REVENUE TRENDS IN HEALTHCARE FACILITIES IN THE POST-PANDEMIC ERA

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Abstract
In a world where the demands of the healthcare sector are evolving rapidly, revenue efficiencies in healthcare facilities are becoming increasingly crucial. Effective revenue management not only ensures the financial sustainability of hospitals, but also plays a key role in improving the quality of care provided. The aim of this study is to conduct an econometric analysis of managerial performance as a function of revenue in Romanian hospitals. The objectives set for the study on revenues in health units are: O1 - To conduct a comprehensive literature review, through a detailed examination of relevant academic papers and case studies to identify current trends and research prospects related to revenue in the hospital sector; O2 - To develop an econometric model for assessing revenue trends, which will analyze and predict revenue trends in health units. The model uses relevant real data to generate accurate forecasts and provides a solid basis for strategic decision making in the sector; O3 - Study the impact of the COVID-19 pandemic on hospitals in Romania, assessing the effects of the COVID-19 pandemic crisis on the Romanian hospital system. The study will examine changes in hospital revenues, operational adaptations, and financial challenges faced during the pandemic, providing a comprehensive perspective on the resilience and adaptability of the health system in the face of a global crisis.

Keywords: *hospital performance; revenue; revenue trend.*

JEL Classification: M41

I. INTRODUCTION

In a rapidly changing world with increasingly complex health problems, an ageing population and rapid technological advances, effective management of health services is essential for access to quality healthcare. Hospital management focuses on the efficient organisation and management of hospital units. It aims to provide quality health care, patient care, efficient use of resources, through income earned and expenditure incurred, and the achievement of financial and operational objectives (Guerriero & Guido, 2011). A hospital's revenue is directly linked to its ability to provide quality healthcare. It funds the purchase of modern medical equipment, maintenance of infrastructure and investment in new technology, and provides the resources needed to deliver high quality care, including medicines, consumables and support services, directly influencing patient satisfaction and treatment outcomes, as well as the long-term financial viability of the hospital. For hospitals involved in research, the revenue enables the funding of clinical trials and research projects, contributing to medical progress. Through effective revenue management, the manager contributes to the implementation of strategic planning and the development of programmes for continuous improvement.

This study aims to conduct a dynamic econometric analysis of management performance in hospitals, focusing on how it is influenced by total revenue. To achieve this aim, the objectives set are:

O1: Conduct a literature review to identify research trends on the stated topic;
O2: to generate an econometric model on the trend of revenues in health facilities;
O3: the effects of the Covid 19 epidemic crisis on Romanian hospitals.

In order to achieve the stated aim and, implicitly, the three defined objectives, literature and statistical data will be used. The latter will be interpreted and analysed using an econometric approach.

II. LITERATURE REVIEW

In the current context of the health sector, hospital management, as described by Porter and Lee (2013) in "The Strategy That Will Fix Health Care", plays a key role in ensuring the efficiency and effectiveness of health care. Healthcare management is the planning, coordination, organization and evaluation of resources and processes in a healthcare system, with the aim of providing efficient, equitable and patient-centred care (Desebbe et al., 2016). Current managers consider that the main objective of hospital management is to increase the quality of medical services provided in relation to the patient's situation at discharge (Li et al., 2009). Any hospital wishing to maintain a high quality of service, while also considering cost-effectiveness, is aware that the only solution is to implement quality management of healthcare services. Continuously increasing the quality of the healthcare services provided (McCalman et al., 2018) is the most effective way of meeting the demands of citizens, is an effective defence against competition from the private sector and is the only way to develop and make a profit. Managers deal with complex issues ranging from the rational allocation of scarce resources to implementing innovative technologies and ensuring compliance with ethical and legal standards (Schulz & Johnson, 2003), as well as establishing effective management strategies.

Revenue maximization and effective expenditure management strategies, detailed by, are essential to meet today's economic challenges (Cross, 2011). These approaches include optimizing processes and adopting technological innovations. In this context, managers of hospital units, according to the vision presented by Burns et al. (2012) in Shortell and Kaluzny's Healthcare Management: Organization Design and Behavior, must balance financial requirements with patient and staff needs.

