on Lessons Learnt from the Pandora Papers and Other Revelations*, Committee on Economic and Monetary Affairs, A9-0095/2023, 21. The OECD has published a report on wealth taxation. See Organisation for Economic Co-operation and Development (OECD), *The Role and Design of Net Wealth Taxes in the OECD* (Paris: OECD Publishing, 2018). For a brief account of the discussions in the G20 see Stephanie Soong, "G20 Finance Ministers Advance Minimum Wealth Tax Taxation Talks," *Tax Notes International* 113 (2024): 1378. See also Julian Limberg and Laura Seelkopf, "The Historical Origins of Wealth Taxation," *Journal of European Public Policy* 29, no. 5 (2022): 670-688, who highlights the current interest against the backdrop of the historical origins.

[4] Gabriel Zucman, *A Blueprint for a Coordinated Minimum Effective Taxation Standard for Ultra-High-Net-Worth Individuals*, report commissioned by the Brazilian G20 Presidency, published June 25, 2024.

[5] Zucman, *Blueprint for a Coordinated Minimum Taxation Standard*, 33-34. More precisely, Zucman proposes that wealth is used as a reference to compute the minimum amount of tax to be paid by ultra-high-net-worth individuals. Actual implementation could be in the form of a presumptive income tax, a tax on a broad notion of income, or a wealth tax. However, all three alternatives require measuring wealth.

[6] Miranda Perry Fleischer, "Not So Fast: The Difficulties of Taxing Wealth," *Nomos* 58 (2017): 261–308.

[7] Fleischer, "Not So Fast," 275-276.

[8] See e.g. James R. Repetti, "It's All About Valuation," *Tax Law Journal* 53, no. 4 (2000): 607–14, who argues that the necessity of annual valuations constitutes and endemic problem which makes net wealth taxes unworkable. See also David Shakow and Reed Shuldiner, "A Comprehensive Wealth Tax," *Tax Law Review* 53 (2000): 499–585, at 526, who despite advocating for the introduction of a comprehensive net wealth tax acknowledge that the need for valuations constitute a substantial administrative challenge. Arun Advani, Emma Chamberlain and Andy Summers, *A Wealth Tax for the UK*, Wealth Tax Commission Final Report (London: Wealth Tax Commission, 2021), emphasize that it

Among the assets that are hardest to valuate are private businesses and shares in unlisted companies.[9] This is also a challenge when it comes to taxing global billionaires, as almost half the wealth of these taxpayers is estimated to consist of shares in unlisted companies.[10] Much of the difficulty arises from the presence of goodwill and other intangible assets—such as brand, market share, human capital, intellectual property, and business models—which play an increasingly important role in modern firm value.[11] Consequently, in order to design appropriate wealth taxes, whether global or domestic, there is a need to address and discuss the valuation of unlisted shares. Against that background, our intention is to contribute to the ongoing debate on taxing with reference to wealth by discussing challenges and possible solutions related to valuing shareholdings in unlisted companies.

More precisely, we use a dataset provided by the Norwegian tax authorities, consisting of over 10,000 companies where all shares were traded between 2018 and 2021, to test different valuation methods for unlisted shares and assess their accuracy in reflecting reported sale prices.

First, we evaluate the accuracy of the Norwegian wealth tax valuation rules by comparing reported wealth values with reported sales prices. Norway is particularly relevant for this analysis as it is one of the few countries that still levies a comprehensive net wealth tax.[12] Additionally, we use the dataset to simulate and evaluate replicas of valuation methods used in Denmark and Switzerland, assessing whether these approaches yield valuations that more closely reflect the sales prices of the shares.[13]

The Norwegian valuation method is the simplest among these, as it relies exclusively on a company's net asset value, thus excluding unrecorded assets, such as human capital, market position, intellectual property, and business ideas. In contrast, the Danish and Swiss methods attempt to capture these goodwill elements by incorporating the company's past income into their valuations. The Swiss method is applied for wealth tax purposes, whereas the Danish method is used, among other things, for inheritance and gift taxation (Denmark does not levy

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is a serious albeit common misapprehension to think that a wealth tax raises entirely novel contexts for valuation. Instead, they argue that the challenge of valuation for wealth taxes arises from the scale on which these valuations would be required.

[9] OECD, *Net Wealth Taxes in the OECD*, 86.

[10] Zucman, *Blueprint for a Coordinated Minimum Taxation Standard*, 34.

[11] See e.g., Mary E. Barth et al., "Evolution in Value Relevance of Accounting Information," *The Accounting Review* 98, no. 1 (2023): 1–28; Baruch Lev, "Ending the Accounting-for-Intangibles Status Quo," *European Accounting Review* 28, no. 4 (2018): 713–36; Baruch Lev and Feng Gu, *The End of Accounting and the Path Forward for Investors and Managers* (Hoboken, NJ: Wiley, 2016), 81ff.

[12] Within the OECD only Switzerland and Spain also levy net wealth taxes. In fact, a number of OECD member states, which had net wealth taxes in place in the past, have rolled back these taxes over the course of the last decades. See OECD, *Net Wealth Taxes in the OECD*, 15-25. See also Moris Lehner et. al., "The European Experience with a Wealth Tax," *Tax Law Review* 53 (2000): 615–92. For a short review of the background for and the history of the Norwegian wealth tax rules, see e.g. Ole Gjems-Onstad, *La gründere flytte – Formueskattens dilemmaer i krisenes tidsalder* (Oslo: Cappelen Damm Akademisk, 2020), 17–18.

[13] See section 4.1 for more on why the Swiss and Danish methods are particularly useful for this purpose.

a wealth tax anymore). We are able to test replicas of the Danish and Swiss methods because our dataset includes not only wealth values based on recorded assets and reported share-sale prices but also information on companies' net income from recent years.

Together, the Norwegian, Danish and Swiss methods represent key conceptual frameworks for constructing standardized valuation models. As such, we believe our testing provides a realistic benchmark for what can be achieved with standardized methods, making our findings broadly relevant for policymakers and others considering the implementation of wealth taxes. At the same time, many of the valuation challenges we explore are also highly relevant for other tax regimes, such as inheritance, gift, capital gains, and exit taxation. A central difference, however, is that these other taxes typically involve valuation at the point of a transaction or realization event, which allows for greater use of individualized assessments to supplement standard methods. In contrast, wealth taxes are levied annually, making individualized adjustments less practical—underscoring the importance of assessing how well standardized methods perform on their own.

Furthermore, we do not limit our focus to the numerical results of the empirical analysis, as we aim to address broader legal issues that hold significant value for policymakers, and often also for courts, when assessing the implementation, amendment, or scrutiny of wealth taxes. In particular, we will discuss our empirical findings in light of the principle of equality, which in broad terms prescribes that individuals must be treated equally under the law, or more specifically that equal situations should be treated alike, and that any differential treatment should pursue legitimate aims and be proportionate. Hence, by building on generally accepted methods for doctrinal analysis and research on legal reform,[14] we will discuss our empirical findings in light of this principle, while also offering certain recommendations in an effort to balance the need for equal treatment with considerations of legal certainty and administrative convenience.[15]

As our aim is to specifically address and discuss challenges related to the valuation of unlisted shares for wealth tax purposes, we will not explore the broader policy arguments related to wealth taxation. Moreover, we will not delve into general issues related to the economic efficiency and design of net wealth taxes – including the determination of the taxable persons,

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[14] See e.g. Terry Christine M. Hutchinson, "The Doctrinal Method: Incorporating Interdisciplinary Methods in Reforming the Law," *Erasmus Law Journal* 3 (1996): 130–38. Specifically, we will address the issue from a prospective angle, i.e. with the aim of using the empirical results to provide guidance for future reform of the law either through amendment of existing rules or introduction of new ones (sometimes referred to as *rule design research*). See Jørn Jacobsen, *Legal Reform Research* (Oslo: Karnov, 2022).

[15] For more on these well-known legal principles, see section 3.3 and 4.3. In fact, Zucman himself highlights that his report primarily takes an economic perspective, and that additional legal analysis would be valuable in future work. See Zucman, *Blueprint for a Coordinated Minimum Taxation Standard*, 8.

overall tax base, tax rate, and administrative procedures – as well as questions related to the compliance with international law and EU law.[16]

Against that background, the paper is structured as follows. In Section 2, we outline the context and legal framework under investigation and clarify the focus of our research questions. Section 3 presents our empirical analysis of the Norwegian valuation rules, based on the dataset provided by the Norwegian tax authorities. In this section, we also offer a preliminary discussion of how the Norwegian method aligns with perspectives on the principle of legal equality. However, the question of whether a valuation method is legally defensible may also depend on the availability of alternative, more precise methods. This naturally leads the discussion into Section 4, where we test replicas of Swiss and Danish valuation methods for unlisted shareholdings to assess whether these alternatives yield valuations closer to market values compared to the Norwegian method. Toward the end of Section 4, and in our final analysis in Section 5, we reflect on how these methods compare in relation to the principle of equality and discuss possible adjustments that could enhance the robustness of valuation practices applied to unlisted shares. Section 6 gathers our main conclusions and highlights key insights relevant to legislators and courts in the design and review of valuation rules.

2. Framework and Focus

2.1. Principles for Valuing Unlisted Shares

A net wealth tax operates on the principle that a taxpayer's total assets are valued, liabilities are deducted, and the resulting net wealth is taxed as a percentage of the assessed amount. The typical rationale, aside from securing revenue, is the ability-to-pay principle. While the ability-to-pay principle in income taxation assumes that tax capacity increases with income,[17] its application in wealth taxation assumes that tax capacity increases with the size of one's wealth, with vertical and horizontal equity also functioning as subcategories under this variant of the principle. The assumption is that individuals with higher net wealth are better

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[16] For more on such issues see e.g. César Martínez Sánchez, "Can Inequality Be Reduced by a Net Wealth Tax and Is This a Good Idea?" *Bulletin for International Taxation* 71, no. 11 (2017): 640–48.; Advani, Chamberlain and Summers, *A Wealth Tax for the UK,*, Rebecca. S. Rudnick and Richard K. Gordon, "Taxation of Wealth," in *Tax Law Design and Drafting*, vol. 1, ed. Victor Thuronyi (Washington, DC: International Monetary Fund, 1996), chap. 10; Jason Oh and Eric M. Zolt, "Wealth Tax Design: Lessons from Estate Tax Avoidance," *Tax Law Review* 74 (2021): 175–209; Robin Boadway, Emma Chamberlain, and Carl Emmerson, "Taxation of Wealth and Wealth Transfers," in *Dimensions of Tax Design: The Mirrlees Review*, ed. Stuart Adam et al. (Oxford: Oxford University Press, 2017), 737–824, at 776; and Peter Hongler and Matthias Valta, *International Perspectives on Wealth Taxation*, IFF-HSG Working Paper No. 2021-8 (St. Gallen: University of St. Gallen, Institute of Finance and Financial Law, 2021).

[17] The ability-to-pay principle is more often emphasized in connection with income taxation. See Ira K. Lindsay, "Tax Fairness by Convention: A Defense of Horizontal Equity," *Florida Tax Review* 19, no. 1 (2016): 80–119, at 80–81. Some associate vertical equity with progressive rates, while others hold that vertical equity is achieved as long as those with higher income face a higher tax burden than those with lower income, a scenario even possible under flat tax rates. The requirements of horizontal and vertical equity are often seen as different sides of the same coin. See Richard A. Musgrave, *The Theory of Public Finance: A Study in Public Economy* (New York: McGraw-Hill, 1959), 160.

equipped to bear a higher tax burden than those with less net wealth, while individuals with equal net wealth should bear the same tax burden.[18]

To uphold this principle, and to minimize distortions in investment decisions, asset valuations should ideally mirror market prices as closely as possible.[19] This means that the valuation should reflect the price at which the asset in question would change hands between a willing buyer and a willing seller, neither being under any compulsion to buy or sell and both having reasonable knowledge about relevant facts.[20]

However, assets vary significantly in terms of ease of valuation.[21] For example, cash and cash equivalents are typically straightforward to value, while real estate often poses moderate difficulties, but which have lessened over time due to the emergence of reliable price data.[22] At the most difficult end of the spectrum are closely held businesses and shares in unlisted companies, where precise valuation is challenging due to the lack of comparable market transactions. In such cases, standardized valuation methods may be necessary for practical reasons.[23]

Two primary approaches are commonly used in standardized valuation methods for unlisted shares: (1) pure asset-based valuation and (2) combination models which combine net asset value with a capitalized earnings component based on historical profitability. Both approaches share a key limitation: they are backward-looking in nature. None of them attempts to explicitly model future earnings, growth trajectories, or risk—elements that are central to market-based valuations but difficult to operationalize in a standardized and administrable system.[24]

The first approach focuses solely on the company's net asset value, either by relying on book values or applying specific valuation rules for the company's recorded assets. This approach limits the valuation to identifiable and well-defined assets and is not suited to capture goodwill—such as human capital, market position, or other unrecorded elements. Norway employs a variant of this approach, focusing exclusively on net asset value.[25]

The second approach, which may capture goodwill, involves supplementing net asset value with an earnings-based component derived from the company's historical income. Switzerland uses a variant of this model by averaging the net asset value with an estimated earnings value derived from recent years. The Danish valuation method—also incorporates

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[18] OECD, *Net Wealth Taxes in the OECD*, 53.

[19] OECD, *Net Wealth Taxes in the OECD*, 86.

[20] Repetti, "It's All About Valuation," 609.

[21] Fleischer, "Not So Fast," 277.

[22] However, as mentioned by Oh and Zolt, "Wealth Tax Design," 190, real estate is a category of assets where valuation difficulty is highly variable. While apartments in condominium buildings are often relatively easy to value, more unique pieces of real estate can be extremely challenging to valuate.

[23] OECD, *Net Wealth Taxes in the OECD*, 69-70.

[24] Jens Müller, "The Challenge of Assessing the Market Value of Private Companies Using a Standardised Combination Method for Tax Purposes – Lessons to Be Learnt from Past Experience," *European Accounting Review* 23, no. 1 (2014): 117–41, 118.

[25] NO: Tax Act [*Skatteloven*] sec. 4-12 (2) and sec. 4-1 (1) [hereinafter *Sktl*].

earnings, but in a different way: it applies a premium whenever historical income exceeds what a normal rate of return on recorded assets would suggest.

Regardless of which approach is used, the resulting values are typically allocated to the taxable persons based on their respective ownership stakes. For instance, in Norway unlisted companies are required to report their net wealth, which is then passed up through the ownership chain and included in the wealth tax calculation for individual shareholders.[26]

2.2. The Norwegian Framework

While we will later examine valuation methods used in Switzerland and Denmark, the first part of this article focuses on the accuracy of the Norwegian valuation rules. Moreover, since the Norwegian valuation method serves as the foundation for our dataset, it is essential to first provide an overview of how it operates.

Although our focus will be on the valuation of unlisted shares, it is worth noting that Norway levies a broad wealth tax with a relatively low basic allowance—NOK 1,700,000 (EUR 150,000)—in contrast to proposals for a global wealth tax aimed primarily at billionaires.[27] This broad scope means that, in practice, all companies must be valued, which may explain why Norwegian lawmakers have opted for a particularly simple approach for unlisted shareholdings—one based solely on the company's net asset value.

The assets and liabilities that comprise a company's net asset value—and thus determine the values allocated to individual shares—are generally defined by the same rules that apply when individual taxpayers hold the corresponding items directly.[28] These rules cover tangible and other clearly identifiable assets such as cash and cash equivalents, receivables, inventories, real estate, fixed assets, other tangible property and shares, while most intangible assets and goodwill, such as market shares, business relationships, trade secrets, trademarks, human capital, and self-created intellectual work and patents, are excluded.[29] Similarly, time-limited or conditional rights are also excluded.[30] Accordingly, the asset categories largely resemble standard categories used in accounting, although their classification is governed by specific tax rules rather than accounting standards.

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[26] Companies themselves are not liable for wealth tax but are required to report their wealth. See NO: Tax Administration Act [*Skatteforvaltningsloven*] sec. 7-7 (1) [hereinafter *Sktfvl*]. This means that unlisted companies report their net asset value, which is then used to calculate the value of the individual shares in the company. If the owner is another company, this value is included in the net asset value of the owning company, which is subsequently reported further up the ownership chain, and ultimately included in the wealth tax calculation for the individual shareholders at the top level.

[27] NO: Parliamentary Decision on the Taxation of Income and Wealth, etc. for 2024 [Stortingets skattevedtak] sec. 2-1 (1).

[28] NO: Sec. 4-12 (2) Sktl. provides that unlisted shares are valued based on a proportional share of the company's taxable net wealth, where net wealth is generally determined according to the same asset and liability valuation rules that apply to assets and liabilities held directly by individual taxpayers.

[29] NO: Sec. 4-2 (1) e-g Sktl. Intellectual work and patents are excluded as long as the patent rights remain with the original creator or inventor. See. Sec. 4-2 (1) e Sktl.

[30] NO: Sec. 4-2 (1) a-c Sktl.

When it comes to valuation, bank deposits, mortgage bonds, promissory notes, receivables, and other outstanding claims or cash equivalents are assessed at their nominal value unless the taxpayer can demonstrate that the claim is unlikely to be fully or partially fulfilled, in which case it is valued at its reasonably expected yield.[31] Cash and receivables in foreign currency follow the same valuation principles but are converted using the applicable exchange rate.[32]

Real estate is generally valued based on price statistics from the relevant area, but for commercial properties rented out on the market, formulas based on the actual rental income are used.[33] Most operational assets are valued at historical cost minus depreciation, in line with how they are valued for income tax purposes.[34] Inventories are valued at acquisition cost without depreciation.[35]

Private cars (not held as inventory or used as operating assets) are assigned values from specific price lists that account for depreciation over time.[36] Certain holdings, such as artwork and private tangible property, are valued at their insurance value.[37]

Shares in listed companies are valued at their stock market price,[38] whereas unlisted shares are valued by valuing all the company's assets in accordance with the principles outlined above, subtracting the company's debt, and then proportionally allocating the resulting net asset value to the individual shares.[39] While assets in general are valued as of the end of the tax year (January 1 of the assessment year),[40] the net asset value of unlisted companies is determined based on their value at the beginning of the tax year to ensure sufficient time for valuation and reporting throughout the ownership chain.[41]

The Norwegian valuation rules also incorporate discount rates for certain asset categories to address concerns about overvaluation and minimize disputes, while also reflecting social

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[31] Bank deposits, mortgage bonds, promissory notes, receivables, and other outstanding claims or cash equivalents are valued at their nominal value, with the exception for claims not expected to be paid in full or partially, which are to be valued at the amount reasonably expected to be collected on the claim. See Sec. 4-15 Sktl.

