International Journal of Finance, Insurance, and Risk Management
Volume XVI, Issue 2, 2026

pp. 20-27

Moral and Economic Obsolescence of a Product: How to Recognize the Inevitable

Submitted 20/11/25, 1st revision 07/12/25, 2nd revision 24/02/26, accepted 27/04/26

Kevin Grace Moupegnou Nzoussi[1], Olga Alexandrovna Tsenova[2]

Abstract:

Purpose: *This study aims to develop a practical system of indicators for distinguishing between moral and economic obsolescence in product life cycle management, addressing the critical gap in diagnostic tools that leads to recurring strategic errors in product policy decisions.*
Design/Methodology/Approach: *The research synthesizes classical marketing theory with contemporary concepts of planned obsolescence, technological acceleration, and regulatory intervention. A multidimensional framework is constructed, integrating objective metrics (market share dynamics, price elasticity of demand, repair frequency) with subjective indicators (design evolution rates, perceived relevance, software support duration) to enable systematic differentiation between obsolescence types.*
Findings: *The analysis reveals that moral obsolescence manifests through technological lag, aesthetic drift, repairability limitations, and software support discontinuation, whereas economic obsolescence is primarily signaled by unfavorable price positioning, heightened demand elasticity, escalating total cost of ownership, and repair cost thresholds exceeding replacement value. A two-dimensional assessment matrix is established, demonstrating that each combination of obsolescence types demands distinct strategic responses—price adjustments for economic obsolescence versus product modernization or replacement for moral obsolescence.*
Practical Implications: *The proposed indicator system equips marketing practitioners and product managers with actionable criteria for diagnosing decline stage causes, preventing the common error of using price reductions to compensate for moral obsolescence or investing in modernization when price competitiveness is the core issue. The framework aligns with emerging regulatory contexts, including EU Right to Repair provisions.*
Originality/Value: *This study advances beyond the generic dichotomy of obsolescence types by operationalizing measurable indicators applicable to contemporary market conditions shaped by accelerated technological cycles, planned obsolescence practices, psychological consumption patterns, and environmental regulations. The integrated assessment matrix*

[1]*Ph.D., Candidate of Economic Sciences, Associate Professor of the Department of Economics, Melitopol State University (MelSU), Russia; ORCID :0000-0003-1224-7425, e-mail: kevinnzoussi@gmail.com;*
[2]*The same as in 1, ORCID: 0009-0005-6129-0915, e-mail: tsenovaolga@yandex.ru;*

offers a novel decision-support tool that bridges theoretical constructs with strategic product policy formulation.

Keywords: *Moral obsolescence, economic obsolescence, product life cycle, planned obsolescence, obsolescence indicators, product policy, right to repair, decline stage diagnosis.*

JEL Codes: *M31, L15, O33, D12.*

Paper type: *Research article.*

1. Introduction

The product life cycle is a model that has been used in marketing for over half a century. The idea that every product goes through stages of introduction, growth, maturity, and decline has become firmly entrenched in textbooks and assortment management practices (Kotler and Keller, 2018, pp. 437-438).

However, the familiarity of this framework has obscured an important nuance: the decline stage is explained too generally. It is typically stated that a product has become obsolete either morally or economically (Solovyova, 2009, p. 24). How one differs from the other, and how to understand in time exactly what is happening – these are questions that theory struggles to answer.

In the same work from which this distinction originates, moral obsolescence is linked to the emergence of superior alternatives, while economic obsolescence is linked to the entry of cheaper options into the market (Solovyova, 2009, p. 27).

This is essentially correct, but it is insufficient for practical purposes. What metrics can measure that a product has lost competitiveness due to price, rather than because it has been surpassed in quality or design?

Companies often make mistakes: they lower the price when they urgently need to change the product, or they invest in modernizing something that the market rejects due to its high cost.

Today, the situation has become more complex. Technologies are updated faster than consumers can adapt to them, tastes change rapidly, and environmental regulations can render a perfectly functional item illegal overnight.

Identifying the main cause of decline is now almost impossible (Bartels *et al.,* 2012, pp. 45-47). Add to this planned obsolescence – the deliberate shortening of a

product's lifespan, built into its design to encourage consumers to buy new ones more frequently (Planned Obsolescence Indicator, 2025). This is no longer a natural process but a man-made one, and it requires a separate discussion.

The aim of this article is to propose a set of indicators that will allow us to distinguish between moral and economic obsolescence and to notice the approach of decline in time. To achieve this, it is necessary to clarify the concepts themselves, analyze which factors most strongly influence obsolescence today, and compile from these a set of workable metrics.

2. Theoretical Foundations: Classics and New Meanings

In classical marketing, the decline stage is explained by moral and economic obsolescence (Kotler and Keller, 2018, p. 440). Solovyova specifies moral obsolescence is the appearance of a new, superior product; economic obsolescence is the emergence of cheaper alternatives (Solovyova, 2009, p. 27).

Both processes can act simultaneously, but their contribution to the drop in demand differs, and it is necessary to separate them.

