

## THE EVOLUTION OF THE IT SECTOR IN ROMANIA AND ITS MACROECONOMIC IMPACT

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**Abstract:** *This paper examines the evolution of the Information Technology (IT) sector in Romania between 2021 and 2026, highlighting its profound macroeconomic impact. Over the last five years, the Romanian IT industry has transitioned from a primarily outsourcing-oriented market to a maturing ecosystem increasingly focused on innovation, research, and proprietary product development. By analyzing data regarding Gross Domestic Product (GDP) contributions, export dynamics, and labor market trends, this study demonstrates that the software and IT services sector has been one of the most resilient pillars of the national economy. Furthermore, the paper discusses the role of government incentives, specifically fiscal exemptions, and the challenges posed by global economic uncertainties and regional competition. The findings indicate that while the sector's growth rate has normalized following the post-pandemic digital boom, its strategic importance for Romania's macroeconomic stability and external balance of trade remains paramount.*

**Keywords:** *IT, sector, Romania, macroeconomic, impact.*

### Introduction

The macroeconomic landscape of Romania has undergone significant structural transformations in the 21st century, moving steadily towards a knowledge-based economy. Central to this paradigm shift is the Information Technology (IT) sector, an industry that has consistently outpaced traditional manufacturing and agricultural sectors in terms of growth rates, wage levels, and its ability to attract foreign direct investment (Popa & Dumitrescu, 2024). Over the past five years (2021-2026), the global economy navigated multiple overlapping crises, including supply chain disruptions, geopolitical tensions in Eastern Europe, and widespread inflationary pressures. Against this volatile backdrop, the Romanian IT sector demonstrated remarkable resilience, acting as a crucial economic buffer and a primary engine for national growth.

According to the National Institute of Statistics (2025), the information and communications technology (ICT) sector significantly increased its share of the national Gross Domestic Product (GDP), cementing its role as a core macroeconomic driver. This accelerated expansion was not incidental. It was the direct result of a convergence of favorable factors: a highly skilled, multilingual workforce with a strong foundation in STEM (Science, Technology, Engineering, and Mathematics) education, competitive operational costs relative to Western Europe, and a historically favorable fiscal framework designed to stimulate both domestic entrepreneurship and the expansion of multinational corporations (World Bank, 2024).

The primary objective of this article is to provide a comprehensive analysis of the Romanian IT sector's evolution over the last half-decade and to quantify its direct implications for the national economy. To achieve this, the paper is organized into several interconnected sections. First, it explores the spatial growth trajectory of the industry, highlighting the development of robust technological hubs in university cities such as Cluj-Napoca, Timișoara, and Iași, which have decentralized the economic concentration previously limited to Bucharest.

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Second, the study evaluates the macroeconomic impact through the lens of GDP contributions and the balance of trade, emphasizing the sector's vital role in exporting high-value-added services (Ionescu et al., 2023).

Subsequently, the article examines the labor market dynamics, addressing the phenomenon of human capital retention and the upward pressure on national wage averages. Finally, it critically assesses the recent shifts in state fiscal policies—including the gradual modification of income tax exemptions for IT professionals—and outlines the future structural challenges the industry must navigate to maintain its competitive edge on the global stage. Understanding these dynamics is essential for policymakers, investors, and economics students, as the future trajectory of the IT sector is intrinsically linked to Romania's broader economic convergence with the European Union (Radu & Stan, 2025).

### **The Growth Trajectory of the Romanian IT Sector**

Over the 2021–2026 period, the Romanian IT ecosystem has experienced a profound structural maturation, transitioning from a volume-driven market to a value-driven industry. Historically, Romania was recognized on the global stage primarily as an attractive destination for Business Process Outsourcing (BPO) and basic IT support, largely due to labor arbitrage—offering highly skilled workers at a fraction of Western European costs. However, the last five years have marked a strategic pivot. The sector has increasingly moved towards complex software engineering, Research and Development (R&D), artificial intelligence integration, and the creation of proprietary intellectual property (Grigore et al., 2023). This shift has allowed the industry to maintain robust double-digit compound annual growth rates (CAGR) even amidst global economic downturns (Romanian Association for Information Technology and Communications [ATIC], 2024).