A hospital's total revenue is essential to its efficient operation and the provision of quality healthcare (Jha et al., 2005). These revenues come from many sources and are used to cover a wide range of costs, from salaries to investments in technology. Higher revenues allow institutions to invest in state-of-the-art equipment, hire qualified staff and implement continuous training programs for employees.

It is proposed as an econometric model (Macovei, 2021), a time series of the form:

$$Y = \alpha + \beta\,t + \gamma\,t^2 + \lambda\,t^3 + \varepsilon\,, \tag{1}$$

where: Y the dependent variable, t time variable, ε error variable and model parameters $\alpha, \beta, \gamma, \lambda$.

III. ECONOMETRIC MODEL REGARDING THE TREND OF REVENUES IN HEALTH CARE UNITS

Managing revenue from services provided in health facilities presents certain challenges. These include fluctuating demand for services, pressure to maintain competitive tariffs and the need to adapt to changes in health policy. Burns et al. (2012) suggest that adopting innovative strategies, such as optimizing billing processes and improving operational efficiency, can help maximize revenue. Revenues are vital to the operation and sustainability of health institutions, ensuring a steady flow of funds, allowing hospitals to cover operating expenses, invest in state-of-the-art equipment for efficient patient treatment, and ensure competitive salaries for medical and non-medical staff. These in hospitals come from various sources and are shown in Table 1.

Tabel 1. Types of hospital revenue and percentage of total revenue

Income from Concessions and Rentals	Income from services rendered	Income from contracts with Social Health Insurance Funds	Revenue from contracts concluded with the DSP from amounts allocated from the Ministry of Health's own revenue	Income from contracts concluded with DSP from amounts allocated from the State budget
0.07%	1.47%	53.35%	0.52%	6.44%
Revenue from contracts concluded with forensic medicine institutes	Donations and sponsorships	Subsidies from bug. for health capital expenditure	Subsidies from local budget FINUASS to cover salary increases	Other revenue from services and other activities
0.58%	0.07%	1.20%	36.12%	0.18%

Source: Own processing. Database https://extranet.anaf.mfinante.gov.ro/anaf

According to Table 1, income from concessions and leases, as well as donations and sponsorships, which represent the smallest percentage of total income. Revenue from concessions and leases is a significant component of hospitals' non-taxable revenue. These revenues are generated through the operation of available hospital premises and the rental of medical equipment and technology.

According to studies by Young et al. (2013), these revenue sources provide a substantial profit margin and help diversify revenues, reducing reliance on traditional sources such as payments for medical services. Donations and sponsorships, while contributing to total hospital revenues, have a relatively limited impact compared to other sources. This observation is supported by Porter and Lee's (2013) study, which points out that donations can play a crucial role in funding specific projects or purchasing state-of-the-art equipment, and they are not a constant or predictable source of revenue.

The next largest contributor to total revenue at 0.18% is other revenue from services and other activities. Revenue from contracts concluded with the DSP from amounts allocated from the Ministry of Health's own revenue represents 0.52% of total revenue. Contracts concluded between hospitals and the DSP are often financed from the Ministry of Health's (MoH's) own revenue, reflecting budget allocations based on specific criteria such as the health needs of the population and the efficiency of the health services provided. Contracts play a key role in securing funding for hospitals, with a direct impact on their ability to provide quality services. Revenues from contracts with forensic institutions represent 0.58% of total revenues and subsidies from local budgets for health capital expenditure represent 1.20% of total revenues. The mechanism for allocating grants from local budgets varies according to criteria such as community health needs, regional policy priorities and availability of financial resources.

According to studies by Porter and Lee (2013), efficient allocation of these funds is crucial to maximize their impact on public health. Total revenue contains 1.47% of service delivery revenue and there is a direct link between service delivery revenue and the quality of care provided. This leads to improved quality of care and increased patient satisfaction. Efficient management of revenues from contracts with Public Health Directorates financed from the state budget, which represent 6.44% of total revenues, is crucial for the financial stability of the health sector. Hospital managers must ensure that the funds received are used efficiently, maximising the benefits for patients and ensuring the long-term sustainability of services. This involves prudent management and strategic planning to adapt to changes in health policy and budget fluctuations. Subsidies from the FINUASS budget to cover salary increases is an important factor influencing total revenue and has a share of 36.12%. Salary increases are an important tool for motivating and retaining health employees.

