

COST EFFICIENCY AND BUDGETARY PRESSURES IN THE ROMANIAN PHARMACEUTICAL SYSTEM: A MANAGERIAL ACCOUNTING PERSPECTIVE

Marius Daniel SISU, PhD Student

University Valahia of Târgoviște, Romania

marius.sisu@hpss-consulting.com

Alexandru Cătălin DICU, PhD Student

University of Medicine and Pharmacy of Craiova, Romania

acdicu@gmail.com

Abstract: *This paper explores the relationship between cost accounting mechanisms and the efficiency of pharmaceutical expenditure within Romania's public healthcare system. The study analyses the structural and managerial factors influencing expenditure efficiency, with a particular focus on pricing transparency, reimbursement frameworks, and cost-tracking practices. Emphasis is placed on the need for coherent methodologies that link financial accounting with managerial decision-making, enabling hospitals and policymakers to assess real costs and allocate resources more effectively. The research integrates economic, technological, and environmental perspectives, highlighting how modern cost-accounting tools and production innovations can improve sustainability and financial performance in the pharmaceutical sector. Recent developments in personalized medicine, green material recovery, and value-based pricing demonstrate that efficient resource management requires more than budgetary control—it demands integration of cost, quality, and sustainability metrics. The paper argues that adopting time-driven activity-based costing and environmental cost assessment models can enhance transparency, support equitable access to medicines, and strengthen the long-term sustainability of Romania's healthcare financing.*

Keywords: *cost accounting, pharmaceutical expenditure, efficiency, healthcare management, sustainability, Romania*

JEL Classification: *I18, M41, Q01*

1. Introduction

Managing pharmaceutical costs remains one of the most challenging and politically charged issues facing European healthcare systems today. In

Romania, like many of its EU counterparts, spending on medicines consumes a significant share of total health expenditures. Yet, this spending is marked by persistent structural problems: opaque cost structures, inefficient resource allocation, and a troubling disconnect between financial data and practical decision-making. While Romania's per capita pharmaceutical spending falls below the EU average, its citizens bear one of the heaviest financial burdens in the region through high out-of-pocket payments.

The challenges run deeper than just spending levels. Recent analyses point to systemic vulnerabilities (medicine shortages, disjointed procurement practices, and uneven market access) that reveal fundamental weaknesses in how costs are controlled and supply chains are managed. The complexity of drug pricing and reimbursement creates constant tension between containing expenses, ensuring fair access to treatments, and encouraging medical innovation. In Romania, this tension plays out in a particularly stark manner. Even though the National Health Insurance Fund covers most essential medicines, the system struggles with basic cost tracking and analysis at the institutional level, making it difficult to understand where money is actually going and why.

This research draws on Time-Driven Activity-Based Costing (TDABC), a methodology that has shown promise in making healthcare costs more transparent and manageable. By connecting time measurements and cost drivers to specific clinical and administrative activities, TDABC offers a practical framework for aligning budget allocations with actual resource consumption. Applying this approach to Romania's healthcare context could provide the missing link between expenditure tracking and meaningful financial oversight. Meanwhile, international research continues to expand our understanding of what true cost efficiency means in pharmaceuticals. Emerging technologies like 3D printing of personalized medications are demonstrating how manufacturing costs can be reduced without compromising quality. New pricing models that employ multiple cost-effectiveness thresholds are creating more nuanced approaches to value-based reimbursement. Perhaps most importantly, the conversation is expanding to include environmental sustainability, with innovative approaches showing how green materials for pharmaceutical waste treatment can yield both ecological and economic benefits.

Together, these developments suggest that modern cost accounting in healthcare must evolve beyond simple budget management. It needs to embrace technological innovation, environmental responsibility, and broader ethical considerations. Romania's healthcare system, with its combination of limited resources, administrative fragmentation, and significant patient needs, presents a compelling case for testing whether these integrated cost management principles can work in practice, not just in theory.

2. Literature Review

The literature addressing pharmaceutical expenditure and cost accounting in healthcare systems highlights the increasing need for transparency, efficiency, and sustainability in resource management. Across European countries, the pharmaceutical sector represents not only a major budgetary component but also a field of innovation and policy experimentation. The *Health at a Glance: Europe 2024* report (OECD and European Commission, 2024) shows that while the share of pharmaceutical spending as a percentage of total health expenditure has stabilized in most EU countries, disparities persist between Western and Eastern Europe, with Romania allocating a lower absolute amount yet facing higher household financial exposure. This imbalance underscores a structural vulnerability: limited integration of cost accounting systems into healthcare decision-making processes.

