

ECONOMY AND FINANCE

THE EXCEPTION THAT PROVES THE RULE

Evolutions in Romanian IT

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translated from Romanian



The reality of the IT sector in Romania is quite different from its public image.



As in other important sectors of the economy, low value-added activities predominate, for which the low cost of labour is paramount.



Although important, the contribution of the IT sector to the national economy (GDP, exports, employment) is relatively modest compared to the exaggerated figures circulating in the public space.

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INTRODUCTION

“IT was the darling of the Romanian economy and the triumphant sector in the pandemic that hit in the first half of 2020.”¹ And not only in 2020, one must add, when we recall the unquestionable glamour surrounding IT in the eyes of the Romanian public - whatever “IT” is supposed to mean² Not unsurprisingly, observers contend that we are dealing with an exception compared to the rest of the economy: in the plethora of pessimistic headlines regarding the development of the COVID-19 pandemic and its impact on the economy in 2020, the IT sector accounted for a substantial share of the rare positive news articles to be found on the topic. This is understandable when we consider that IT activity has grown steadily in a period of widespread uncertainty and when we take into account, among other things, the significant impetus that the pandemic has provided to the digitisation process - precisely due to the surge in demand for IT products and services.

Nobody will probably be surprised by such statements, since this fascination is not simply a press artefact. Instead, it has a tangible expression in the person of the “IT worker”. The “IT worker” became the contemporary equivalent of the “engineer” from the post-war period of industrialisation and urbanisation, or the “entrepreneur” from the 1990s. What all these have in common - of course, in an idealised sense - is the performance of complex work and a significantly higher-than-average remuneration, but at their common core is an association with quick social ascent, due on the one hand to personal effort and, on the other hand, with an opportunity to be “fashionable” (“the right man at the right time”). Undoubtedly, engineering and entrepreneurship are and will continue to be as high up on the list of respectable and frequently well-paid occupations, but there is no way that they can offer opportunities for social ascent on the same scale as “IT”. Today’s “IT workers” are not only paid much better than the average individual at another job - they are also much more in control of their own professional trajectory and, implicitly, their personal life than other professions. In a country in which the majority of the population still has problems achieving a decent minimum standard of living, the

“IT worker” would appear to be a rare (if not the only) profile that aligns with the socio-economic desires of the general population. These observations probably reflect a widespread view among inhabitants of large cities in Romania, cities whose transformation has largely depended in recent years on the development of economic activities popularly associated with the IT sector.

“IT workers” themselves also contribute significantly to shaping this image. To be more precisely, it is primarily their companies and related organisations which produce an unusually large volume of knowledge and information. Alongside articles in the daily press, we are referring to regular reports dedicated to the industry, as well as whole series of events (conferences, workshops, etc.) whose sole purpose often seems to be to feed this general fascination with “IT”. Not coincidentally, despite this appetite for knowledge and information, some key aspects remain as foggy as can be. After all, what does this highly-touted “IT” really stand for? Despite the abundance of content on this topic, it is difficult to come up with an answer even in general terms. In all the information circulating in the public space, it is difficult to distinguish between what is advertising, what is self-delusion and what is fact and reality.

Looking at things more closely, the rubric of “IT” has two central components: national development and work. Looking at the first aspect, the IT sector is a priori conceived as a set of complex activities, with high added value and, as a result, with a comparatively significant contribution to the development of the national economy and society in general. Implicitly or explicitly, the terms of comparison are simple activities with low added value - activities that predominate in contemporary Romania. The notion of the IT sector as being something exceptional is more than plausible. Moreover, it is assumed that this eminently positive exception of a profession can lead the way forward from a macro-economic point of view, with IT in Romania being among the few sectors of the economy (perhaps the only one) that can help overcome a certain stage of economic underdevelopment and mediocrity.

How do we explain such exceptionalism? Well, by citing another exception: there is much talk about an alleged competitive advantage of Romania when it comes to IT activities, a competitive advantage made possible mainly by

1 Ziarul financiar [The financial newspaper], 14 October 2020, available online at <https://www.zf.ro/banci-si-asigurari/it-ul-vedeta-economiei-romanesti-sectorul-castigator-pandemiei-prima-19654861>.

2 We will return to the actual meaning of the abbreviation “IT”, which in most cases is far from clear.

well-trained staff. The Romanian workforce is therefore held to be exceptionally good compared to other countries (at European or at least regional level, as the narrative goes). The issue of IT work is much more complicated, however. We have a competitive advantage bestowed by the labour force, but there is also talk of an acute labour force shortage, not only in terms of quantity (too few candidates compared to the supply of jobs), but also in terms of quality (insufficient capacity of the education system). Related to these deficits, we know that wages in the IT sector continue to grow at a steady pace, seemingly oblivious to the realities of the remainder of the labour market; this has been underscored yet again during the COVID-19 pandemic. Hence a partial explanation of the increase in income inequalities and, increasingly, in wealth (mainly in the form of real estate) between major cities and the rest of the country as well as within the former is warranted. Finally, the landscape becomes even more complicated when we take into account the income tax exemption that has been granted to the IT sector since the early 2000s - an exemption that has been the subject of much controversy over the course of time.

The debate over the IT sector therefore dovetails with the overarching issue of the country's socio-economic development, as well as the issue of income and wealth inequalities or of tax-driven redistribution. None of these are

simple economic issues, but they also raise important moral questions. In other words, underlying the public discourse about the IT sector in Romania are a whole host of assumptions and hypotheses about the individual good and the common good, as well as about the right balance between these.

This study does not aim to provide authoritative solutions to such fundamental dilemmas. The problem stems not so much from the complexities involved as from the fact that these are not topics that can be technocratically steered. Of course, the analysis may provide stronger indications than the anecdotal accounts circulating in the public arena when it comes to the IT sector. In the following, we shall first clarify what we have in mind when we refer to the IT sector in Romania. As we shall see, this is not in the least an unambiguous and clear-cut matter. We then go on to analyse the essential features of the sector: how big it is, what contribution to the national economy it makes, which way development is really trending. From there we move to a more concrete discussion, in which we examine in detail the situation of the largest companies in the field operating in Romania. Finally, we look at the situation of "IT experts" from the perspective of the labour market and wages, including the thorny issue of tax exemptions.

1

WHAT IS THE "IT SECTOR"?

Press headline 1: „The Romanian IT industry will reach 400,000 employees in the next 14 years”.³ Press headline 2: „100,000 employees contribute almost 6% to Romania's GDP”.⁴ The information does not come from journalists, but rather from representatives of companies in the field, whose word we have to take literally, since regular readers are only served up sensational characterisations like these. We are left with the impression that 100,000 to 110,000 “programmers” (so not even any employee in the sector) contribute significantly more to the national economy than the most important industrial sector (the automotive industry) and about as much as the nearly 500,000 employees in the retail sector.⁵ It does not even matter that these numbers have little to do with reality. What is important is that such portrayals constantly fuel a popular understanding of what the IT sector is: hundreds of thousands of programmers who play an absolutely vital role in the national economy.

How does this popular vision reconcile with official data published by Eurostat, according to which almost 200,000 “IT&C specialists” were working in Romania in 2019 (approximately 2.3% of the total employed population), and the contribution of IT&C activities to GDP amounted to 3.7% (see table 1)? Obviously not very well. In fact, comparative data published by Eurostat show a familiar landscape, with Romania far from the level of Western European countries and surpassed by most of its neighbours in Central and Eastern Europe, lying far below even Bulgaria.

In order to begin to understand where such huge differences come from, the discrepancy between what we see in the Romanian press and Eurostat figures, we must take into account that, not surprisingly, we are comparing apples and oranges. Thus, the Eurostat definition for IT&C specialists is very comprehensive: IT&C service managers, software deve-

3 Ziarul financiar [The Financial Paper], 17 October 2018, available at <https://www.google.com/search?client=firefox-b-d&q=Industria+IT+din+Rom%C3%A2nia+va+ajunge+la+400.000+de+angaja%C5%A3i+%C3%AEn+urm%C4%83torii+14+ani>.

4 Adevărul.ro [TheTruth.ro], 2 June 2019, available online at https://adevarul.ro/economie/stiri-economice/reactia-industriei-it-propunerea-orban-impozitare-veniturilor-100000-angajati-contributie-aproape-6-pib-1_5cf3a0a1445219c57e59bd4c/index.html.

