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EVALUATING THE LEGAL FRAMEWORK FOR ACCELERATED DEPRECIATION TAX INCENTIVES IN VIETNAM'S CIRCULAR ECONOMY: A COMPARATIVE ANALYSIS WITH ASEAN STANDARDS AND DEVELOPING COUNTRIES

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Abstract

The transition to a circular economy is a strategic priority in Vietnam's sustainable development agenda, necessitating robust fiscal instruments to mitigate high capital cost barriers. This study aims to evaluate the legal and financial efficacy of accelerated depreciation mechanisms for sustainable investments in Vietnam by benchmarking them against ASEAN Taxonomy standards. Using a doctrinal legal analysis and a quantitative simulation of the Depreciation Tax Shield (DTS) via a Net Present Value (NPV) approach, the study quantifies the financial impact of various depreciation scenarios on a hypothetical capital expenditure.

The simulation-based evidence indicates that the current maximum depreciation coefficient of 2.0 provides a marginal tax shield benefit of only 2.86 billion VND per 100 billion VND of investment, which is approximately 20% lower than the tax shield values in neighboring countries that utilize initial investment allowances. Furthermore, the doctrinal analysis confirms a systemic misalignment between Vietnam's project-based regulatory management and the asset-based classification logic of the ASEAN Taxonomy, creating significant barriers to rapid capital recovery amid risks of technological obsolescence. The study concludes that Vietnam should establish a synchronized national green asset catalogue and increase the depreciation coefficient to 3.0 for strategic equipment. Such reforms would not only optimize financial benefits but also directly enhance Vietnam's competitiveness in attracting green foreign direct investment within the region.

Keywords circular economy, accelerated depreciation, tax shield, ASEAN taxonomy, green FDI, Vietnam

JEL Classification K34, Q58, O16, G11, G31

INTRODUCTION

Within the global paradigm of sustainable development, the transition to a circular economy (CE) has become a policy focal point in Vietnam, as enshrined in Articles 141 and 142 of the Law on Environmental Protection 2020 and further codified through green investment provisions in the Law on Investment 2025. However, the operationalization of CE projects faces significant financial hurdles, as initial capital expenditures (CAPEX) for resource optimization and recycling systems are substantially higher than those of traditional linear models (Wang et al., 2023). In this context, fiscal instruments, particularly accelerated depreciation mechanisms, serve as vital solutions to catalyze capital recovery and improve corporate

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liquidity (Saad et al., 2024). Accelerated depreciation functions not merely as a financial incentive but as a strategic regulatory tool to mitigate the risks of technological obsolescence inherent in high-value green assets (Wang et al., 2025).

Although the Law on Investment 2025 establishes accelerated depreciation as a formal incentive, the current legal framework suffers from systemic inconsistencies and a lack of synchronized enforcement, undermining its overall efficacy. This study identifies three primary dimensions of the problem:

First, the misalignment between environmental technical standards and tax regulations. While CE investments require a taxonomy-based recognition mechanism tailored to the specific technical characteristics of each asset, the Vietnamese tax system remains anchored in a project-based or location-based approach (Vũ, 2024). The absence of a national classification of circular assets in tax legislation means modern green technologies are ineligible for accelerated depreciation.

Second, the lack of harmonization between domestic law and international benchmarks. Specifically, while the ASEAN Taxonomy for Sustainable Finance provides a detailed "asset-based classification system," it is crucial to clarify that it is a sustainable finance classification framework not a tax statute (Zolkover et al., 2024). This study does not suggest that the Taxonomy directly regulates depreciation, but rather argues for adopting its underlying logic to reform tax eligibility criteria. The failure to establish a synchronized verification mechanism for green assets between environmental authorities and tax agencies creates regulatory gaps, thereby increasing compliance risks for enterprises when self-declaring and applying for incentives (Le Ha et al., 2024).