[32] NO: Sec. 4-1 (1) Sktl.

[33] Residential properties are now generally valued based on statistical square meter prices for sold houses of similar type and age in the area, while commercial property is usually valued using a formula that considers the average rental income of the property over the past three years, deducts an estimated 10 percent for owner costs, and divides the result by a calculation factor, which was 0.078 for the year 2023. See NO: Sec. 4-10 (7) Sktl.

[34] NO: Sec. 4-17 (2) Sktl.

[35] NO: Sec. 4-17 (1) Sktl.

[36] NO: Sec. 1-1-3 of the Norwegian Tax Administration's Valuation Rules for 2023 [*Takseringsreglene*], issued on 27 November 2023 [hereinafter *Tsr*]].

[37] NO: Sec. 1-1-6 Tsr.

[38] Shares in listed companies are valued at their stock market price on 1 January in the tax assessment year. See Sec. 4-12 (1) Tsr.

[39] NO: Sec 4-12 (2) Sktl.

[40] NO: Sec. 4-1 (1) Sktl.

[41] NO: Sec. 4-12 (2) Sktl.

considerations. These discounts apply to assets such as real estate, fixed assets, and shares.[42] The current discount rate for shares in both listed and unlisted companies is set at 20%.[43] Moreover, to prevent taxpayers from artificially reducing their taxable wealth through leveraged investments in discounted assets, the Norwegian rules include a provision that limits the debt deduction, requiring that the portion of a taxpayer's debt corresponding to the share of assets eligible for valuation discounts is itself subject to a proportional reduction.[44]

Since these discount rates generally apply only to persons subject to wealth tax for the assets they own directly (in our context, personal shareholders), they are not applied when calculating a company's net asset value.[45] In the forthcoming analysis, we assess companies' net asset value without factoring in the discount the personal shareholders receive, as our focus is on evaluating the precision of the valuation method itself. It is important to note that companies classified as undervalued in our analysis may, in practice, be even more undervalued once the discount granted to personal shareholders is applied, whereas companies classified as slightly overvalued may, in fact, not be overvalued when this discount is factored in.

Nevertheless, the primary issue with the Norwegian rules, in terms of equal treatment of taxpayers, is not the discount rules but rather the exclusion of intangibles and goodwill from the tax base. This exclusion has the potential to create substantial disparities in the tax burden among taxpayers with similar net market values in shares and businesses. Such disparities may arise both between unlisted companies with differing asset compositions and between unlisted and listed companies, as shares in listed companies are valued based on their stock market price, inherently reflecting goodwill and intangible values. The extent of this differential treatment in valuation—i.e., the deviation from actual sales prices on the market—is the focus of our analysis and discussion in section 3, using our dataset obtained from the Norwegian tax authorities.

2.3. Previous Studies and Our Approach

The difficulty of valuing unlisted companies is a recurring theme in both legal and economic literature, often highlighted as a key challenge in designing equitable and efficient wealth and inheritance tax systems. However, while theoretical and policy-oriented analyses are

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[42] NO: Sec. 4-10, 4-12, and 4-17 Sktl.
[43] NO: Sec. 4-12 Sktl.
[44] NO: Sec. 4-19 Sktl.
[45] NO: Sec. 4-12 (7) Sktl. However, according to this provision, an exception exists for aquaculture licenses, which are subject to a specific valuation discount even when held by companies.

abundant,[46] empirical studies on standardized valuation methods—based on observed data—remain relatively scarce.[47]

Among important empirical contributions in this area are Müller (2014) and Müller and Sureth (2011), who have evaluated standardized valuation methods used for inheritance tax purposes in Germany, employing data from listed firms as proxies to assess their accuracy.[48] The 2011 study focuses on the simplified earnings value method introduced by the 2009 German inheritance tax reform and finds that it leads to substantial and inconsistent misvaluation, with a median valuation approximately 40% below market value, offering little improvement over previously applied methods.[49] The 2014 study focuses on the previously applied Standardised Combination Method (Stuttgarter Verfahren), which closely resembles the Danish method discussed below. Müller finds that this method results in an average undervaluation of 31.0% and a median undervaluation of 47.1%.[50] Notably, he also conducts detailed matching procedures to assess whether listed companies serve as reasonable proxies for unlisted ones, finding that valuation gaps are similarly pronounced in both groups, though

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[46] See e.g., Noboru Tanabe, "The Taxation of Net Wealth," *IMF Staff Papers* 14, no. 1 (1967): 124–68, 152-154, Rudnick and Gordon, "Taxation of Wealth," chap. 10, 20-22; Repetti, "It's All About Valuation,"; Boadway, Chamberlain, and Emmerson, "Taxation of Wealth and Wealth Transfers," 784; Fleischer, "Not So Fast," 275-281; Advani, Chamberlain and Summers, *A Wealth Tax for the UK*, 54-61; Oh and Zolt, "Wealth Tax Design," 192-196; and OECD, *Net Wealth Taxes in the OECD*, 69-70, 85-87.

[47] Some early empirical studies do exist, although they are highly limited in scope and predate the current valuation frameworks. Armin Schoenfeld, "Das Stuttgarter Verfahren zur Bewertung nicht notierter Anteile im Vergleich zu den Börsenkurswerten deutscher Aktiengesellschaften," *Die Wirtschaftsprüfung* 36, no. 8 (1984): 425–30, compares the tax value of listed companies to their market value using a sample of 60 companies from the trade and production sectors between 1977 and 1981. He finds that the tax value amounts to approximately 50% of market value. Thomas Rödder, "Der Einfluß der Erbschaftsteuer auf die Rechtsformwahl mittelständischer Familienunternehmen," *Der Betrieb* 45, no. 43 (1993): 2137–47, analyzes annual reports from 30 publicly listed family-owned corporations. He observes that, for a standardized book equity value of 100%, the tax value under the standardized capitalized earnings method (SCM) averaged 150%, while the market value was 250%—implying that the tax value represented only 60% of market value. These results reflect the then-prevailing legal framework, which relied primarily on book values in the asset component.

[48] Müller, "Challenge of Assessing Market Value,"; and Jens Müller and Caren Sureth, "Marktnahe Bewertung von Unternehmen nach der Erbschaftsteuerreform," *Zeitschrift für betriebswirtschaftliche Forschung* 63, no. 11 (2011): 45-83. For a discussion of the Austrian so-called Vienna Method see Friedrich Fraberger, "Das Wiener Verfahren 1996 zur Bewertung von Anteilen an Kapitalgesellschaften – Grundsätze und Zweifelsfragen," *RWZ – Zeitschrift für Recht und Rechnungswesen*, no. 3 (2001): 85–94

[49] The new simplified earnings value method (vereinfachtes Ertragswertverfahren), introduced with the 2009 reform, estimates firm value by dividing the average annual earnings from the past three years by a standardized capitalization rate. A minimum value equal to the firm's book equity applies. The method is intended to be simple, objective, and easy to implement—but it ignores firm-specific risks, future expectations, and market conditions. The previous Stuttgarter Verfahren combined past earnings and book equity but used fixed multipliers and a more complex formula. Müller and Sureth, "Marktnahe Bewertung," 59 and 79, show that both methods systematically undervalue firms: the median deviation from observed market values was about 50% under the old method and 40% under the new one. While the new method sometimes yields higher valuations, it also exhibits greater variability and more extreme overvaluations.

[50] Müller, "Challenge of Assessing Market Value," 120.

somewhat less severe among matched private firms. Hence, the papers stands out for quantifying the extent of misvaluation and exploring how firm characteristics, such as profitability and capital structure, influence valuation outcomes.

In the Norwegian context, a few empirical studies have attempted to estimate disparities in the valuation of unlisted shares under the wealth tax regime. Gobel and Hestal (2015) conducted an empirical analysis comparing the reported net asset value of 133 Norwegian companies listed on the OTC market with their actual market prices. They found that shares in unlisted companies were, on average, valued for wealth tax purposes at 31.9% of their market value.[51] Similarly, Andresen and Bø (2022) used statistical methods to estimate the price-to-book ratios for Norwegian listed companies between 2004 and 2019.[52] Under the assumption that these ratios are representative of unlisted companies, they extrapolated the findings to suggest that unlisted companies, as a group, were undervalued by a factor of approximately 1.9 during this period (equivalent to an average valuation of 52.6% of their market value).

Our contribution builds on and extends these studies in several key respects. Most notably, unlike the studies by Müller and Sureth, and by Andresen and Bø, we use data on unlisted firms directly rather than relying on listed companies as proxies. We also base our analysis on the actual net wealth values reported for tax purposes, rather than book values—a distinction that matters particularly for asset types like real estate, where tax valuations tend to be much more precise. Additionally, we draw on a large dataset, including many small and family-owned enterprises—unlike the more limited sample used in the analysis by Gobel and Hestal.

Finally, we use the legal principle of equality—as broadly recognized across legal systems—as the primary normative standard for evaluating valuation methods. Hence, the article takes an interdisciplinary approach: we apply descriptive statistics, supplemented by regression analysis,[53] both to map valuation disparities and to explore whether certain company characteristics are associated with the observed deviations. The normative assessment, however, is firmly grounded in legal analysis and draws on both case law and legal literature on equality standards in taxation.

This legal perspective shapes our evaluative focus. Rather than emphasizing average deviations from market value across the sample, we concentrate on the range of deviations—

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[51] Maria N. Gobel and Thea Hestdal, *Formueskatt på unoterte aksjer – En analyse av ulikheter i verdsettingsgrunnlaget til børsnoterte og unoterte aksjer* (master's thesis, Norwegian School of Economics, 2015), https://openaccess.nhh.no/nhh-xmlui/handle/11250/2382998.

[52] Martin E. Andresen and Erling E. Bø, *Verdsetting av unoterte selskaper*, Report 2022/31 (Oslo: Statistisk sentralbyrå, 2022).

[53] As a robustness check, we have conducted multivariate regression analyses, using the Ordinary Least Squares (OLS) estimator, where the ratio between wealth value and sale price is explained by the companies' asset composition and income profile. The results (see Tables 5–7 in the appendix) show some statistically significant associations, but the linear model has limited explanatory power, due in part to the non-linear structure of the data. We have therefore chosen to place primary emphasis on the descriptive analysis.

an aspect more directly relevant to legal equality. If some companies are valued at a fraction of their market price while others are valued at several multiples, such disparities may raise constitutional concerns, regardless of the average. Since tax law is often subject to constitutional requirements of equal treatment, the viability of wealth taxes—including proposals for a global wealth tax—may depend on whether the valuation methods used comply with these standards.

Although our primary concern is to assess valuation rules from a legal—specifically, an equality-based—perspective, this should not be taken to diminish the relevance of broader economic considerations in the policy context. Valuation misalignments may also generate economic inefficiencies, distorting firm behavior, investment decisions, and organizational structures. While these effects lie beyond the scope of our analysis, they further underscore the importance of pursuing accurate and equitable valuation methods.

2.4. The Principle of Equality as an Evaluation Standard

The principle of equality, which we apply as a normative standard in our assessment, is well established in many jurisdictions and often enshrined in constitutional law.[54] While its core idea—that like cases should be treated alike—is widely accepted, its application varies across legal systems.[55] Rather than an absolute rule,[56] it is generally understood as a flexible standard that prescribes an ideal.[57] This ideal does not imply that all differential treatment is prohibited; indeed, drawing distinctions between cases is a core function of the law. However, differential treatment should have a rationale behind it— rather than being arbitrary.[58] In countries where the principle of equality is constitutionally protected, this may allow courts to set aside legislation that results in differential treatment not based on sufficient justification.

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[54] Hence, also within constitutional law a tendency towards increased convergence between jurisdictions can be seen. See Mathias Siem, *Comparative Law* (Cambridge: Cambridge University Press, 2018), 272. Günter Frankenberg, "Comparative Constitutional Law," in *The Cambridge Companion to Comparative Law*, ed. Mauro Bussani and Ugo Mattei (Cambridge: Cambridge University Press, 2012), 171–90, at 183, operates with four building blocks that characterize the architecture of constitutions all over the world. The first block deals with elements of justice and agency, and among other things translates into rights and principles, including the principles of equality and non-discrimination.

[55] Susanne Baer, "Equality," in *The Oxford Handbook of Comparative Constitutional Law*, ed. Michel Rosenfeld and András Sajó (Oxford: Oxford University Press, 2012), 982–1001, at 982, argues that in a sense, equality forms the bedrock of the rule of law and a key component of constitutionalism.

[56] None of the typical rights enshrined in constitutions can sensibly be absolute. Hence, sometimes one person's rights must be limited in order to avoid violations of another's rights. Moreover, exercise of individual rights sometimes interferes with important social or public interests. See Mark Tushnet, "Comparative Constitutional Law," in *The Oxford Handbook of Comparative Law*, 2nd ed., ed. Mathias Reimann and Reinhard Zimmermann (Oxford: Oxford University Press, 2019), 1193–1221, at 1215.

[57] Robert Påhlson, *Likhet inför skattelag* (Uppsala: Iustus Förlag, 2007), 5, 13. Påhlsson describes equality as an ideal and argues that it is more reasonable to speak of relative similarities. Moreover, he emphasizes that the principle of equality, like other legal phenomena, is a social construct.

[58] Baer, "Equality," 986 explains that equality amounts to the prohibition against arbitrariness, and thus to an obligation to act rationally.

This is the case, for example, under the French constitutional framework. Article 1 of the 1958 French Constitution states that equality of all citizens before the law should be ensured.[59] Moreover, Article 1 in the Declaration of the Rights of Man and of the Citizen of 1789 proclaims that men are born and remain equal in their rights, Article 6 prescribes equal treatment by the law, both in protection and punishment, and Article 13 imposes a dual constraint on taxation entailing that taxes must be levied on an egalitarian basis and should respect the economic capacity of the taxpayer.[60] In its interpretation of the equality principle, the French Constitutional Council has held that the legislature may regulate different situations in different ways and derogate from equal treatment for reasons of general interest, but it generally requires that, in either case, the resulting difference in treatment is related to the purpose of the law establishing it.[61]

Similarly, the German Federal Constitutional Court, when interpreting Article 3, paragraph 1 of the Basic Law (equality rights),[62] has taken the stance that equal situations must be treated equally, and unequal situations must be treated unequally.[63] Based on this principle, a so-called arbitrariness formula (*Willkürformel*) has been established, which allows the Court to strike down legislation if the legislator cannot justify unequal treatment with a rational and proportional explanation.[64]

The principle of equality also features several places in the Spanish Constitution, including in Article 14 which generally proclaims that Spaniards are equal before the law and may not be discriminated against.[65] Further, the case law of the Spanish Constitutional Court has outlined a framework for the appropriate treatment of taxpayers, including limitations to arbitrary treatment.[66]

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[59] FR: French Constitution, 4 Oct. 1958 [*La Constitution française*].

[60] FR: Declaration of the Rights of Man and of the Citizen, 26 August 1789 [*Déclaration des droits de l'homme et du citoyen de 1789*]. See also John Bell, *French Constitutional Law* (Oxford: Oxford University Press, 1992), 199.

[61] FR: Constitutional Council, 27 Dec. 2002, no. 2002-464 DC; and Constitutional Council, 14 August 2003, no. 2003-483 DC. More recently see also FR: Constitutional Council, 14 May 2021, Decision no. 2021-907 QPC. See also Lise Chatain, "France," in *Taxation and Inequalities*, ed. Rita de la Feria (Amsterdam: IBFD, 2025), 479-506, at 483.

[62] GE: Basic Law for the Federal Republic of Germany, 23 May 1949 [*Grundgesetz für die Bundesrepublik Deutschland*].

[63] For more on Constitutional requirements in a German tax context see e.g. also Joachim English and Hanno Kube, "Constitutional Requirements for Substantive Tax Law in the Federal Republic of Germany," *Review of International and European Economic Law* 2, no. 3 (2023).; and Ruben Rehr, *Financing COVID-19 Costs in Germany: Is a Wealth Tax a Sensible Approach*, Wealth Tax Commission Background Paper no. 131 (London: Wealth Tax Commission, 2020)

[64] Oliver Lepsius, "Constitutional Review of Tax Laws and the Unconstitutionality of the German Inheritance Tax," *German Law Journal* 16, no. 5 (2015): 1191–1226, 1194. See also Joachim Englisch and Christina Osterloh-Konrad, "Germany," in *Taxation and Inequalities*, ed. Rita de la Feria (Amsterdam: IBFD, 2025), 507-532, 512.

[65] ESP: Spanish Constitution, 6 Dec. 1978 [*Constitución Española*].

[66] Violeta Ruiz Almendral, "Spain," in *Taxation and Inequalities*, ed. Rita de la Feria (Amsterdam: IBFD, 2025), 847-867, 850.

While strict constitutional equality principles are prevalent in much of Continental Europe,[67] some jurisdictions do take a more relaxed approach. In Norway, the principle is formally recognized in Section 98 of the Constitution,[68] but the Supreme Court has never invalidated legislation solely on this basis, traditionally granting broad discretion to the legislature.[69] Moreover, in Denmark the Constitution itself does not even explicate any general principle of equality or non-discrimination,[70] and in Switzerland, although equality and non-discrimination are formally guaranteed by Article 8 of the Swiss Constitution,[71] the particular political and constitutional set-up of the Swiss Federal State entails that the protection granted through these principles is rather limited.[72]

Finally, it should be mentioned that the U.S. Constitution also contain an equal protection clause.[73] However, in this context the U.S. Supreme Court has shown judicial restraint when it comes to the domain of economic legislation.[74] Moreover, the scholarly discussions in the United States on the (un-)constitutionality of a wealth tax have taken a quite different

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[67] Påhlson, *Likhet inför skattelag*, 225. For an overview see also Rita de la Feria, "Tax Fairness: Reconceptualizing Taxation and Inequalities," in *Taxation and Inequalities*, ed. Rita de la Feria (Amsterdam: IBFD, 2025), 3-108.

[68] NO: Constitution for the Kingdom of Norway, 17 May 1814 [*Kongeriket Norges Grunnlov*]. For a brief introduction to the role of the principle of legal equality in the Norwegian Constitution see Frederik Zimmer and Henrik Skar, "Norway," in *Taxation and Inequalities*, ed. Rita de la Feria (Amsterdam: IBFD, 2025), 737-754.

[69] See for instance NO: Supreme Court, 4 October 1055, Rt. 1955 p. 937. However, in the literature the Norwegian wealth rules have been subject to severe criticism for being inadequate when perceived from an equal treatment perspective. See Magnus Aarbakke, *Skatt på formue* (Oslo: Universitetsforlaget, 1998), 18.