5 On the automotive industry, see Stefan Guga, *Automotive industry, which way? Global trends, peripheral perspectives*, Bucharest, Friedrich Ebert Stiftung, 2018. About trade, see Stefan Guga and Marcel Spatari, Bucharest, Friedrich Ebert Stiftung, 2019.

Table 1
IT&C Specialists (2019) and their contribution to GDP formation (2018)

	IT&C Specialists		IT&C contribution to GDP (% of value-added at factor cost)
	thousands	% of the working population	
EU27	7844.1	3.9	-
SE	359.8	7.0	5.9
FI	174.5	6.8	4.9
LU	17.7	6.1	-
EE	40.4	6.0	5.4
NL	504.6	5.6	-
UK	1807	5.6	6.2
DK	150.9	5.2	4.6
BE	238.9	5.0	4.0
IE	112.6	4.9	-
MT	11.8	4.6	8.1
AT	184.6	4.3	3.6
FR	1129.6	4.2	4.3
CZ	213.8	4.0	4.6
DE	1686.9	4.0	4.4
SI	38.5	3.9	3.6
SK	95.6	3.7	4.1
ES	712.5	3.6	3.3
PT	174.4	3.6	-
IT	819.7	3.5	3.3
HU	152.4	3.4	6.0
HR	53.7	3.2	4.5
BG	101.2	3.1	6.1
LV	28.6	3.1	4.9
LT	41.9	3.1	3.1
PL	510.9	3.1	3.6
CY	11.2	2.7	-
RO	197.3	2.3	3.7
EL	80.1	2.1	2.5

Data source: Eurostat

lopers, analysts, database specialists, system administrators, technicians, electronics and telecommunications engineers, graphic and multimedia designers, trainers, sales specialists, specialists in electronic mechanics, IT&C installation and maintenance. So, far from just being just about “programmers”, practically anyone who has anything to do with information and communication technology is counted.

We leave for later the question of the contribution to GDP. For now, we need to clarify what it is we are really talking about. We have seen that the official definition of IT&C includes not only software programming, but a whole host

of other areas. However, the popular definition (but not only the popular one, since tax law follows the same logic) refers strictly to software development and does not include, for example, hardware manufacturing or telecommunications

Table 2
NACE nomenclature, Information and Communications section

J – Information and communications	
58 – Editing activities	
	581 - Publishing of books, newspapers, magazines and other editing/publishing activities
	5811 - Book publishing activities
	5812 – Editing/publishing of guides, compendiums, mailing lists and the like
	5813 - Newspaper publishing activities
	5814 - Publishing of magazines and periodicals
	5819 - Other editing/publishing activities
	582 - Software editing activities
	5821 - Computer games editing activities
	5829 - Other software publishing activities
59 – Motion picture, video and television production activities; audio recordings and music editing activities	
	591 – Motion picture, video and television production activities
	5911 - Motion picture, video and television production activities
	5912 – Activities of post-production of films, videos and television programs
	5913 - Motion picture, video and television program distribution activities
	5914 - Screening of motion pictures
	592 - Audio recording activities and music editing activities
	5920 - Audio recording activities and music editing activities
60 - Program broadcasting and transmission activities	
	601 - Radio broadcasting activities
	6010 - Radio broadcasting activities
	602 - Television programmes broadcasting activities
	6020 - Television programmes broadcasting activities
61 - Telecommunications	
	611 - Wired networks telecommunications activities
	6110 - Wired networks telecommunications activities
	612 - Wireless network telecommunications activities
	6120 - Wireless network telecommunications activities (satellite only/excluding satellite)
	613 - Satellite telecommunications activities
	6130 - Satellite telecommunications activities
	619 - Other telecommunications activities
	6190 - Other telecommunications activities
62 - Information technology service activities	
	620 - Information technology service activities
	6201 - Custom software development activities (customer-oriented software)
	6202 - Information technology consultancy activities
	6203 - Management activities (management and operation) of computing means
	6209 - Other information technology service activities
63 – IT service activities	
	631 - Web portal activities, data processing, web page administration and related activities
	6311 - Data processing, web page administration and related activities
	6312 - Web portal activities
	639 - Other IT service activities
	6391 - - Activities of news agencies
	6399 - Other information service activities n.c.a.

maintenance. We can easily exclude from the analysis industrial activities relating to IT&C, since these are somewhat insignificant not only in Romania (contributing 0.24% to GDP in 2018, according to Eurostat), but also in most European countries (although in Hungary this figure is about 1.65% of GDP). If we focus strictly on IT&C services using official statistical categories (more precisely those used in the Romanian Nomenclature of Economic Activities – the NACE code), we see that things are not all that simple. First, the "Information and Communications" section includes not only activities popularly classified as IT, but a whole host of other activities, from book publishing and film production to news agencies. A substantial part of the sector is occupied by the telecommunications field, with giant companies such as Vodafone, Orange or Telekom, whose main object of activity is the provision of telecommunications services to the population and companies, and not software development. The tacit inclusion of areas that do not actually deal with IT activities when talking about the IT sector is commonplace and leads to a significant distortion of macro figures. On closer inspection, we find that what we spontaneously understand IT to mean is Group 582 (software publishing activities), Division 62 (information technology service activities) and, although this is debatable, Group 631 (web portal activities, data processing, web page administration and related activities). For Romania, we are talking about approximately 61.4% of total employees in the Information and Communications sector, and 64.2% of added value (for 2018).

Of course, there are quite a few problems with this approach as well. The most serious objection is that the NACE nomenclature only partially captures reality on the ground, in fact underestimating the share of IT activities in the national economy, since companies are classified by their main activity and because more and more companies employ people and even create entire departments with IT functions. These are mainly the automotive industry, the banking sector and support service activities.⁶ However, the importance of software development activities for these sectors remains relatively marginal in Romania, and wherever it accounts for a greater share we notice that the respective companies prefer to create separate entities that are classified as such (for example, ING or Emag). The estimation error is probably more than compensated by the inclusion of activities and employees that have nothing to do with what we understand popularly to be IT: if we exclude employees in Group 631 (data processing, hosting and web portals), we are left with approximately 111,000 employees in 2018. This figure covers not only "programmers", but all employees of software companies, from the security department and cleaning staff (if these are not outsourced services) to accounting, human resources and, of course, management. Most likely, the

figure of over 100 thousand overestimates the number of "IT workers" in Romania, but in the absence of much more detailed data from companies, the use of the NACE nomenclature remains the best method to obtain a quantitative picture of the IT sector.

In addition to all these observations, there is an extremely important qualitative dimension. More specifically, only a part of directly productive employees of these companies align with the definition of "programmer", many of them being in fact being involved with testing, maintenance or customer relations.⁷ We thus move from a strictly statistical perspective to a more discriminating look at the value chain of the IT industry, a chain that is in no way circumscribed by national borders. As in many other important economic fields in Romania, foreign capital also dominates the IT sector, with Romanian branches of multinational companies often having low value-added activities, and parent companies keeping high value-added activities in their countries of origin. Contrary to popular belief, writing software code is not necessarily a high value-added activity, and is rather more akin to the assembly process in manufacturing industry. As in industry, research, development, marketing and creative activities are the most productive. And more specifically, like workers in industry, many programmers employed by the subsidiaries of multinational companies in the Romanian IT sector actually perform more or less routine tasks, having no control or even overview of the finished product. Again, as in industry, these low value-added activities are more prone to relocation, depending on the cost of labour. It is no accident that critical voices in the Romanian IT sector characterise the predominant business model as being similar to lohn production in the textile industry.

The detailed analysis of the position of the IT sector in Romania in transnational value chains is much too complex a task for a study like this, as it would require confidential information from these companies. To the degree this is possible, we shall try to address this issue using publicly available data, but the extent to which we can go beyond the level of speculation and anecdote is quite limited. In the following we will be guided mainly by the best available estimate, namely the one offered by the NACE nomenclature. This approach is more complicated than it seems at first glance, since a lot of data is only available at a very high level of aggregation, which does not even allow it to be broken down, as described above. This is partly due to a distorted popular image, according to which an IT sector makes an improbable contribution to the national economy.

THE BIG PICTURE

Reactions to the statement that in September 2020 an employee in the Romanian IT sector had an average salary

⁶ For technological evolutions in the automotive industry, see Stefan Guga, *Automotive industry, which way? Global trends, peripheral perspectives*, Bucharest, Friedrich Ebert Stiftung, 2018. For digitisation in the banking sector, see Stefan Guga and Marcel Spatari, *Back to Bargaining in Banking – How digitalisation plays Romanian trade unions an upper hand*, Berlin, Friedrich Ebert Stiftung, 2020.