Third, the existing depreciation framework is structurally outdated. The depreciation coefficients and asset lifetime schedules were designed for an era of traditional manufacturing and do not reflect the rapid innovation cycles and shorter economic lifespans of CE technologies (Sawhney, 2018). This "lifetime fallacy" penalizes early adopters of green technology and poses the risk of "stranded assets."

Consequently, the central research problem is the theoretical and practical conflict between a legacy tax structure and the dynamic requirements of a modern circular economy. This study aims to dissect this conflict and propose a transition toward an asset-driven incentive model that is both financially effective and institutionally robust.

This study evaluates the regulatory barriers and the financial effectiveness of the accelerated depreciation mechanism for circular-economy assets in Vietnam. By benchmarking against the practices of leading ASEAN member states and other emerging economies, the research identifies critical policy gaps to propose a comprehensive legal reform framework. The core objective is to offer evidence-based recommendations for integrating tax incentives with a standardized green asset classification system, thereby enhancing Vietnam's capacity to attract high-quality green investment.

1. LITERATURE REVIEW

1.1. Neoclassical theory of investment and the depreciation tax shield

The theoretical foundation for analyzing the impact of tax incentives on investment behavior is rooted in the neoclassical model developed by Hall and Jorgenson (1967). This model posits that a firm's optimal capital stock is determined by the "user cost of capital," which represents the implicit rental cost of using a capital asset for one period. This cost is a function of the financing cost (interest rate), the economic depreciation rate, and, crucially, the tax treatment of capital expenditures. Tax policies that reduce the user cost of capital, such as investment tax credits or accelerated depreciation, directly stimulate investment demand (Auerbach, 1983; Chirinko, 1993).

Accelerated depreciation lowers the user cost of capital by increasing the present value of tax savings from depreciation deductions. This financial benefit is known as the "Depreciation Tax Shield" (DTS). Due to the time value of money, tax deductions received sooner are more valuable than those received later. By shifting deductions to the early years of an asset's life, accelerated depreciation generates a larger DTS in present value terms, thereby improving a project's post-tax cash flow and NPV (Auerbach, 1982; Jorgenson & Yun, 2001).

The efficacy of cost-based incentives, such as accelerated depreciation, is particularly pronounced in capital-intensive sectors and for new ventures, including green technology firms. Unlike profit-based incentives (e.g., tax holidays), which benefit only firms that are already profitable, cost-based incentives provide immediate cash-flow benefits from the moment an investment is made. This is critical for green projects that often face a prolonged initial phase of low or negative profits (Klemm, 2010). Recent empirical studies confirm that well-designed green financial incentives can effectively bridge the economic performance gap created by the "green premium" (Wang et al., 2025; Tyurina et al., 2023), whereas tax holidays often prove to be a redundant and inefficient tool for stimulating new greenfield investments (OECD, 2021).

1.2. Green asset classification: The role of sustainable finance taxonomies

The effectiveness of any targeted fiscal incentive hinges on the precision and transparency of its eligibility criteria. Without a clear, objective, and legally robust classification framework, tax incentives are prone to inconsistent application, administrative discretion, and the risk of "greenwashing," where firms claim benefits for activities with minimal environmental merit (OECD, 2020; World Bank, 2022). The global response to this challenge has been the development of Green Taxonomies, standardized classification systems that define what constitutes an environmentally sustainable economic activity or asset (Bhandary et al., 2021).

The EU Taxonomy is the pioneering and most comprehensive example, but regional taxonomies are rapidly emerging. The ASEAN Taxonomy for Sustainable Finance represents a landmark effort to create a common language for sustainable finance in Southeast Asia (ASEAN Taxonomy Board, 2021). Version 3 of the Taxonomy (2023) establishes a multi-tiered framework with a "traffic light" system (Green, Amber, Red) and detailed Technical Screening Criteria (TSC) for key sectors (ASEAN Taxonomy Board, 2023). These TSCs provide granular, science-based thresholds for evaluating an asset's environmental performance (e.g., CO2 emissions per kWh, percentage of recycled content).

