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CHALLENGES IN THE SCENARIO-BASED ASSESSMENT OF THE FINANCIAL AND TAX IMPLICATIONS OF FIXED ASSET REVALUATION

Ani Serobyan
Armenian State University of Economics, Lecturer
ani.serobyan@asue.am
ORCID ID: https://orcid.org/0009-0000-5601-4012

Abstract: The revaluation of property, plant and equipment (PPE) in financial statements significantly affects an entity's financial position and financial performance. However, the financial and tax accounting implications of revaluation are not necessarily proportional to changes in asset values, owing to the structure of previously accumulated revaluation surpluses and differences between the carrying amounts of assets and their respective tax bases. Against this background, the research addresses how different scenarios of changes in PPE values affect financial results, equity, deferred taxes and key financial ratios, and under what conditions revaluation is economically justified. The research findings suggest that decisions regarding the revaluation of property, plant and equipment should be informed not solely by the auditor's professional opinion but also by a comprehensive scenario-based assessment of the resulting financial and tax implications, as well as changes in the indicators characterising the entity's financial position, with due regard to the requirements of applicable financial reporting standards.

Keywords: property, plant and equipment, revaluation, deferred tax, financial ratios, revaluation surplus, deferred tax assets (DTA), deferred tax liabilities (DTL), profit or loss

JEL codes: M41, Q40, H25

Research aims: The aim of this study is to develop a multi-stage, scenario-based approach to assessing how changes in the value of property, plant and equipment (PPE) affect financial reporting and deferred taxes. Using the 2023 financial statements of Yerevan Thermal Power Plant, the study examines the effects of hypothetical increases and decreases in PPE values on profit or loss, revaluation surplus, deferred taxes, equity and key financial ratios.

Particular attention is given to the uneven distribution of previously recognized revaluation surpluses across asset groups and its effect on the recognition of subsequent decreases in asset values. The analysis also considers how assumptions about tax bases and deferred tax recognition influence the results. Rather than estimating actual fair values, the study provides a systematic approach to assessing the potential financial consequences of PPE valuation uncertainty.

Research novelty: This study develops a multi-stage scenario framework to assess how changes in property, plant and equipment (PPE) values affect financial reporting, deferred taxes and key financial ratios. The approach considers the distribution of previously recognised revaluation surpluses and the allocation of valuation changes between profit or loss and other comprehensive income.

Using Yerevan Thermal Power Plant's 2023 financial data, the analysis shows that the proportion of a downward PPE adjustment recognised in profit or loss increases from 62.3% under a 5% decrease to 85.4% under a 15% decrease, reflecting the uneven distribution and limited availability of existing revaluation surpluses.

The study also highlights that changes in equity and leverage ratios do not necessarily reflect changes in cash flows or outstanding debt. Its main contribution is methodological, providing a structured approach to assessing the financial consequences of PPE valuation uncertainty. However, further verification using individual asset records and detailed tax bases is required before the calculated adjustments can be recognized in financial statements.

Introduction

PPE represents a substantial share of the assets of energy companies. Changes in its reported value can therefore affect profit or loss, other comprehensive income, deferred tax balances and equity. These effects become difficult to interpret where the auditor has insufficient evidence about asset values. A qualified opinion relating to insufficient evidence does not establish whether PPE is overstated or understated, nor does it identify the amount of any misstatement. Consequently, this study examines hypothetical valuation adjustments rather than estimating a correction to the published accounts.

The research question is whether equally sized upward and downward adjustments lead to different financial statement effects when previously recognized revaluation surpluses are unevenly distributed. The contribution is an integrated scenario calculation

linking changes in asset values to their recognition in profit or loss or other comprehensive income, the corresponding tax effects, and selected financial ratios. It is an analytical framework, not an independent fair-value assessment.

Literature Review and Regulatory Framework

Prior research associates' revaluations with financing constraints and debt covenants (Whittred & Chan, 1992), while also questioning their costs and reporting benefits (Henderson & Goodwin, 1992). Evidence on the informational content of upward revaluations is mixed and depends partly on company characteristics (Aboody et. al., 1999). Studies of the value relevance of deferred taxes similarly point to context-dependent interpretations (Hanlon et. al., 2014; Görlitz & Dobler, 2023). A higher reported asset value may improve leverage ratios without generating cash or reducing borrowing.