[70] DK: The Constitutional Act of Denmark, 5 June 1953 [*Danmarks Riges Grundlov*]. It is doubtful whether any general principle of equality may be deduced from other principles mentioned in the Constitution or the "spirit" behind it. See Jens Peter Christensen et al., *Dansk Statsret* (Copenhagen: Jurist- og Økonomforbundets Forlag, 2020), 175–76. In a few non-tax court cases it has been submitted that a principle of equality should exist at constitutional level, but the Danish Supreme Court has never explicitly acknowledged this. See DK: Supreme Court, 22 Mar. 1965, no. U 1965.293/2H; DK: Supreme Court, 24 Oct. 1986, no. U.1986.898/3H; DK: Supreme Court, 19 Feb. 1999, no. U.1999.841H. For a critical discussion on the existence of a principle of proportionality at constitutional level see Michael Hansen Jensen, "Proportionalitetsprincippet i forfatningsretlig belysning", *Ugeskrift for retsvæsen B* (1994), 335-344. However, Danish administrative law does contain a general principle of equality as well as a principle of proportionality. See Søren Højgaard Mørup et al., *Forvaltningsret – almindelige emner* (Copenhagen: Jurist- og Økonomforbundets Forlag, 2022), 246–52, and Louise Blichfeldt Fjord and Peter Koerver Schmidt, "Denmark," in *Taxation and Inequalities*, ed. Rita de la Feria (Amsterdam: IBFD, 2025), 439-459.

[71] CH: Federal Constitution of the Swiss Confederation, 18 April 1999 [*Bundesverfassung der Schweizerischen Eidgenossenschaft / Constitution fédérale de la Confédération Suisse / Costituzione federale della Confederazione Svizzera*].

[72] Patrick Waldburger, "Switzerland," in *Taxation and Inequalities*, ed. Rita de la Feria (Amsterdam: IBFD, 2025), 893-922, 895-896.

[73] US: Amend. XIV, § 1. The Constitution of the United States of America, 17 Sep. 1787.

[74] Ari Glogower, "The Constitutional Limits to the Taxing Power," *Fordham Law Review* 93, no. 3 (2024): 781–842, at 831-833.

direction, inter alia compared to the German discussions,[75] as it instead has centered around an *apportionment requirement*, which prescribes that federal direct taxes shall be apportioned among the states relatively to population.[76] This requirement primarily prohibits differential treatment based on where the taxpayer resides—a matter that falls outside the scope of this study.[77]

Regardless of whether a country follows a strict constitutional equality principle, as in Germany, or takes a more flexible approach, like Norway and Denmark, it is nonetheless essential for political reasons to assess whether the valuation methods applicable under a wealth tax ensure a sufficient level of equal treatment, and whether differential treatment is based on rational and proportionate justifications. Perceived arbitrary disparities—where taxpayers experience different treatment without a clear rationale—tend to be particularly troubling for the legitimacy of the rules. Hence, such unjustified valuation differences may create political resistance to the implementation or continuation of wealth taxes. Moreover, unequal treatment of taxpayers may also clash against other legal principles and standards found outside of constitutional law, for example in EU law and in the European Convention of Human Rights as well as in domestic administrative law and specific non-discrimination legislation.[78]

Against that background, we do not aim to assess our empirical findings in light of one specific constitutional definition of legal equality.[79] Rather, we rely on what we consider to be the core of the equality principle—constitutionally protected in some countries, and regarded more as an important criterion for legislative legitimacy in others.[80] Based on this understanding, we examine, in light of our empirical findings, how well standardized valuation methods for unlisted shareholdings—and the differential treatment they produce—can be justified on relevant and proportionate grounds.

In this assessment, it is directly relevant to compare the Norwegian, Danish, and Swiss valuation methods and the outcomes they produce, not least because disparities in valuation

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[75] See for e.g. Paul Kirchhof, "Die Gleichheit vor dem Steuergesetz – Maßstab und Missverständnisse," *Steuer und Wirtschaft* 1 (2017): 3–16, at 8.

[76] US: United States Constitution, article I, Section 2 and 9.

[77] See instead e.g., Ari Glogower, "A Constitutional Wealth Tax," *Michigan Law Review* 118, no. 5 (2020): 717–84, and Dawn Johnson and Walter Dellinger, "The Constitutionality of a National Wealth Tax," *Indiana Law Journal* 93 (2018): 111–37.

[78] Ilias Trispiotis, "Taxation and inequality: A human rights perspective," in *Taxation and Inequalities*, ed. Rita de la Feria (Amsterdam: IBFD, 2025), 117-166.

[79] Since our aim is to contribute to a broader academic discussion that is relevant beyond a single jurisdiction, we have chosen not to pursue a detailed constitutional analysis of any one country. Instead, we focus on general legal equality considerations that may inform debates across different legal systems. While we do refer to constitutional case law—particularly from Germany—these references appear both in the main text and in footnotes, and serve illustrative purposes rather than forming the basis for a jurisdiction-specific analysis..

[80] France, Germany, and Spain have been selected as reference points because they exemplify a Continental European legal tradition with a relatively strict approach to the principle of equality—an approach that is particularly influential across civil law jurisdictions. In contrast, Norway and Denmark represent a more pragmatic and flexible Nordic variant.

results may be easier to justify if no more accurate or feasible alternatives exist.[81] In addition to comparing these three methods, we also consider whether they could be modified to enhance consistency of treatment without undermining administrative feasibility or legal certainty. In particular, toward the end of the paper, we consider whether standardized methods can be combined with elements of individual assessment in a way that promotes greater equality without imposing a disproportionate burden on taxpayers or tax authorities.

3. Evaluation of the Norwegian Method

3.1. Sample selection

The dataset provided by the Norwegian tax authorities, which we use in this section to test the accuracy of the Norwegian valuation method, comprises Norwegian unlisted companies where 100% of the shares were reported as sold to a single buyer between 2018 and 2021.[82] The dataset is based on information from the (traded) companies' own tax filings.[83] The companies are required to provide information to the authorities on both their wealth values, which are used to determine the shareholders' taxable wealth, and on the sale of shares in the company.[84] By comparing the companies' reported wealth value with the reported sales price of the shares, we aim to estimate how accurately the current Norwegian valuation methods capture the price for which the shares were sold on the market.

Furthermore, the dataset also includes aggregated information on the companies' asset composition, debt, and net income over the past few years. While the details are not highly granular, the dataset allows us to discern general trends regarding the characteristics of companies whose reported wealth values diverge significantly from the sales price of the shares, compared to those with valuations more closely aligned to the sales price.

We requested the tax authorities to apply specific filters during the extraction process, particularly to ensure that the included companies had recorded wealth values and that the sales prices were minimally influenced by non-market factors. Further, a filter was used to exclude certain companies that had been involved in specific transactions prior to or in connection with the sale, which would complicate comparisons.

More specifically, we requested that the initial selection was based on all unlisted companies where 100% of the shares were reported as sold to a single buyer in any given year between

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[81] Oppositely, if there do exist another equally effective alternative that would entail less of a limitation on the constitutional right, the law in question will be hard to justify. See Aharon Barak, "Proportionality (2)," in *The Oxford Handbook of Comparative Constitutional Law*, ed. Michel Rosenfeld and András Sajó (Oxford: Oxford University Press, 2012), 738–55, at 744. See also Bernhard Schlink, "Proportionality (1)," in *The Oxford Handbook of Comparative Constitutional Law*, ed. Michel Rosenfeld and András Sajó (Oxford: Oxford University Press, 2012), 718–37, at 723.

[82] The dataset is not restricted to transactions between individual taxpayers; it also includes the sale and purchase of shares by companies.

[83] Specifically forms RF-1086, RF-1028, and RF-1167.

[84] Norwegian companies are required not only to report their net asset value to the Tax Authorities, but also to disclose their shareholders, any changes in shareholder position during the tax period, and other relevant information for the taxation of shareholders upon the realization of shares. See NO: Sec. 7-7 (1) Sktfvl.

2018 and 2021. The 100% transfer requirement was introduced to avoid complications related to price discounts for minority holdings. Additionally, exclusions were made for companies established in the same year they were sold,[85] companies with different classes of shares,[86] and companies reporting changes in share capital, demergers, or mergers.[87] Transactions disclosed as inheritances, gifts, gift sales, other succession transfers, or intra-group transfers were also filtered out, as they typically do not reflect market prices. Lastly, companies with a reported sales price for all shares below NOK 100,000 (EUR 9,000) were excluded because they are often of a trivial nature, and because the price is sometimes reported as 0 in cases of gifts to family members or intra-group transfers.[88]

After receiving the dataset from the tax authorities, containing 10,504 observations, we proceeded with cleaning the data and making certain corrections for companies that had paid or received dividends and group contributions in the same year as the sale. More specifically, since wealth values are determined as of January 1,[89] we adjusted the wealth values by deducting dividends and group contributions paid, and adding group contributions received, after this date but before the sale, to ensure comparability at the time of the sale.

Additionally, we applied some further filters. First, because our analyses examine, among other things, company characteristics related to the composition of their assets, we removed 1,497 companies that held shares in other companies, as it is not possible to determine the underlying assets associated with these shares. Therefore, there are no holding companies in our sample.

Second, we excluded 1,206 companies that had not reported taxable income in the current or previous two tax years, as income data from two years back is required to test the alternative valuation methods discussed in Section 4. This group of companies included those established within the last two years, such as companies formed as part of a demerger—a common approach before a sale when the intention is to sell only part of the business. This exclusion means that our sample includes only companies that have existed for at least three years including the year of the sale. After applying these filters, our final sample consists of 7,801 companies.[90]

3.2. Analysis of the Data on the Norwegian Method

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[85] Companies established in the same year as the sale are filtered out because they do not have a wealth tax value as of 1 January.

[86] These companies have been filtered out because several share classes complicate the analysis.

[87] Companies that have undergone changes in share capital, demergers, or mergers in the year of the sale have been filtered out to avoid the need for numerous manual adjustments to ensure comparable values.

[88] In addition to this, a handful of companies were also removed from the dataset on other grounds, such as companies where wealth has been determined discretionary, or where there have been calculation errors leading to total wealth not corresponding with the value of assets and debt.

[89] In our testing below, we use the net asset values reported in the same years as the transfers, even though these values technically are first applied for wealth taxation in the following year. See NO: Sec. 4-12 (2) Sktl.

[90] Please refer to the Appendix for further information about data filtering.

We assess the accuracy of the Norwegian valuation method by comparing the unlisted companies' reported wealth values to the reported total sales prices of the shares. The wealth-to-price ratio for each company is calculated by dividing the company's reported wealth value by the reported total sales price. A wealth-to-price ratio below one (or below 100%) indicates that the company's net value calculated under the wealth tax regime is less than its market value (i.e., undervalued), while a ratio above one (or above 100%) suggests that the calculated net value under the wealth tax regime exceeds the market value (i.e., overvalued).

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

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

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

Table 1, Panel A in the appendix presents the mean and median wealth-to-price ratio for the total sample of 7,801 companies. Although the average ratio is 109% (1.09), suggesting slight overvaluation on average, this figure is heavily skewed by extreme cases of overvaluation (which we will comment on further below). Thus, the median ratio of 61% provides a more representative measure, showing that half of the companies are undervalued by approximately 40% or more relative to the sale prices.

To further explore valuation differences, we distributed the companies into deciles based on their wealth-to-price ratios. Due to the large number of companies reporting zero wealth values, we placed all 1,285 zero-wealth companies in decile D1 and 276 companies in D2, collectively representing 20% of the sample. In the remaining deciles (D3 to D10), the companies are evenly distributed, with 780 companies in each decile.

The median wealth-to-price ratio in D2 is 2.5%, meaning that 15% of the total sample has either no reported wealth value or a wealth value below 3% of sale prices. The median wealth-to-price ratio gradually increases from 12% in D3 up to 89% in D7, indicating improving accuracy as we move toward D8, where valuations most closely match sale prices (median 104%, mean 105%).

In contrast, clearly overvalued companies in D9 (median 132%, mean 135%) and D10 (median 306%, mean 595%) exhibit significantly greater variation, reflecting numerous extreme outliers. Together, D9 and D10 show that approximately 20% of the companies in our sample are overvalued, but the high standard deviations and extreme outliers suggest that there may be specific factors making these findings less representative.

A possible explanation for the extreme cases of overvaluation is misreporting of underpriced related-party transactions, such as gift sales to family members. As previously noted, we have attempted to filter out such transactions, but this process relies on companies correctly ticking the relevant boxes in their schedules to indicate related-party transactions, inheritance, or gift sales. However, since reporting this information often has limited impact on the owner's tax liability (as Norway does not have gifts or inheritance taxes), and because companies may not always be aware of the buyer-seller relationship, it is likely that some gift sales and similar transactions remain in the dataset, especially contributing to the extreme outliers in D10.

Misreporting of the sale price may also account for some of the observed undervaluation. In particular, part of the reported sale price may, in some cases, reflect compensation for the seller's continued work in the company during a post-sale transition period. Both from a fair market value perspective and under Norwegian tax rules, such compensation—i.e., payment linked to work obligations—should be treated as salary rather than as part of the share consideration.[91] Thus, if correctly classified, it should not distort the valuation ratio. However, if the entire amount is mistakenly reported as consideration for the shares, the sale price will appear artificially high relative to the company's reported wealth. Still, the possibility of such misclassifications does not alter the broader pattern observed in the data: the Norwegian method tends to produce systematic undervaluation.[92]

We now turn to the characteristics of companies across the different deciles. While our dataset does not provide detailed information on specific industries or precise asset composition, it includes aggregated financial data from tax forms covering asset and liability categories and net income. Panel B of Table 1 presents the mean values of these aggregated financial variables for each decile, while Table 5 complements this by reporting a simple multivariate regression that controls for the same variables. In the following discussion, we focus on the descriptive patterns in Panel B, referring to the regression results only in footnotes.[93] Additionally, we offer potential explanations for the observed trends, although these interpretations are not based on statistical methods.

Table 1, Panel B shows that the most undervalued companies (D1–D4) appear to hold substantially less real estate compared to companies valued closer to their sale prices (D5–D8).[94] Instead, these undervalued companies tend to have higher values in inventories and other fixed assets.[95] This aligns with expectations from the Norwegian valuation rules, as real estate is valued using more precise methods tied to market price data or rental income,

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[91] NO: Supreme Court, 17 Jun. 2009, Rt. 2009, 813.

[92] Another factor that may increase the apparent undervaluation without necessarily indicating true undervaluation is that some companies may have tax losses carried forward from previous years. While such losses can increase the company's value to a buyer—by reducing future taxable income—they are not included in the net asset value used for wealth tax purposes, as tax attributes are excluded. This structural difference may contribute to a smaller part of the observed gap between reported wealth values and sale prices, although it is unlikely to account for the broader pattern of systematic undervaluation observed in the data.

[93] In particular, we estimate the following model using the Ordinary Least Squares (OLS) estimator: $Wealth\ to\ price\ ratio_{it} = \beta_0 + \beta_1 \times Cash\ and\ receivables_{it} + \beta_2 \times Inventory_{it} + \beta_3 \times Fixed\ assets_{it} + \beta_4 \times Real\ estate_{it} + \beta_5 \times Debt_{it} + \beta_6 \times Past\ income_{it} + \varepsilon_{it}$, where i indicates company i and t indicates year t.

[94] Companies in D1-D4 own, on average, 17.82 million NOK less in real estate than companies in D5-D8 and this difference is statistically significant at the 1% level. In Table 5, the coefficient on the real-estate ratio is positive and highly significant (β = 0.067, t = 5.06), indicating that higher real-estate holdings are associated with higher wealth-to-price ratios. This result should be interpreted in light of Norway's pronounced tendency to undervalue companies: because real estate is appraised relatively accurately, whereas other assets are systematically undervalued or omitted, firms with larger property shares will mechanically exhibit higher wealth-to-price ratios.

[95] On average, companies in D1–D4 hold NOK 0.34 million more inventory and NOK 0.48 million more in fixed assets than those in D5–D8, with both differences statistically significant at the 1% level.

whereas inventories and fixed assets rely primarily on historical costs (less depreciation for fixed assets). Additionally, higher proportions of inventories and fixed assets may suggest active business operations generating more intangible value and goodwill, compared to passive real estate activities such as rental.

Debt levels also differ across the deciles. Undervalued companies in D1–D7 tend to report higher debt levels than those more accurately valued or overvalued in D8–D10.[96] This finding also aligns with expectations under the Norwegian valuation framework, as debt financing— including loans from owners or investors, particularly when used for intangible investments such as human capital or business development—creates recorded liabilities without necessarily increasing recorded asset values.

Furthermore, zero-wealth companies (D1) report, on average, the lowest incomes (mostly negative) and the highest debt levels in the sample. Although we cannot determine the exact characteristics of these companies, these patterns align with what one would typically expect of early-stage businesses, where zero-wealth values may be linked to loans—including those from owners and investors—being directed toward human capital and business development. In contrast, undervalued companies with positive wealth values (D2–D6) typically report the highest incomes in the sample, suggesting that they have, to a greater extent, successfully converted their business ideas into profitable operations.[97] Their significantly higher average sale prices compared to the zero-wealth companies in D1 further support this interpretation.[98]

For companies that are moderately undervalued, as well as those valued close to market prices (D5–D8), we observe not only a notable increase in real estate investments but also a gradual decline in profitability compared to D2–D4. This may also support the interpretation that these companies are more engaged in passive operations such as rentals.

The decline in profitability continues for the overvalued companies in D9–D10. While the most extreme cases of overvaluation are likely due to misreporting—particularly in connection with intrafamily transfers or gift-related sales—a more general explanation may be that overvaluation is linked to lower profitability, as buyers may be less willing to pay high prices for assets that generate weaker returns or are harder to monetize. For example, if a company owns real estate that is valued for wealth tax purposes based on general price statistics, the assessed value may exceed what the property is actually worth to potential buyers—particularly if the income potential or usability of the property is limited. Unlike zero-wealth companies, which also report low profitability on average, the companies in D9 and D10 may to a larger extent include businesses that hold recorded assets contributing to

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[96] Companies in D1-D7 have, on average, 3.38 million NOK more debt than companies in D8-D10 and this difference is statistically significant at the 1% level. The debt-ratio coefficient in Table 5 is negative and significant ($\beta = -0.047$, $t = -2.55$), consistent with higher leverage depressing the wealth-to-price ratio.

[97] Table 5 shows that the income ratio is statistically insignificant in the full sample ($\beta = 0.062$; $t = 1.05$). This weak overall effect is consistent with the non-linear pattern in Panel B: income is lowest in D1, rises sharply in D2–D6, and then declines again in the upper deciles.

[98] The sale price of companies in D2-D6 is, on average, 15.36 million NOK higher than that of companies in D1 and this difference is statistically significant at the 1% level.

high assessed values, but which generate modest income or have weak future prospects. It is also possible that part of the apparent overvaluation reflects distress sales, where the sales price is lower than what could have been achieved under less time-constrained circumstances.