The core argument of institutional governance literature is that integrating such taxonomies into fiscal law can trigger a paradigm shift in policy administration. It moves the system away from discretionary, project-by-project approvals toward a standardized, rules-based validation of assets. This shift significantly reduces transaction costs and legal uncertainty for investors, fostering a more predictable and attractive investment climate (Schulze Waltrup, 2025; Volz et al., 2020).

1.3. Technological obsolescence, stranded assets, and carbon lock-in

The debate over depreciation rules is critically linked to the dynamics of technological change, a concept central to Schumpeter's (1942) theory of "creative destruction." In the context of the green transition, technologies related to the circular economy, such as advanced sorting robotics, chemical recycling processes, and energy storage systems, are evolving at an exponential rate. Consequently, the economic lifespan of these assets is often significantly shorter than their physical lifespan (IEA, 2024).

This disconnect poses the risk of "stranded assets", investments that suffer premature write-downs or devaluation due to technological shifts, new regulations (e.g., stricter emissions standards), or changing market preferences (Caldecott, 2017; Mercure et al., 2018). If a country's tax laws require a firm to depreciate a high-tech piece of equipment over 15 years when it becomes technologically obsolete in just 7 years, the firm cannot fully recover its investment through tax deductions. This creates a powerful disincentive for technological upgrading and innovation (Auerbach, 1982; Pfeiffer et al., 2016).

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Furthermore, rigid and outdated depreciation rules can create a "carbon lock-in" effect. This phenomenon occurs when existing institutional and technological systems perpetuate carbon-intensive pathways, making a transition to low-carbon alternatives difficult and costly (Unruh, 2000). If firms cannot rapidly recover capital from their existing, less efficient assets, they are less likely to invest in new, cleaner technologies. Flexible and accelerated depreciation regimes are therefore considered essential policy instruments for aligning the fiscal system with the rapid pace of green innovation and preventing the entrenchment of outdated, carbon-intensive capital stock (Popp et al., 2020; Singh, 2026).

1.4. Comparative policy benchmarking: Accelerated capital recovery in practice

A review of practices in other developing and emerging economies reveals a clear trend toward the use of accelerated capital recovery mechanisms to drive green investment.

Malaysia: The Malaysian government has been particularly proactive, implementing the Green Investment Tax Allowance (GITA) and Green Income Tax Exemption (GITE). Under GITA, companies can claim an allowance equivalent to a significant portion of the qualifying CAPEX for certified green technology assets. A key feature is the provision of an Initial Allowance (IA), which allows firms to deduct up to 60% of the asset's value in the first year alone. The certification process is managed by a specialized agency, the Malaysian Green Technology and Climate Change Corporation (MGTC), which decouples technical validation from tax administration (MIDA, 2024; Zainol Ariffin & Mas'ud, 2024).

China: As part of its broader industrial policy to dominate green technology sectors, China employs a "Super Deduction" policy for R&D and investment in environmental protection equipment. This often allows firms to deduct more than the actual cost of the investment (e.g., 175% or 200%) from their taxable income. Eligibility is tied to a dynamically updated National Catalogue of Encouraged Technologies, creating a direct and powerful link between industrial strategy and fiscal incentives (State Taxation Administration of China, 2023; Wang et al., 2025).

Thailand: The Thailand Board of Investment (BOI) (2023) offers a suite of incentives for investments in the Bio-Circular-Green (BCG) economy. These include enhanced depreciation schemes in which firms can deduct more than 100% of the acquisition cost of specific energy-saving or environmentally friendly machinery, effectively creating a tax credit on top of accelerated depreciation. This approach maximizes the value of the DTS and provides a strong financial incentive to adopt green technologies (Thailand BOI, 2023).

In comparison, Vietnam's framework, with a maximum coefficient of 2.0 and a complex, project-based approval process, appears conservative and less financially potent, potentially placing it at a competitive disadvantage in the regional race for green FDI (Vũ, 2024; OECD, 2021).