International authors go further. Bartels et al. identify four types of obsolescence: technological (new technologies render old ones uncompetitive), functional (the product ceases to perform its functions due to wear and tear), economic (operating costs exceed the product's value), and planned (intentional limitation of service life by the manufacturer) (Bartels *et al.,* 2012, pp. 18-20).

"Moral obsolescence" in the Russian tradition encompasses technological and functional obsolescence, adding an aesthetic component. This is important: today, a product's design and symbolic value often matter as much as its utilitarian characteristics.

The phenomenon of planned obsolescence is the result of a deliberate strategy, not a natural course of events.

The Planned Obsolescence Indicator aims to measure the intentional shortening of service life for commercial purposes, distinguishing it from objective wear and tear (Planned Obsolescence Indicator, 2025).

Tangible markers include non-repairable joints, non-replaceable batteries, and the cessation of software support while the device remains physically functional. A point of contention is whether this can be considered moral obsolescence.

If the improvements in new models are merely cosmetic, and the old one is simply cut off from the ecosystem (e.g., no updates), we are dealing with a hybrid form.

The European Union has already responded to this practice with the Right to Repair Directive (2024/1799), which obliges manufacturers to ensure repairability and the availability of spare parts (Directive (EU) 2024/1799, 2024; Sustainable consumption of goods…, 2023).

However, as Vitova (2025) notes, the directive's effectiveness is hindered by cultural and economic barriers: people are accustomed to replacing rather than repairing (Vitova, 2025, pp. 98–100).

3. What Accelerates Obsolescence Today

Technological Progress: Moore's Law is still in effect: processor power doubles every two years, causing electronics to become obsolete rapidly. But a "technology gap" has emerged – new technologies appear faster than consumers can master them.

Products become morally obsolete without having exhausted their physical lifespan. Research from the US National Institutes of Health shows that machine learning methods are already being used to predict the obsolescence of electronic components, taking into account technical characteristics and market dynamics (Component Obsolescence Risk…..2024).

For smartphones, for example, it is possible to predict when a model will cease to be relevant.

Psychological Obsolescence: This arises not from malfunctions but from fashion and shifting cultural norms. In terms of planned obsolescence, this is referred to as aesthetic drift – the deliberate change in design that makes previous models visually outdated while functionality remains intact (Planned Obsolescence Indicator, 2025).

Consumers increasingly demonstrate product durability neglect: a willingness to sacrifice longevity for the immediate possession of something new. This suits manufacturers just fine.

Environmental Regulation: Strangely enough, this cuts both ways. Bans on certain materials and requirements for energy efficiency can render products obsolete overnight, regardless of their actual quality (Bartels *et al.,* 2012, p. 20).

Yet, the same environmental agenda promotes product life extension through the circular economy.

Ahmed *et al.* (2025) demonstrate that diagnostic methods are being developed to assess the condition of components in products that have reached the end of their life cycle, enabling decisions on what can be reused and what should be disposed of (Ahmed *et al.,* 2025).

4. Indicator System: How to Distinguish Types of Obsolescence

Distinguishing between moral and economic obsolescence is not merely an academic exercise – specific actions depend on it. If a product is losing on price, discounts can be used. If it is morally obsolete, lowering the price only delays the inevitable. In that case, modernization or replacement is required.

5. What Indicates Moral Obsolescence

Technological lag can be easily measured by comparing the product's key characteristics with the market average. For smartphones, this includes performance, memory capacity, camera quality; for cars, fuel consumption, emission levels, and electronic assistants. When the gap becomes too noticeable, the product automatically falls into the category of yesterday's news (Component Obsolescence Risk Assessment, 2024).

Another marker is ***how frequently competitors change their design***. If in a given category appearances are updated every three or four years, but your product remains unchanged for seven, consumers begin to perceive it as outdated, even without delving into the specifications (Planned Obsolescence Indicator, 2025). This is psychological obsolescence: the item ceases to be visually relevant.

Repairability also reveals a great deal. In France, manufacturers are required to publish a repairability index on a ten-point scale. Low scores and a lack of spare parts are clear signs that a product was designed to be thrown away rather than repaired (Planned Obsolescence Indicator, 2025; Vitova, 2025). This is planned obsolescence embedded in the design.

For digital devices, there is another marker: ***the duration of software support***. When a manufacturer stops releasing updates, the device ceases to be safe and compatible with new applications. Physically, it works, but it can no longer be used. Formally, this is moral obsolescence, but the cause is not the technology itself but the company's decision. The case of slowing down older iPhones is a classic example.

6. What Indicates Economic Obsolescence

The first and most obvious indicator is ***price relative to competitors***. If a product is significantly more expensive than alternatives with the same features, demand will begin to fall. However, it's not just a high price that matters, but its dynamics: a product can become more expensive because competitors are getting cheaper while it remains static.

The second indicator is ***consumer reaction to price***. When a product ceases to be justifiably expensive, the elasticity of demand increases: small discounts yield

noticeable sales growth, while attempts to raise the price result in a sharp decline. This signals that consumers already consider the product overvalued.