According to Burns et al. (2012), FINUASS subsidies allow hospitals and other health institutions to offer competitive salaries without compromising their financial stability or ability to provide quality health services. Income from contracts with the Social Health Insurance Funds has the largest share of total income, i.e. 53.35%. Effective management of contracts with social health insurance funds requires careful negotiation and close monitoring of compliance with quality criteria and standards. Burns et al. (2012) stress the importance of adapting to the changing requirements of the insurance system and optimising service provision to maximise revenue.

Income maximisation strategies are key to meeting today's economic challenges, even in the health sector. These approaches include optimising processes and adopting technological innovations. Analysing all types of revenue: Income from Concessions and Rentals, Income from Services, Income from Contracts with Social Health Insurance Houses, Income from Contracts with DSP from amounts allocated from the State Budget, Income from Contracts with DSP from amounts allocated from the Ministry of Health's own income, Income from Contracts with Forensic Medicine Institutes, Other Income from Services and Other Activities, Donations and Sponsorships, Subsidies from the Bug. for capital expenditure on health, Subsidies from the Bug. for capital expenditure on health and Subsidies from the local budget FINUASS to cover salary increases, there is a cubic or quadratic evolution of these, all with an upward trend.
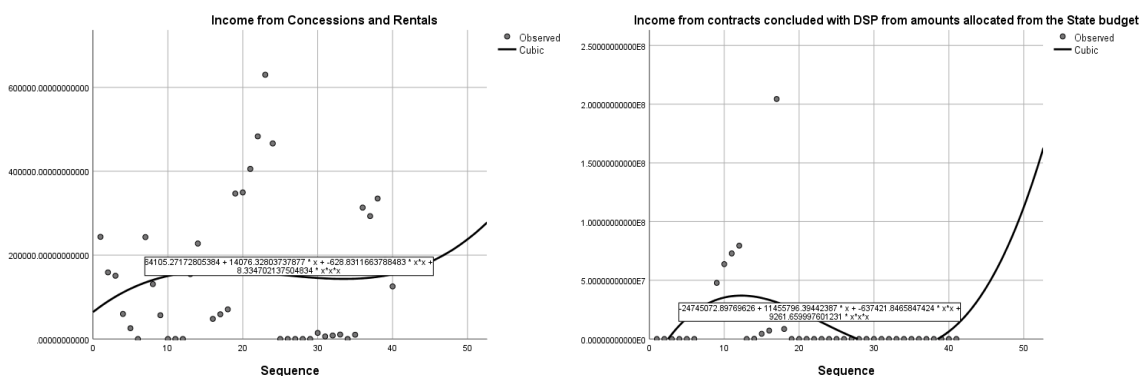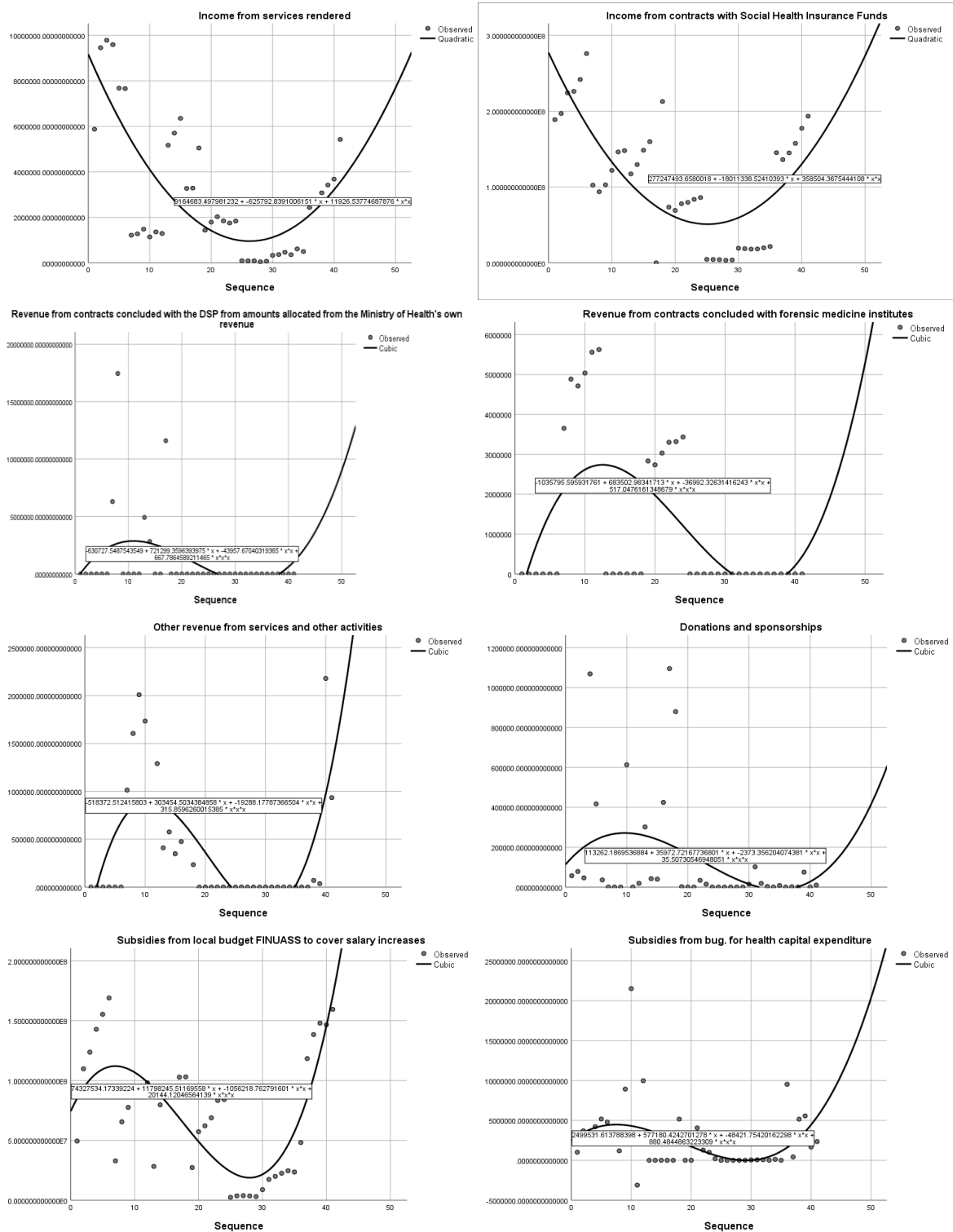
Figure 1. Evolution of different types of income in health units
Source: Authors Computation with the aid of IBM SPSS Statistics, version 26