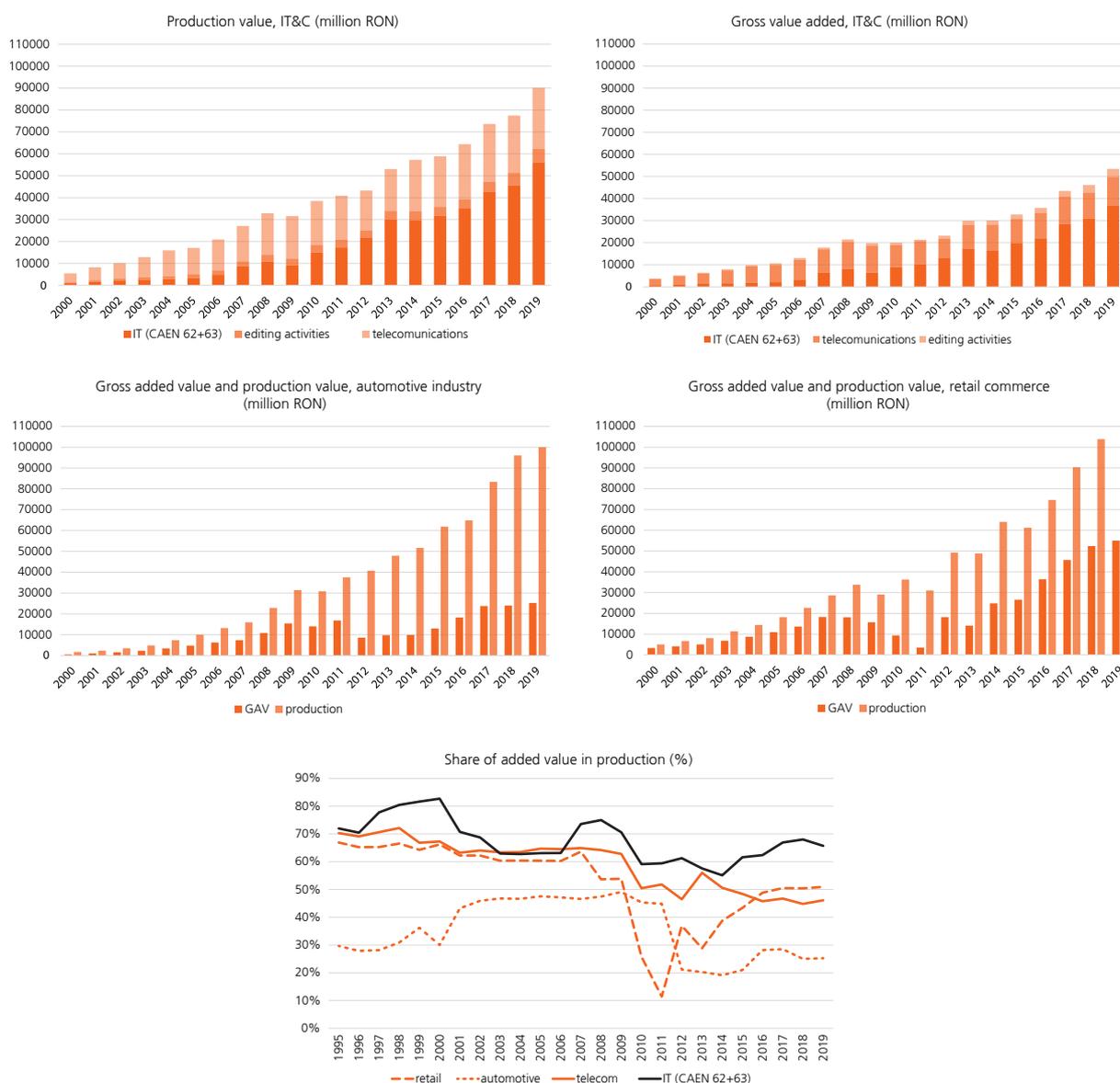
⁷ The Romanian subsidiaries of some large companies in the sector, such as HP, IBM, Oracle or Microsoft, are in fact shared service centers or outsourcing centers. See KPMG, *Romania as the destination for SSCs and BPO*, available online at <http://dev.absl.ro/press-room/#>.

“in hand” of RON 7750 are predictable: most workers would say that this is “good” or even “a lot”, while experts in the field might say that it is not enough, compared to how productive these employees are or to what their counterparts in other countries earn. We will come back to the issue of wages in detail in a future part of this study. What is important for the moment is to note that this kind of information is immediately interpretable by most people, for obvious reasons. But if we say that the value of the production by the IT sector in 2019 was about RON 56 billion, while the total added value amounted to almost RON 37 billion, most people very likely could not say if this is a lot or a little. After all, a lot or a little compared to what?

Let’s first distinguish between IT and IT&C. We see in Figure 1 that both the value of production and added value from the entire IT&C sector have increased substantially in the last twenty years, from somewhere around RON 5 billion in 2000

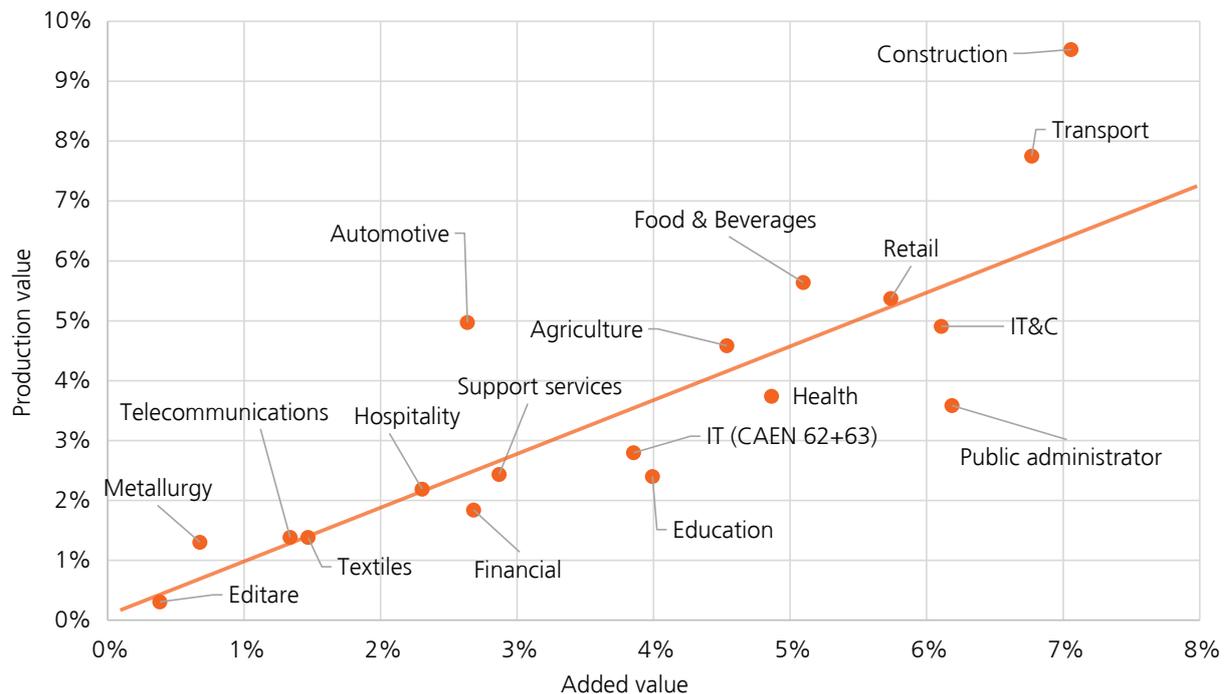
to RON 90 billion in 2019, and from about 3 billion to 55 billion, respectively - of course, if we take into account the increase in prices, this evolution would be much more modest, but still significant. We note that at least until the first part of 2010, most of the value of production, as well as the added value, were accounted for by telecommunications activities. However, their growth has tended to slow down as the internal market has become more and more saturated. IT activities, on the other hand, have increased rapidly in the last decade, as is visible from both indicators. The increase in production itself is not unusual, with similar developments being observed in the case of the automotive industry or retail, which in 2019 recorded values of production almost double that of IT. However, the story is quite different from the perspective of added value; from this point of view the automotive industry has seen a much more modest evolution than IT; even if we are unable to say the same about retail, it is much more vulnerable to the business cycle than IT. As a

Figure 1
Production value and added value, IT&C, automotive industry and retail, 2000-2019



Data source: Eurostat.