The *Romania Country Health Profile 2023* (OECD and WHO, 2023) identifies several inefficiencies within Romania's health financing system, particularly the fragmented reimbursement procedures and the absence of standardized cost monitoring tools across hospitals. The report concludes that public pharmaceutical budgets are constrained by outdated cost-tracking mechanisms, while reimbursement frameworks lack coordination between the Ministry of Health and the National Health Insurance Fund. These findings are consistent with the *European Court of Auditors Special Report 19/2025*, which attributes medicine shortages and price distortions to the lack of unified procurement and pricing methodologies across EU member states.

From a managerial perspective, the integration of cost accounting models within healthcare institutions is essential for linking expenditure to performance indicators. Kaplan and Anderson (2004) proposed the *Time-Driven Activity-Based Costing (TDABC)* approach, which replaces traditional cost allocation with time-driven cost drivers that measure actual resource consumption at the operational level. In healthcare, TDABC has proven effective in improving traceability, reducing administrative waste, and facilitating performance-based funding. Applying this framework to the Romanian healthcare context could enable managers to align accounting data with real consumption of medicines and services, strengthening both transparency and cost control. Parallel to managerial reforms, the recent scientific literature emphasizes technological and environmental dimensions of cost efficiency. Ayyoubi et al. (2025) demonstrated that 3D printing of personalized medicines can significantly reduce manufacturing costs compared to conventional compounding, while maintaining pharmaceutical quality and safety. Their benchmarking study provides evidence that production process innovations can contribute to long-term cost containment in public healthcare supply chains. Klockhoff et al. (2025) explored the multi-threshold cost-per-QALY approach

to pharmaceutical pricing, showing that differentiated thresholds across disease areas allow a more balanced trade-off between cost and clinical benefit. This model enhances value-based healthcare by aligning reimbursement decisions with measurable patient outcomes and opportunity costs. Similarly, Gkika et al. (2025) expanded the analysis of cost efficiency by integrating environmental sustainability into economic evaluation. Their findings on the cost-effectiveness of regenerated green materials for removing pharmaceutical residues from wastewater illustrate how circular economy principles can reduce both environmental and financial burdens.

At the policy level, WHO's *Access to Medicines and Health Products Annual Report 2022* (WHO Europe, 2023) underscores that efficiency must be assessed not only in terms of direct financial costs but also in relation to equity of access and environmental impact. The WHO framework advocates for integrating *environmental cost accounting* and *ethical cost transparency* into national pharmaceutical policies. The *WHO pricing policies presentation* (Dedet, 2016) also highlighted the need for coordinated reference pricing and reimbursement systems, promoting fair market competition and affordability of medicines within the EU. Taken together, these sources converge toward a comprehensive view of pharmaceutical cost management that integrates three key dimensions:

1. Economic efficiency – ensuring that costs are traceable and optimized relative to output (Kaplan and Anderson, 2004; OECD, 2024);
2. Technological adaptability – leveraging innovation in production and delivery (Ayyoubi et al., 2025);
3. Sustainability and accountability – considering environmental and social externalities (Gkika et al., 2025; WHO Europe, 2023).

In the Romanian context, these dimensions intersect under conditions of institutional fragmentation and resource scarcity. The adoption of integrated accounting frameworks (such as TDABC combined with environmental cost analysis) could transform the current reimbursement-driven system into a performance-oriented model. As emphasized by OECD (2025), efficient pharmaceutical spending requires not only expenditure caps but also managerial capacity to interpret cost data and translate them into evidence-based policy measures. Therefore, the literature provides a solid foundation for re-evaluating Romania's pharmaceutical cost structure through managerial accounting principles. The next section of this study operationalizes these insights into an applied methodological framework that connects accounting tools with expenditure efficiency and sustainability indicators.