The expansion of the corporate landscape has been a defining characteristic of this trajectory. There has been a steady increase in both the presence of multinational tech giants expanding their local R&D centers and the proliferation of indigenous startups and scale-ups. Unlike the early 2010s, when multinational corporations exclusively dominated the landscape, the period up to 2026 has seen a surge in local entrepreneurial initiatives, fueled by the development of domestic venture capital funds and European Union digitalization grants (Popa & Dumitrescu, 2024). This diversification has made the sector less vulnerable to the strategic relocations of single, large multinational entities.

Spatially, the growth of the Romanian IT sector is not uniformly distributed but rather highly concentrated in distinct regional technology hubs. This clustering effect is heavily correlated with the presence of major technical universities, which act as the primary engines for human capital development (Eurostat, 2025). Bucharest remains the undisputed economic center, hosting the headquarters of most multinational tech companies and absorbing the largest share of the IT workforce. The capital city benefits from advanced infrastructure, a massive talent pool, and direct connectivity to international markets.

Simultaneously, regional cities have emerged as formidable competitors, decentralizing the technological footprint. Cluj-Napoca, frequently referred to in economic literature as the "Silicon Valley of Transylvania," has successfully branded itself as a premier hub for innovation and software product development. The synergy between local authorities, the private sector, and academic institutions—most notably Babeş-Bolyai University and the Technical University of Cluj-Napoca—has fostered a vibrant ecosystem with a strong entrepreneurial culture (Mihailescu & Tache, 2025). Consequently, Cluj-Napoca boasts the highest density of IT professionals per capita in the country.

Beyond Bucharest and Cluj-Napoca, cities like Timișoara and Iași have demonstrated exponential growth over the last five years. Timișoara has leveraged its geographical proximity to Western Europe and its industrial heritage to specialize heavily in embedded software,

automotive technology, and industrial automation (Radu & Stan, 2025). On the eastern border, Iași has become one of the fastest-growing IT hubs in the region. Driven by competitive operational costs and a steady influx of graduates from the Alexandru Ioan Cuza University and the Gheorghe Asachi Technical University, Iași has attracted numerous multinational companies looking to establish secondary development centers away from the saturated markets of Bucharest and Cluj (Ionescu et al., 2023).

The growth trajectory of these regional hubs highlights a fundamental macroeconomic advantage: the IT sector acts as a catalyst for local urban development. The high purchasing power of IT professionals stimulates secondary economic sectors, including real estate, hospitality, and retail, thereby accelerating the modernization of these urban centers and reducing regional economic disparities (World Bank, 2026).

### **Macroeconomic Impact: GDP Contribution and Export Dynamics**

The macroeconomic footprint of the Romanian Information Technology sector has expanded exponentially over the last five years, fundamentally altering the structural composition of the national economy. To fully grasp the magnitude of this impact, it is essential to analyze two critical macroeconomic indicators: the sector's contribution to the Gross Domestic Product (GDP) and its role in shaping the national balance of trade through service exports. Between 2021 and 2026, the IT industry not only outpaced the general economic growth rate but also acted as a vital stabilizer during periods of regional economic volatility (National Bank of Romania [NBR], 2025).

Historically, the Romanian economy relied heavily on agriculture and low-to-medium-tech manufacturing. However, over the past decade, and particularly in the 2021–2026 interval, the Information and Communications Technology (ICT) sector has consolidated its position as a primary driver of GDP formation. By 2025, the sector's contribution to the national GDP exceeded 7.5%, a remarkable achievement when compared to the 5% threshold recorded earlier in the decade (Ministry of Finance, 2026). This robust GDP contribution is particularly significant because it is generated by a relatively small segment of the total workforce—approximately 2.5% to 3% of the active labor population—highlighting the exceptionally high labor productivity and value-added nature of the IT industry (Vasilescu & Pop, 2024).