Figure 2
Production value and added value (% of the total), 2019



The line marks the balance between production value and added value.

Data source: Eurostat

result, value added resulting from IT activities (NACE 62 and 63) in 2019 was almost 50% higher than that produced by the entire automotive industry and only one-third lower than the entire retail trade. From this point of view, no one can deny that the IT sector has become an important component of Romania's economy.

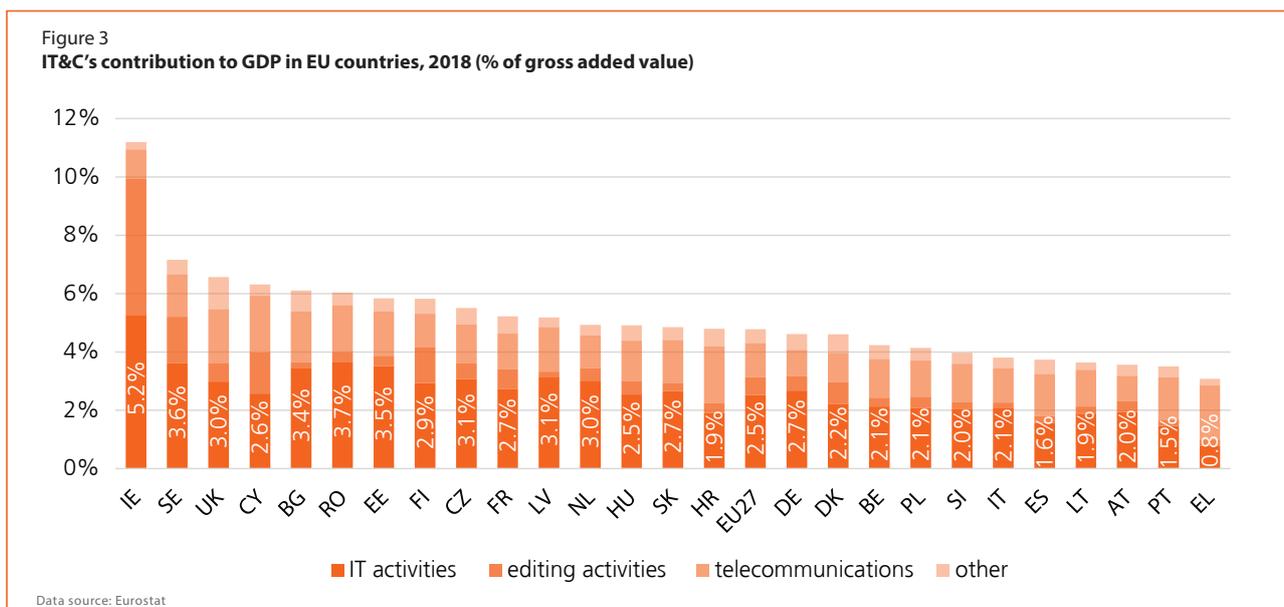
An analysis of the ratio between added value and production value reveals some significant differences between the sectors of activity, as well as some interesting developments. First, we see a relatively large share of value added in total production for the IT sector: somewhere close to 70% in 2017-2019, compared to 50% for retail, about 45% for telecommunications and only 25% for the automotive industry. How do we explain such differences? First of all, we need to take into account what production actually looks like in these sectors of activity: there are considerable differences when it comes to capital engaged in production (which is on a massive scale in the automotive industry, but only a minor one in IT) and the complexity of supply chains (extended and trans-sectoral sectors for industry or retail, relatively restricted for IT). In other words, if in the automotive industry equipment and suppliers play an absolutely vital role, in IT the main means of production remains labour, while raw material and components do not really exist here. We do not even see fluctuations in retail, since prices are not as sensitive to the economic cycle, and stocks cannot be a topic of enquiry. Historically speaking, we see a declining trend in the share of added value in total production in all these sectors, which indicates increasingly strong integration in transnational value chains and may also be an indication of the subordinate position that economic activities in Romania have within

these chains. At least at first glance, this seems less true for IT than for other sectors.

Overall, the IT sector (NACE 62 and 63) accounted for approximately 2.8% of the value of total production in Romania and 3.9% of added value in 2019. The entire IT&C sector really produced 6.1% of the added value, this being the figure that is circulating in the public space in Romania. As already noted, however, this interpretation is incorrect if we are strictly interested in the contribution of the IT sector, excluding telecommunications services and other activities that are usually included in IT&C, but which have little to do with IT. Even so, the IT sector makes an important contribution to the national economy, although one cannot really say "6% with 100 thousand employees". The sector of services, transport and storage is by far the most important, accounting for almost 7% of added value and 8% of production (Figure 2).

Transport, construction, retail, state-dominated sectors (public administration, health) and even industries such as food, beverage and tobacco manufacturing are quantitatively speaking much more important activities in terms of the national economy than IT.

A comparison with other countries shows that both IT and IT&C make a relatively large contribution to Romania's national economy (Figure 3). In terms of IT&C, accounting for 6% of gross added value, Romania is in 6th place at European level, ahead of countries like France or Germany, as well as the Czech Republic, Hungary or Poland. It should be noted that Romania is not performing well when it comes to editing/publishing activities (which, again, include the



activities of publishing finished software products on the market), the Scandinavian countries (Sweden, Finland) and tax havens (Ireland, Cyprus) being the run-away leaders in this case. Here we review more general macro dynamics: multinational companies register their high value-added activity in tax havens, keeping basic and intermediate activities within the production chain in countries with cheap labour. This is certainly one of the reasons why countries like Romania have a relatively large share of custom software production, consulting and services activities NACE 62 (in Figure 3 these are cumulated under NACE 63): 3.7% of total added value is the largest share in the EU after Ireland, which in this case also reports a much higher figure than any other European country.⁸

However, is the IT sector in Romania more advanced (larger, more productive) than the one in France, Germany or Poland? Of course not. Since in each case the focus is on national economies, the fact that Romania has an economy in which simple activities with low added value predominate makes IT have a relatively large share. In other words, **the share of the IT sector in the German national economy is lower than in Romania not because the IT sector in Romania is unusually large or productive, but because the Romanian economy as a whole is relatively unproductive.**⁹ In order to avoid returning prematurely to the trap of fascination with the IT sector in Romania, we must keep in mind that the added value produced by this sector in Romania was in 2018 13.2 times lower than in Germany for a population only 4.3 times greater, while in the Czech Republic, added value produced by the IT sector was equivalent to that for Romania, but with a population only half the size of Romania's (Table 3). Only in

⁸ Regarding Ireland as a tax haven and the impact on GDP, see Stefan Guga, *Chestiunea productivității: controveerse și clarificări* [The issue of productivity: controversies and clarifications], Bucharest, Friedrich Ebert Stiftung, 2020.

⁹ Which has nothing to do with the extent in which employees work hard at their job. See Stefan Guga, *Chestiunea productivității: controveerse și clarificări* [The issue of productivity: controversies and clarifications], Bucharest, Friedrich Ebert Stiftung, 2020.

comparison to Poland, Portugal, Bulgaria, Greece, Croatia and Lithuania can we say that Romania leads in this category, but in no case are the discrepancies nearly as large as those compared to Western countries. More generally, we should note that the size of the IT sector in Romania is not at all exceptional in the Eastern European landscape - the Czech Republic would appear to be the only exception in this regard.