1.5. Research gap and hypotheses

Despite a growing body of literature on green finance, a specific research gap exists regarding the intersection of depreciation rules, legal frameworks, and circular-economy investment in the Vietnamese context. Existing studies tend to focus either on environmental policy or on tax law in isolation, without integrating the two through rigorous financial modelling of capital recovery mechanisms (Wang et al., 2023; Polzin & Sanders, 2020).

This paper aims to fill this gap by providing a mixed-methods analysis that bridges legal doctrine and financial simulation.

Based on the theoretical and comparative review, this study formulates the following hypotheses:

H1: Accelerated depreciation incentives significantly improve the financial viability of CE projects by increasing the present value of the Depreciation Tax Shield (DTS).

H2: Vietnam's current maximum depreciation coefficient of 2.0 provides a substantially

lower level of financial incentive compared to the Initial Allowance and super-deduction mechanisms used in benchmark ASEAN and developing economies.

H3: The lack of a synchronized, asset-based green taxonomy framework in Vietnam's tax law creates legal uncertainty and institutional barriers, undermining the effectiveness of existing incentives.

2. METHODOLOGY

This study employs a mixed-methods research design, integrating doctrinal legal analysis, comparative law, and an empirical financial simulation. This approach is chosen to provide a holistic assessment, transforming qualitative legal provisions and institutional structures into quantifiable financial impacts to robustly test the hypotheses. It is important to note that the findings derived from the quantitative model are designated as simulation-based evidence and legal-doctrinal findings, rather than empirical results from firm-level panel data.

2.1. Research procedure and algorithm

The research is executed through a structured four-step algorithm:

Step 1 (Doctrinal Legal Analysis): A qualitative review of Vietnam's legal framework, focusing on the Law on Environmental Protection 2020, the Law on Investment 2025, the Law on Corporate Income Tax, and the key implementing regulations (Circular No. 45/2013/TT-BTC and Circular No. 30/2025/TT-BTC). The analysis identifies internal inconsistencies, ambiguities, and conflicts between environmental objectives and tax administration procedures.

Step 2 (Comparative Legal Analysis): A functional comparison between Vietnam's "project-based" regulatory model and the "asset-based" model implicit in the ASEAN Taxonomy (Version 3) and implemented in countries like Malaysia. This step benchmarks Vietnam's institutional architecture against regional best practices.

Step 3 (Quantitative Financial Modelling): The establishment of a discounted cash flow model to simulate and calculate the Present Value (PV) of the Depreciation Tax Shield (DTS) under different policy scenarios. This step quantifies the financial impact of the legal rules identified in Step 1.

Step 4 (Synthesis and Hypothesis Testing): Integrating the qualitative and quantitative findings. The hypotheses (H1, H2, and H3) are tested by analyzing the variance between the simulation results, the doctrinal findings, and the regional benchmarks established in Step 2.

2.2. Quantitative modeling of the depreciation tax shield (DTS)

To empirically test hypotheses H1 and H2, the study utilizes the standard Present Value (PV) model from corporate finance. The formula for calculating the *DTS* is:

$$DTS = \sum_{t=1}^{n} \frac{D_t \cdot \tau}{(1+r)^t}, \quad (1)$$

where D_t – The annual depreciation expense of the asset in year t, τ – The corporate income tax (CIT) rate is fixed at 20% as per current Vietnamese law. r – The discount rate, representing the firm's Weighted Average Cost of Capital (WACC), t – The specific year within the asset's depreciation life (from year 1 to n), n – The total depreciation period of the asset as permitted by law.

2.3. Model parameters and justification

Depreciation Expense (D_t): This is the core variable, calculated based on different methods (Straight-line vs. Adjusted Declining Balance) and coefficients (k = 1.0, 2.0, 3.0) to reflect various policy scenarios.