3.3. Main Takeaways and Reflections on the Data on the Norwegian Method

The descriptive statistics of the Norwegian method reveal significant variation in how accurately reported wealth values reflect sale prices, with a strong overall tendency toward undervaluation. Specifically, 15% of companies are valued at less than 3% of the sale price, over 35% are valued at less than 30%, and nearly half are valued at less than 60% of the sale price.

Although our data lacks detail on industries and asset types, we observe certain patterns: companies valued close to market prices tend to hold more real estate, while undervalued companies have more inventories and fixed assets, and carry higher debt. Among the undervalued, zero-wealth companies report the lowest incomes, while clearly undervalued companies with positive wealth values report the highest—indicating that the latter group to a greater extent consists of companies that have successfully established themselves as profitable ventures. Roughly 20% of the companies appear overvalued. While extreme cases are likely due to misreporting, genuine overvaluation may also occur due to, for instance, hard-to-monetize assets and weak profitability.

3.4. Evaluation of the Norwegian Method against Equality Standards

The substantial disparities in the valuation of unlisted companies observed under the Norwegian valuation method raise important questions about how such significant deviations can be reconciled with the principle of legal equality. However, evaluating these disparities specifically against the Norwegian equality principle in Article 98 of the Constitution is somewhat less relevant in the international context, as Norway has very little tradition of actively enforcing this principle.

In fact, one would need to look back to 1955 for a case where the Norwegian Supreme Court considered the principle of equality in relation to wealth taxes. This case concerned particularly high wealth taxes imposed in the aftermath of World War II, which had disparate effects on taxpayers.[99] Nevertheless, the Court upheld the regulations, rejecting the idea that tax laws could readily violate the principle of equality. It emphasized that any tax must be imposed based on fixed and general norms, and that it is difficult to avoid some individuals being more heavily affected than others.

Today, what is typically regarded as the core of the equality principle under the Norwegian Constitution is the prohibition against discrimination based on personal characteristics such as origin, ethnicity, and sex.[100] Furthermore, there also exists an unwritten principle that

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[99] NO: Supreme Court, 4 Oct. 1955, Rt. 1955, 937

[100] NO: *Rapport til Stortingets presidentskap fra Menneskerettighetsutvalget om menneskerettigheter i Grunnloven*, 19 Dec. 2011, doc. 16, at p. 142. Here it is stated that for differential treatment to constitute unlawful discrimination, it must be linked to a characteristic of the individual or, alternatively, a characteristic of someone with whom the individual is associated. Furthermore, the report focuses on

prohibits arbitrary differential treatment in the exercise of administrative authority, but this primarily serves as a limitation on the administration's discretionary powers, not the legislature.[101] Hence, it is not likely that the Norwegian Supreme Court will strike down the wealth tax valuation methods on the basis of equal treatment concerns.

However, for other states contemplating to introduce a wealth tax, it is still relevant to consider whether the disparities following from the application of valuation methods like the Norwegian one would be compatible with legal equality standards within their jurisdictions. As already explained in Section 2, states following the civil law tradition, such as France, Germany, and Spain, often apply a constitutionally protected general principle of legal equality that goes beyond discrimination based on sex, origin or other personal characteristics, by more generally targeting legislation resulting in differential treatment based on arbitrary or unjustified grounds. The foundation of this principle lies in the idea that the legislature, as a democratically legitimate authority, can and should create distinctions based on political priorities and societal needs, but not on random or irrational grounds.[102]

Hence, the French Constitutional Court has developed a specific application of this principle in the context of taxation, emphasizing that the distribution of tax burdens among citizens must not be uneven without justifiable reasons.[103] Similarly, the Spanish Constitutional Court has stressed that arbitrary distribution of the tax burden is prohibited, while justified differentiation—based on economic capacity or other relevant factors—is permissible.[104]

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the types of personal characteristics that, according to general human rights conventions, cannot serve as a basis for discrimination.

[101] Nor has the Norwegian Supreme Court traditionally applied this unwritten principle—prohibiting arbitrary differential treatment in the exercise of administrative authority—strictly in the field of taxation; see, e.g., NO: Supreme Court, 4 Oct. 2001, Rt. 2001, 1201. That said, the Supreme Court has in recent years occasionally challenged legislation—or its application—on other equality-related grounds, without directly invoking the Constitution or the unwritten principle prohibiting arbitrary differential treatment by the administration. For a notable example see NO: Supreme Court, 14 Sep. 2015, Rt. 2015, 982. In its decision the Court struck down arbitrary double taxation. The tax authorities had amended the taxpayer's 2005 tax assessment to include income that had already been declared and taxed in 2006, but without reassessing the 2006 tax year. When the taxpayer subsequently requested an amendment to the 2006 assessment, the authorities refused to eliminate the income, citing that the deadline for complaints for that tax year had expired. Although the tax authorities' interpretation was consistent with the wording of the statute of limitations, the Supreme Court deemed the outcome unacceptable, as it conflicted with the fundamental principle in tax law that income should only be taxed once for the same taxpayer.

[102] Kirchhof, "Die Gleichheit vor dem Steuergesetz," 8.

[103] See for instance FR: Constitutional Council, 28 Jul. 2011, no. 2011-638 DC, at para. 24; and Constitutional Council, 17 Jan. 2020, Decision no. 2019-820 QPC, at para 4 and 5. See also Olivier Fouquet, "Le Conseil constitutionnel et le principe d'égalité devant l'impôt," *Les Nouveaux Cahiers du Conseil Constitutionnel* 33 (2011): 7–13, at 8; and Ayrault Ludovic, "Le principe d'égalité en matière fiscale," *Titre 7*, no. 4 (2020).

[104] See ESP: Constitutional Court, 14 Mar. 2005, no. 57/2005, where the court stated (our translation): "It must not be forgotten that, according to our doctrine, an exemption or reduction—a privilege for its holder—that breaks the principle of generality governing taxation (Article 31.1 CE), as it neutralizes the tax obligation derived from a taxable event indicative of economic capacity, will only be

Moreover, and as already mentioned in Section 2.2, a similar principle is found in Germany, referred to as the *Willkürformel* (arbitrariness formula).

Accordingly, in jurisdictions where these types of equality principles are applied, challenges may arise if the wealth tax rules result in substantial disparities in valuations that cannot be rationally justified. A notable example is the 1995 landmark case from the German Federal Constitutional Court which eventually led to the abolition of the German wealth tax.[105] In that judgment, the Court concluded that the German net wealth tax (*vermögensteuer*) conflicted with the principle of equality, as set out in Article 3 of the Basic Law. The ruling was based on the fact that outdated real property valuations (from 1964) were significantly lower than the current market values applied to other assets like cash and securities. This inconsistency led to more favorable treatment for real estate owners, creating unequal tax burdens. The Court also made broader observations on the inadmissibility of applying entirely different valuation rules to different types of assets, particularly where only some assets were valued in a way that reflected market prices, while others were not.

If one applies this line of reasoning to the Norwegian valuation method, serious concerns emerge. Most notably, Norway employs different valuation principles for listed and unlisted shares, where listed shares are valued based on stock market prices, which capture human capital, market shares and other types of goodwill. In contrast, the valuation of unlisted shares is limited to the value of concrete and identifiable assets, as previously explained. This represents a key inconsistency like the one emphasized by the German Federal Constitutional Court; the application of valuation methods that not only differ in approach but also capture values of a completely different nature. When a method fundamentally diverges from the goal of approximating market value, as appears to be the case for unlisted shares in Norway, there is a significant risk that it would not withstand constitutional scrutiny in jurisdictions with stricter equality principles than those currently applied in Norway.

A possible counterargument is that the differential treatment may be justified by differences in the accessibility of value to the owners. Assets in the form of goodwill may be more restricted, less accessible, or provide a lower economic capacity to pay the tax compared to more tangible assets, such as real estate, which can, for instance, more easily be used as collateral for loans. This argument might also be linked to the ability-to-pay principle, as this principle may require consideration of the taxpayer's economic capacity and access to

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constitutionally valid when it responds to general interest objectives justifying it (e.g., economic or social policy reasons, ensuring a subsistence minimum, tax technicalities, etc.). Otherwise, it is prohibited, since the principles of equality and generality are violated when a criterion for the distribution of public burdens is used that lacks any reasonable justification and is, therefore, incompatible with a fair tax system, as enshrined in Article 31 of our Constitution …".

[105] GER: Federal Constitutional Court, 2 BvR 552/91, 93 BVerfGE 165 (22 June 1995). See also GER: Federal Constitutional Court, 1 BvL 10/02, 117 BVerfGE 1 (7 November 2006), where the Court found that inheritance tax valuation of unlisted shares based on book values violated the constitutional principle of equality, emphasizing that book values reflect historical rather than actual market values, thereby leading to systematic undervaluation. Another important case concerning inheritance tax is GER: Federal Constitutional Court, BvL 21/12, 1 BVerfG 138 (17 Dec. 2014). About this decision and its consequences see Lepsius, "Constitutional Review of Tax Laws," 1191.

liquidity to meet their tax obligations. In Spain, for example, the Constitutional Court has interpreted the ability-to-pay principle as requiring attention to the taxpayer's actual economic capacity, albeit in a different context. The Court ruled that taxing increases in land value without considering the taxpayer's actual income could violate the principle.[106]

However, in our context, differences in economic capacity appear to be a rather remote or insufficient justification for the observed unequal treatment in Norwegian wealth tax valuations. While accessibility to liquidity and asset types may play a role, it is important to note that the Norwegian wealth tax rules are broadly formulated and blunt in their application, and they are not explicitly designed to account for differences in asset liquidity or accessibility. Thus, these factors do not seem to provide a convincing justification for the substantial disparities in tax burdens for taxpayers with similar net market values.

Accordingly, if one is to justify the disparities caused by the Norwegian valuation method for unlisted shares, the rationale must likely be sought elsewhere, most notably in the consideration of administrative efficiency. In a mass-administration system a degree of inequality or discrepancies must be tolerated to ensure the system remains manageable and cost-effective. This broader trade-off between e.g. ensuring equality on the one hand and administrative feasibility on the other hand is a common challenge in designing and implementing tax systems and constitutes an important consideration for the legislature.[107]

Whether standardized valuation methods can be justified on grounds of administrative efficiency depends, among other factors, on the practical burdens associated with more individualized assessments. The larger the number of taxpayers or cases, and the more complex, uncertain and prone to disputes a tailored valuation would be, the stronger the case becomes for a simplified solution. In the context of valuing unlisted companies for wealth tax purposes, several features make individualized valuations particularly demanding: assessments must be made annually, a large number of companies must be valued, there are often no comparable market transactions to refer to, and incorporating forward-looking elements—such as earnings potential or business plans—would significantly increase

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[106] ESP: Constitutional Court, 16 Feb. 2017, no. 26/2017; ESP: Constitutional Court, 24 Apr. 2017, no. 39/2017; ESP: Constitutional Court, 11 May 2017, no. 59/2017, and ESP: Constitutional Court, 26 Oct. 2021, 182/2021. In Germany, such an application of the ability-to-pay principle has also been discussed. In the already mentioned 1995 judgement from the Federal Constitutional Court , 93 BVerfGE 165, the Court, led by Judge Paul Kirchhof, in an obiter dictum suggested that the tax burden on wealth should not exceed an equal share of the overall proceeds from the wealth, ensuring that the substance and income from private property remain largely with the taxpayer. However, this notion was rejected in a dissenting opinion by Judge Ernst-Wolfgang Böckenförde, and in 2006, the Federal Constitutional Court explicitly retreated from its earlier statements, becoming somewhat more open to tax burdens exceeding income. See GER: Federal Constitutional Court, 2 BvR 2194/99, 115 BVerfGE 97 (18 January 2006.
[107] Miranda Stewart, *Tax and Government in the 21st Century* (Cambridge: Cambridge University Press, 2022), 75ff.; and Müller, "Challenge of Assessing Market Value, 118.

complexity. These structural factors increase the weight of administrative considerations and support the use of standardized methods.

Moreover, if no more accurate alternatives are available that remain feasible in practice, the general aims of the wealth tax may further support the use of simplified valuation methods. Under such conditions, it can be argued that administrative efficiency should not be seen as an independent justification, but as a means to achieving those broader objectives—whether to generate public revenue, to better capture taxpayers' financial capacity, or to counteract economic inequality and the concentration of wealth.

Nevertheless, it becomes difficult to rely on such justifications if alternative standardized methods exist that are both reasonably efficient and more accurate in approximating market value. Against this background, and still drawing on our Norwegian dataset, we will in the next section explore alternative standardized methods for determining the value of unlisted shareholdings, based on Swiss and Danish methods.

4. Evaluation of Danish and Swiss Methods

4.1. The idea

As previously explained, the purpose of this section is to test the precision of valuation methods commonly applied to unlisted shareholdings in Denmark and Switzerland using our Norwegian dataset. These methods were chosen because, unlike the Norwegian approach, they incorporate the historical earnings of unlisted companies over recent years as part of the valuation process, potentially capturing goodwill more effectively.

At the same time, the Danish and Swiss methods are constructed somewhat differently. While the Danish method involves a separate valuation of goodwill based on earnings, which is then added to the net asset value with the result constituting the company's tax value, the Swiss method bases the valuation on an average of the company's net asset value and earnings value. Thus, while both methods integrate earnings into their frameworks, they exemplify two distinct approaches to incorporating earnings value.

Other reasons for selecting these two methods are that Switzerland is among only a few other countries still levying a net wealth tax,[108] thereby having recent experience with handling the related valuation issues. In the same vein Denmark, despite not levying a net wealth tax anymore, has in recent years experienced significant political interest into the methods used for valuating shareholdings in unlisted companies for capital gains taxation as well as inheritance and gift tax purposes.[109] While such taxes are obviously different from a net wealth tax, it is often argued that using the same valuation methods across different taxes may help lower the cost of administration.[110] Additionally, the Danish method is rather simple, which

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[108] See section 1.

[109] See e.g. this report prepared by an expert committee established by the Danish Government in 2019: DK: Skatteministeriet (Denmark), *Rapport fra ekspertgruppe om værdiansættelse ved generationsskifte*, November 17, 2021 (Copenhagen: Skatteministeriet, 2021).

[110] Stephen Daly and Glen Loutzenhiser, *Valuation*, Wealth Tax Commission Evidence Paper no. 9 (London: Wealth Tax Commission, 2020); and OECD, *Net Wealth Taxes in the OECD*, 87.

is important concerning net wealth taxes, as these are levied annually and not only upon transfers. Hence, also for these reasons it makes sense to test the dataset on the Danish method.

Since we are testing the methods on Norwegian companies, based on how assets and income are classified and reported under Norwegian wealth tax and income tax rules, the other methods cannot and are not applied directly. Instead, we apply replicas that aim to approximate the two methods as closely as possible.[111]

Furthermore, because the Swiss method does not apply to real estate companies, we must use a more restricted sample when testing it. In contrast, for the Danish method, we can use the same sample as in our testing of the Norwegian method. This makes it logical to first evaluate the Danish method, which we will do in section 4.2. Subsequently, in section 4.3, we will examine the Swiss method using the restricted sample, where we also test the Norwegian and Danish methods on this sample for the sake of comparability.

4.2. The Danish Method

4.2.1. Method Overview

Denmark decided to abolish its wealth tax in 1995,[112] but appropriate valuations are still needed for transfers between related parties, inter alia for the purposes of capital gains taxation, inheritance taxation, and gift taxation.[113] To meet this need, Denmark has long relied on simplified guidelines for valuing unlisted shares and goodwill. These guidelines were historically set out in two circular letters,[114] but in April 2025 the rules governing valuations for inheritance and gift transfers were formally codified and slightly amended.[115] The new

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[111] While it would have been interesting to apply the two methods in full, applying slightly simplified versions also has its advantages. Hence, as wealth taxes are levied annually, contrary to e.g. inheritance taxes that are typically levied several years apart, it is particularly important to keep valuation methods simple under a wealth tax. See OECD, *Net Wealth Taxes in the OECD*, 69.

[112] For more on Denmark's experiences with net wealth taxes see Peter Koerver Schmidt, "Formuebeskatning i Danmark – aktuel debat om en gammel kending." *Juristen*, no. 1 (2023): 34–42.

[114] DK: Circular Letter on Valuation of Shares [*Cuirkulære om værdiansættelse af aktier og anparter*], CIR no. 45 of 28 March 2000 [hereinafter the *Shares Valuation Guidelines*], and Circular Letter on Valuation of Goodwill [*Cirkulære om vejledende værdiansættelse af goodwill*], CIR no. 44 of 28 March 2000 [hereinafter the *Goodwill Valuation Guidelines*].

[115] DK: Act no. 359 of 9 April 2025 and Bill L 123 of 22 January 2024. One of the important amendments entails that, under certain circumstances, the taxpayer has a legal right to apply a standardized valuation model, provided that a number of conditions are met. See Sec. 12a and 27(1) of the Danish Inheritance Tax Act (*boafgiftsloven*). Hence, if the conditions are fulfilled, the taxpayer can now rely on the standardized model even if the result does not express market value, e.g. if it is lower than market value. However, if the calculated value is higher than market value, the taxpayer can decide to rely on the lower market value instead. See DK: Bill L 123 of 22 January 2024, p. 14. Providing a legal right to apply the standardized model goes against the recommendations made by a majority the Danish expert committee, who argued that it is impossible to design a sufficiently reliable standardized valuation model. Instead, the majority proposed certain adjustments to the amortization period and an abolishment of the decay rate. See Skatteministeriet, *Rapport om værdiansættelse*, 5-8.

model closely resembles the former framework with respect to the simplified rules, but it also diverges from it in certain respects.[116]

Since our dataset covers the years 2018–2021 (and includes only three years of historical earnings as opposed to the five-year average prescribed under the new rules), our analysis is based on the earlier model set out in the circular letters.[117] According to this framework, the simplified method is only meant to be indicative, which means it must be supplemented by more sophisticated techniques whenever the default valuation is too coarse or special circumstances arise.[118] By contrast, our aim is to test whether a version of the Danish method could be appropriate under a wealth-tax regime, where annual assessments leave little scope for individual tailoring. Therefore, we confine our analysis to the simplified, standardized rules set out in the circular letters.

According to this method, the value of an unlisted company should be calculated based on the sum of the company's individual assets (excluding acquired goodwill) minus its liabilities—that is, its net asset value. Subsequently, an estimated value of goodwill is added. Accordingly, the following basic formula applies:[119]

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

(1)

The net asset value is primarily based on the company's book value as reported in its latest annual accounts, except for real estate, which is valued according to the most recent public assessment. The estimated goodwill value must be calculated through several steps,[120] where the basis is the financial results before tax for the last 3 financial years, with financial income deducted, financial expenses added, extraordinary items deducted/added, and amortization of acquired goodwill added.