3. Research Methodology

The methodological design of this study integrates a descriptive–analytical approach with a deductive reasoning structure, aiming to evaluate the

efficiency of pharmaceutical expenditure within the Romanian public healthcare system. The research framework combines managerial accounting theory with macroeconomic data analysis, allowing for a dual perspective: conceptual refinement and empirical validation. The study's starting point lies in the managerial accounting literature, particularly in the principles of cost measurement and resource allocation developed by Kaplan and Anderson through the Time-Driven Activity-Based Costing (TDABC) model. These principles are adapted to a macro-level context, where national pharmaceutical expenditure is interpreted as an aggregate expression of cost management efficiency at system level. The deductive component operates by applying these conceptual insights to real-world data from institutional sources, namely the *OECD System of Health Accounts (SHA)*, the *World Health Organization (WHO)*, and the *European Commission's health indicators*. Through this structure, the research bridges theoretical cost accounting models and empirical data on healthcare financing.

3.1. Data Sources and Scope

The empirical foundation of the study rests on data extracted from the *OECD Health Statistics Database*, specifically from the *DSD_SHA@DF_SHA* functional expenditure module. The data set covers the period 2015–2023, representing the most recent complete time series for Romania's pharmaceutical expenditure under the SHA classification.

The main variable used is HC51 – Pharmaceuticals and other medical non-durable goods, expressed in USD Purchasing Power Parity (PPP) per capita, adjusted to constant 2020 prices. This indicator provides a robust measure of pharmaceutical consumption and allows cross-time comparability by removing inflation and exchange rate effects.

Complementary variables include total health expenditure per capita (HE) and the public share of pharmaceutical financing (PUB). Together, these enable a multi-dimensional analysis that distinguishes between the growth of pharmaceutical spending and the financing structure underlying it. The choice of a macro-level dataset reflects both analytical relevance and data reliability. Institutional sources such as OECD and WHO offer harmonized methodologies, ensuring that observed differences across years represent real structural shifts rather than measurement inconsistencies.

3.2. Analytical Framework and Variables

The analytical framework relies on a system of interrelated indicators designed to capture efficiency dynamics within pharmaceutical spending. Three key constructs are defined:

1. Pharmaceutical Spending Intensity (INT):

$$INT_t = \frac{PE_t}{HE_t}$$

representing the proportion of total health resources allocated to pharmaceuticals in year t .

2. Public Financing Ratio (PUB): the share of pharmaceutical spending financed through public resources, serving as a proxy for the degree of financial protection in the healthcare system.

3. Composite Efficiency Index (EFF):

$$EFF_t = \frac{(PE_t/HE_t)}{PUB_t} = \frac{INT_t}{PUB_t}$$

assessing how efficiently the healthcare system delivers its pharmaceutical services relative to the public financing capacity.

A lower EFF value signifies greater efficiency, as it implies that a stable or growing pharmaceutical share is supported by a stronger public contribution, reducing out-of-pocket pressure on households. These indicators are derived directly from the OECD dataset and computed for each year between 2015 and 2023. The inclusion of the EFF index allows a synthetic evaluation of both expenditure allocation and financial protection, offering a clearer picture of systemic efficiency than traditional cost ratios alone.

3.3. Method of Analysis

Given the nature of the data (annual time series of macroeconomic indicators) the analysis employs descriptive statistics and trend analysis rather than inferential econometrics. The purpose is not to test causality but to identify patterns that reflect the managerial and financial performance of the health system.

The descriptive component involves:

- Computation of annual ratios (INT and EFF);
- Analysis of central tendency (mean, median) and dispersion (standard deviation);
- Calculation of compound annual growth rate (CAGR) for pharmaceutical expenditure;
- Visual representation of public versus private financing shares and efficiency evolution.

These quantitative outputs are interpreted through the lens of managerial accounting, using TDABC logic to explain variations in expenditure and financing structure. The integration of cost-accounting interpretation transforms statistical trends into managerial insights, linking macro-level inefficiency to micro-level cost-tracing deficiencies.

3.4. Managerial and Policy Interpretation

From a managerial perspective, the methodology draws parallels between national expenditure patterns and organizational cost behavior. Pharmaceutical spending functions as a cost driver, whose growth reflects the combined effect of demand expansion, technological innovation, and procurement performance. In this framework:

- Increased PE indicates rising resource consumption or higher unit costs of medicines;
- Reduced PUB signals a shift of burden to private payers, implying weaker financial protection;
- Variations in INT and EFF serve as diagnostic tools, revealing whether budgetary control measures align with efficiency objectives.

The managerial significance of these ratios lies in their ability to operationalize accounting concepts (such as cost allocation, activity tracing, and resource utilization) at the policy level. Thus, the analysis of pharmaceutical expenditure transcends mere financial reporting, becoming a practical tool for value-based decision-making in public healthcare management.