Discount Rate (r): The WACC is assumed to be 10%. This rate is chosen as a realistic proxy for the cost of capital for new, moderately risky industrial projects in an emerging market like Vietnam, reflecting both the cost of debt and a higher-risk equity premium.

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Asset Life (n): The simulation assumes a base asset life of 10 years, which falls within the typical range (5 to 15 years) for industrial machinery under Vietnamese tax regulations. This allows for a clear comparison of depreciation schedules over a standard investment horizon.

Initial Investment (CAPEX): A hypothetical investment of 100 billion VND is used as the basis for all simulations. This round figure facilitates clear interpretation and percentage-based comparisons of the DTS benefits.

Input data for the model regarding typical CAPEX for CE technologies (e.g., waste heat recovery systems, polymer recycling lines) are synthesized from industry reports and technical parameters published by the International Energy Agency (IEA, 2024).

2.4. Simulation scenarios

Three primary scenarios are simulated to test the hypotheses:

Baseline Scenario (Straight-line): Standard depreciation with a coefficient k = 1.0. This represents the default tax treatment without any incentive.

Current Policy Scenario (Accelerated k = 2.0): Accelerated depreciation using the maximum coefficient of 2.0 allowed under Circular No. 30/2025/TT-BTC.

Proposed Reform Scenario (ASEAN-aligned): A more aggressive accelerated depreciation with a coefficient of k = 3.0, combined with a 40% Initial Allowance (IA) in the first year, mirroring practices in Malaysia.

2.5. Sensitivity analysis and model limitations

While the model uses fixed parameters for clarity, a sensitivity analysis acknowledges that the magnitude of the results depends on these assumptions. For instance, a higher WACC would amplify the benefit of accelerated depreciation, as near-term cash flows become even more valuable. Conversely, a lower WACC would reduce the gap between scenarios. However, the directional conclusion – that faster depreciation yields a higher DTS and that Vietnam's current policy lags behind regional benchmarks – is robust across a reasonable range of WACC and asset life assumptions. The primary limitation of this study is its reliance on a simulation model rather than ex-post firm-level data, a constraint necessitated by the novelty of CE policies in Vietnam.

3. RESULTS AND DISCUSSION

3.1. Doctrinal finding: The project-based vs. asset-based conflict (testing H3)

The doctrinal legal analysis confirms a deep-seated incompatibility between Vietnam's tax administration and the requirements of a modern, technology-driven circular economy, strongly supporting H3. The regulatory framework for depreciation, even under the recent Circular No. 30/2025/TT-BTC, remains wedded to a traditional "project-based" logic. A close reading reveals that the Circular's primary innovations concern mechanisms for deferring or suspending depreciation. For instance, Article 5 of the Circular provides detailed guidance for State-Owned Enterprises (SOEs) to adjust depreciation schedules for underperforming assets or those awaiting divestment. This focus on reactive measures for legacy assets highlights a significant "policy gap": the law has been updated to manage old problems but has not been proactively re-engineered to incentivize new, strategic investments in CE technologies.

The comparative review in Table 1 illustrates this doctrinal conflict. Vietnam's reliance on administrative discretion creates substantial barriers to entry and transaction costs for private investors, particularly in the CE sector, where technology is new and may not fit into pre-existing administrative categories (Sawhney, 2018). In contrast, the asset-based logic of the ASEAN Taxonomy provides a clear, predictable, and performance-oriented pathway for identifying eligible investments. This institutional deficiency in Vietnam's tax code effectively neutralizes the progressive environmental goals of the LEP 2020, as the intended incentives remain administratively difficult to access.

Table 1. Comparison of asset identification criteria: Vietnam vs. ASEAN taxonomy

Criteria	Current Vietnamese Regulations (Circular No. 30/2025)	ASEAN Taxonomy (Version 3) Logic
Primary Focus	Reactive management of underperforming assets (deferred depreciation).	Proactive incentivization of new green/circular assets.
Asset Identification	Administrative discretion based on government-approved projects or enterprise status (e.g., SOEs).	Objective, science-based Technical Screening Criteria (TSC) focusing on environmental performance.
Scope of Application	Primarily targeted at specific sectors or types of enterprises (e.g., SOEs facing difficulties).	Universal and cross-sectoral, applicable to any qualifying green investment.
Legal Certainty	Low. Eligibility is subject to interpretation and approval, creating uncertainty for private investors.	High. Eligibility is based on meeting clear, pre-defined technical thresholds.