IAS 16 governs the recognition of PPE revaluation increases and decreases. The reversal of an earlier revaluation surplus is assessed for the same asset, not merely against an aggregate surplus for a wider asset class (IFRS Foundation. IAS 16). IAS 12 governs the resulting deferred tax effects and the conditions for recognising deferred tax assets and offsetting balances (IFRS Foundation. IAS 12). These requirements motivate the separation of the gross valuation change, its recognition pathway and its tax treatment.

Research Methodology and Data

The study is based on the hypothesis that the potential financial and tax consequences of a revaluation of property, plant and equipment (PPE) that has not been undertaken depend not only on

the magnitude of changes in asset values but also on the availability and distribution of previously accumulated revaluation surpluses, the tax bases of the underlying assets, and the applicable accounting requirements for recognising revaluation gains and losses. Consequently, upward and downward valuation adjustments of equal magnitude may have asymmetric effects on an entity's profit or loss, equity, deferred taxes and financial stability indicators. To examine this hypothesis, the study assesses the potential financial and tax consequences that would have arisen had Yerevan Thermal Power Plant CJSC revalued its property, plant and equipment as at 31 December 2023.

The scenario-based model assumes that tax bases and outstanding loan balances remain unchanged, thereby isolating the financial effects attributable to changes in the carrying amounts of PPE. Particular methodological importance is attached to the availability and distribution of previously recognised revaluation surpluses, as these determine the extent to which downward valuation adjustments affect profit or loss. Given the limited availability of asset-specific historical data, the allocation is performed at the asset-group level. Although this approach reflects the underlying recognition principles of IAS 16, it limits the precision of the estimated allocation between profit or loss and other comprehensive income.

Deferred tax calculations are based on an 18% corporate income tax rate and reflect the potential tax consequences of changes in temporary differences arising from hypothetical revaluation adjustments. The actual recognition of these effects, however, remains conditional on the nature of the underlying

temporary differences and the recognition criteria prescribed by IAS 12, particularly those governing the recognition of deferred tax assets.

Given the hypothetical nature of the valuation scenarios and the reliance on a single-company case study, the findings should be interpreted within the scope of the adopted methodological assumptions. The purpose of the proposed model is not to establish the actual fair value of individual assets but to identify and quantify the mechanisms through which valuation changes affect financial reporting, deferred taxation and key financial indicators. Although the numerical results are entity-specific, the methodological framework may be adapted to other capital-intensive enterprises, taking into account their asset structure, revaluation history, applicable tax regulations and accounting policies.

Research results

This article examines the potential financial and income tax implications of uncertainty in PPE valuation. Using the financial data of Yerevan Thermal Power Plant, the analysis considers a situation in which the auditor's qualified opinion identified insufficient evidence regarding PPE valuation, without determining the direction or magnitude of any potential valuation difference. This uncertainty motivated the scenario-based design of the study. Rather than seeking to establish the presumed actual value of the assets, the analysis assesses how interrelated financial statement items might change under alternative valuation assumptions.

The scenario analysis places particular emphasis on the history of PPE revaluations. Potential changes in the carrying amounts of

assets cannot be assessed solely in aggregate when previously recognised revaluation surpluses differ across assets. Such differences determine the accounting treatment of potential valuation decreases and may alter the allocation of their effects between profit or loss and equity. The existing revaluation surplus is therefore considered not only as a component of equity but also as historical information necessary for assessing the accounting consequences of changes in asset values.

Examining potential changes in PPE values alongside the deferred tax position reveals a further dimension of the analysis. The tax effect arising from a change in an asset's carrying amount must be considered in relation to its tax base, the nature of the temporary difference and the corresponding accounting treatment. This distinction makes it possible to differentiate between the calculated tax effect and the amount eligible for recognition in the financial statements, provided that the relevant recognition criteria are met.

In assessing the sensitivity of financial ratios to valuation changes, the analysis distinguishes changes in accounting measures from actual changes in the entity's economic performance. A revision of PPE values may alter the relationship between assets and equity, leverage indicators and reported profitability without any repayment of liabilities or inflow of cash.

Table 1. Six valuation scenarios (AMD thousand)
Source: *Author's own work based on audited financial statements (Yerevan TPP, 2016–2025).*

Scenario	Change in PPE	Change in deferred tax	Change in equity
–15%	–15,187,969.2	–2,733,834.5	–12,454,134.7
–10%	–10,125,312.8	–1,822,556.3	–8,302,756.5
–5%	–5,062,656.4	–911,278.2	–4,151,378.2
+5%	+5,062,656.4	+911,278.2	+4,151,378.2
+10%	+10,125,312.8	+1,822,556.3	+8,302,756.5
+15%	+15,187,969.2	+2,733,834.5	+12,454,134.7

Note: The deferred tax column reports the signed effect associated with changes in temporary differences

Previous gross revaluation surplus totals AMD 2,965,554.0 thousand but is not evenly distributed: AMD 1,210,380.0 thousand relates to land, AMD 1,661,777.0 thousand to the new plant (excluding land and the substation), AMD 93,397.0 thousand to the old plant, and none to the 220/110/35 kV substation. As a result, uniform percentage decreases produce different recognition outcomes across asset groups.