An upward trend in all types of income in health care facilities suggests increasing demand for the health care services provided. This is the result of the Covid-19 pandemic, which generated significant demand for health services, including testing, treatment and intensive care. This increase in demand has led to an increase in all types of revenue for many health facilities. Analysing the evolution of all revenues in health units we obtain the results from Table 2, where it can be seen that across the model there is a significant relationship and a strong correlation, R = 0.836. According to the determination ratio R2 = 0.698, we find that the change in total income is 69.8% explained over time. The variation in revenues of health facilities is due to: changing medical requirements, technological innovations, new more expensive treatments, health regulations and compliance requirements.

Table 2. Model Summary

R	R Square		Adjusted R Square	Std. Error of the Estimate
.836	.698		.674	104489366.131

Source: Authors Computation with the aid of IBM SPSS Statistics, version 26

Demand for health services fluctuates according to demographic factors, epidemics, or changes in the prevalence of certain diseases. During the period under review, Romania is facing the Covid-19 pandemic, which has led to an increase in demand for emergency medical care and specific treatments.

Table 3. ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	934709332201085440.000	3	311569777400361790.000	28.537	.000
Residual	403967022477546500.000	37	10918027634528284.000		
Total	1338676354678631940.000	40			

Source: Authors Computation with the aid of IBM SPSS Statistics, version 26

The model obtained confirms the upward trend in health unit revenues for the hospitals analysed.