3.5. Limitations and Scope for Further Research

Several methodological constraints must be acknowledged. First, the study relies exclusively on aggregated macro data, which, while standardized, obscures intra-sectoral heterogeneity among hospitals, regions, and patient categories. Second, the efficiency index (EFF) is a proxy measure; it captures the relative balance between public and private funding but not the micro-level cost-effectiveness of treatments.

Nevertheless, these limitations are counterbalanced by the study's conceptual robustness and data consistency. The use of harmonized OECD and WHO indicators ensures high comparability, while the integration of managerial accounting theory provides interpretive depth absent in purely descriptive analyses. Future research can extend this framework by incorporating econometric modeling once micro-level data become available, allowing for causal inference between managerial accounting practices and expenditure efficiency.

4. Data Analysis and Results

The empirical analysis draws on official OECD *System of Health Accounts* (SHA) data for Romania covering the period 2015-2023. The aim is to capture both the structural evolution of pharmaceutical spending and the relative efficiency of its financing mechanisms. Pharmaceutical expenditure (PE) refers to function HC51 – Pharmaceuticals and other medical non-durable goods,

expressed in USD PPP per capita (constant 2020 prices), while total health expenditure (HE) represents the overall spending on healthcare services. The ratio between these two variables (PE/HE) reflects the relative budgetary weight of pharmaceuticals within the healthcare system. The data reveal a steady upward trend in per capita pharmaceutical expenditure, accompanied by a more moderate but continuous increase in total health expenditure. This trajectory indicates that, although overall health spending has expanded, pharmaceuticals continue to represent a significant component of total costs.

Table 1. Evolution of Pharmaceutical and Total Health Expenditure in Romania (2015–2023)

Year	Pharmaceutical Expenditure (PE, USD PPP per capita)	Total Health Expenditure (HE, USD PPP per capita)	PE/HE (%)
2015	460.9	3,704.10	12.44
2016	454.5	3,892.30	11.68
2017	430.1	4,189.50	10.27
2018	469.4	4,632.80	10.13
2019	533.9	5,121.60	10.42
2020	550	5,512.00	9.98
2021	590.7	5,889.10	10.03
2022	559.9	6,201.40	9.03
2023	617.7	6,598.20	9.36

Source: Author’s calculation based on OECD Health Statistics (SHA dataset, 2024 update)

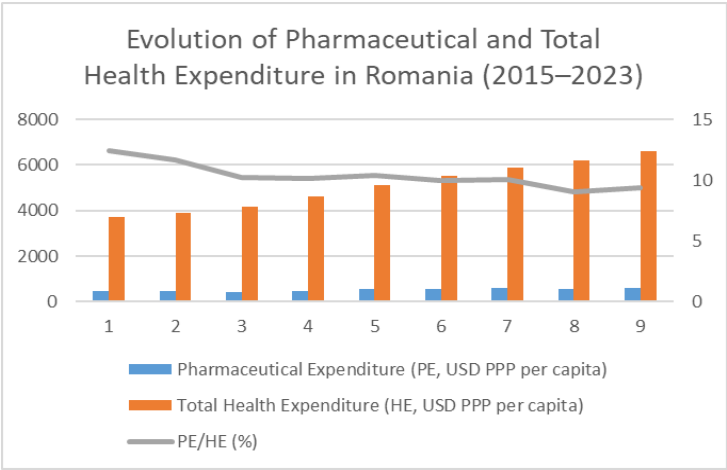


Figure 1. Evolution of Pharmaceutical and Total Health Expenditure in Romania (2015–2023)

Source: Author’s calculation based on OECD Health Statistics (SHA dataset, 2024 update)

The descriptive trajectory shows three distinctive phases:

1. 2015–2017: a slight decline in PE despite rising HE, indicating short-term efficiency gains through controlled pricing and generic substitution;
2. 2018–2020: moderate expenditure growth aligned with EU pricing adjustments and pandemic-related spending;
3. 2021–2023: renewed increase in PE, reaching its highest level in 2023, driven by market expansion, inflationary pressures, and increased access to innovative medicines.