Table 3
Size of IT sector in European countries, compared to Romania, 2018

	Added values in IT sector (NACE 62 + 63, compared to Romania)	population (compared to Romania)
DE	13.2	4.3
UK	10.0	3.4
FR	8.9	3.5
IT	5.0	3.1
NL	3.3	0.9
ES	2.7	2.4
IE	2.7	0.3
SE	2.6	0.5
PL	1.5	2.0
BE	1.4	0.6
AT	1.1	0.5
CZ	1.0	0.5
FI	0.9	0.3
DK	0.9	0.3
HU	0.5	0.5
PT	0.4	0.5
SK	0.3	0.3
BG	0.3	0.4
EL	0.2	0.6
HR	0.14	0.21
EE	0.14	0.07
LT	0.13	0.14
LV	0.13	0.10
SI	0.12	0.11
CY	0.08	0.05

Data source: Eurostat

Table 4
Percentage of workers in research & development of total employed population, 2018 (%)

	total	manufacturing industry	IT&C
EU27	0.9%		
DK	1.4%		
SE	1.3%		
AT	1.3%		
NL	1.3%		
BE	1.1%		
FI	1.1%	5.0%	4.9%
LU	1.1%		
DE	1.1%	4.5%	2.0%
SI	1.1%	2.6%	3.1%
FR	1.0%		
IT	0.9%	3.2%	5.1%
IE	0.8%		
CZ	0.8%	1.4%	5.3%
UK	0.8%	3.4%	3.9%
HU	0.7%	1.2%	4.1%
ES	0.5%	1.7%	2.8%
PL	0.5%	0.9%	5.8%
PT	0.5%	1.1%	5.0%
BG	0.4%	0.9%	3.0%
MT	0.4%	0.9%	4.6%
EL	0.4%		
EE	0.3%	0.4%	2.6%
LT	0.3%	0.7%	2.4%
HR	0.3%	0.9%	0.9%
SK	0.3%	0.6%	1.8%
CY	0.2%	1.0%	2.1%
RO	0.1%	0.3%	1.2%
LV	0.1%	0.6%	0.6%

Data source: Eurostat

Table 5
Research & Development spending in EU countries, 2018

	euro per capita			% of the GDP		
	total	manufacturing industry	IT&C	total	manufacturing industry	IT&C
SE	1 095.9	:	:	2.36	:	:
DK	1 016	:	:	1.94	:	:
AT	959.1	:	:	2.2	:	:
DE	870.9	743.7	43.5	2.2	1.8	0.1
FI	766.7	470.7	119.7	1.8	1.1	0.3
BE	753.5	:	:	1.87	:	:
NL	640.1	:	:	1.42	:	:
LU	623.1	:	:	0.62	:	:
IE	575.1	:	:	0.85	:	:
FR	507.3	:	:	1.44	:	:
EU27	439.4	:	:	1.45	:	:
UK	427.2	166.6	66.3	1.2	0.5	0.2
SI	320.5	236.4	18.9	1.4	1.1	0.1
IT	263.4	177.2	28.4	0.9	0.6	0.1
CZ	233.9	127.7	47.1	1.2	0.6	0.2
ES	181	82.1	21.2	0.7	0.3	0.1
HU	158.6	76.3	17.1	1.1	0.6	0.1
PT	138.4	56.8	29.3	0.7	0.3	0.2
EE	117.4	33.4	50.1	0.6	0.2	0.3
PL	104.7	45.3	22.4	0.8	0.4	0.2
MT	98.8	24.1	43.7	0.4	0.1	0.2
EL	97.7	:	:	0.58	:	:
SK	74.6	52	10	0	0	0
LT	63.5	24.5	8.5	0.4	0.2	0.1
CY	62.4	22.7	32.8	0.3	0.1	0.1
HR	58.7	38.8	4.6	0.5	0.3	0.0
BG	43.2	14.3	14.9	0.5	0.2	0.2
RO	31.1	10.4	4.2	0.3	0.1	0.0
LV	23.9	11.5	3.8	0.2	0.1	0.0

Data source: Eurostat

Figure 4
Employment in knowledge-based and high-tech services, 2019 (% of total employment)

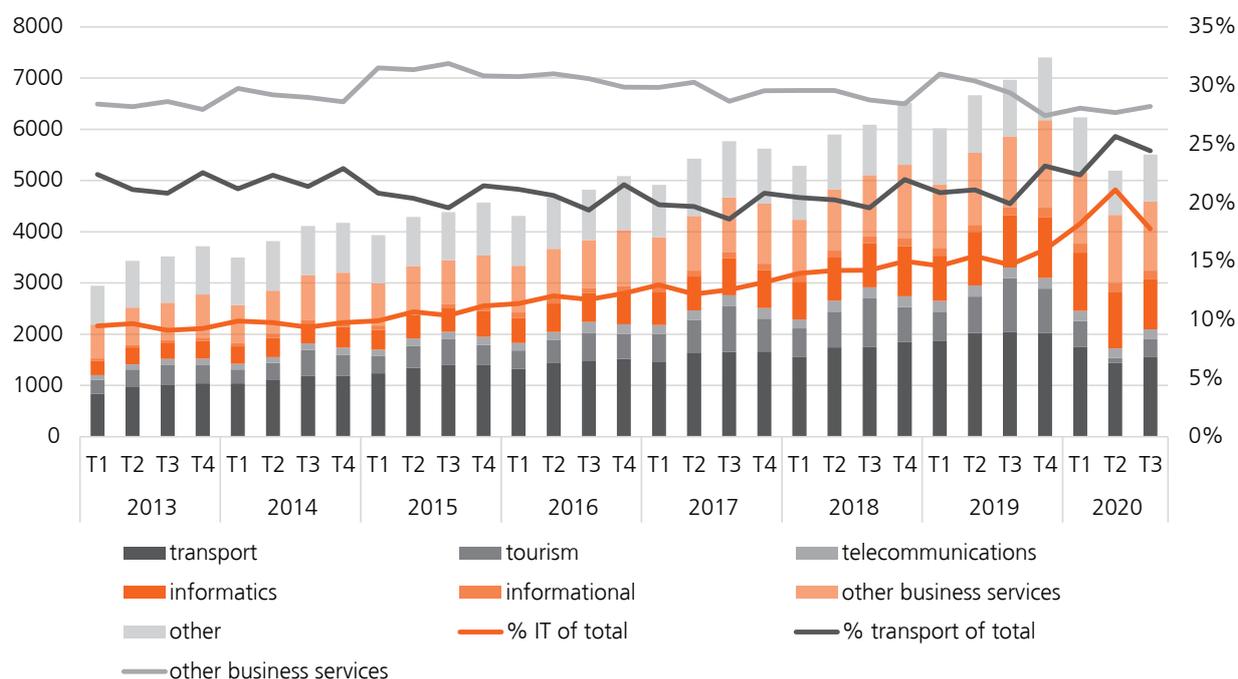


Data source: Eurostat

This image is reinforced by the employment situation. In 2019, only 2.1% of the employed population in Romania was working in knowledge-based and high-tech services (most of which are found in the IT sector), compared to the European average of 3% (Figure 4). The Czech Republic, Slovakia, Bulgaria and Hungary also had 50% higher percentages. Breaking this down into more detail, the share of research and development workers in the total employed population was only 0.1% in 2018, compared to a European average eight times higher, with the difference being quite large compared even with neighbouring countries (Table 4). Even if the share of research and development workers in IT&C is slightly higher (1.2%), Romania lags far behind countries such as Bulgaria (3%), the Czech Republic (5.3%) or Poland (5.8%). According to Eurostat data, in 2018 Romania only had 2,170 research and development workers

in the IT&C sector, compared to 3,100 in Bulgaria, 4,7000 in Hungary, 9,5000 in the Czech Republic and almost 24,000 in Poland. Of these, over 1,600 were working in software publishing activities, a relatively minor field for the Romanian IT sector, which, however, includes an important company with local capital - Bitdefender. Unsurprisingly, Romania is not doing well even when it comes to spending on research and development: only EUR 4.2 per capita go to IT&C, ten times less than in Germany and more than five times less than in Poland. In terms of GDP, research and development does not matter that much in Romania generally speaking, and IT&C is even less important, merely accounting for a share of 0.04%, almost five times less than for Bulgaria. All this once again confirms the finding that the IT sector in Romania fits quite well into the landscape of the country's economy.

Figure 5
Romania's service exports, 2013 – 2020 (in millions of euros)



Data source: National Bank of Romania

The latter performance is relatively high at the comparative European level, with only Finland, Sweden, Bulgaria and Estonia recording higher net exports relative to GDP (excluding Ireland, of course, for which figures are not comparable). In absolute terms, Romania's net exports of IT services are higher than those of countries such as Germany or the Netherlands, as well as most of Romania's neighbouring countries. This result is not due to unusually large exports, however, but rather to unusually small imports. The low value of imports of IT services once again highlights the weakness of the internal market when it comes to the absorption of high technology. This is true for both industry and services in general, and therefore for the IT sector.