A weighted average should be calculated, so that the most recent year has the greatest weight and the oldest year the least weight.[121] If the results show a consistent upward or downward

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[116] Notable differences include the fact that the new model is based on figures from the most recent five financial years (instead of three years), that an adjustment for earnings trends should no longer be made, and that the amortization period may extend up to a maximum of 15 years. For further details, see Troels Behnke Skak and William Brændekilde, "Nye regler om nedsat bo- og gaveafgift ved generationsskifte," *SR-Skat*, no. 18 (2025).

[117] As a consequence of the new valuation rules the Shares Valuation Guidelines, CIR no. 45/2000, and the Goodwill Guidelines, CIR no. 44/2000, were abolished. See announcement from the Danish Tax Authorities, 7 March 2025, SKM2025.127SKTST.

[118] DK: Guidelines on Transfer Pricing, Controlled Transactions, and Valuation [*Transfer Pricing; kontrollerede transaktioner værdiansættelse],* Guidance E no. 238, 21 January 2019. See also DK: para. C.J.2 *DJV*.

[119] DK: Shares Valuation Guidelines, CIR no. 45/2000.

[120] DK: Goodwill Valuation Guidelines, CIR no. 44/2000, para.3.1-3.7.

[121] Therefore, the adjusted result for the third last financial year is multiplied by 1, the adjusted result for the second last financial year is multiplied by 2, and the adjusted result for the last financial year is multiplied by 3. This is then divided by 6, resulting in a weighted average earnings.

trend in net income over the three reference years, the weighted average should be adjusted by adding or subtracting half of the total change from year 1 to year 3. A standard return on all assets in the company's latest balance sheet prior to the transfer should be deducted, except for non-operating assets such as bonds and mortgage deeds, as well as the book value of acquired goodwill. The return rate should be set at the capital return rate applicable at the time of the transfer plus 3% (it was 0 % in the years covering our dataset).[122]

Finally, a capitalization should take place. The capitalization factor expresses the relationship between the expected annual return in the form of a return rate and the expected lifespan of the goodwill, indicating how many years a return on the goodwill can be expected. The return should be set at the capital return rate applicable at the time of transfer plus 8% (as explained right above the capital return rate was 0 % during the years 2018-2021, i.e. the years of our dataset. Since goodwill can have varying lifespans—for example, lasting longer for unique goods or services and shorter for standardized, mass-produced ones—the capitalization factor must be set to reflect the expected lifespan. However, as a point of departure, a lifespan of 7 years should be assumed.[123]

4.2.2. How we have Applied the Danish Method to our Norwegian Sample
When applying the Danish method to our Norwegian dataset we have tried to follow the above mentioned steps as closely as possible. However, particulary because our data only provides information on asset values and net income reported for Norwegian tax purposes, we have had to make certain simplifications and adjustments.

When it comes to using asset values reported for Norwegian tax purposes, there may naturally be some differences compared to how asset values are calculated in Denmark. That said, it is our overall impression that there are few critical differences on this point. In both Norway and Denmark, the principles for determining asset values generally result in values that reflect or closely align with book values for most purposes. For real estate, both countries use methods that deviate significantly from book values due to the availability of more precise valuation data, but we do not find the differences between the two countries to be substantial in this respect either.

However, when it comes to the calculation of the estimated goodwill value, the Danish method relies on accounting profits from financial statements, while we, due to the data available to us, must base our calculations on income reported according to Norwegian income tax rules.[124] Furthermore, in Denmark, the profit is adjusted by deducting financial income, adding financial expenses, and excluding extraordinary items, such as capital gains

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[122] The capital return rate is determined and published once a year. The legal basis is DK: Sec. 9 of the Business Taxation Act [*Virksomhedsskatteloven*], Law no. 144 of 19 March 1986 with later amendments.
[123] DK: para. C.C.6.4.1.2 *DJV*. A capital return rate of 0 % (entailing a total rate of 8 %) and a lifespan of 7 years amounts to a capitalization factor of 2,83.
[124] We have extracted the net income figure from the company's business statement, which includes all economic benefits and gains derived from business operations or capital assets, minus incurred costs and capital losses from asset realizations. The reported income does not reflect deductions for contributions to reserves, profit distributions, or loss carryforwards.

from the sale of business property, and finally, adding amortization of acquired goodwill. This type of adjustment is not possible for us based on the data we have available.[125] In particular, the inability to deduct financial income and add financial expenses represents a limitation in our testing—an issue we will revisit in our discussion of the descriptive statistics below.

Regarding the return rate, we have applied a rate of 3%, as was used in Denmark during the years covered by our dataset (2018–2021). While macroeconomic conditions in Norway were not identical to those in Denmark during this period—Norway experienced moderately higher inflation and central bank interest rates—we do not consider these differences substantial enough to warrant the use of a different rate.[126] For the capitalization factor, we have adhered to the rate used in Denmark during the same period, which was 8%, and applied the standard assumption of a goodwill lifetime of 7 years, resulting in a capitalization factor of 2.83.

4.2.3. Analysis of the Danish Method
The descriptive statistics for the Danish method, provided in Table 2, Panel A, indicate that it results in less undervaluation than the Norwegian method. While the Norwegian method had a median wealth-to-price ratio of 61%, the Danish method shows a significantly higher median of 87%, meaning it is only 13% below the sale price.

Nevertheless, undervaluation remains substantial for many companies. The group of companies with zero wealth value consists of 510 companies, which is still significant despite being smaller than for the Norwegian method. Additionally, in D2, the median wealth-to-price ratio is 13%, meaning that 15% of the total sample has reported wealth values at or below this level.

Valuations improve gradually from D3 to D6, with the median wealth-to-price ratio increasing from 37% in D3 to 96% in D6. Accordingly, D6 is the decile where wealth values align most closely with sale prices, whereas under the Norwegian method, this did not occur until D8.

At the same time, a much larger share of companies is overvalued, with overvaluation becoming particularly pronounced from D8 onwards, where the average wealth-to-price ratio is 143%, and the median is 140%. In D9 and D10, overvaluation is far more extreme than under the Norwegian method, with median values reaching 234% in D9 and 757% in D10.

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[125] While the reported Norwegian net income does not include financial income or expenses related to shareholdings, such as dividends or costs associated with managing shares, it does include interest income and interest expenses, creating a difference compared to the adjusted profits used under the Danish method. Companies in our sample generally have more interest expenses than interest income, meaning that these deductions may result in a lower estimated goodwill value in our study compared to what would be obtained using the actual Danish method.

[126] According to World Bank data, Norway's average annual inflation rate from 2018 to 2021 was approximately 2.5%, compared to approximately 1.0% in Denmark. Over the same period, the average central bank policy rate was about 0.6% in Norway and –0.65% in Denmark, implying a difference of roughly 1.3 percentage points, see https://data.worldbank.org.

Additionally, overvaluation varies significantly more in these deciles, as reflected in much higher standard deviations compared to the Norwegian method.

As discussed in Section 3 regarding the Norwegian method, some of the extreme cases of overvaluation may stem from misreporting, such as gift sales or related-party transactions conducted at below-market prices without proper disclosure. While these factors may also contribute to overvaluation under the Danish method, they cannot explain the significantly higher degree of overvaluation observed in our replication. This suggests that the Danish method itself—or at least as applied in our study—has a much greater tendency to produce overvaluations compared to the Norwegian method.

We now turn to the company characteristics shown in Table 2, Panel B (complemented by a regression analysis reported in Table 6). Here we observe a similar pattern to the Norwegian method: companies with valuations closely aligned with market prices (D5–D7) tend to have substantially higher values in real estate compared to those in D1–D4 and D8–D10.[127] Meanwhile, companies in the clearly undervalued (D1–D4) and overvalued (D8–D10) deciles hold more inventories and fixed assets than those in the middle deciles.[128] While we cannot determine the exact drivers, possible explanations are the same factors identified for the Norwegian method—real estate valuations are generally more precise than those for inventories and fixed assets, and a higher share of the latter may indicate more active business operations that generate goodwill, in contrast to passive real estate management (rental).

Yet, it is not exactly the same companies that tend to be undervalued or overvalued under the Danish and Norwegian methods. The Danish method (or our replica of it) builds on the same net asset values as the Norwegian method and should therefore undervalue and overvalue many of the same companies. However, by incorporating earnings, it also introduces a shift—one that is evident when comparing the tables for the two methods: the most undervalued companies (D1–D4) under the Danish method generally have lower income, and the most overvalued companies (D9–D10) have higher income compared to the corresponding groups under the Norwegian method. Unsurprisingly, this pattern reflects the design of the Danish method: by incorporating earnings, it reduces the likelihood of undervaluing highly profitable firms, while simultaneously increasing the risk of overvaluing them.[129]

Furthermore, under the Norwegian method, we saw that undervalued companies tended to have higher debt than those valued closer to market price or those that were overvalued, but

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[127] Companies in D5-D7 own, on average, 11.42 million NOK and 10.91 million NOK more real estate relative to companies in D1-D4 and D8-D10, respectively. The differences are statistically significant at the 1% level.

[128] The average inventory for companies in D5-D7 is 0.31 million NOK and 0.30 million NOK lower than the average inventory of companies in D1-D4 and D8-D10, respectively. Similarly, the average non-real estate fixed assets for companies in D5-D7 is 0.34 million NOK and 0.17 million NOK lower than the non-real-estate fixed assets of companies in D1-D4 and D8-D10, respectively. All these differences are statistically significant at the 1% level 1.32 million difference on average.

[129] Table 6 corroborates this: the coefficient on Past income is positive and statistically significant in the full-sample regression ($\beta = 0.293$, $t = 2.06$), showing that higher earnings lift the Danish wealth-to-price ratio and thereby lessen undervaluation—and heighten overvaluation—for profitable firms.

this pattern is even more pronounced under the Danish method. However, debt itself is unlikely to lower wealth values more in our replication of the Danish method, as both methods use the same net asset value calculations. Instead, the more plausible explanation is that higher debt leads to higher interest expenses, which reduces the net income used in our testing of the Danish method, resulting in lower valuations. That said, our testing differs from the full Danish method in the handling of interest expenses. As previously explained, the Danish method technically requires financial expenses, including interest expenses, to be added back to net income before performing the valuation. Due to data limitations, we were unable to apply this adjustment. As a result, companies with high debt—and consequently high interest expenses—are likely to appear more undervalued in our testing than they would under a full implementation of the Danish method.

4.2.4. Main Takeaways and Reflections from the Danish Method

The descriptive statistics indicate that the Danish method performs somewhat better in our sample than what was previously reported by a Danish expert committee. The committee found that only 10% of valuations fell within ±20% of the observed sales price.[130] In our sample, 23% of companies are valued within this range.[131]

When comparing the results to those for the Norwegian method, we observe that the Danish method results in significantly fewer instances of undervaluation. However, substantial undervaluation still occurs, with 15% of companies valued at zero or at no more than 13% of the sale price, and 25% valued below 37%. Thus, by factoring in historical income, the Danish method is clearly more effective than the Norwegian method in capturing goodwill, but it still falls short in many situations. This is perhaps not surprising, as incorporating historical income does little to address cases where the future prospects of a business are significantly greater than what is reflected in the income so far.

Furthermore, the Danish method results in significantly more overvaluations than the Norwegian method, with over 30% of companies clearly overvalued and a much larger share assigned wealth values that are multiple times their sale prices. Moreover, our analysis indicates a greater tendency towards overvaluation than what was reported by the Danish expert committee.[132]

This discrepancy may partly reflect differences in sample composition. While we do not have full insight into the committee's dataset, our own data includes many small, individually or family-owned businesses. Notably, the committee itself observed that smaller firms are more prone to overvaluation.[133]

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[130] Skatteministeriet, *Rapport om værdiansættelse*, 44.

[131] Based on 998 of the total 7,801 companies having a Danish wealth-to-price ratio between 0.9 and 1.1.

[132] DK: Skatteministeriet, *Rapport om værdiansættelse,* 44. The Expert Group found that only 13 % of the cases resulted in overvaluations.

[133] DK: Skatteministeriet, *Rapport om værdiansættelse*, 42-45. Müller, "Challenge of Assessing Market Value," 132 finds that standardized combination models perform better for larger companies than for smaller ones.

One important reason for this may be a key limitation of income-based valuation methods: their tendency to capture the owner's human capital.[134] Many unlisted companies, especially smaller ones, derive much of their income from the owner's labor, skills, and network. For example, a law firm or dental practice where the owner is also the sole employee may report high net income if profits are retained in the company or payed out as dividends rather than as salary. However, the actual market value may primarily reflect the client portifolio and the operating assets, as the owner's labor does not transfer upon sale.

Accordingly, without individualized assessments, income-based valuation methods risk systematically overvaluing such companies by failing to separate business value from owner-dependent income, and this may account for much of the overvaluation we observe when applying the Danish method. In this regard, it is thus worth remembering that in Denmark taxpayers may request the use of more advanced methods if the simplified method does not provide a reliable estimate of market value.[135] However, when applied for wealth tax purposes, incorporating such individualized assessments becomes considerably more challenging—an issue we will return to later.

4.3 The Swiss Method
4.3.1. Method Overview
Even though wealth taxes in Switzerland are levied on cantonal level,[136] the various rules hold some similarities, among other things because the Swiss Federal Constitution includes a harmonization provision for direct taxes, which entails that the federation shall set out certain principles on harmonization.[137]

These harmonization principles are prescribed in the Federal Act on the Harmonization of Direct Cantonal and Communal Taxes but concerning valuation for wealth tax purposes the act only prescribes minimal guidelines.[138] Hence, it states that assets should be measured at

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[134] See also Advani, Chamberlain and Summers, *A Wealth Tax for the UK*, 59-60, who stresses the importance of ensuring that the valuation does not take account of the owner's own skills, attributes, and personality.

[135] As explained in footnote 115 the Danish rules have recently been amended, and if certain conditions are fulfilled, the value calculated after the standardized method can now be relied on by the taxpayer even if the result does not express market value. However, the taxpayer still have the option to resort to more advanced methods.

[136] Switzerland has a longstanding tradition for levying net wealth taxes. See Jean-Blaise *Eckert and Lukas Aebi, Wealth Taxation in Switzerland*, Wealth Tax Commission Background Paper no. 133 (London: Wealth Tax Commission, 2020), 3; Peter Hongler and Florian Mauchle, "Is Switzerland a Role Model for Wealth Taxes?" *Tax Notes International* 97, no. 6 (2020): 646–53; and Scheuer and Slemrod, "Taxing Our Wealth," 211.

[137] CH: Art. 47(2) and art. 3 of the Federal Constitution of the Swiss Confederation, 18 Apr. 1999 [*Bundesverfassung der Schweizerischen Eidgenossenschaft*]. The cantons, however, are sovereign in deciding the tax scales, rates, and allowances. See Hongler and Mauchle, "Is Switzerland a Role Model," 646.

[138] CH: Federal Act on the Harmonization of Direct Cantonal and Communal Taxes [*Bundesgesetz über die Harmonisierung der direkten Steuern der Kantone und Gemeinden*], 1990. SR 642.14. Valuation is regulated in Art. 14(3).

fair market value at the end of the tax year but does not elaborate on how to calculate it. However, for unlisted shareholdings the so-called Swiss Tax Conference has published guidelines with commentaries on how to estimate the value.[139] These guidelines include a formula-based approach commonly known as the practitioner's method, which has become the de facto standard for such valuations across the cantons.[140]

If the fair market value of an unlisted operational company cannot be easily determined—e.g. when there have not been any recent transfers of shares between unrelated parties—the practitioner's method prescribes that the value of the company shall be calculated as the average of two times its capitalized earnings value and one time its net asset value:[141]

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

(2)

The capitalized earnings value is determined by capitalizing the company's adjusted average net profit of the last two to three years with a fixed capitalization rate.[142] The net asset value is mainly determined as the book value of the company's assets and liabilities (with specific rules applying to certain assets, including real estate owned by the company).[143] When making the calculation, generally accepted Swiss accounting principles should be relied on.[144]

Finally, it should be noted that lump-sum deductions are granted if the taxpayer has no voting rights,[145] and that specific valuation guidelines should be applied for certain companies, including holding companies, real estate companies, and companies in liquidation.[146]

4.3.2. How we have Applied the Swiss Method to our Norwegian Dataset

As mentioned, we have had to make certain adjustments to the Swiss method when applying it to our dataset, as our data only reflects asset values and net incomes reported for Norwegian tax purposes. The Swiss method derives the earnings value from financial statements

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[139] The Swiss Tax Conference is a representative association of the 26 cantonal tax authorities and the Federal Tax Authorities. See CH: Guidelines on the Assessment of Securities without a Market Price for Wealth Taxes [*Wegleitung zur Bewertung von Wertpapieren ohne Kurswert für die Vermögenssteuer*], Circular letter no. 28 of 28 August 2008 [hereinafter the *Assessment Guidelines*].

[140] Hongler and Mauchle, "Is Switzerland a Role Model," 648-649.

[141] CH: Sec. 3.2 of the Assessment Guidelines, Circular no. 28/2008.

[142] Each canton selects whether to use two or three years as the cantonal standard. See CH: Sec. B(1) of the Assessment Guidelines, Circular no. 28/2008. Explained in brief the capitalization rate consists of the risk-free interest rate and the risk premium applicable to unlisted companies increased by a percentage to account for illiquidity. For more details see CH: Sec. B(3) of the Assessment Guidelines, Circular no. 28/2008.

[143] CH: Sec. 2-2(4) of the Assessment Guidelines, Circular no. 28/2008.

[144] Swiss GAAP allows for hidden reserves, which means that the net asset value according to Swiss GAAP is often lower than the fair market value of the assets minus the liabilities. See Hongler and Mauchle, "Is Switzerland a Role Model," 648-649.

[145] CH: Sec. 5 of the Assessment Guidelines, Circular no. 28/2008.

[146] CH: Sec. 3-3(6) of the Assessment Guidelines, Circular no. 28/2008.

reflecting accounting profits, adjusted for specific factors (e.g., excluding capital gains from non-recurring sale of assets, and adding expenses related to investments, contributions to reserves, as well as open and hidden profit distributions).[147] The Norwegian taxable income available in our dataset is derived from the so-called business income statement used for income tax purposes, and is based on many similar calculations (e.g., reported taxable income does not deduct investment expenses, contributions to reserves, or profit distributions).[148] However, there are also differences (such as the inclusion of gains from non-recurring asset sales) which makes the results not fully comparable.