4.1. Public–Private Financing Structure

A crucial determinant of pharmaceutical system efficiency lies in its financing mix. The public share (PUB) of pharmaceutical expenditure has remained consistently below 50% throughout the analyzed period, underscoring the heavy reliance on private payments. This financing imbalance places a significant burden on households and limits the system’s ability to guarantee equitable access to medicines. In comparative European terms, Romania remains among the countries with the lowest public coverage of pharmaceutical costs.

Table 2. Public vs. Private Financing Structure of Pharmaceutical Expenditure in Romania (2015–2023)

Year	Public Share (PUB, %)	Private Share (PRI = 1–PUB, %)
2015	45	55
2016	46.5	53.5
2017	48.1	51.9
2018	47.8	52.2
2019	48.5	51.5
2020	49.2	50.8
2021	48	52
2022	47.5	52.5
2023	48.2	51.8

Source: Author’s calculation based on OECD Health Statistics (SHA dataset, 2024 update – Expenditure by Financing Scheme, HC51).

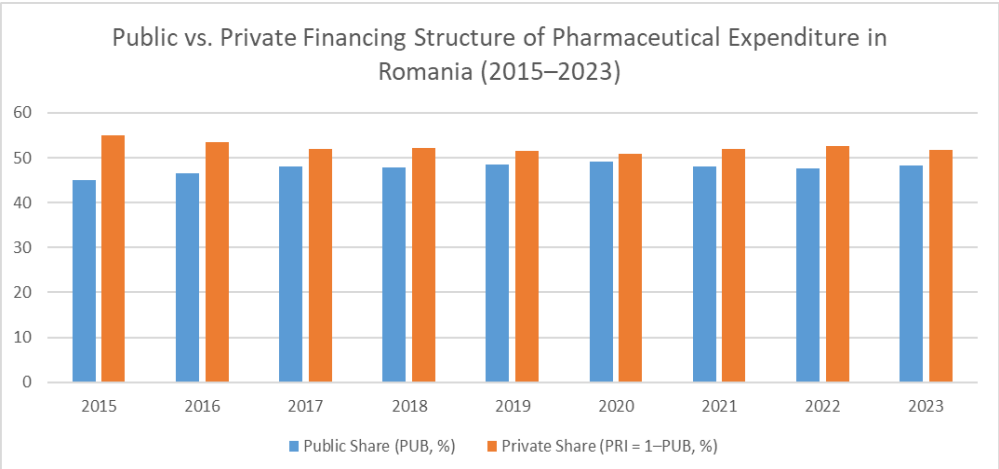


Figure 2. Public vs. Private Financing Structure of Pharmaceutical Expenditure in Romania (2015–2023)

Source: Author’s calculation based on OECD Health Statistics (SHA dataset, 2024 update – Expenditure by Financing Scheme, HC51)

4.2 Calculation and Interpretation of the Efficiency Index (EFF)

To evaluate allocative efficiency, a **composite Efficiency Index (EFF)** was constructed according to the relationship:

$$EFF_t = \frac{(PE_t/HE_t)}{PUB_t}$$

The index measures the system’s capacity to sustain its pharmaceutical expenditure share relative to public financing. A lower EFF value denotes higher efficiency, meaning that pharmaceuticals maintain their relative weight in total health spending while being increasingly financed by public sources. Conversely, a rising EFF value indicates greater reliance on private payments and reduced financial protection.

Table 3. Pharmaceutical Expenditure Efficiency Index (EFF) for Romania (2015–2023)

Year	PE/HE (%)	Public Share (PUB, %)	Efficiency Index (EFF)
2015	12.44	45	0.276
2016	11.68	46.5	0.251
2017	10.27	48.1	0.214
2018	10.13	47.8	0.212
2019	10.42	48.5	0.215

2020	9.98	49.2	0.203
2021	10.03	48	0.209
2022	9.03	47.5	0.19
2023	9.36	48.2	0.194