However, the Romanian IT sector has a relatively large share in total exports: only Finland, Sweden and, of course, Ireland were above the level of 3.7% recorded by Romania in 2018. On the other hand, the gap between 3.7% and 1.7% in the ratio between exports of IT services and gross domestic product shows that Romania's exports in general are low compared to those of other countries. **In other words, exports of IT services have such a large share in total Romanian exports primarily because Romania is not a major exporter of industrial products, as are most of its neighbouring countries.** Romania's total exports in 2019 accounted for only 40.4% of GDP, while for Poland this figure is 56%, for Bulgaria 64.2%, the Czech Republic 76% and Hungary 82%. Once again, the IT sector in Romania is exceptional only from the perspective of the economic weakness of the surrounding landscape and, even from this point of view, this exceptionalism is only partial.

Historical data shows a steady increase in exports of IT services, from EUR 279 million in the first quarter of 2013 to

Table 6
Exports of IT services of EU countries, 2018

	exports			trade balance	
	million euro	% of GDP	% of total exports	million euro	% of GDP
IE*	58045	21.4%	22.9%	56695	20.9%
FI	6436	2.8%	7.1%	3302	1.4%
SE	10979	2.3%	5.4%	6329	1.3%
BG	838	1.5%	2.2%	651	1.2%
EE	565	2.2%	2.7%	299	1.2%
RO	3418	1.7%	3.7%	2160	1.1%
LV	442	1.5%	2.3%	295	1.0%
CZ	2848	1.4%	1.4%	1561	0.7%
HR	623	1.2%	2.2%	373	0.7%
PL	5706	1.1%	2.0%	2904	0.6%
LT	455	1.0%	1.2%	252	0.6%
SK	1084	1.2%	1.2%	495	0.6%
HU	2044	1.5%	1.6%	738	0.5%
ES	9970	0.8%	2.3%	5787	0.5%
BE	8309	1.8%	1.7%	2205	0.5%
PT	1237	0.6%	1.4%	570	0.3%
AT	5284	1.4%	2.4%	1062	0.3%
NL	13241	1.7%	1.6%	1575	0.2%
SI	206	0.4%	0.5%	53	0.1%
EL	489	0.3%	0.7%	132	0.1%
DE	30757	0.9%	1.9%	2047	0.1%
IT	3602	0.2%	0.6%	-874	0.0%
FR	11618	0.5%	1.6%	-1853	-0.1%
DK	3640	1.2%	2.3%	-587	-0.2%
MT	55	0.4%	0.3%	-171	-1.4%
LU	1349	2.2%	1.2%	-1449	-2.4%

Data source: Eurostat. For Ireland, the data is for 2016

a peak of EUR 1,182 million in the fourth quarter of 2019 (Figure 5). The share of exports of IT services in total exports of services increased during this period from 9.5% to 16%, thereafter surging to 21.1% in the second quarter of 2020 due to the COVID-19 pandemic. The soaring percentage registered in 2020 is, of course, due to the strong contraction in exports of services severely affected by the pandemic (like tourism and transport). The slower decline in IT exports shows that the IT sector is less affected by the pandemic, but by the third quarter of 2020 IT exports had fallen to below EUR 1 billion, the lowest level in a year and a half.

Two more relevant observations can be made on the basis of the data in Figure 5. First, by far the most important category is exports of transport services, and in particular road freight. Even in the second quarter of 2020, at the height of pandemic restrictions, exports of road freight services were 9% higher than those of IT services, with the gap widening to 30% in the third quarter. If exports of services are so crucial to the national economy, we should be at least as interested in what truck drivers do as we are in what programmers do. Secondly, exports of business services are a very important category, reflecting the importance of Romania as an outsourcing location due to the low cost of labour. This is more generally true for exporting sectors in Romania, including industry and the IT sector.

The increase in exports of IT services is based on the combination of a small internal market and the low cost of labour. As in other sectors of activity that have grown a lot in the last decade and a half (the car industry is a paradigmatic case), the recipe is clear: economic activity develops as a result of direct foreign investment, Western multinational companies being interested in using a cheap labour force to export to their home markets. In this case as well, the dominant public discourse tends to single out the IT sector as an exception, where local capital is said to register successes of a European, if not global, scale. However, this image is based on anecdotal

evidence and unrepresentative examples - companies such as Bitdefender or UiPath (the latter is actually no longer a Romanian company) are total exceptions. The reality is completely different, with foreign capital dominating without the IT sector in Romania having any say in it all.

Table 7 presents a comparison of the percentage accounted for by foreign capital in Romania in the overall competitive economy, in manufacturing industry and in the IT&C sector; the figures for the latter are presented broken down for each relevant category in the NACE code. In 2018, foreign capital held 7.3% of the capital of IT&C enterprises, compared to a figure of 5.5% for the overall economy; the share for IT services themselves (programming, consulting and related activities - NACE 62) was higher, at 9%. In the latter case, foreign capital accounted for almost three-quarters of turnover, just under 70% of added value and 62.9% of employees; this is once again far above the figure for the economy as a whole - and even for manufacturing industry. Otherwise, the same familiar percentages are repeated: enterprises with foreign capital are much larger than those with domestic capital and pay their employees better overall (EUR 29 thousand per year average cost per employee for foreign capital, compared to EUR 24,500 for the sector as a whole), including when it comes to productivity. In fact, the only important differences with respect to the IT activities displayed in Table 7 consist of the relatively minor advantage foreign companies have when it comes to labour productivity, which even becomes a disadvantage when we adjust for wage costs. Although there is a similar level of investment, the IT sector does not require significant fixed assets, and investment in intangible assets cannot be too important in Romania, where research and development activities are insignificant. Again, apart from these differences, the IT sector stands out more through the dominance and strength of foreign capital, and by no means through any revival of domestic capital.

Table 7
Foreign capital in Romania, 2018

		Competitive economy	Manufacturing industry	IT&C	Software publishing	Telecommunications	IT services	Data processing
Companies	<i>foreign capital</i> (% of total)	5.5%	8.5%	7.3%	12.2%	4.6%	9.0%	6.3%
Turnover		51.5%	71.5%	65.8%	60.9%	73.1%	66.4%	49.9%
Added value		44.7%	65.9%	64.9%	60.2%	64.8%	69.2%	
Operating margin		45.9%	74.9%	58.0%	54.1%	69.1%	43.6%	
Employees		29.2%	48.5%	51.8%	54.9%	43.2%	62.9%	45.7%
Apparent labour productivity (thousands € / person / year)	<i>foreign capital</i>	28.2	22.5	40.5	44.9	64.0	34.2	:
	<i>sector total</i>	18.4	16.6	32.3	41.0	42.7	31.1	18.4
Labour productivity adjusted for salaries (€ added values / € personnel cost)	<i>foreign capital</i>	191.7	179.6	152.6	138.7	286.9	118.3	:
	<i>sector total</i>	187.2	164.0	162.9	145.0	256.8	132.5	195.1
Average personnel cost (thousand € / person / year)	<i>foreign capital</i>	14.8	12.6	26.6	32.5	22.3	29.0	:
	<i>sector total</i>	10.1	10.2	20.7	29.0	16.8	24.5	10.7
Operating margin (% of the turnover)	<i>foreign capital</i>	9.6	9.1	17.4	16.9	21.4	10.3	:
	<i>sector total</i>	10.8	8.6	19.7	19.0	22.6	15.7	25.4
Investment per employed person (thousand € / year)	<i>foreign capital</i>	11.2	8.8	5.2	1.8	20.2	1.9	:
	<i>sector total</i>	6.5	5.9	4.8	2.2	15.5	1.9	0.9
Turnover per company (thousand € / year)	<i>foreign capital</i>	5985.8	14528.5	4490.3	3984.9	38610.1	2801.5	1008.5
	<i>sector total</i>	640.9	1718.6	500.8	795.6	2449.8	380.5	126.4
Employees per company	<i>foreign capital</i>	42.8	131.8	55.9	53.7	198.0	54.7	26.2
	<i>sector total</i>	8.1	23.0	7.9	11.9	21.2	7.8	3.6

Data source: Eurostat

A comparison with other countries reinforces this interpretation. With 62.9% of employees in the IT services sector employed by foreign companies, Romania is 2nd place in the EU, being surpassed only by Luxembourg, where it is somewhat natural to have an unusually high percentage of foreign capital (Table 8). We clearly notice here the cleavage between (countries in the) east and west, with the former being the source of the latter's capital. However, there are also important differences among eastern European countries: in the Czech Republic, Slovakia and Hungary, foreign capital accounts for less than 40% of total IT employees and less than half of turnover and added value - much less than in countries like Romania or Bulgaria. In these countries, one can truly say that the IT sector is an opportunity for domestic capital, with differences being significant compared to manufacturing industry, where the presence of foreign capital is overwhelming. Not so in Romania, however, where, once again, the IT sector turns out to instead be an opportunity for foreign capital.