Table 4. Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
Case Sequence	35968958.787	14613038.171	2.355	2.461	.019
Case Sequence ** 2	-3632856.177	803272.382	-10.303	-4.523	.000
Case Sequence ** 3	71689.918	12581.136	8.043	5.698	.000
(Constant)	315083456.511	71730632.139		4.393	.000

Source: Authors Computation with the aid of IBM SPSS Statistics, version 26

According to Table 4 we can write the model equation:

$$TOTAL\ REVENUE_t = 315083456.511 + 71689.918\ t - 3632856.177 \cdot t^2 + 71689.918 \cdot t^3$$
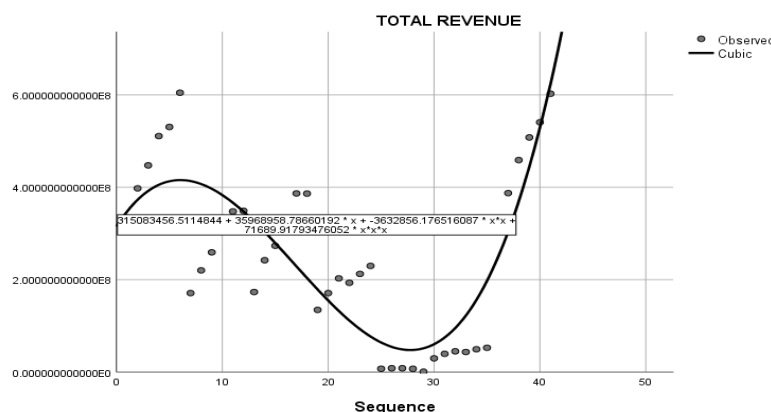
and the model determined has the graph:

Figure 2. Evolution of total revenue
Source: Authors Computation with the aid of IBM SPSS Statistics, version 26