3.2. Simulation-based evidence: The financial insufficiency of the current tax shield (testing H1 and H2)

The quantitative simulation provides clear financial evidence of the current policy's limitations. The results, summarized in Table 2, are based on a 100 billion VND investment over a 10-year life with a 10% WACC and a 20% CIT rate.

The results first confirm H1: Moving from a straight-line method (DTS of 12.29 billion VND) to the current accelerated method with k=2.0 (DTS of 15.15 billion VND) yields a significant financial benefit. The marginal gain is 2.86 billion VND, demonstrating that accelerated depreciation, in principle, improves project viability.

However, the results more strongly support H2, revealing the insufficiency of this gain. The 2.86 billion VND benefit represents less than 3% of the initial investment. In the context of a "green premium" that can be 15-25% higher for CE technologies, this incentive is financially marginal and unlikely to be a decisive factor in investment decisions.

Most critically, when benchmarked against the proposed ASEAN-aligned reform scenario, Vietnam's current policy is clearly suboptimal. A framework incorporating a 40% Initial Allowance and a k = 3.0 coefficient would generate a DTS of 18.40 billion VND. This means Vietnam's current tax shield is approximately 21% lower in value than it would be under a regionally competitive policy. This "Financial Disadvantage Zone" erodes Vietnam's attractiveness for green FDI. The slow pace of capital recovery under a 2.0 coefficient means the real value of the tax shield is diminished by inflation and opportunity costs, inadvertently favoring lower-CAPEX, less efficient conventional technologies.

3.3. The anatomy of regulatory lag and the "lifetime fallacy"

A key finding is the significant regulatory lag and path dependency evident in the transition from Circular No. 45/2013 to Circular No. 30/2025. Rather than a fundamental modernization, the 2025 amendment largely preserves the core logic of its predecessor and fails to address the unique characteristics of CE assets.

This is most evident in the persistence of the "Lifetime Fallacy." Both circulars mandate depreciation schedules based on the physical lifespan of an asset category, as defined in a rigid appendix. For example, industrial machinery is often assigned a depreciation life of 10-15 years. This framework ignores the reality of technological obsolescence in the CE sector. A state-of-the-art polymer recycling system might have a physical life of 15 years, but become economically uncom-

Table 2. Simulation results of the depreciation tax shield (DTS)

Depreciation Scenario	Coefficient / Method	PV of DTS (Billion VND)	% of Initial Investment	Capital Recovery Potential
1. Baseline (Straight-line)	*k*=1.0	12.29	12.29%	Low
2. Current Vietnamese Policy	*k*=2.0	15.15	15.15%	Moderate
3. Proposed Reform (ASEAN-aligned)	*k*=3.0 + 40% IA	18.40	18.40%	High

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petitive in 5-7 years due to new, more efficient technologies. By forcing a 15-year tax recovery schedule onto a technology with a 7-year economic life, the law creates a significant risk of stranded assets (Caldecott, 2017) and imposes a "hidden tax" on innovation. This regulatory lag acts as a "carbon lock-in" mechanism, discouraging firms from decommissioning older equipment to invest in the latest green technology (Singh, 2026).

3.4. "Insufficiency threshold" and the financial disadvantage zone

The simulation results provide robust evidence for what can be termed an "Insufficiency Threshold" in tax incentive policy. A fiscal incentive is only effective if its financial value is sufficient to cross a certain threshold that meaningfully alters the risk-return calculus of an investment. Our finding that the current k=2.0 coefficient provides a marginal benefit of only 2.86 billion VND (or <3% of CAPEX) suggests that Vietnam's policy falls below this threshold. It fails to adequately compensate for the "green premium" and the higher perceived risks associated with new technologies.