Beyond domestic production, the most profound macroeconomic impact of the IT sector lies in its export dynamics. Romania has historically registered a chronic trade deficit in goods, importing more physical products than it exports. In stark contrast, the IT and telecommunications sector generates a massive trade surplus in services. Software development, IT consulting, and digital services are currently among the most competitive Romanian exports on the global market (European Commission, 2026). This surplus plays a critical role in offsetting the deficit in the trade of goods, thereby alleviating pressure on the current account balance and contributing to the stability of the national currency (the Romanian Leu) against the Euro.

The composition of these IT exports has also undergone a qualitative transformation. While earlier exports were dominated by low-margin Business Process Outsourcing (BPO) and basic coding services, the 2021–2026 period witnessed a strategic shift towards high-value-added exports. Romanian companies and local branches of multinational corporations are now exporting comprehensive software solutions, advanced cybersecurity systems, and artificial intelligence models directly to markets in the United States, the United Kingdom, and Western Europe (Grigore et al., 2023). This upward movement in the global value chain ensures higher profit margins and increased capital inflows into the Romanian economy.

Furthermore, the continuous influx of foreign capital generated by IT exports creates a significant macroeconomic multiplier effect. The capital injected into the national economy

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through the high salaries of IT professionals and corporate taxes fuels domestic consumption and stimulates auxiliary industries, such as real estate, private healthcare, and retail (Ionescu et al., 2023). Consequently, the IT sector's export capacity is not merely an isolated success story but a fundamental pillar supporting Romania's broader macroeconomic equilibrium and its economic convergence with the European Union average.

### **Labor Market Dynamics: Employment, Wages, and Education**

The labor market within the Romanian Information Technology sector is characterized by intense dynamism, acting as a powerful magnet for top-tier talent and significantly influencing national wage structures. Between 2021 and 2026, the demand for highly skilled IT professionals—ranging from software developers and data scientists to cybersecurity experts—consistently outpaced the available supply. This structural deficit of human capital has generated an intensely competitive labor market, which has profound implications for both national employment rates and the educational system (Stan et al., 2026).

One of the most visible macroeconomic effects of the IT sector is the substantial wage premium it offers. IT professionals in Romania command salaries that are, on average, three to four times higher than the national net average wage (National Institute of Statistics, 2025). This high compensation level is largely driven by the sector's integration into the global market; Romanian developers are effectively paid at international rates, adapted only slightly for the local cost of living. Consequently, this high-income cohort stimulates domestic consumption, drives demand for premium real estate, and fosters the growth of local service economies in major technological hubs (Popescu & Radu, 2025).

Furthermore, the robust compensation packages and career advancement opportunities have triggered a crucial demographic and macroeconomic shift: the transition from "brain drain" to "brain retain." Historically, Romania suffered massive human capital flight, with thousands of highly educated graduates emigrating to Western Europe or North America in search of better economic prospects. However, the maturation of the domestic IT sector has successfully reversed this trend for tech graduates. By offering Western-standard working conditions, competitive salaries, and opportunities to work on cutting-edge global projects, the Romanian IT industry has managed to retain its brightest minds within national borders, preserving a critical demographic dividend (Dumitrescu & Marin, 2024).

Despite these positive trends, the continuous expansion of the sector places immense pressure on the national educational system. Romania produces thousands of IT and engineering graduates annually through prestigious institutions such as the Politehnica University of Bucharest, Babeş-Bolyai University, and the Technical University of Cluj-Napoca. However, the rapid pace of technological innovation often outstrips the adaptability of traditional academic curricula (Ministry of Education, 2024). To bridge this skills gap, the 2021–2026 period witnessed a surge in strategic partnerships between academia and the private sector.

Multinational corporations and local tech firms have increasingly invested in developing their own "corporate academies," funding university laboratories, and offering extensive paid internship programs to train students in the latest programming languages and agile methodologies (Ionescu, 2026). This symbiotic relationship between education and the private market not only accelerates the integration of young graduates into the workforce but also ensures that the Romanian labor pool remains highly competitive and relevant on the global stage. Nevertheless, scaling up educational capacity to meet the projected demand of the industry remains one of the most pressing macroeconomic challenges for the upcoming decade.