The upward trend in revenues in health facilities is a positive indicator of health management's financial stability, showing its ability to respond to the changing needs of the population and to invest in continuous improvements. In the aftermath of the Covid-19 pandemic, government policies have been to increase revenues to expand the range of services offered by health facilities, including the introduction of new treatments, technologies or specialisations. Cross-correlation analysis (Podobnik & Stanley, 2008) between different types of revenue and total revenue is shown in Figure 3 and is a valuable tool for understanding the financial health and dynamics of an organisation, providing clues to its economic strengths, vulnerabilities and opportunities.
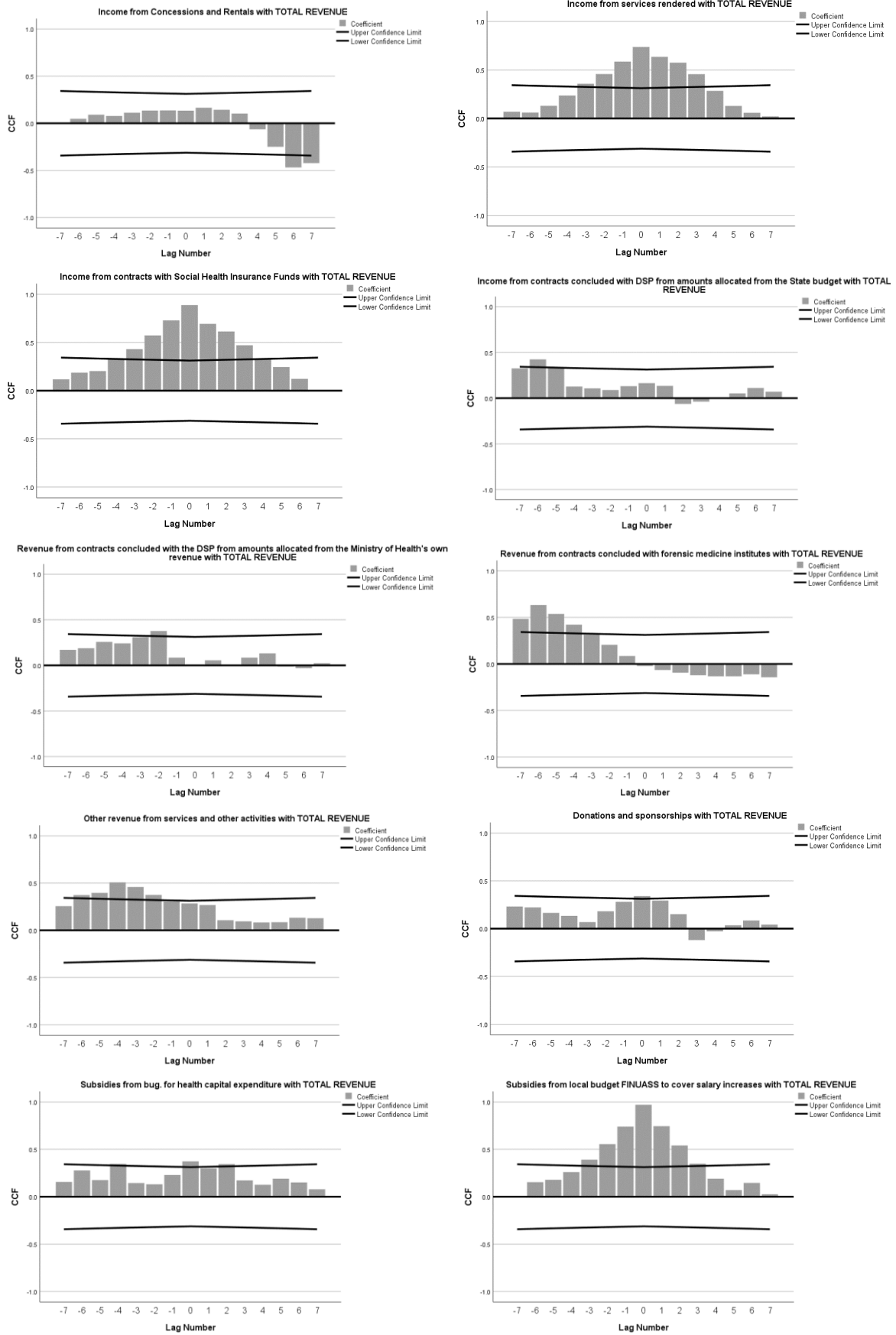
Figura 3. Cross Correlations between different types of income and total income
Source: Authors Computation with the aid of IBM SPSS Statistics, version 26

Hospitals face challenges such as changes in health policy, fluctuations in insurance coverage and pressures to reduce costs. The Covid-19 pandemic has generated significant demand for medical services, including testing, treatment and intensive care. This increase in demand has led to increased revenues for many health facilities (Mossialos & Dixon, 2002; Fisher et al., 2006). Challenges in revenue management include fluctuations in government funding, changes in health policy, and rising operational costs. Many governments have allocated additional funds to health systems to cope with the pandemic. These funds have helped cover additional costs and contributed to increased revenues.

IV. CONCLUSION

The critical role of revenue in hospital management and the complexity of managing financial resources in a sector that prioritises patient care highlight the importance of a balanced and innovative approach to hospital management. Revenue efficiency in healthcare facilities is essential to ensure that hospitals can continue to provide quality services and meet the changing needs of patients. By adopting innovative strategies and focusing on efficiency, hospitals can successfully navigate financial challenges and continue to play a vital role in the health of the communities they serve.

Within the financial ecosystem of health institutions, the analysis of revenues from contracts with the Public Health Directorates, financed from the Ministry of Health's own revenues, is of particular importance. These revenues are a key element in the financial structure of hospitals, reflecting the interaction between public health policies and resource management at the level of health services. It is imperative that hospital institutions understand the dynamics and implications of revenues generated through contracts with Social Health Insurance Funds. This understanding allows hospitals to navigate the complex financial landscape more effectively, ensuring sustainability of healthcare services in the context of fluctuating health policies. Contracts with the Social Health Insurance Funds are a fundamental pillar of financing in the health sector. Total hospital revenues are fundamental to ensuring a high level of health care and adaptability to the changing demands of the health sector.

This study provides a broad overview of total revenue in health facilities, highlighting the various sources of revenue and the importance of strategic and effective revenue management to ensure high quality health care.

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