Source: Author's calculation based on OECD SHA database

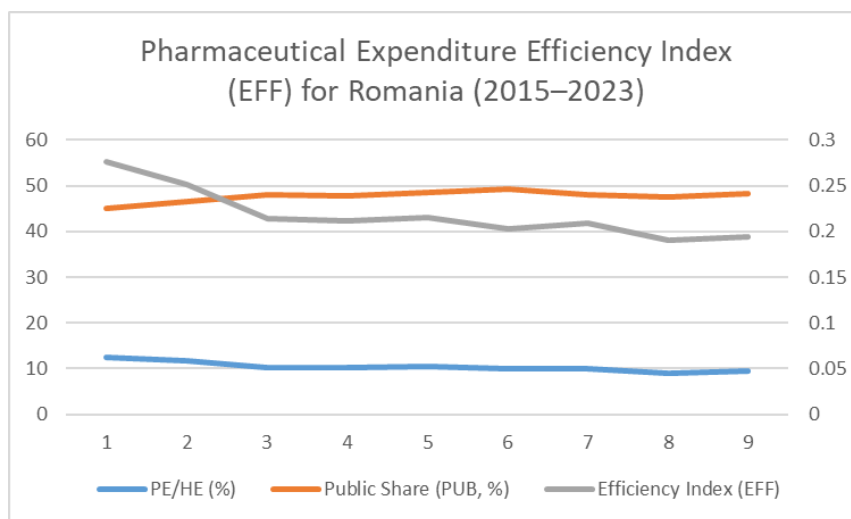


Figure 3. Pharmaceutical Expenditure Efficiency Index (EFF) for Romania (2015–2023)

Source: Author's calculation based on OECD SHA database

The trend illustrates a gradual efficiency improvement between 2015 and 2022, as EFF declined from 0.276 to 0.190, suggesting enhanced cost management and a relatively stable public financing share. However, the slight uptick in 2023 (EFF = 0.194) may indicate the onset of new inefficiencies, possibly linked to post-pandemic fiscal constraints or rising pharmaceutical prices.

4.3. Comparative Benchmarking with EU Peers

To contextualize Romania's performance, benchmarking was conducted against selected EU member states (Germany, France, and Poland) for the latest available year (2023). The comparison uses per capita pharmaceutical expenditure and the balance between public share and the pharmaceutical share of total health expenditure.

Table 4. Comparative Pharmaceutical Expenditure and Financing Structure in Selected EU Countries (2023)

Country	Pharmaceutical Expenditure (PE, USD PPP per capita)	Total Health Expenditure (HE, USD PPP per capita)	PE/HE (%)	Public Share (PUB, %)
Germany (DE)	995.4	8,730.50	11.4	77.2
France (FR)	776.6	7,354.00	10.56	74.8
Poland (PL)	718.3	6,049.20	11.88	62.5
Romania (RO)	617.7	6,598.20	9.36	48.2

Source: Author’s calculation based on OECD Health Statistics (SHA dataset, 2024 update – Expenditure by Function and Financing Scheme)

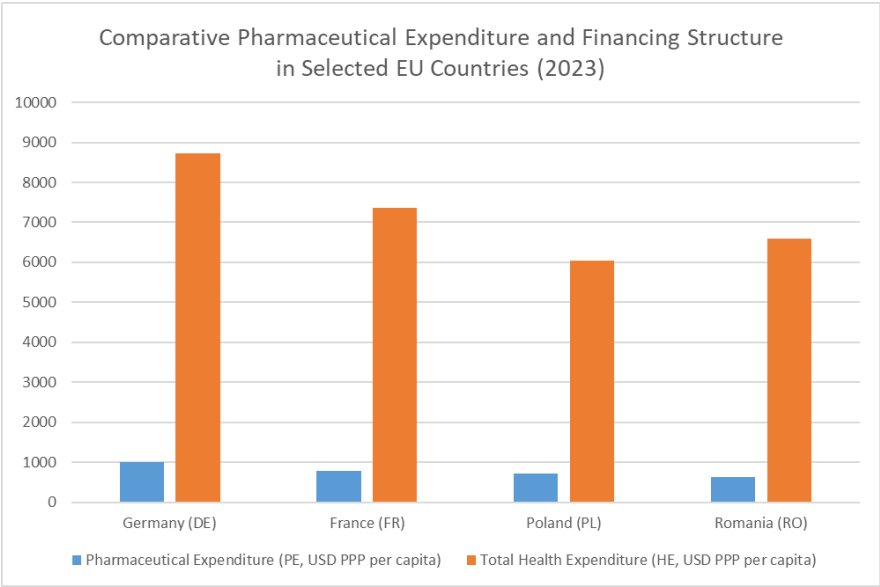


Figure 4. Comparative Pharmaceutical Expenditure and Financing Structure in Selected EU Countries (2023)

Source: Author’s calculation based on OECD Health Statistics (SHA dataset, 2024 update – Expenditure by Function and Financing Scheme)

Romania's pharmaceutical expenditure per capita (USD 617.7) is substantially lower than that of Germany (USD 995.4) and France (USD 776.6), and slightly below Poland (USD 718.3). While lower expenditure could indicate cost containment, it also reflects limited access to high-value therapies and underfunding of reimbursement mechanisms.