The existence of a revaluation surplus helps explain why increases and decreases of equal magnitude do not have identical effects on profit. Under IAS 16 Property, Plant and Equipment, a revaluation increase is generally recognised in other comprehensive income, whereas a decrease is first charged against any existing revaluation surplus relating to the same asset, with the excess recognised in profit or loss. (IFRS Foundation, IAS 16 Property, Plant and Equipment, paragraphs 31 - 42)

Table 2. Existing revaluation surplus and the allocation of tax effects

Source: *Author's own work*

Year	Gross surplus	Deferred tax effect (18%)	Revaluation surplus (net)
2017	10,500,461	1,890,083.0	8,610,378.0
2023	2,965,554	533,799.7	2,431,754.3
2024	2,886,375	519,547.5	2,366,827.5

As shown in Table 3.16, 28.2% of the 2017 surplus remained in 2023, primarily reflecting the long useful lives of buildings and structures. The composition of the revaluation surplus must therefore be examined separately for land, the new plant (excluding land and the substation), the substation and the old plant (excluding land).

Table 3. Distribution of the existing revaluation surplus by asset group in 2023

Source: *Author's own work*

Asset group	Surplus (AMD thousand)
Land	1,210,380
CCGT plant (excluding land and substation)	1,661,777
Substation	-
Old plant (excluding land)	93,397

Approximately 40.8% of the 2023 surplus relates to land and 56.0% to the combined-cycle gas turbine (CCGT) power plant. No surplus had been established for the 220/110/35 kV substation, which was commissioned in 2020. Under the proposed model, a decrease in the value of one asset group is not offset against surpluses associated with other groups. Accordingly, the uniform

10% decrease is allocated across asset groups rather than applied against the company's aggregate surplus.

Table 4. Allocation of valuation decreases under the negative scenarios (AMD thousand)
Source: *Author's own work*

Scenario	Allocated to revaluation surplus	Charged to profit or loss	Profit or loss share, %
–5%	1,908,218.9	3,154,437.5	62.3%
–10%	2,061,263.8	8,064,049.0	79.6%
–15%	2,214,308.7	12,973,660.5	85.4%

Note: Amounts are measured before tax and use hypothetical allocations of earlier surpluses at asset-group level.

The share of each hypothetical decrease charged to profit or loss rises from 62.3% to 85.4% as the reduction grows. The existing surplus cannot absorb the larger adjustments, particularly in asset groups with little or no previous revaluation surplus. Thus, the relation between the size of a downward adjustment and its effect on earnings is not proportional.

Under the +10% scenario, a gross increase of AMD 10,125,312.8 thousand produces an additional illustrative deferred tax effect of AMD 1,822,556.3 thousand and an after-tax equity increase of AMD 8,302,756.5 thousand. On an analytical net basis, the initial net deferred tax asset of AMD 819,215.0 thousand changes to a calculated net deferred tax liability of AMD 1,003,341.3 thousand. This net presentation is not an assertion that the conditions for offsetting deferred tax assets and liabilities under IAS 12 are met (IFRS Foundation. IAS 12).

The tax consequence of downward adjustments is less certain. Reversing a recognised deferred tax liability is not the same as recognising a new deferred tax asset, which requires satisfaction of IAS 12 recognition criteria (IFRS Foundation. IAS 12). For example, a –10% scenario produces a gross profit-or-loss charge of AMD 8,064,049.0 thousand and a hypothetical pre-tax loss of AMD 2,097,696.0 thousand. The resulting annual loss is AMD 1,440,186.2 thousand if the full illustrative tax benefit is recognised, but AMD 2,891,715.0 thousand if no incremental benefit is recognised. Neither outcome can be treated as definitive without detailed tax-base reconciliation.