For the calculation of the earnings value, we have adhered to the Swiss method by computing it as the sum of the current year's taxable income and the taxable incomes of the two preceding years, following the three-year approach.[149] In cases where the calculation resulted in a negative earnings value, we followed the Swiss guidelines by setting the earnings value to zero.[150] Positive earnings were scaled using the capitalization rates applied in Switzerland during the corresponding years: 7% from 2018-2020, and 9.5% in 2021.[151] Even though macroeconomic conditions in Norway and Switzerland were not identical during the period,[152] we do not consider these differences significant enough to warrant adjusting the rate.[153]

When it comes to *the net asset value,* we have used the asset values calculated according to the Norwegian wealth tax rules. In general, these seem quite similar to how the Swiss method operates, as valuations are closely aligned with book values for most purposes, except for real estate, where more precise valuation methods are used, as is also the case in Switzerland.[154]

An important factor to consider is that the Swiss practitioner method is not applied to real estate companies.[155] Many companies in our sample own real estate, and a substantial portion of them are likely to constitute real estate companies according to the Swiss definition. However, due to insufficient information about the nature of their operations, we cannot

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[147] CH: Sec. B, 1, para. 7 of the Assessment Guidelines, Circular no. 28/2008.

[148] Furthermore, the reported net income in our dataset has not been reduced by carryforward losses from previous years or adjusted (reduced/increased) for group contributions, as such adjustments are made in a separate form.

[149] As explained in note 142, each canton selects whether to use two or three years as the cantonal standard.

[150] CH: Example 3 in the Assessment Guidelines, Circular no. 28/2008.

[151] Von Graffenried Treuhand, *Zahlen-Info 2024: Kennzahlen, Indices, Facts, Rechnungslegungsrecht* (Bern: Von Graffenried Treuhand, 2024), 16.

[152] According to World Bank data (https://data.worldbank.org/), Norway's average annual inflation rate during this period was approximately 2.5%, compared to 0.3% in Switzerland. The average central bank policy rate was around 0.6% in Norway, while the Swiss National Bank maintained a negative rate of approximately –0.75%.

[153] Our main objective is to study systematic disparities in the wealth-to-price ratio across companies, and while a moderately different capitalization rate may shift the overall level of valuations, it is unlikely to substantially affect the pattern of disparities.

[154] CH: Sec. B, 2, para 11 of the Assessment Guidelines, Circular no. 28/2008.

[155] CH: Sec. B, 3.5 of the Assessment Guidelines, Circular no. 28/2008.

definitively identify such companies. To address this, we have restricted the sample to companies that do not report real estate values, resulting in a total of 3,836 companies.[156]

Excluding companies holding real estate introduces greater variation in the wealth-to-price ratio, as real estate is typically valued quite accurately, cf. section 3. Consequently, when testing the Swiss method, we must also retest the Norwegian and Danish methods on the restricted sample to ensure comparability.

4.3.3. Analysis of the Swiss method compared to the Norwegian and Danish Methods

Table 3, Panel A presents the decile distribution of the wealth-to-price ratio for the Swiss method, while Panel B and Panel C show the distributions for the Norwegian and Danish methods, respectively, based on the restricted sample that excludes companies with real estate holdings.

Panel A shows that the Swiss method results in significantly higher valuations than the Norwegian method, with a median wealth-to-price ratio of 83%, compared to 28% in Panel B. This means that the Swiss method undervalues the median company by 17%, while the Norwegian method undervalues it by 72%. The Danish method, shown in Panel C, has a median ratio for the total sample of 84%—almost the same to the Swiss method— corresponding to a shortfall of about 16%.

Looking more closely at undervaluation, the Swiss method reaches a median ratio about 30% in D4 and 60% in D5, while the Norwegian method does not reach 30% until D6 and 60 percent in D7. The Danish method shows even milder undervaluation, with a median ratio of 47% in D4 and 72% in D5. This suggests that while all three methods result in significant undervaluation for many companies, the Norwegian method does so to a far greater extent than both the Swiss and Danish methods. The Danish method, in turn, produces valuations that are noticeably closer to market prices than the Swiss method, though the difference between them is smaller.

When examining overvaluation, the differences between the methods become equally apparent. The Swiss method produces the highest frequency and severity of overvaluation, with the median wealth-to-price ratio surpassing 100% already in D6, rising to 163% in D7, and reaching 1,436% in D10. The Danish method also results in substantial overvaluation, though to a notably lesser extent than the Swiss method, with a median ratio of 126% in D7 and 1,057% in D10. In contrast, the Norwegian method produces considerably less overvaluation, with the median wealth-to-price ratio not surpassing 100% until D9 (118%) and remaining significantly lower even in D10 at 269%.

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[156] We take a conservative approach because we do not have sufficient information to identify real estate companies. A benefit of this approach is that it allows us to keep companies' decisions about acquiring or renting real estate constant within the sample. However, the drawback is that this restriction substantially reduces our sample.

The variation within the highest deciles further underscores these differences. The standard deviation in D10 under the Swiss method is exceptionally high (2,458%), far exceeding the corresponding figures under the Danish method (1,227%) and the Norwegian method (559%). This suggests that overvaluation is not only more frequent but also much more extreme under the Swiss method.

Company characteristics are shown in Table 4, Panels A–C for the Swiss, Norwegian, and Danish methods, respectively. Since the dataset now excludes all companies that own real estate, some of the differences seen earlier in Sections 3 and 4—such as real estate companies being valued closer to market prices than those involved in active business operations—are not visible in the current sample. However, a key difference when comparing the panels is that the Swiss method clearly exhibits the strongest tendency both to undervalue companies with negative or low historical earnings and to overvalue those with high historical earnings. This is confirmed by the regressions in Table 7, where the coefficient on past income is highest under the Swiss method ($\beta \approx 1.17$), smaller under the Danish method ($\beta \approx 0.27$), and essentially zero under the Norwegian method, highlighting how much more strongly the Swiss formula responds to profitability.

4.2.4. Main Takeaways and Reflections from the Swiss Method
Our findings show that while the Swiss method reduces undervaluation significantly compared to the Norwegian method, undervaluation remains substantial and still exceeds the level seen under the Danish method. At the same time, the Swiss approach leads to significantly more overvaluation than either of the other two methods.

This pattern indicates a key shortcoming of the Swiss method compared to the Danish approach. A major issue is its reliance on an average of net asset value and earnings value, where historical earnings exert a much greater influence on the final valuation than under the Danish method. In the Danish approach, net asset value serves as the baseline, and an income-based premium is only added when earnings exceed a threshold reflecting a normal return on assets. Crucially, this premium is capitalized using a discount factor. The Swiss method lacks such a discounting mechanism, allowing strong historical earnings to exert full upward pressure on valuations, even when future prospects are weak. Conversely, it also allows weak earnings to pull valuations below net asset value, thereby exacerbating undervaluations.

Furthermore, the Swiss method fundamentally shares the same issue as the Danish method in that the owner's human capital may be included in the valuation, inflating assessments when income generated by the owner's personal efforts is retained in the company or paid out as dividends rather than as salary. To partially address this issue, the Swiss tax authorities allow adjustments for companies where value creation depends heavily on a single individual, such as a majority shareholder.[157] In such cases, taxpayers can request equal

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[157] CH: Commentary on Sec, 8 of the Guidelines on the Assessment of Securities without a Market Price for Wealth Taxes [*Kommentar zur Wegleitung zur Bewertung von Wertpapieren ohne Kurswert für die Vermögenssteuer*], 2024 [hereinafter: *Commentary to the Assessment Guidelines*]. https://www.ssk-csi.ch/fileadmin/dokumente/kreisschreiben/KS_28_Kommentar_d_2024.pdf

weighting of earnings value and net asset value instead of favoring earnings. However, the burden of proof lies with the taxpayer, who must annually document the case and submit it to the responsible canton for approval. While this adjustment could help reduce overvaluation in such situations by tempering the influence of earnings value, the extreme overvaluations observed under the Swiss method suggest that it serves more as a limited corrective measure than a sufficient safeguard against extensive overvaluations.

Our finding that the Swiss method performs worse than the Danish method aligns well with the conclusions of Müller and Sureth (2011) in their evaluation of the 2009 German inheritance tax reform. That reform replaced a model similar to the Danish approach with a system that relies more on case-by-case assessments but uses a standardized earnings-based formula as a main valuation input. Müller and Sureth find that this new valuation input, which places increased emphasis on historical profits, results in greater disparities in valuations and a higher risk of overvaluation compared to the previous method.[158]

5. Addressing the Observed Disparities

As demonstrated above, the Norwegian, Danish, and Swiss valuation methods all produce outcomes where many companies have no wealth value or are valued at only a fraction of their market price, while others are assigned values far exceeding their actual worth. While the Danish and Swiss methods reduce instances of undervaluation and better capture goodwill compared to the Norwegian method—due to their reliance on historical income— this improvement comes at the cost of significantly more and extensive overvaluations.

This outcome is hardly surprising, given the simplicity of all three methods.[159] The Norwegian method entirely disregards intangible values and goodwill, while the Danish and Swiss methods attempt to account for these elements but mostly just do so to the extent that these values are already reflected in the company's historical earnings. Since past income is not necessarily a reliable indicator for future income potential,[160] these methods remain prone to misvaluation, even though they result in fewer instances of undervaluation compared to the Norwegian method.

The disparities created by all three methods have both political and legal ramifications. As we have explained, unequal treatment of taxpayers not only risks undermining political and public support for a wealth tax, but in some jurisdictions, it can also trigger serious constitutional challenges regarding equality before the law.[161] However, as we have also

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[158] Müller and Sureth, "Marktnahe Bewertung," 79.

[159] As noted by Jenny Nelder, *Valuation of Shareholdings in Private Companies*, Wealth Tax Commission Background Paper no. 141 (London: Wealth Tax Commission, 2020), 18., there will always be situations where a valuation formula is inadequate.

[160] Stephen J. Leacock, "Anatomy of Valuing Stock in Closely Held Corporations – Pursuing the Phantom of Objectivity into the New Millennium," *Columbia Business Law Review* (2000): 161–201, at 188–89.

[161] See para. 2.4 above.

discussed, the legal acceptability of imprecise valuation methods often depends on whether viable alternatives that yield more accurate and rational outcomes are available.

Among the three methods, the Swiss approach stands out as the most readily dismissible—because the Danish method, which also incorporates earnings, appears to do so in a more rational way, resulting in both less undervaluation and overvaluation. Accordingly, the most relevant comparison moving forward is between the Danish and Norwegian methods.

From an economic perspective, incorporating earnings is a viable starting point,[162] which initially speaks in favour of the Danish method, but the method's pronounced tendency to produce severe overvaluations is particulary concerning. While undervaluation can create disparities between taxpayers, excessive overvaluation, may be even more problematic, as it risks imposing tax burdens far exceeding a taxpayer's actual financial capacity. In this sense, it could be argued that the Norwegian method, despite its strong tendency towards undervaluation, is the least problematic alternative.

That said, it would be too simplistic to conclude that approaches like the Norwegian method are immune to legal challenges simply because alternative standardized methods have significant shortcomings. As previously discussed, particularly in the context of the German principle of equality, proportionality requirements are often factored into legal assessments of equality. This typically means that if simplified valuation methods create disparities that outweigh their administrative benefits, more advanced approaches may be required, even if they come at the cost of increased complexity.[163]

Thus, the key question is whether a relatively simple, standardised method that incorporates a company's earnings—such as the Danish method—can serve as an acceptable starting point,

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[162] OECD, *Net Wealth Taxes in the OECD*, 86, and Saez and Zucman, "Progressive Wealth Taxation," 483, who highlights Switzerland as a best example of a country that has successfully taxed equity in private businesses by using simple formulas. More generally Stephen Daly, Helen Hughson, and Glen Loutzenhiser, "Valuation for the purposes of a wealth tax", Fiscal Studies (2021), 615-649, at 634 find that simple formulaic approaches, albeit being incredibly crude, appear to be a plausible option for valuing smaller private businesses.

[163] This was emphasized by the German Constitutional Court in the 2006 ruling concerning valuation of unlisted firms for inheritance tax purposes, see BVerfG 1 BvL 10/02 (Ger.). The Court found that the the then-prevailing Stuttgart method–which bears a strong resemblance to the current Danish standardised approach– violated the equality principle. While the Court acknowledged that administrative simplicity is a legitimate concern, it held that this could not justify the methods systematic and significant deviations from fair market value. In response, the 2009 inheritance tax reform replaced the Stuttgart method with a more judgment-based system, in which standardised approaches—particularly a simplified earnings-based formula—may still be used, but their appropriateness must be assessed individually in each case. This ruling and the subsequent legislative measures may be illustrative for proportionality considerations, but the outcome itself cannot necessarily be transferred in full to the context of the wealth tax. In evaluating proportionality, one must also consider that the acceptable degree of simplification is closely tied to the administrative burden involved—something considerably greater under a wealth tax, where the volume of valuations renders individual assessments impractical as a general solution.

provided that there is scope for certain adjustments to improve accuracy without making the system overly complex.

Some have suggested combining the use of a formulaic approach with a "catch-up clause" that takes advantage of the fact that market values are often eventually revealed through transactions. Under such a system, if a taxpayer sells shares in an unlisted company to a third party, and it is determined that the actual sales price deviates substantially from the amounts previously reported for wealth tax purposes, these values could be retrospectively adjusted.[164]

However, this approach raises legal concerns, as the sales price does not necessarily reflect the company's value in prior years, as changes in operations, market conditions, or other factors may have influenced its worth. Although a "catch-up clause" shares certain similarities with capital gains taxation, there are critical differences. While capital gains taxation seeks to tax the value increase over the period leading up to a sale, a wealth tax is intended to tax the annual value of an asset as it stands in a specific year. Retrospective adjustments based on later developments could therefore undermine legal equality and certainty. Additionally, "catch-up clauses" may be vulnerable to manipulation or abuse.

Another option, as suggested by some, could involve distinguishing between smaller and larger companies, requiring the use of more sophisticated methods and/or certified appraisals for the latter group.[165] Some have also pointed out that it might be possible to leverage valuations already conducted by the financial sector for other purposes, such as venture capital funding, mergers and acquisitions, or share issuances.[166] In addition, the possibility of such third-party reporting could, in itself, spur taxpayers towards better compliance.[167] Furthermore, in situations where larger companies have already undergone comprehensive valuations, it could be considered to allow the taxpayer to rely on these valuations for several

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[164] Saez and Zucman, "Progressive Wealth Taxation," 482. However, a weakness of applying such a "catch-up clause" appears if the assumption of a steady increase over time does not mirror the actual facts. See Victor Thuronyi, "All of the Above: How to Tax the Wealthy," *Tax Notes International* 102 (2021): 315–39, at 325. A softer alternative would be to allow taxpayers to defer their wealth tax liability until the shareholding is disposed of. The sales price could then be used to impute a value for the assets for each year during which the taxpayer held the asset and an interest could be charged. See Oh and Zolt, "Wealth Tax Design," 195.

[165] David Gamage et al., *How to Measure and Value Wealth for a Federal Wealth Tax Reform*, Roosevelt Institute Report (April 2021), 13–16. See also Skatteministeriet, *Rapport om værdiansættelse*, 5-8. Moreover, some large private companies are in fact valued on various secondary markets and their stock transactions are centrally registered. See also Saez and Zucman, "Progressive Wealth Taxation," 482, who suggest that is possible to draw on the financial system to put market values on certain assets.

[166] Saez and Zucman, "Progressive Wealth Taxation," 482. Obviously, if valuations have been required/obtained for other tax purposes, e.g. for inheritance tax purposes, it may make sense to apply these valuations also for wealth tax purposes. See OECD, *Net Wealth Taxes in the OECD*, 87.

[167] Leandra Lederman, "Valuation as a Challenge for Tax Administration." *Notre Dame Law Review* 96, no. 4 (2021): 1495–1516, 1503-1507, who however, highlights that it should be taken into consideration that not all third parties have an incentive to act at arm's length. The author also considers the use of penalties, at p. 1507-1509 to enhance valuation compliance by taxpayers, but concludes that the expected deterrent effect may be modest. Oh and Zolt, "Wealth Tax Design," 195, appear to be more optimistic in this regard.

years or, at the very least, to use them as a starting point in subsequent years, adjusted by certain parameters.[168]

While this distinction between small and large companies may make sense from an administrative efficiency perspective—allowing resources to be allocated based on the revenue at stake—it raises concerns from an equality perspective. The size of a company does not necessarily correlate with the significance of valuation errors for its owners, as this depends on their shareholding proportions and the owners' economic position. Moreover, this solution does nothing to address the issue of overvaluation for smaller companies—a risk that appears to increase significantly when relying on historical income, as observed in this study.

An alternative approach could be to use the standardized Danish method as a baseline, supplemented by a straightforward adjustment for owner-operator compensation. As discussed, the heightened risk of overvaluation for smaller companies may largely stem from the fact that many unlisted companies are driven by owners who are also key or sole employees. This risk could be partially mitigated by introducing a standard deduction applicable in cases where the active owner's salary is disproportionately low relative to their workload, measured in annual working hours. The adjustment could rely on the number of hours worked, multiplied by a uniform hourly benchmark for owner labour, with a deduction for the actual salary received.

However, adjusting the Danish method with deductions for reasonable owner salaries alone would not eliminate risks of excessive overvaluation. Expanding adjustments further would quickly become complex and resource-intensive. Standardized discounts for minority shareholdings could be considered,[169] as well as modifications to account for capital structure and debt levels, given that high leverage increases financial risk and affects valuation. However, incorporating additional industry-specific factors, such as regulatory exposure or market volatility, would add significant complexity. The same applies to accounting for growth expectations, as companies in high-growth phases often reinvest earnings rather than distribute profits, affecting their market value. Similarly, reliance on key individuals beyond the owners could justify further risk adjustments, but incorporating such considerations would be administratively demanding.

Perhaps the most challenging aspect of refining the method lies in capturing factors that reflect expected future earnings. Naturally, there exists models for valuing companies that attempt to estimate future cash flows,[170] but these are highly advanced and sophisticated, requiring a

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[168] Boadway, Chamberlain, and Emmerson, "Taxation of Wealth and Wealth Transfers," 784.

[169] As also stressed by Advani, Chamberlain and Summers, *A Wealth Tax for the UK*, 60, an open market basis valuing the shares of five shareholders with 20 % each will not add up to 100 % of the company's value, as there will be a significant discount for each minority shareholding.