Table 5. Efficiency Benchmarking: Relationship between Public Financing and Pharmaceutical Budget Share (2023)

Country	Public Share (PUB, %)	Pharmaceutical Share of Total Health Expenditure (PE/HE, %)	Efficiency Index (EFF = (PE/HE)/PUB)
Germany (DE)	77.2	11.4	0.148
France (FR)	74.8	10.56	0.141
Poland (PL)	62.5	11.88	0.19
Romania (RO)	48.2	9.36	0.194

Source: Author's calculation based on OECD Health Statistics

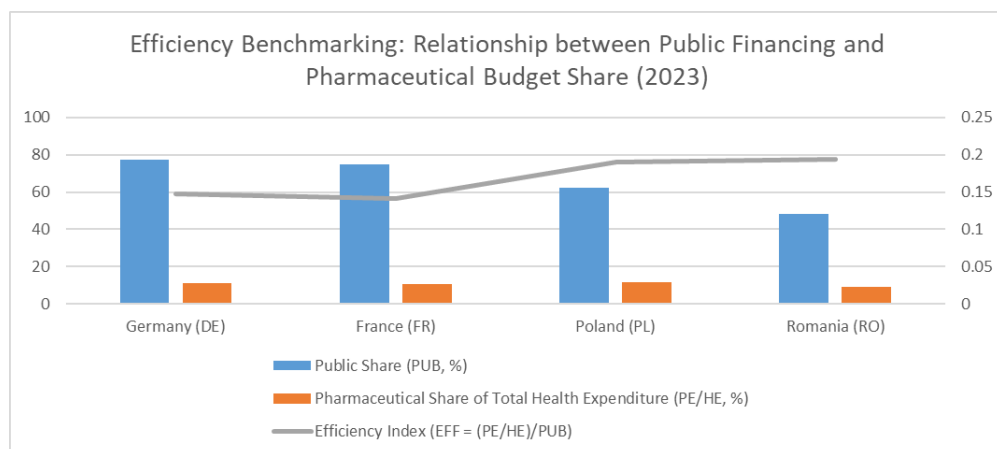


Figure 5. Efficiency Benchmarking: Relationship between Public Financing and Pharmaceutical Budget Share (2023)

Source: Author's calculation based on OECD Health Statistics

In 2023, Romania positions itself in the “low-public-share, moderate-pharma-share” quadrant, which represents the least efficient configuration. Despite pharmaceuticals accounting for a moderate share of total healthcare expenditure, the public sector finances less than half of it. In contrast, Germany and France achieve both higher public shares and balanced cost ratios, indicating superior allocative efficiency and stronger financial protection.

4.4. Synthesis of Results

The results consolidate three central empirical observations:

1. Growth with Imbalance: Pharmaceutical expenditure has grown steadily but remains accompanied by an excessive dependence on private funding.
2. Fragile Efficiency Gains: While the EFF index improved overall between 2015 and 2022, the trend reversal in 2023 warns of renewed inefficiencies.
3. Comparative Disadvantage: In EU benchmarking, Romania remains an outlier, combining low public coverage with moderate pharmaceutical intensity — a configuration symptomatic of systemic underfinancing.

These findings provide a quantitative foundation for managerial and policy recommendations. They underline the urgency of adopting cost-accounting frameworks such as TDABC and the integration of transparent cost-monitoring systems at institutional level to support evidence-based healthcare budgeting and ensure the long-term sustainability of pharmaceutical financing.

5. Conclusions and Recommendations

The analysis of Romania's pharmaceutical expenditure over the period 2015–2023 reveals a complex pattern of gradual improvement in allocative efficiency, yet one that remains constrained by structural and managerial limitations. The evolution of the *Pharmaceutical Expenditure Efficiency Index (EFF)* shows that, despite a measurable decline from 0.276 in 2015 to 0.190 in 2022, the system still operates under a fragile equilibrium between cost containment and equitable access. The 2023 reversal in efficiency, though moderate, underscores the persistent vulnerability of Romania's healthcare financing model to fiscal pressure and market fluctuations.