Table 5. Sensitivity of financial ratios
Source: *Author's own work*

Item	–10%	As reported	+10%
Equity / total assets	26.52%	31.07%	34.85%
Loans / equity	2.122	1.699	1.416
Loans / PPE	0.776	0.698	0.635
ROA: annual profit / year-end assets	–1.15%	3.86%	3.61%
ROE: annual profit / year-end equity	–4.32%	12.42%	10.36%

The +10% revaluation improves the reported equity-to-assets and loans-to-equity ratios, although the loans balance remains unchanged at AMD 70,721,687.0 thousand. These are measurement effects, not evidence of improved liquidity or debt repayment. Higher PPE amounts may also increase subsequent depreciation: under the study's +10% scenario, additional annual depreciation is estimated at AMD 469,898.5 thousand, assuming an average remaining useful life of 20.90 years. Accordingly, an

initially favourable equity effect need not imply improved future profitability.

The effects of revaluation extend beyond the initial adjustment to PPE and the associated tax balances in the financial statements. For depreciable assets, additional accounting depreciation gradually reduces the temporary difference arising from revaluation in subsequent years. Under the +10% scenario for 2023, the value of depreciable PPE increases by AMD 9,819,223 thousand. Assuming an average remaining useful life of approximately 20.90 years, the illustrative annual additional depreciation amounts to AMD 469,898.5 thousand, with a corresponding tax effect of AMD 84,581.7 thousand. These estimates illustrate the potential reversal pattern over time rather than substitute for asset-specific depreciation calculations.

Table 6.Illustrative movement in the additional deferred tax liability under the +10% revaluation scenario (AMD thousand)
Source: *Author's own work*

Year	Additional DTL balance	Cumulative reversal
2023	1,822,556.3	0.000
2024	1,737,974.6	84,581.7
2025	1,653,392.8	169,163.5
2026	1,568,811.1	253,745.2
2027	1,484,229.4	338,326.9
2028	1,399,647.6	422,908.7
2029	1,315,065.9	507,490.4

Under this scenario, the outstanding additional deferred tax liability arising from revaluation would amount to approximately AMD 1,315,066 thousand in 2029. The estimate depends on the assumed average remaining useful life and excludes subsequent

revaluations, new investments, disposals and potential changes in tax rates. It is presented to illustrate the method of assessing the effects over time.

The qualified audit opinion on the 2023 financial statements of Yerevan Thermal Power Plant CJSC identified uncertainty regarding PPE valuation but did not quantify the potential valuation difference or its effects on the company's financial ratios and financial position. This gives rise to a distinct research problem: how a potential valuation difference is transmitted across interrelated financial statement items. The outcome of the research is therefore not an estimate of the company's presumed actual revalued asset amounts, but a structured assessment of the accounting and tax consequences of alternative scenarios.

The scenario calculations yielded three principal findings.

First, upward and downward valuation adjustments of equal magnitude do not have identical effects on financial performance, since the limited availability of existing revaluation surpluses is a determining factor in downward scenarios.

Second, the uneven distribution of surpluses across assets affects the amount recognised in profit or loss. The proportion charged to profit or loss is 62.3% under the - 5% scenario and 85.4% under the - 15% scenario.

Third, increases and decreases in asset values may substantially alter financial ratios without any immediate change in the principal amount of long-term liabilities or cash balances.

Under the +10% scenario, the equity-to-assets ratio increases from 31.07% to 34.85%, whereas under the –10% scenario it declines to 26.52%. In the latter scenario, the reported profit before

tax of AMD 5,966,353 thousand becomes an illustrative pre-tax loss of AMD 2,097,696 thousand, owing to the portion of the valuation decrease not covered by existing surpluses. These findings suggest that the direction of the balance sheet effect and the impact on financial performance need to be assessed separately.

Potential changes in PPE values are treated as the initial driver of changes in interrelated financial statement measures. The calculations sequentially determine the amount absorbed by the existing revaluation surplus, the potential effect recognised in profit or loss, the associated tax component and the resulting changes in financial ratios. The assessment is supplemented by analytical thresholds and alternative assumptions concerning the reversal of temporary differences.

The numerical application of the proposed approach suggests that a valuation issue not quantified in the auditor's report can be examined through a set of interrelated financial effects rather than a single hypothetical adjustment. The advantage of this approach is that it identifies not only the magnitude of a potential valuation difference but also the distribution of its effects across individual financial statement items.

The academic and practical relevance of the proposed approach is particularly evident in entities with substantial PPE holdings, where the history of previous revaluations, the composition of assets and differences in tax bases may considerably alter the financial consequences of an otherwise identical valuation adjustment. The calculations based on Yerevan Thermal Power Plant CJSC demonstrate the applicability of the method within the

scenarios examined and provide a basis for further testing in other capital-intensive entities.