[170] For an overview of the methods that can be applied to valuation of businesses see Daniel Ryan, *Valuation of Businesses and Intellectual Property Assets*, Wealth Tax Commission Background Paper no. 144 (London: Wealth Tax Commission, 2020. See Nelder, *Valuation of Shareholdings*.

high degree of discretion. Such complexity would likely lead to more disputes, increase legal uncertainty, and create opportunities for taxpayers to manipulate valuations.[171]

To limit discretion, one approach could be to establish that the standardized method (based on the Danish model) remains binding unless it can be demonstrated—using more advanced valuation techniques—that the formula-based value deviates from the market price by more than a predetermined margin, such as 40 percent.[172] This approach would treat the formulaic result as a rebuttable presumption, which can only be challenged if the burden of proof is met to substantiate that the formula-based valuation is significantly inaccurate.[173] Even within such a framework, certain standardized adjustments could be allowed without meeting this high threshold—for example, a deduction for a reasonable owner-operator salary—while more nuanced and individualized adjustments would require more substantial support. Moreover, to reduce the risk of overvaluation, a general discount on shares could be considered. One option is to align the discount with the dispute threshold, but given that the standardized method already produces significant undervaluation in many cases, such a reduction may go too far. However, applying a more moderate discount rate to shares could still offer some protection against overvaluation, and has also been recommended by the OECD.[174]

Such a framework could also be supplemented by dedicated dispute resolution structures. One option would be to establish a specialized tribunal or valuation board to handle valuation disputes.[175] Historically, during earlier Norwegian wealth tax regimes—when valuations of

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[171] As noted by Repetti, "It's All About Valuation," 611-612: *"…the selection of appropriate comparable businesses, the estimate of future earnings, the selection of appropriate discount rates to calculate the present value of future earnings, and the liquidation values of a business all require subjective decisions that are as much art as science."* Oppositely, Advani, Chamberlain and Summers, *A Wealth Tax for the UK*, 57-60, 98-100 conclude that if a wealth tax is levied an open market value should be applied to all asset types, including unlisted shares, as they find the alternatives to be worse, e.g. using standardized models producing horizontal inequity and resulting in resentment and a loss of public support. See also Lederman, "Valuation as a Challenge," 1495- 1516, who instead stresses that taxpayers' incentive to provide erroneous self-serving valuations may be a significant challenge for a well-functioning wealth tax. In the same vain see also Oh and Zolt, "Wealth Tax Design," 189-196.
[172] Gaeme Cooper, "Taking Wealth Taxation Seriously," *Record of the Association of the Bar of the City of New York* 34 (1979): 24, 35 has, in an American context, suggested the use of a formula that would be mandatory unless it produced a value that varied by more than 20% from that proposed by the taxpayer. Referenced via Repetti, "It's All About Valuation," 610.
[173] Gamage et al., *How to Measure and Value Wealth*, 15. Repetti, "It's All About Valuation," 609-610 acknowledges that such a procedure might reduce litigation cost, but he argues that the reduction would probably be modest, and he foresees that a battle about whether the percentage threshold was crossed would replace the battle over the value of the unlisted company.
[174] OECD, *Net Wealth Taxes in the OECD*, 86, recommends the use of discount rates to prevent valuation disputes but also to account for certain costs that may be incurred to hold or maintain the assets.
[175] Advani, Chamberlain and Summers, *A Wealth Tax for the UK*, 60 who propose that valuations should be undertaken at the level of the company itself by a professional valuer or alternatively by a specialized government agency.

unlisted shares involved considerable discretion—valuation boards were used to resolve such disputes.[176]

Alternative dispute resolution models have also been discussed in the broader tax policy debate. Some have proposed a "baseball-style" arbitration model to resolve disputes and encouraging compromises. In this approach, both the taxpayer and the tax authority submit their valuation estimates, and an independent arbitrator selects the one closest to the "correct" value. This design is intended to encourage both parties to propose reasonable figures.[177]

However, the practical effectiveness of this approach is uncertain, and it may raise concerns regarding legal certainty. The model likely does not differ significantly from conventional dispute resolution models in terms of the effort required from all parties to prepare and review detailed valuations. Moreover, there is a risk of fostering strategic behavior rather than ensuring objective accuracy. If one party has greater resources and expertise, it may leverage that advantage to push the other party into accepting a biased figure, under the threat that the arbitrator might adopt an even more inflated valuation from the opposing side.[178]

Another option suggested by Saez and Zucman is that, in cases of valuation disagreements between the tax authority and the taxpayer, the taxpayer should pay the wealth tax in shares.[179] They argue that this would allow the government to create the missing market for the unlisted shares and could at the same time ameliorate liquidity problems for the taxpayer. However, even though this forced payment in kind approach is innovative, it is probably politically unfeasible due to its intrusive nature.[180] Moreover, a requirement to settle a tax liability with a specific asset, could probably constitute unlawful expropriation in certain jurisdictions.[181]

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[176] Aarbakke, *Skatt på formue*, 19.

[177] Oh and Zolt, "Wealth Tax Design," 195.

[178] George L. Priest and Benjamin Klein, "The Selection of Disputes for Litigation," *The Journal of Legal Studies* 13 (1984): 1–55, at 55.

[179] Saez and Zucman, "Progressive Wealth Taxation," 482.

[180] Lederman, "Valuation as a Challenge," 1513, and Oh and Zolt, "Wealth Tax Design," 195. See also Thuronyi, "All of the Above," p. 325, who describes the proposal as draconian.

[181] Forced in-kind tax payment—requiring taxpayers to satisfy their liabilities with goods rather than money—is rarely discussed in the legal literature. Where it appears, the debate typically centers on whether generic non-cash assets (like gold, silver, grain or livestock) can be used instead of cash. See, e.g., Jeremy Bearer-Friend, "Tax Without Cash," *Minnesota Law Review* 106 (2021): 953–1016. Historically, many jurisdictions have permitted taxes in kind, and the U.S. Supreme Court has acknowledged the theoretical possibility of such taxation: "if . . . the condition of any State, in the judgment of its legislature, requires the collection of taxes in kind, that is to say, by the delivery to the proper officers of a certain proportion of products, or in gold and silver bullion, or in gold and silver coin, it is not easy to see upon what principle the national legislature can interfere." See *U.S. Supreme Court, 13 May 1929, 279 U.S. 392, 397*, citing *Supreme Court, 1869, 74 U.S. 71*. However, compelling a taxpayer to transfer a specific, non-fungible asset—such as shares in a particular company or a specific parcel of real estate— seems to bring the measure closer to expropriation. In a Danish context see. e.g. Michael H. Jensen, "Kan en skat indebære ekspropriation?" in *Festskrift til Jan Pedersen*, ed. Malene Kerzel (Copenhagen:

Accordingly, we remain skeptical of dispute resolution mechanisms based on either baseball-style arbitration or forced payment in shares. However, the approach outlined above—relying on the Danish standardized method, allowing certain straightforward adjustments such as a simple deduction for a reasonable owner-operator salary, and permitting more advanced adjustments only where a misvaluation of at least 40 percent can be demonstrated—combined with a dedicated tribunal to resolve such disputes, could improve accuracy without being entirely unrealistic from an administrative perspective.

Such a method would, at the very least, have a greater chance of withstanding legal equality standards than approaches that rely exclusively on book value or net asset value, without any attempt to account for goodwill—such as the Norwegian approach. With the latter type of method, even if the valuation of unlisted firms is not directly challenged, it could provide grounds for contesting the valuation of other assets, such as listed shares. In particular, one could contest the use of stock market prices for listed shares by arguing that this constitutes unjustified unequal treatment compared to the simplified valuation method applied to unlisted shares—especially since there are no significant administrative obstacles to applying the same simplified method to listed shares. Consequently, a system that values unlisted shares based on net asset value while assessing listed shares at market prices may be open to challenge from several angles. By contrast, a more refined method that uses historical earnings to capture values not reflected in net asset value—and that limits complex adjustments to cases where clear misvaluations can be demonstrated—offers a stronger basis for justifying such differential treatment on administrative grounds.[182]

6. Summary and Concluding Remarks

Our analysis of the Norwegian, Danish, and Swiss valuation methods—applied to share sales of Norwegian unlisted companies between 2018 and 2021—shows that none of the methods reliably reflect observed sale prices. Among the three, the Danish method emerges as the most promising foundation, though it still requires refinement to be suitable for wealth tax purposes.

Jurist- og Økonomforbundets Forlag, 2011), 193–201., who argues that taxation will generally not constitute expropriation, but that it is not inconceivable that a tax, which disproportionately affects only certain taxpayers, could justify protection under constitutional principles of expropriation. Hence, in most jurisdictions, takings or expropriation trigger a constitutional requirement for compensation at fair market value, but market value cannot necessarily be equated with the valuation reported by the taxpayer for wealth tax purposes.

[182] There may also be rationales for accepting standardized combination methods over advanced valuation models based on projected cash flows and market expectations, beyond practical feasibility. When relying on historical earnings and recorded asset values, firms that have not yet generated income or accumulated assets—such as start-ups and early-stage companies—will receive a low, or even zero, valuation despite potentially high future earnings potential. While this may diverge from more sophisticated market-based approaches, it can be justified on liquidity grounds.

The Norwegian method, which relies solely on net asset value, leads to the most pronounced undervaluations among the three. In our sample, 15% were valued at less than 3% of the sale price, 35% at less than 30%, and 50% at under 62%. About 20% appeared clearly overvalued—though some of these likely reflect misreported transactions, such as gift sales to family members. The method performs best for real estate companies, but tends to undervalue firms with inventories, fixed assets recorded at historical cost, or intangible assets and goodwill. This undervaluation bias became even more pronounced when real estate companies were excluded: in that subsample, half the firms were valued at below 30% of the sale price.

The Danish method improves on this by adding a premium to net asset value when historical earnings exceed a normal return. This reduces undervaluation but increases the risk of overvaluation. Applied to the full sample, 15% of companies were valued at 13% or less of the sale price, 35% at 60% or less, and 50% at under 87%. More than 30% were significantly overvalued with many valuations several times higher than the sale price—well beyond what is observed under the Norwegian method. The method performs best for firms with real estate and better than the Norwegian method for companies with active operations, thanks to the earnings adjustment. Notably, its performance remained far more stable than the Norwegian method when excluding real estate companies, highlighting its relative robustness—but also the heightened risk of overvaluation.

The Swiss method, which uses a weighted average of net asset and earnings values, performs worse compared to the Danish method on both undervaluation and overvaluation. It reduces undervaluation relative to the Norwegian approach but produces the most extreme cases of overvaluation. Its weaknesses stem from a mechanical structure: low or negative earnings pull values below net asset value, while the earnings component—set relatively high to counteract undervaluation—can drastically inflate valuations, for instance when past earnings are strong but future prospects weak.

In conclusion, the Swiss method can be readily dismissed. The Danish method is clearly more effective at capturing goodwill value than the Norwegian model. While the Norwegian method carries less risk of extreme overvaluation, its failure to account for goodwill is a critical flaw—especially when compared to the valuation of listed shares at market price.[183]

On this basis, we find that a carefully adjusted version of the Danish method may represent the most balanced and workable approach. To be viable, however, the method would need to be supplemented with certain standardized deductions—such as adjustments for owner-operator salaries and discounts for minority shareholdings. More advanced or individualized adjustments could then be reserved for cases where a substantial deviation from market value can be demonstrated—for instance, exceeding a threshold of 40 percent. To mitigate the risk

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[183] However, a possible solution to make this differential treatment more justifiable is to increase the discount rate for shares in listed companies. In the expert committee report NO: Norwegian Official Report, 19 Dec. 1922, NOU 2022:20 [*Norges Offentlige Utredninger*], 276, Jarle Møen and Frederik Zimmer, as part of a minority opinion, suggested such an approach by proposing an increased valuation discount of 20 percent for listed shares in the context of the review of the Norwegian tax system.

of overvaluation, applying a standard discount to share values could be considered.[184] Furthermore, to support this framework, a dedicated valuation tribunal could be established to resolve disputes and assess whether the threshold for more advanced adjustments has been met.

Whether this approach is feasible in practice may also depend on the scope and rate of the wealth tax, as a narrowly targeted tax on the very wealthy—with a high exemption threshold—would reduce the number of annual valuations, ease the administrative burden, and exclude most small, owner-dependent businesses, where the risk of overvaluation is particularly high. Further, since individuals with substantial wealth often have greater flexibility in how and when income is realized—reducing their income tax burden—a wealth tax may be more defensible for this group, despite its valuation challenges.[185]

Moreover, the need for adjustments of standardized valuation methods increases with the tax rate. Switzerland's low rate of 0.03% may help explain the tolerance for the Swiss method's relatively high risk of overvaluation. By contrast, Norway's rate of 1.1%—and proposals for even higher rates in global wealth tax models—amplify the negative consequences of valuation disparities, strengthening the case for a more refined valuation approach.

While much of the discussion has focused on how valuation methods might be improved, the findings also raise a deeper concern: whether a comprehensive wealth tax—including on shares—can remain legally sustainable over time. The large valuation disparities observed, combined with limited scope for individualized adjustments, suggest that the very structure of such a tax may struggle to meet basic requirements of legal equality. That said, expectations around valuation accuracy are not fixed. They evolve with broader societal and political developments. If wealth accumulation continues apace,[186] calls for wealth taxation—are likely to intensify, strengthening its political viability and potentially leading courts to show greater tolerance for valuation disparities.[187]

In sum, our findings may be particularly relevant for tax legislators designing standardized valuation methods for unlisted shares. The substantial disparities identified should serve as a warning: if left unaddressed, they may undermine the legitimacy of the rules and, in some jurisdictions, trigger legal challenges.

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[184] See e.g. Skatteministeriet, *Rapport om værdiansættelse*, 6, where a majority in the Danish expert committee recommends a 30 percent discount on the estimated value of goodwill and other intangible assets in order to address the inherent valuation uncertainties.

[185] Saez and Zucman, "Progressive Wealth Taxation," 18, 59.

[186] Zucman, *Blueprint for a Coordinated Minimum Taxation Standard*, 19, which illustrates the sharp rise in global wealth concentration since 1984. In 2024, the wealth owned by the top 0.0001% of households globally is estimated at 13% of global GDP, up from significantly lower levels in earlier decades.

[187] See e.g. the statement by three judges in the previously mentioned German case on inheritance tax. GER: Federal Constitutional Court, BvL 21/12, 1 BVerfG 138 (17 Dec. 2014). While concurring with the overall conclusion of the majority, the three judges highlighted that the decision should also take the Social State Principle into account, i.e. the constitutional mandate to establish a just social order and to balance social discrepancies. See Lepsius, "Constitutional Review of Tax Laws," 1191.

We have proposed certain refinements, though their implementation will require administrative resources. While such adjustments cannot guarantee full legal certainty under strict equality standards, they may nonetheless strengthen the overall defensibility of the valuation rules.

A key factor in this regard is the legislature's ability to provide clear and reasoned justifications for selecting one valuation method over others—something to which research of the kind presented here may contribute. Just as the findings may guide the legislature, they may also assist courts in assessing whether the chosen valuation approach strikes a reasonable balance between administrability and the principle of equal treatment, or whether the resulting disparities go beyond what is necessary to uphold that balance.

Appendix

Table A.1. Variable definitions

Variable	Definition
Wealth value	Net wealth value of a company estimated as the sum of cash and cash equivalents, recievables, operating goods, other fixed assets, real estate, less debt (RF-1028)
Price	Price paid by the acquirer for all company shares (RF-1086, item 23)
Wealth to price ratio	*Wealth value* scaled by *Price*
Cash & recievables	Cash, cash equivalents and receivables held by the company, in NOK million (RF-1028, items 406-419, 463)
Inventory	Sum of the company's inventory, in NOK million (RF-1028, items 402b and 402c)
Fixed assets	Miscellaneous of fixed assets and other tangibles, excluding real estate, held by the company, in NOK million (RF-1028, items 402a, 403, 404, 405)

Real estate	Property held by the company, in NOK million (RF-1028, item 401)
Debt	Sum of debts subscribed by the company, in NOK million (RF-1028, items 443 and 445)
Past income	Three-year average income (current year plus past two years), in NOK million (RF-1167 item 0999)

Table A.2. Sample selection

The dataset used in this study was extracted by the Norwegian Tax Authority's research department at our request. We provided a detailed list of criteria to guide their data extraction process. Below is an outline of the selection process based on these criteria:

- **Identification of Unlisted Companies Where All Shares Were Transacted**: For this study, all unlisted companies where a shareholder started with zero shareholding at the beginning of the year and ended with 100% of the shares by the year's end were identified. This step was conducted for the years 2018 through 2021, using data sourced from form RF-1086, submitted by the companies to the Norwegian Tax Authority.

- **Filtering Out Newly Founded Companies**: Any company founded in the same calendar year as the share sale was excluded due to the lack of a wealth value on January 1. This information was sourced from the Norwegian Public Register of Companies (Brønnøysundregistrene).

- **Exclusion of Companies Undergoing Mergers or Demergers**: Companies that reported mergers or demergers in the same year as the sale were excluded to avoid distortions in the comparison between sales prices and wealth values, arising from share deposits or withdrawals. Data was retrieved from Brønnøysundregistrene.

- **Exclusion Based on Share Class Consistency**: Companies that did not maintain a single share class throughout the year were omitted, as multiple share classes could complicate the analysis. The RF-1086 form was the primary data source for this criterion.

- **Exclusion Based on Share Capital Adjustments**: Instances where share capital changed during the year were excluded to avoid manual adjustments for rendering wealth values comparable to sales values. This data was sourced from RF-1086.

- **Cross-referencing Data from Dual Reports in OBI:** Data extraction involved cross-referencing two distinct reports in the OBI system. Any transactions found in one report but not corroborated in the other were systematically filtered out. Only a few companies were affected by this step. Data was sourced from RF-1086.

- **Exclusion Based on Transaction Value and Intra-Group Sales**: Companies with a total purchase price for all shares below 100,000 NOK or where the price was not reported were excluded. Such transactions were deemed too trivial for this analysis. Additionally, purchase prices listed as 0 often indicated intra-group sales, where the stated price might be artificially determined. Data was sourced from RF-1086.

- **Exclusion of Companies with Shares Transferred Through Gifts or Inheritance**: Companies where shares were transferred via gifts or inheritance were excluded, as such transactions may not reflect true market prices. Data was sourced from RF-1086.

- **Exclusion of Companies with Intra-Group Transfers and Taxable Continuity:** Companies where shares were transferred intra-group or under taxable continuity were excluded, as these transactions often do not occur at market price. Data was sourced from RF-1086.

- **Exclusion of Sale and Repurchase Arrangements:** Companies where shares were sold and repurchased by the same shareholder were excluded due to the significant tax avoidance risks associated with these transactions. Data was sourced from RF-1086.

- **Exclusion of Companies Without Reported Wealth:** Companies without reported wealth (blank entries in RF-1028) were excluded, as wealth values are essential for comparative analysis.