Let's not forget, however, that the term start-up became entrenched in the public discourse in Romania precisely in connection with entrepreneurial opportunities being advertised in the IT sector. It is therefore worth looking at companies in this sector in more detail to understand if and to what extent we can identify any differences compared to other sectors of activity when it comes to entrepreneurship. Indeed, if we look at the rate of establishment of companies, we can see that since the first part of 2010 this has been consistently higher for the IT services sector (NACE 62) compared not only to the competitive economy as a whole, but also to other sectors, including activities where we would expect entrepreneurship to be relatively more salient (construction, retail, hotels and restaurants, real estate activities, etc.). In 2018, over 18% of companies in the IT services sector were newly established, compared to 11% for the competitive economy and 15% in the real estate sector.

So one can say that the IT field is relatively more attractive for entrepreneurial activity than others. But things are a bit more complicated. If we look at the second graph in Figure 6, we can see that the liquidation rate of companies in the IT services sector is much more volatile than in other sectors, which may suggest additional difficulties faced by companies in this sector in their efforts to remain viable. The third graph in Figure 6 confirms this: in 2018, only 38% of IT companies set up five years before had survived, as opposed to 49% for construction, 50% for hotels and restaurants, 55% for retail, 58% for real estate activities and 52% for the overall competitive economy. The peculiarity of the IT sector is the rapid decrease in the survival rate after 2-3 years of existence of companies - in any case, this drop is clearly faster than in other sectors. In other words, **even if we see some entrepreneurial effervescence in the IT sector, in the medium term the failure rate is also significantly higher than in other sectors that favour entrepreneurship.** In fact, many of the companies in the IT sector operate at a low level of activity and sporadically, as is indicated by the fact that 64.4% of them had zero employees in 2018, up from 23% ten years ago and compared to 45.2% for the competitive economy as a whole.

Nothing in all this is really surprising. After all, such a situation is typical of a developing sector, where the market, technologies and business models have yet to mature. The trend over time is also quite predictable: the sector tends to become more and more concentrated as small companies fail or are absorbed by the larger ones, while barriers to entrepreneurial entry mount. These trends are at least in part already visible in Romania. On the one hand, we observe an accelerated increase in the number of enterprises, from just over 7,000 in 2011 to over 13,000 in 2018, with most of the new enterprises having at most one employee (see the first graph in Figure 7); however, it should be noted that the number of enterprises with over 250 employees tripled from 20 to 61 in the same period, while the number of those in the range of 50-249 employees skyrocketed by 80%. In terms of turnover, added value and number of employees, however, the situation is exactly the opposite: in 2018, companies with more than 250 employees accounted for more than 40% of total turnover in the sector and produced almost half of the added value with little more than 40% of the employees; thus, the weights have practically doubled since the end of the previous decade. At the same time, companies with no more than one employee generated less than 5% of the turnover and added value with roughly 8% of employees. These figures hence indicate a slight dip compared to the end of the 2000s. The most pronounced decreases are to be observed among companies with 10-50 employees and among those with 50-249 employees. In the case of the latter, we may conjecture that some enterprises have grown enough to broaden the ranks of large enterprises, but the former companies more than likely had difficulties remaining viable in the market and, in the case of those that offered products with some potential, were taken over by larger and more financially powerful companies.

In the last two graphs in Figure 7 we see turnover and added value per employee according to the size of the enterprise. As expected, for companies with at most one employee we see a fairly high volatility and in general the situation is less favourable than for larger companies. Again, this suggests that these companies are characterised by sporadic and unstable activities, with many of them leaving the market in a relatively short time. Another predictable observation relates to the relatively high productivity of larger companies, which, even if they do not achieve a high turnover per employee, manage to obtain better results with added value. Surprisingly or not, we notice that the gap between small companies (2-19 employees) and the larger ones (over 20 employees) decreased substantially during the 2010s, as there is a trend towards convergence even in terms of added value. From this point of view, the IT sector is truly special, with the trend in other sectors of activity being more one of a strong widening of these gaps.¹⁰ The explanations are multiple, but in addition to the ones relating to the business cycle (for which a growing market is the most important

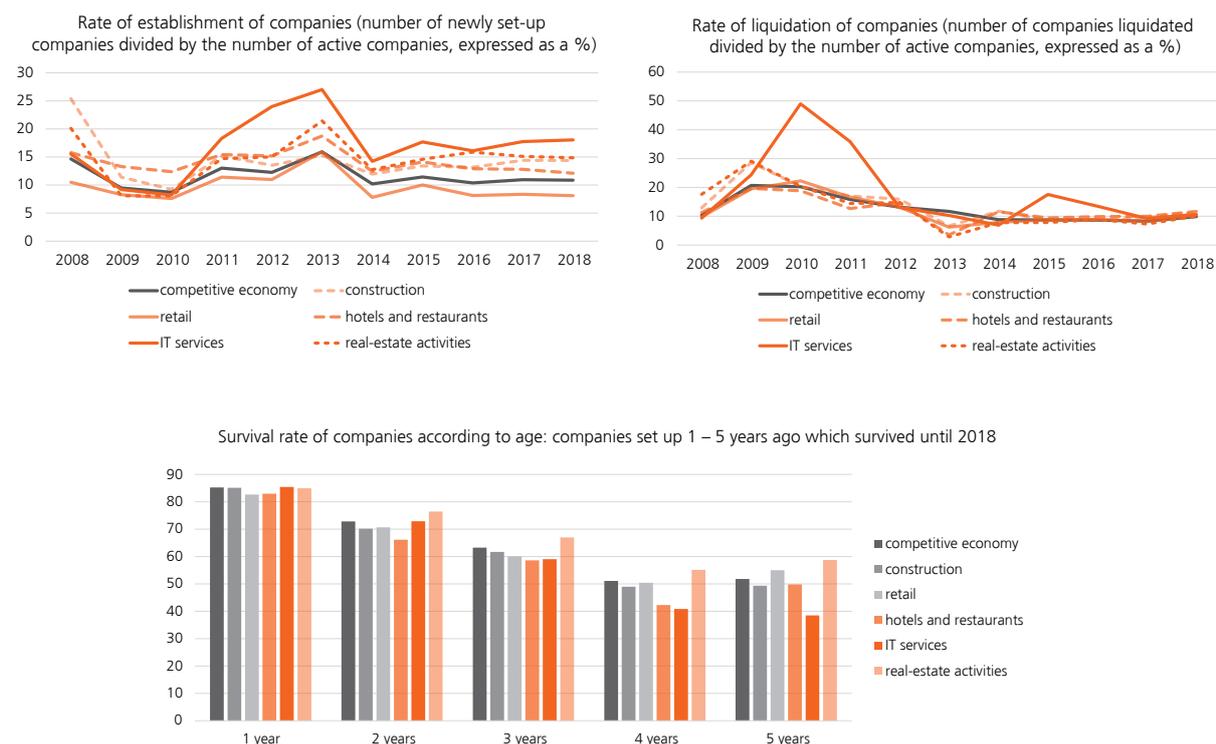
¹⁰ For a detailed analysis of the situation in the trade sector, see Stefan Guga and Marcel Spataru, Commerce sector in Romania: A review after three decades of transformations, Bucharest, Friedrich Ebert Stiftung, 2019.