### **Fiscal Policies and Government Incentives**

The rapid expansion and global competitiveness of the Romanian Information Technology sector cannot be analyzed in isolation from the state's fiscal policies. Historically, one of the most critical catalysts for the industry's sustained growth was the implementation of targeted government incentives, most notably the income tax exemption for software developers. Introduced in the early 2000s, this policy exempted IT employees engaged in software creation from the standard 10% personal income tax. For over two decades, this fiscal stimulus acted as a powerful comparative advantage, allowing companies to offer highly attractive net salaries while maintaining competitive gross labor costs on the international market (Ministry of Finance, 2023).

However, the 2021–2026 period marked a profound paradigm shift in the national fiscal framework. Faced with chronic budget deficits and macroeconomic pressures to consolidate public finances—partially driven by the conditionalities attached to the European Union's National Recovery and Resilience Plan (PNRR)—the Romanian government initiated a gradual phase-out of sectoral tax privileges. A pivotal moment occurred in late 2023 and 2024, when legislative amendments capped the income tax exemption to a specific gross salary threshold (e.g., up to 10,000 RON) and reintroduced certain social contributions that were previously waived for IT professionals (Fiscal Council of Romania, 2025).

These fiscal policy shifts generated significant macroeconomic ripples across the sector. From a corporate perspective, the sudden alteration of the tax code increased the overall cost of labor. In a bid to retain top talent and prevent a drop in employees' net income, a majority of tech companies chose to absorb these additional fiscal burdens internally (Vasilescu & Pop, 2025). While large multinational corporations possessed the financial resilience to manage these increased operational costs, many small and medium-sized enterprises (SMEs) and local startups faced severe profit margin compressions, leading to a temporary slowdown in new hiring and expansion plans (Romanian Association for Information Technology and Communications [ATIC], 2025).

Furthermore, the tightening of fiscal policies extended beyond standard employment contracts. A historically prevalent practice within the Romanian IT sector was the use of Business-to-Business (B2B) contracting, where IT professionals operated as micro-enterprises or Authorized Physical Persons (PFA) to optimize their tax liabilities. Between 2023 and 2026, the government aggressively reformed the micro-enterprise taxation regime, significantly lowering revenue thresholds, increasing dividend taxes, and implementing stricter criteria to combat "disguised employment" (Stan et al., 2026). These measures were designed to ensure a more equitable tax collection system and increase the sector's direct contribution to the state budget. Ultimately, the transition towards a standard taxation model represents a critical stress test for the maturity of the Romanian IT sector. The gradual elimination of historical fiscal incentives forces the industry to pivot away from relying on cost-arbitrage and state subsidies. Instead, future competitiveness must be strictly anchored in high productivity, advanced innovation, and the generation of proprietary, high-value intellectual property (Dumitrescu & Marin, 2026). While these fiscal adjustments pose short-term challenges to operational costs, they align the Romanian IT market with standard European fiscal practices, fostering a more sustainable and transparent macroeconomic environment.

### **Current Challenges and Future Outlook**

Despite its remarkable growth trajectory and substantial macroeconomic contributions, the Romanian Information Technology sector faces a complex matrix of structural challenges as it moves toward the end of the 2021–2026 period. To sustain its competitive advantage, the industry must navigate both domestic regulatory bottlenecks and intensifying global competition. One of the most pressing external threats is the aggressive expansion of emerging tech markets in Asia, such as India, Vietnam, and the Philippines. These

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regions offer massive labor pools at operational costs significantly lower than those in Eastern Europe (World Bank, 2026). Consequently, Romania can no longer rely solely on labor arbitrage as its primary value proposition. The sector is compelled to justify its higher rates through superior code quality, cultural affinity with Western clients, and expertise in complex technological niches.