The third is ***the total cost of ownership***. Some items are only cheap at first glance. Adding up the costs of maintenance, repairs, spare parts, and disposal might reveal that a "more expensive" competitor is ultimately more cost-effective.

When the cost of operation becomes too high, a product becomes economically obsolete, even if its shelf price looks attractive.

The fourth is ***the frequency and cost of repairs***. The logic is simple: if a repair costs half the price of a new device or more, the consumer is more likely to buy new than to bother with the old one (Planned Obsolescence Indicator, 2025).

Manufacturers are aware of this and sometimes build weak points into the design that are guaranteed to fail after the warranty period. For diagnosis, the fact itself matters: an increase in service requests and a rise in the average repair bill are warning signs.

All these metrics, when combined, do not just provide a snapshot but an understanding of which direction to take. Whether to lower the price or change the product – the answer depends on which type of obsolescence we have identified.

7. Integral Assessment of the Decline Stage

It is not enough to simply record the fact of obsolescence; one must understand exactly what we are dealing with. Otherwise, it is easy to choose a strategy at random. It is convenient to represent the situation in two coordinates: one axis assesses moral obsolescence, the other, economic obsolescence. Their combinations yield four fundamentally different scenarios, each with its own logic.

When both indicators are normal, the product is still holding its own and requires no intervention. If obsolescence is occurring along the qualitative dimension but the price remains acceptable, modernization is inevitable – discounts will not help here.

In the opposite situation, when the product is still good but losing on cost, price maneuvering is indeed appropriate.

The worst-case scenario is when both risks are high: the product is hopelessly outdated and cannot be made cheap – there is only one way out.

This approach guards against typical miscalculations. The most common of these is trying to use price to stop a decline in demand caused simply by the product no longer meeting customer needs.

8. Conclusion

The discussion of moral and economic obsolescence is not merely a nod to academic tradition. It is a question that affects real-world decisions: whether to discontinue a product, invest in its renewal, or simply adjust its price. The classic distinction between these two types of obsolescence has not become outdated, but today it is no longer sufficient.

Moral obsolescence no longer just means the appearance of a superior model – it now encompasses technological obsolescence, changes in design, the psychological perception of novelty, and even planned obsolescence engineered by the manufacturer. Economic obsolescence has also changed: one must consider not only the price but also the costs of operation, repair, and disposal.

The factors pushing a product toward decline do not act in isolation. Technologies accelerate product generation shifts, fashion changes perceptions of what is considered relevant, and environmental regulations can either drive a product from the market or extend its life. In such conditions, it is impossible to rely on a single universal indicator.

The proposed system of indicators offers a way, if not to predict decline, then at least to understand its nature in time. Some metrics are hard and quantifiable – market share, elasticity of demand, failure rates. Others are more nuanced, such as the speed of design changes among competitors or consumers' feeling that a product is "outdated."

Together, they allow for informed action rather than guesswork: not cutting the price where a redesign is needed, and not wasting resources on modernizing something that is losing on cost.

Next steps would involve testing these indicators on real markets – observing how they perform across different categories and which strategies prove more successful.

A separate topic is how environmental requirements and the transition to a circular economy will reshape the very concepts of obsolescence. It is possible that in a few years, the criteria will need to be reconsidered anew.

References:

Ahmed, W., Siva, V., Bäckstrand, J., Sarius, N., Sundberg, H.Å. 2025. Extending lifespan: Wear and non-wear component analysis in end-of-life products. MethodsX, vol. 14, article 103423.

Bartels, B., Ermel, U., Pecht, M., Sandborn, P. 2012. Strategies to the Prediction, Mitigation and Management of Product Obsolescence. Hoboken: John Wiley & Sons, 290 p.

Component Obsolescence Risk Assessment. National Institutes of Health. 2024. Available at: https://pmc.ncbi.nlm.nih.gov/articles/PMC10665736/. Table 4: Obsolescence metrics and forecasting methodologies.

Directive (EU) 2024/1799 of the European Parliament and of the Council on common rules promoting the repair of goods. Official Journal of the European Union, 2024.

Kotler, P., Keller, K.L. 2018. Marketing Management. 15th ed. St. Petersburg: Piter, (In Russ.).

Planned Obsolescence Indicator. Product Sustainability Directory. 2025. Available at: https://product.sustainability-directory.com/term/planned-obsolescence-indicator/.

Solovyova, L.L. 2009. Product Policy of an Enterprise. Moscow: INFRA-M, (In Russ.).

Sustainable consumption of goods – promoting repair and reuse: Commission Staff Working Document Impact Assessment Report. Brussels: European Commission, 2023.

Toshniyozova, M.I., Nizomova, D.A., Xo'jamberdiyeva, N.A. 2024. The Marketing Mix Revisited: Towards the 21st Century Marketing. American Journal of Economics and Business Management, vol. 7, no. 6, pp. 81-86.

Vítová, B. 2025. The Sustainability Concept in the Consumer Purchase Contract – Is the R2R Directive Sustainable Enough? International and Comparative Law Review, vol. 25, no. 1, pp. 84-105.