This places Vietnam in a "Financial Disadvantage Zone" relative to its regional competitors. As our literature review shows, nations like Malaysia and China have implemented far more aggressive capital recovery mechanisms (Initial Allowances, Super Deductions) that provide immediate and substantial cash flow benefits, often covering a significant portion of the green premium in the first few years. In the global competition for green FDI, where capital is mobile and investors compare the full lifecycle costs of projects, capital recovery speed is often a more critical determinant than the headline corporate tax rate (De Mooij & Ederveen, 2003). Vietnam's current framework, by prioritizing slow and steady depreciation, inadvertently penalizes the very capital-intensive, high-tech investments it seeks to attract.

3.5. Critiquing regulatory lag: "Lifetime fallacy" as an anti-Schumpeterian force

This research introduces the concept of the "Lifetime Fallacy" as a critical flaw in Vietnam's regulatory architecture. By tethering depreciation schedules to physical durability rather than economic or technological lifecycles, the tax law becomes an anti-Schumpeterian force. Schumpeter's (1942) theory of "creative destruction" posits that economic progress is driven by the constant replacement of old technologies with new, more efficient ones. A tax system that facilitates rapid capital recovery from new investments and allows for the swift write-off of obsolete assets is pro-Schumpeterian; it accelerates innovation.

Conversely, Vietnam's current framework creates a "hidden tax" on innovation. It forces early adopters of green technology to carry obsolete assets on their books for years, trapping capital and slowing down the next wave of investment. The analysis of Circular No. 30/2025 reveals a mindset focused on asset preservation and managing the decline of old SOE assets, rather than catalyzing the rise of a new, dynamic circular economy. This regulatory lag is not just an administrative issue; it is a fundamental brake on technological progress and structural economic transformation.

3.6. Institutional fragmentation and "enforcement paralysis"

The doctrinal conflict between the project-based tax system and the asset-based logic of environmental policy creates a state of "enforcement paralysis." Tax authorities, lacking the technical expertise to evaluate the environmental credentials of a specific piece of machinery, are naturally hesitant to approve accelerated depreciation. This forces businesses into a costly and time-consuming two-front battle: they must first get their technology certified as "green" by the Ministry of Natural Resources and Environment (MONRE) and then separately convince the Ministry of Finance (MOF) and local tax offices to grant the incentive.

This institutional fragmentation erodes the value of the policy signal. An incentive that is legally available but practically inaccessible due to bureaucratic hurdles is ineffective. This contrasts sharply with the Malaysian model, where a single, specialized agency (MGTC) provides a technical certification that is automatically recognized by the tax authority. This creates a seamless, "one-stop-shop" process that minimizes compliance costs and maximizes legal certainty for investors

(Schulze Waltrup, 2025). Without resolving this institutional disconnect, even a more generous depreciation coefficient in Vietnam would likely suffer from low uptake.

3.7. A Roadmap for structural reform: From discretion to rules

Based on these findings, this study proposes a comprehensive, four-pillar reform roadmap designed to shift Vietnam's incentive framework from a discretionary, project-based model to a rules-based, asset-driven one.

Pillar 1: Establish a National Circular Asset Directory (NCAD). This is the foundational reform. The government should create and maintain a dynamic, public directory of assets and technologies eligible for tax incentives. Eligibility should be based on clear, quantitative Technical Screening Criteria (TSC) harmonized with the ASEAN Taxonomy. This would replace administrative discretion with objective, science-based rules, transforming the incentive from a negotiated privilege into an automatic right for any firm investing in a listed asset.

Pillar 2: Implement a Joint-Agency Protocol. To overcome institutional fragmentation, a formal protocol should be established in which MONRE and the Ministry of Science and Technology serve as the "technical gatekeepers," responsible for defining and updating the TSC for the NCAD. The MOF would act as the "fiscal executor," automatically applying the incentives to any asset listed in the directory. This clear division of labour plays to each ministry's strengths and eliminates the "enforcement paralysis."