- **Exclusion of Companies with Discretionary Wealth Determination:** Companies subject to discretionary wealth determination (e.g., values present in RF-1028 line 480 but absent in the corresponding sub-lines) were excluded to ensure the use of precise wealth figures.

- **Rectification of Calculation Errors in Wealth Value and Deviations in Total Gross Assets:** Companies with discrepancies in RF-1028's line 480 (sum-post) or deviations in total gross assets (line 420) were excluded to guarantee data accuracy and eliminate reporting errors.

After receiving the dataset from the Norwegian Tax Authority, which included 10,450 observations, we performed additional data cleaning and filtering:

- **Adjustments for Dividends and Group Contributions:** Since wealth values are determined as of January 1, we adjusted the wealth values to account for dividends and group contributions paid or received in the same year as the sale but after January 1. Specifically, we deducted dividends and group contributions paid and added group contributions received to ensure comparability with the sales value at the time of the transaction.

- **Exclusion of Holding Companies:** We removed 1,497 companies that held shares in other companies. As it is not possible to determine the underlying assets associated with these shares, holding companies were excluded to ensure consistency in analyzing company characteristics.

- **Exclusion Based on Taxable Income:** We excluded 1,206 companies that had not reported taxable income in the current or previous two tax years. This exclusion was necessary because our analysis involves testing alternative valuation methods that require income data from prior years. This group includes newly established companies, such as those formed through demergers before a sale. Consequently, our final sample includes only companies that have existed for at least three years (including the year of the sale).

After applying these additional filters, our final sample consists of **7,801**

Selection criteria	N
All Norwegian unlisted companies resulting from the restrictions above	10,504
- Companies holding shares in other companies	- 1,497
- Companies with missing taxable income for the current year or one of the past two years (typically because they are newly founded)	- 1,206
Final sample for the main analysis	= 7,801
- Companies with real estate holdings	- 3,965
Final sample for comparison with the Swiss valuation method	3,836

Table 1. Distribution of Norwegian *Wealth to price ratio*

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	

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

Differences in means

(D1-7)-D8	-7.139[a]	6.660[a]	1.270[a]	0.367[a]	0.359[a]	-6.987[a]	3.741[a]	-0.037
(D9-D10)-D8	-4.091[a]	-9.745[a]	0.325	0.190[c]	0.163[a]	-4.642[a]	0.546	-0.169[c]

Table 1 presents the distribution of the wealth-to-price ratio for a sample of 7,801 Norwegian unlisted companies, all of which were fully sold to a single buyer between 2018 and 2021. The companies are divided into deciles, with D3 to D10 each containing 780 companies. However, D1 consists of 1,285 companies because these companies report a wealth value of zero, which prevents a meaningful calculation of the wealth-to-price ratio. As a result, D1 and D2 together account for 20% of the sample, with D2 containing 276 companies.

Panel A shows the distribution of the wealth-to-price ratios across the deciles, with the lowest deciles containing the most undervalued companies and the highest deciles representing the most overvalued companies. D8 is the decile where the wealth value most closely corresponds to the reported sale price of the shares.

Panel B presents the mean values of financial variables (in NOK millions) for the same sample of companies, categorized by their wealth-to-price ratio. The variables include wealth value, sale price, cash & receivables, inventory, fixed assets, real estate, debt, and past income—all reported for wealth tax purposes. The deciles in Panel B align with those in Panel A, providing insight into the financial characteristics associated with undervaluation and overvaluation across the sample. a, b, and c indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 2. Distribution of Danish Wealth to price ratio

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	

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

Decile	N	Wealth value	Sale price	Cash & recei- vables	Inven- tory	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

Decile	N								
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

Differences in means									
(D1-5)-D6	-10.134[a]	2.588	0.342	0.227[b]	0.284[a]	-7.856[a]	3.404[a]	-0.525[a]	
(D7-10)-D6	-5.015[a]	-11.349[a]	0.070	0.202[c]	0.113[b]	-7.838[a]	-1.193	-0.086	

Table 2 presents the distribution of the wealth-to-price ratio for the Danish valuation method, using the same sample of 7,801 Norwegian unlisted companies that were fully aquired by a single buyer between 2018 and 2021. Companies are divided into deciles based on their wealth-to-price ratio.

Panel A shows the distribution of wealth-to-price ratios, with the lowest deciles representing the most undervalued companies, and the highest deciles representing those that are overvalued.

Panel B presents the mean values of financial variables (in NOK millions) relevant to the calculation of wealth tax, categorized by the same deciles used in Panel A. These variables include wealth value, sale price, cash & receivables, inventory, fixed assets, real estate, debt, and past income, providing insights into the financial characteristics of undervalued versus overvalued companies under the Danish method. a, b, and c indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 3. Distribution of Swiss *Wealth to price ratio* vs. Norwegian and Danish *Wealth to price ratio*

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	

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

Decile	N	Mean	Median	SD	Classification
D1	871	0.000	0.000	0.000	Undervalued
D2	0				
D3	280	0.030	0.031	0.018	Undervalued

Decile	N	Mean	Median	SD	Classification
D4	384	0.113	0.114	0.030	Undervalued
D5	383	0.220	0.216	0.032	Undervalued
D6	384	0.375	0.370	0.057	Undervalued
D7	384	0.620	0.622	0.084	Undervalued
D8	383	0.912	0.925	0.075	Wealth ≈ price
D9	384	1.213	1.179	0.151	Overvalued
D10	383	5.293	2.692	5.585	Overvalued
Total	3,836	0.876	0.281	2.330	

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

Decile	N	Mean	Median	SD	Classification
D1	397	0.000	0.000	0.000	Undervalued
D2	371	0.074	0.075	0.050	Undervalued
D3	383	0.265	0.263	0.057	Undervalued
D4	384	0.474	0.471	0.064	Undervalued
D5	383	0.716	0.716	0.072	Undervalued
D6	384	0.965	0.975	0.062	Wealth ≈ price
D7	384	1.266	1.260	0.127	Overvalued
D8	383	1.986	1.966	0.284	Overvalued
D9	384	3.512	3.364	0.747	Overvalued
D10	383	16.055	10.571	12.273	Overvalued
Total	3,836	2.529	0.840	6.032	

Table 3 presents the distribution of the wealth-to-price ratio under the Swiss valuation method, applied to the same dataset as the previous tables but excluding all companies with real estate entries (as the Swiss method is not applied to real estate companies). As a result, the sample is restricted to 3,836 companies. Since this sample differs from those used in Tables 1 and 2, it has also been necessary to test the Norwegian and Danish valuation methods to this subset for comparative purposes. Accordingly, Table 3 includes dedicated panels for the Norwegian and Danish methods, allowing for a direct parallel comparison with the Swiss approach within the same reduced dataset.

Panel A reports the distribution of wealth-to-price ratios under the Swiss method. Companies are divided into deciles, with D3 to D10 each containing approximately 380 companies. D1 consists of 593 firms with a wealth value of zero, while D2 includes 175 companies, ensuring that D1 and D2 together account for 20% of the sample. The deciles follow the same classification as in previous tables, with lower deciles containing undervalued companies and upper deciles representing overvalued firms.

Panels B and C include the decile distributions of wealth-to-price ratios obtained using the Norwegian and Danish methods, respectively, within the same reduced sample of 3,836 companies.

Table 4. Company characteristics by decile of Swiss, Norwegian and Danish *wealth to price ratios*

Panel A. Company characteristics by decile of Swiss *wealth to price ratio*

Decile	N	Wealth value	Sale price	Cash & recei-vables	Inven-tory	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

Differences in means									
(D1-5)-D6		-14.723[a]	-3.843[c]	-2.556[a]	0.021	-0.119	0.000	2.443[b]	-2.021[a]
(D7-10)-D6		-1.298	-10.442[a]	-1.496[b]	0.009	-0.344[a]	0.000	0.146	-0.162

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

Decile	N	Wealth value	Sale Price	Cash & recei-vables	Inven-tory	Fixed assets*	Real estate	Debt	Past income
D1	871	0.000	11.282	4.358	1.152	0.944	0.000	10.713	-0.226
D2	0								
D3	280	0.892	28.757	5.650	1.270	0.748	0.000	6.333	1.298
D4	384	3.417	25.508	8.148	0.964	1.002	0.000	7.907	1.865
D5	383	5.268	21.356	8.799	1.425	1.088	0.000	8.108	1.857
D6	384	4.315	11.511	7.529	1.437	0.736	0.000	5.781	1.201
D7	384	4.034	6.832	5.436	1.660	0.494	0.000	6.061	0.690
D8	383	3.301	3.883	4.095	1.398	0.434	0.000	3.705	0.318
D9	384	2.996	2.640	4.587	1.330	0.488	0.000	3.980	0.463
D10	383	3.811	0.869	6.182	1.540	0.723	0.000	5.241	0.859
Total	3,836	2.779	11.921	5.879	1.330	0.766	0.000	6.973	0.769

Differences in means									
(D1-7)-D8		-0.775	12.088[a]	2.181[a]	-0.108	0.425[a]	0.000	4.409[a]	0.546[a]
(D9-D10)-D8		0.101	-2.127[a]	1.289[c]	0.037	0.172[c]	0.000	0.905	0.343[a]

Panel C. Company characteristics by decile of Danish *Wealth to price ratio*

Decile	N	Wealth value	Sale price	Cash & recei-vables	Inven-tory	Fixed assets*	Real estate	Debt	Past income
D1	397	0.000	11.715	4.816	1.818	1.104	0.000	13.012	-0.828
D2	371	1.824	23.785	5.200	1.039	0.972	0.000	7.983	0.169
D3	383	5.925	21.611	6.714	1.046	0.967	0.000	7.066	0.824
D4	384	8.679	18.934	7.958	1.221	0.850	0.000	6.799	1.476
D5	383	9.209	14.193	6.577	1.773	0.762	0.000	6.352	1.412
D6	384	8.465	9.977	5.863	1.485	0.522	0.000	5.024	0.984
D7	384	7.907	7.662	6.212	1.381	0.651	0.000	5.734	0.969
D8	383	7.306	5.562	5.013	1.159	0.584	0.000	5.357	0.866
D9	384	6.895	4.831	4.219	1.146	0.525	0.000	5.454	0.799
D10	383	9.239	1.339	6.236	1.199	0.716	0.000	6.769	1.052
Total	3,836	6.537	11.921	5.879	1.330	0.766	0.000	6.973	0.769

Differences in means									
(D1-5)-D6		-3.353[a]	7.989[a]	0.387	-0.100	0.410[a]	0.000	3.254[a]	-0.381[b]
(D7-10)-D6		-0.629	-5.127[a]	-0.443	-0.264	0.097	0.000	0.804	-0.063

Table 4 presents company characteristics for the same sample used in Table 3, consisting of 3,836 Norwegian unlisted companies sold between 2018 and 2021, all of which have reported no values in real estate holdings. Panel A presents characteristics (in NOK millions) for companies categorized by their wealth-to-price ratio under the Swiss method. The variables include wealth value, sale price, cash & receivables, inventory, fixed assets, real estate, debt, and past income. Panels B and C report company characteristics categorized by wealth-to-price deciles under the Norwegian and Danish methods, respectively, applied to the same set of companies. As in the previous tables, a, b, and c indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 5. Regression analysis for the Norwegian wealth-to-price ratio

Variables	Wealth-to-price ratio	Wealth-to-price ratio	Wealth-to-price ratio
	Whole sample	Large companies	Small companies
Cash & receivables	0.068[b]	0.674[a]	0.065[b]
	(2.32)	(10.00)	(2.31)
Inventory	0.094[b]	0.877[a]	0.087[b]
	(2.47)	(8.76)	(2.36)
Fixed assets	0.146[a]	0.873[a]	0.139[a]
	(4.20)	(4.12)	(4.01)
Real estate	0.067[a]	0.724[a]	0.066[a]
	(5.06)	(13.73)	(5.09)
Debt	-0.047[b]	-0.536[a]	-0.046[b]
	(-2.55)	(-7.78)	(-2.55)
Past income	0.062	-0.193[c]	0.065
	(1.05)	(-1.95)	(1.10)
Intercept	0.909[a]	0.101[b]	1.127[a]
	(15.88)	(2.49)	(11.63)
Year FE	Yes	Yes	Yes
R-squared	0.273	0.785	0.271
Observations	7,801	3,899	3,902
Median wealth-to-price ratio	0.612	0.589	0.652

Table 5 shows the results of multivariate regressions of the Norwegian wealth-to-price ratio on company characterisitcs, using the same sample of Tables 1 and 2, consisting of 7,801 Norwegian unlisted companies, all of which were fully sold to a single buyer between 2018 and 2021. All explanatory variables are scaled by the sale price. The estimator is Ordinary Least Squares (OLS). Column (1) presents the results for the whole sample, while Columns (1) and (2) split the sample between large and small companies based on the median sale price (4.75 NOK millions), respectively. t-statistics are reported in parenthesis. As in the previous tables, a, b, and c indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 6. Regression analysis for the Danish wealth-to-price ratio

Variables	Wealth-to-price ratio	Wealth-to-price ratio	Wealth-to-price ratio
	Whole sample	Large companies	Small companies
Cash & receivables	0.118[b]	0.977[a]	0.113[c]
	(1.81)	(5.19)	(1.80)
Inventory	0.153[c]	0.616[a]	0.134
	(1.80)	(3.09)	(1.62)
Fixed assets	0.281[a]	1.084[a]	0.261[a]
	(3.63)	(4.32)	(3.43)
Real estate	0.106[a]	0.624[a]	0.103[a]
	(4.16)	(10.37)	(4.24)
Debt	-0.053	-0.428[a]	-0.053
	(-1.41)	(-5.18)	(-1.46)
Past income	0.293[b]	2.480[a]	0.296[b]
	(2.06)	(3.81)	(2.13)
Intercept	1.501[a]	0.103	2.144[a]
	(13.12)	(1.50)	(11.28)
Year FE	Yes	Yes	Yes
R-squared	0.281	0.480	0.276
Observations	7,801	3,899	3,902
Median wealth-to-price ratio	0.865	0.752	1.071

Table 6 shows the results of multivariate regressions of the Danish wealth-to-price ratio on company characterisitcs, using the same sample of Tables 1 and 2, consisting of 7,801 Norwegian unlisted companies, all of which were fully sold to a single buyer between 2018 and 2021. All explanatory variables are scaled by the sale price. The estimator is Ordinary Least Squares (OLS). Column (1) presents the results for the whole sample, while Columns (1) and (2) split the sample between large and small companies based on the median sale price (4.75 NOK millions), respectively. t-statistics are reported in parenthesis. As in the previous tables, a, b, and c indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 7. Regression analysis for the Swiss, Norwegian, and Danish wealth-to-price ratios

Panel A. Regression analysis for the Swiss wealth-to-price ratio

Variables	Wealth-to-price ratio	Wealth-to-price ratio	Wealth-to-price ratio
	Whole sample	Large companies	Small companies
Cash & receivables	0.057	0.489[a]	0.043
	(0.43)	(3.03)	(0.35)
Inventory	0.102	0.415[a]	0.071
	(0.61)	(2.74)	(0.44)
Fixed assets	0.225[c]	0.942[b]	0.185
	(1.83)	(2.29)	(1.57)
Real estate	Omitted	Omitted	Omitted
Debt	0.023	-0.046	0.025
	(0.26)	(-0.38)	(0.30)
Past income	1.174[a]	6.070[a]	1.179[a]
	(4.63)	(6.06)	(4.78)
Intercept	3.222[a]	0.366[c]	4.904[a]
	(8.62)	(1.93)	(7.84)
Year FE	Yes	Yes	Yes
R-squared	0.298	0.696	0.300
Observations	3,836	1,914	1,922
Median wealth-to-price ratio	0.833	0.792	0.919

Panel B. Regression analysis for the Norwegian wealth-to-price ratio

Variable	Wealth-to-price ratio	Wealth-to-price ratio	Wealth-to-price ratio
	Whole sample	Large companies	Small companies
Cash & receivables	0.059[b]	0.281[a]	0.055[b]
	(2.06)	(3.37)	(2.02)
Inventory	0.074[b]	0.330[a]	0.066[c]
	(2.01)	(4.92)	(1.89)
Fixed assets	0.136[a]	0.456[b]	0.128[a]
	(3.85)	(2.43)	(3.62)
Real estate	Omitted	Omitted	Omitted
Debt	-0.032[c]	-0.150[c]	-0.031[c]
	(-1.73)	(-1.94)	(-1.72)
Past income	0.033	0.397	0.037
	(0.66)	(1.50)	(0.74)
Intercept	0.664[a]	0.060	1.001[a]
	(8.77)	(0.93)	(7.77)
Year FE	Yes	Yes	Yes
R-squared	0.232	0.441	0.225
Observations	3,836	1,914	1,922
Median wealth-to-price ratio	0.281	0.187	0.622

Panel C. Regression analysis for the Danish wealth-to-price ratio

Variable	Wealth-to-price ratio	Wealth-to-price ratio	Wealth-to-price ratio
	Whole sample	Large companies	Small companies
Cash & receivables	0.093	0.346[b]	0.084
	(1.42)	(2.08)	(1.36)
Inventory	0.099	0.214	0.078
	(1.15)	(1.24)	(0.95)
Fixed assets	0.248[a]	0.614[b]	0.222[a]
	(2.95)	(1.98)	(2.69)
Real estate	Omitted	Omitted	Omitted
Debt	-0.018	0.057	-0.017
	(-0.41)	(0.42)	(-0.42)
Past income	0.269[c]	2.289[a]	0.281[b]
	(1.94)	(3.38)	(2.05)
Intercept	1.771[a]	0.147	2.723[a]
	(9.19)	(1.17)	(8.55)
Year FE	Yes	Yes	Yes
R-squared	0.223	0.521	0.216
Observations	3,836	1,914	1,922
Median wealth-to-price ratio	0.840	0.548	1.243

Table 7 presents multivariate regression results of the Swiss, Norwegian, and Danish wealth-to-price ratios on company characteristics for the the same sample used in Tables 3 and 4, consisting of 3,836 Norwegian unlisted companies sold between 2018 and 2021, all of which have reported no values in real estate holdings. All explanatory variables are scaled by the sale price. The estimator is Ordinary Least Squares (OLS). Panel A, shows the results for the wealth-to-price ratio calculated using the Swiss valuation method, while Panels B and C present the results for the wealth-to-price ratios calculated using the Norwegian and the Danish valuation methods. Columns (1) show the results for the whole sample, while Columns (2) and (3) present the results for large and small companies defined based on the median sale price (1.3 NOK millions). t-statistics are reported in parenthesis. As in the previous tables, a, b, and c indicate statistical significance at the 1%, 5%, and 10% levels, respectively.