Conclusion and practical implications

The findings suggest that the financial and tax consequences of property, plant and equipment revaluation are determined not solely by the magnitude and direction of valuation adjustments, but also by the availability and distribution of previously recognised revaluation surpluses and the tax bases of the underlying assets. The scenario-based analysis supports the research hypothesis that valuation adjustments of equal magnitude but opposite direction may generate asymmetric financial reporting outcomes. Specifically, the proportion of the downward valuation adjustment recognised in profit or loss increases from 62.3% under the –5% scenario to 85.4% under the –15% scenario, reflecting the uneven distribution and progressive exhaustion of existing revaluation surpluses.

The results also demonstrate that the recognition of deferred tax effects constitutes a significant determinant of the overall financial consequences of revaluation. Moreover, improvements in equity-based financial ratios following an upward valuation adjustment should not necessarily be interpreted as evidence of enhanced financial stability or improved economic performance, since such changes arise from accounting measurement rather than from additional cash generation or a reduction in outstanding debt.

From a practical perspective, decisions concerning the revaluation of property, plant and equipment should not be based exclusively on the independent auditor's professional opinion.

Although the circumstances underlying a qualified audit opinion require substantive examination and appropriate resolution, the decision-making process should incorporate a comprehensive assessment of the potential effects on financial performance, equity, deferred taxation, capital structure and future depreciation expenses, subject to the requirements of applicable financial reporting standards. Where these standards permit discretion, the economic and financial implications of alternative measurement decisions should also be considered.

The principal scientific contribution of this study lies in the development of an integrated scenario-based assessment model that enables the identification, quantification and interpretation of the interrelated financial and tax consequences of asset valuation uncertainty. Its practical relevance is particularly evident in capital-intensive enterprises, where changes in the carrying amounts of property, plant and equipment may substantially alter reported financial indicators without corresponding changes in underlying economic conditions. The proposed approach may therefore serve as an analytical instrument for supporting informed managerial decisions and improving the interpretation of revaluation-related changes in financial statements.

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ՀԻՄՆԱԿԱՆ ՄԻՋՈՑՆԵՐԻ ՎԵՐԱԳՆԱՀԱՏՄԱՆ ՖԻՆԱՆՍԱԿԱՆ ԵՎ ՀԱՐԿԱՅԻՆ ՀԵՏԵՎԱՆՔՆԵՐԻ ՍՑԵՆԱՐԱՅԻՆ ԳՆԱՀԱՏՄԱՆ ՀԻՄՆԱԽՆԴԻՐՆԵՐԸ

Անի Սերոբյան
Հայաստանի պետական տնտեսագիտական համալսարան
դասախոս

Բանալի բառեր - հիմնական միջոց, վերագնահատում, հետաձգված հարկ, ֆինանսական գործակիցներ, վերագնահատման պահուստ, ՀՀԱ, ՀՀՊ, շահույթ կամ վնաս

Հիմնական միջոցների վերագնահատումը ֆինանսական հաշվետվություններում էականորեն փոփոխում է կազմակերպության ֆինանսական վիճակն ու գործունեության արդյունքները: Միաժամանակ վերագնահատման ֆինանսական և հարկային հաշվառման հետևանքները միշտ չէ, որ համաչափ են ակտիվների արժեքի փոփոխությանը, ինչը պայմանավորված է նախկինում ձևավորված վերագնահատման պահուստի կառուցվածքով, ակտիվների հաշվեկշռային արժեքների և հարկային բազաների միջև առկա տարբերություններով:

Այս համատեքստում հետազոտության առանցքային հարցադրումներն են, թե հիմնական միջոցների արժեքի փոփոխության տարբեր սցենարներում ինչպես են փոփոխվում ֆինանսական արդյունքները, սեփական կապիտալը, հետաձգված հարկերը և հիմնական ֆինանսական գործակիցները, և ինչ պայմաններում է վերագնահատումը տնտեսապես նպատակահարմար: Հետազոտության

արդյունքները ցույց են տալիս, որ հիմնական միջոցների վերագնահատման վերաբերյալ որոշումների կայացման հիմքում պետք է ընկած լինի ոչ միայն աուդիտորի մասնագիտական կարծիքը, այլև վերագնահատման արդյունքում առաջացող ֆինանսական և հարկային հետևանքների, ինչպես նաև կազմակերպության ֆինանսական վիճակը բնութագրող ցուցանիշների փոփոխությունների համալիր սցենարային գնահատումը՝ հաշվի առնելով ֆինան-սական հաշվետվությունների կիրառելի ստանդարտների պահանջները:

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