Pillar 3: Aggressive Fiscal Recalibration. The financial incentive itself must be strengthened to cross the "insufficiency threshold." This study recommends a two-pronged approach: (1) Increase the accelerated depreciation coefficient to 3.0 for assets in the NCAD. (2) Introduce a 40% Initial Allowance (IA) for strategic, high-priority CE technologies. This combination would bring Vietnam's capital recovery speed in line with regional leaders and provide a powerful financial signal to investors.

Pillar 4: Legal Codification for Enhanced Certainty. These reforms should be codified directly into the Law on Corporate Income Tax or a dedicated government decree, rather than being left to lower-level circulars. This would provide the long-term legal certainty that is essential for attracting large-scale, long-horizon green FDI.

CONCLUSION

This study set out to evaluate the legal efficacy and financial impact of accelerated depreciation tax incentives for the circular economy in Vietnam. Through an integrated analysis combining legal doctrine and quantitative financial simulation, the research concludes that while Vietnam has established a policy orientation toward green growth, its current fiscal toolkit is insufficiently sharp to effectively drive this transition. The existing framework is hampered by doctrinal inconsistencies, institutional fragmentation, and financially inadequate incentives.

The findings of this research elucidate three core issues that reveal structural barriers within Vietnam's policy framework for attracting investment into the Circular Economy. First, the research identifies a systemic misalignment between the nation's discretionary, project-based incentive model and the objective, asset-based classification standards becoming the regional norm; the absence of a synchronised national green asset catalogue creates significant legal uncertainty and administrative barriers. Furthermore, as a direct consequence confirmed by quantitative simulation, this misalignment establishes a Financial Disadvantage Zone. The current maximum depreciation coefficient of 2.0 provides a tax-shield benefit insufficient to offset the high capital costs and technological risks of CE investments, thereby making Vietnam approximately 20% less competitive than peers with more aggressive capital-recovery policies. Finally, the study uncovers a persistent Lifetime Fallacy within the legal framework, in which depreciation schedules are tied to outdated assumptions about physical lifespans, thereby cre-

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ating a significant risk of stranded assets and fostering a carbon lock-in effect that slows the pace of technological upgrading. Based on the evidence, this study proposes that Vietnam implement a two-step reform roadmap.

Based on the findings, this study proposes two primary reforms. Institutionally, a transition is recommended from the current project-based, post-audit model to an automated incentive application model based on a National Circular Asset Catalogue that is consistent with the ASEAN Taxonomy. Financially, the study advocates increasing the accelerated depreciation coefficient to 3.0 and introducing an Initial Allowance mechanism at 40% to shorten the capital recovery time. While providing important evidence, this study acknowledges its reliance on simulation data for capital-intensive industries. Future research should therefore expand the analysis using panel data from listed companies once CE mechanisms are fully operational. Furthermore, evaluating the synergistic impact between depreciation incentives and other green financial instruments, such as green credit and carbon markets, will provide a more comprehensive view of the sustainable financial ecosystem.

AUTHOR CONTRIBUTIONS

Conceptualization: Nguyen Thi Thu Thuy.
Data curation: Nguyen Thi Thu Thuy.
Formal analysis: Nguyen Thi Thu Thuy.
Funding acquisition: Nguyen Thi Thu Thuy.
Investigation: Nguyen Thi Thu Thuy.
Methodology: Nguyen Thi Thu Thuy.
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Software: Nguyen Thi Thu Thuy.
Supervision: Nguyen Thi Thu Thuy.
Validation: Nguyen Thi Thu Thuy.
Visualization: Nguyen Thi Thu Thuy.
Writing – original draft: Nguyen Thi Thu Thuy.
Writing – review & editing: Nguyen Thi Thu Thuy.

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