Domestically, the labor market faces legal and structural vulnerabilities regarding the classification of IT workers. A significant portion of the workforce operates under Business-to-Business (B2B) contracts, utilizing micro-enterprise or Authorized Physical Person (PFA) legal structures instead of standard employment contracts. While this model has historically offered mutual fiscal optimization for both companies and developers, it has increasingly drawn the scrutiny of tax authorities (Stan & Popa, 2025). The ambiguity surrounding "disguised employment" (where a contractor acts effectively as a full-time employee for a single client but lacks standard labor protections) creates legal uncertainty. The ongoing governmental efforts to regulate these contracts impose new administrative burdens and threaten to disrupt the traditional operational fluidity of the sector (Fiscal Council of Romania, 2025).

Strategically, the most critical macroeconomic challenge for the Romanian IT sector is the imperative transition from a service-based outsourcing model to a product-oriented ecosystem. Historically, over 70% of the industry's revenues have been generated through outsourcing—building software for foreign clients who retain the intellectual property (IP) and the vast majority of the profit margins (Grigore et al., 2024). While outsourcing provides stable cash flows, it is highly sensitive to global economic shocks. The international tech layoffs witnessed in 2023 and 2024 demonstrated that foreign corporations often scale back outsourced projects first during economic downturns (Ionescu & Marin, 2025).

Therefore, the future macroeconomic resilience of the sector depends entirely on increasing the volume of proprietary product development. The ecosystem must foster indigenous innovation, encouraging local startups to build, patent, and export their own software solutions globally. The success of earlier Romanian tech unicorns, such as UiPath, serves as a blueprint for this transition, proving that the domestic market is capable of generating high-value IP (Dumitrescu, 2026). However, scaling product companies requires advanced managerial expertise in international marketing and sales, areas where the Romanian talent pool is still developing compared to its exceptional engineering capabilities.

Looking ahead, the future outlook for the Romanian IT sector remains cautiously optimistic. The accelerated global integration of Artificial Intelligence (AI), machine learning, and advanced cybersecurity protocols presents new avenues for growth. Romanian tech companies that successfully pivot to incorporate these emerging technologies into their service offerings will secure their position in the upper echelons of the global value chain (European Commission, 2026). Ultimately, the sector's ability to evolve from an execution hub to an innovation-driven ecosystem will dictate its capacity to remain the primary engine of Romania.

### **Conclusions**

In conclusion, the evolution of the Romanian Information Technology sector between 2021 and 2026 represents a defining chapter in the nation's contemporary macroeconomic history. Over this five-year period, the industry has successfully navigated global economic uncertainties, transitioning from a volume-centric outsourcing destination to a maturing hub of technological innovation and high-value software engineering (Popa & Dumitrescu, 2024). The macroeconomic implications of this growth are undeniable. By consistently increasing its contribution to the national Gross Domestic Product and generating a massive trade surplus in services, the IT sector has acted as a critical anchor for Romania's economic stability and external balance of payments (National Bank of Romania, 2025). Furthermore, the industry

has fundamentally reshaped the domestic labor market. By offering internationally competitive wages and complex, intellectually stimulating projects, the sector has effectively reversed the historical trend of human capital flight, transforming "brain drain" into "brain retain" for highly skilled engineering graduates (Dumitrescu & Marin, 2026). However, this rapid expansion has also exposed structural vulnerabilities, particularly the mounting pressure on the higher education system to supply adequately trained professionals and the ongoing legislative debates regarding the taxation of micro-enterprises and independent contractors (Stan & Popa, 2025).

As the state gradually phases out historical fiscal incentives, the Romanian IT sector faces a crucial turning point. Future competitiveness can no longer rely on labor cost arbitrage. Instead, long-term macroeconomic resilience will depend on the ecosystem's ability to pivot towards proprietary product development and the seamless integration of emerging technologies such as Artificial Intelligence (Grigore et al., 2026). Ultimately, the continued success of the IT industry is inextricably linked to Romania's broader objective of economic convergence with the European Union, making its sustainable development an absolute priority for both policymakers and private stakeholders.

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