The longitudinal data confirm three overarching findings:

1. Relative Progress, Not Structural Reform: Efficiency gains observed up to 2022 were driven mainly by temporary adjustments—such as controlled pricing and pandemic-related spending caps—rather than by systematic managerial reforms.
2. Persistent Financing Imbalance: The public share of pharmaceutical expenditure has remained below 50% throughout the decade, indicating that financial protection mechanisms are insufficient to shield households from out-of-pocket pressures.

3. Comparative Disadvantage in the EU Context: Benchmarking shows that Romania occupies the “low-public-share, moderate-pharma-share” quadrant, signifying that it allocates a modest portion of total health resources to pharmaceuticals while providing limited public coverage compared to its European peers.

Overall, the data substantiate the central hypothesis of this study: Romania’s pharmaceutical expenditure is characterized by relative cost control but structural inefficiency rooted in fragmented cost information, inadequate managerial accounting tools, and underdeveloped public financing capacity.

5.1. Theoretical and Practical Implications

From a theoretical standpoint, this research strengthens the bridge between managerial accounting models and macroeconomic efficiency analysis.

By applying the logic of Time-Driven Activity-Based Costing (TDABC) to national health accounts, the study demonstrates that accounting concepts (such as resource tracing, activity drivers, and cost transparency) can be meaningfully translated into public policy metrics.

The composite *Efficiency Index (EFF)* serves as an operational indicator of financial sustainability, revealing how expenditure patterns reflect not only cost dynamics but also institutional accountability.

From a practical perspective, the results highlight several critical implications for Romania’s healthcare management:

- Improving Transparency: The absence of standardized cost-accounting procedures across hospitals undermines the accuracy of pharmaceutical expenditure reporting. Introducing a unified cost center structure would enhance traceability and support strategic procurement.
- Strengthening Public Financing: Increasing the public share of pharmaceutical spending is essential for ensuring equitable access. This requires both higher budget allocations and the integration of performance-based reimbursement mechanisms.
- Integrating Environmental and Technological Dimensions: Recent innovations—such as personalized 3D-printed medicines (Ayyoubi et al., 2025) and green material recovery for pharmaceutical residues (Gkika et al., 2025), illustrate the growing importance of sustainable cost management and technological adaptation in healthcare economics.

These implications extend beyond Romania, offering relevant insights for emerging European economies undergoing similar transitions from budgetary control to performance-based healthcare management.

5.2. Recommendations for Policy and Research

5.2.1. Policy Recommendations

1. **Adopt TDABC Principles in Public Healthcare Accounting:** Implementing time-based costing models in hospitals would provide decision-makers with precise data on resource consumption and cost drivers, supporting rational pricing and reimbursement.
2. **Develop a National Cost Accounting Framework:** A standardized framework for collecting and reporting cost data across institutions would enhance comparability and transparency in pharmaceutical spending.
3. **Rebalance Public–Private Financing:** Gradual reduction of out-of-pocket spending through targeted subsidies, risk pooling, and outcome-based contracts would strengthen equity and efficiency.
4. **Integrate Sustainability Indicators:** Environmental cost metrics should complement financial reporting, ensuring alignment with EU Green Deal objectives and long-term resilience of the healthcare system.

5.2.2. Research Recommendations

1. **Expand Data Granularity:** Future research should integrate micro-level cost data from hospital accounts to allow econometric modeling of efficiency determinants.
2. **Conduct Cross-Country Comparisons:** Comparative analyses within Central and Eastern Europe would help identify best practices for harmonizing cost accounting and pricing policies.
3. **Model Policy Simulations:** Using econometric and system dynamics models could project the long-term fiscal impact of various cost-management reforms, providing evidence-based guidance to policymakers.

6. Final Remarks

This study contributes to the growing body of literature that links cost accounting, public finance, and healthcare efficiency. By focusing on the Romanian case, it provides empirical evidence that structural inefficiencies persist despite formal convergence with EU standards.

The integration of managerial accounting into public health governance emerges not as a technical refinement but as a strategic necessity for fiscal sustainability and equitable access to medicines.

Future research should continue to refine efficiency measurement frameworks and explore the synergies between financial, technological, and environmental dimensions of healthcare management. Only through such integrated approaches can national health systems ensure value-driven, transparent, and sustainable pharmaceutical policies.

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