Table 8
Weight of foreign capital in the sector of information services (CAEN 62), 2018

	companies	turnover	added value	operating profit	cost of personnel	employed persons
LU	42.3%	76.7%	76.9%	88.2%	71.7%	67.7%
RO	9.0%	66.4%	69.2%	43.6%	77.5%	62.9%
MT	18.3%	81.6%	75.3%	80.0%	66.7%	60.4%
EE	47.2%	51.8%	65.3%		61.9%	59.1%
IE	5.7%	91.0%	79.5%	91.7%	62.7%	55.2%
BG	11.5%	55.8%	61.8%	47.9%	66.7%	53.1%
PL	25.5%	49.9%	55.9%	43.8%	60.0%	52.2%
LT	7.4%	55.8%	58.3%	33.0%	65.4%	44.9%
LV	6.6%	55.0%	57.4%	30.5%	65.6%	39.8%
CZ	1.7%	40.4%	47.5%	23.9%	57.6%	37.4%
SK	1.5%	31.3%	42.4%	16.8%	54.7%	36.9%
ES	1.6%	34.5%	37.1%	22.0%	41.4%	31.8%
HU	1.7%	35.0%	44.0%	24.6%	56.2%	29.8%
SE	1.8%	30.8%	33.0%	28.4%	33.7%	28.8%
PT	2.0%	33.7%	35.4%	26.4%	37.9%	28.8%
DK	4.5%	37.2%	32.8%	18.2%	36.9%	28.5%
FI	3.2%	31.1%	31.8%	31.6%	31.9%	27.4%
NL	1.8%	45.1%	37.2%	34.1%	38.7%	25.4%
HR	5.2%	32.2%	33.7%	20.8%	40.5%	24.8%
AT	4.9%	37.5%	33.9%	24.0%	37.8%	24.8%
SI	4.7%	30.0%	27.1%	9.4%	37.7%	20.7%
CY	0.7%	76.5%	52.9%	62.2%	33.2%	20.3%
EL	1.7%	36.2%	34.0%	34.3%	33.8%	20.0%
DE	2.3%	22.4%	23.5%	22.7%	23.8%	17.0%
IT	1.0%	23.5%	21.5%	13.8%	25.8%	16.0%
FR	0.8%	25.7%	24.0%	32.3%	22.2%	14.2%
BE	0.1%	13.9%	16.9%	15.2%	18.0%	7.4%

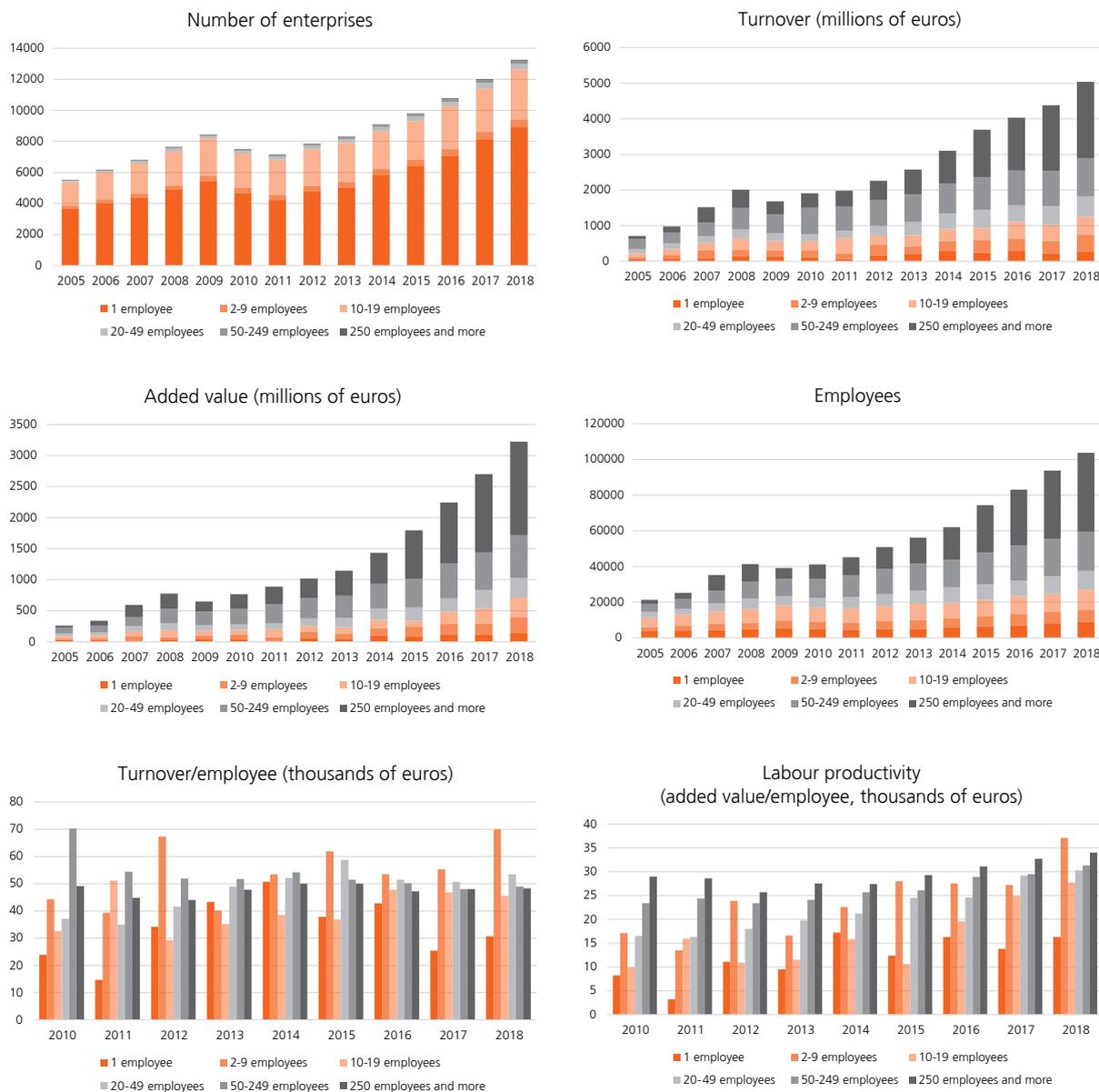
Data source: Eurostat

Figure 6
IT Company Demographics



Data source: Eurostat

Figure 7
IT sector (NACE 62) according to enterprise size classes



Data source: Eurostat

factor), we must take into account the peculiarity of the production process in the IT sector, which does not require massive investments in fixed assets, as these are usually the greater obstacle to entering the market in the case of small enterprises. As long as these conditions prevail, the IT sector will remain attractive to entrepreneurs, as it can offer substantially greater financial benefits (in this case, comparable to those of large companies) than other activities.¹¹ On the other hand, we must not forget the high failure rate and the fact that certain conditions that favour this situation are of a temporary nature. As the market

reaches saturation, products and technologies will become increasingly complex and difficult to manage without considerable human and financial resources, and as large companies seek to grow by expanding into the territory of the smaller ones, we can expect a significant decrease in enthusiasm for entrepreneurship in the IT sector as well.

¹¹ Certainly, the comparison with larger firms has a limited relevance, since the figures in their financial reports are distorted by the position of subordination of the Romanian subsidiaries in the transnational value chains (see below).

2 THE LABOUR MARKET: TURBULENCES AND INEQUALITIES

The topic of work in the IT sector is at least as present in the public space as that of development of the sector as such. In this regard, too, more clarification is needed, since the public discourse is not always in line with reality. First of all, how many employees are we talking about? Following the same logic as the NACE classification, data published by the National Institute of Statistics (Figure 8) shows that in 2019 information and IT services activities (NACE 62-63) employed around 115,000 people, much more than editing/publishing activities (for which 31,000 employees are listed, a figure which includes employees of non-software publishing activities - magazines, books, etc.) and telecommunications (47,000 employees) taken together. Again, that “IT sector” that we hear so much about is related to IT services (NACE 62), which is indeed responsible for most of the increase in IT&C employment in Romania over the last ten years. The number of employees in IT and information services activities increased between 2010 and 2019 at an average annual rate of 14.1%, compared to only 1.7% for telecommunications, 3.8% for publishing activities and 2% for the entire economy. This dramatic increase, resulting in a tenfold surge in the number of IT employees (from 12,000 to 115,000 for NACE 62-63) over the last two decades, has produced and continues to produce turbulence in the labour market and is

the major source of the public fascination that was referred to in the introduction to this study.

What does this new workforce look like? Is the stereotypical image of the “IT worker” (a young man from an urban background with higher education) accurate? To some extent, yes. Only 41% of employees in the IT sector (NACE 62-3) are women, compared to 48% for the national economy, and far below the figure for sectors such as retail or financial services, where women make up the majority.

However, the share of women is slightly higher than in telecommunications, where in 2019 less than 35% of employees were women. Note the relative stability of the share of women in the IT workforce here, as opposed to the administrative and support services sector, where the female workforce has been steadily increasing since the early 2000s as a result of the rapid development of outsourced service centres.

In addition to the low degree of feminisation, the IT workforce is also unusually young (Figure 10). In 2019, employees under the age of 40 accounted for two-thirds of the total IT&C workforce (NACE section J, see Table 2), while

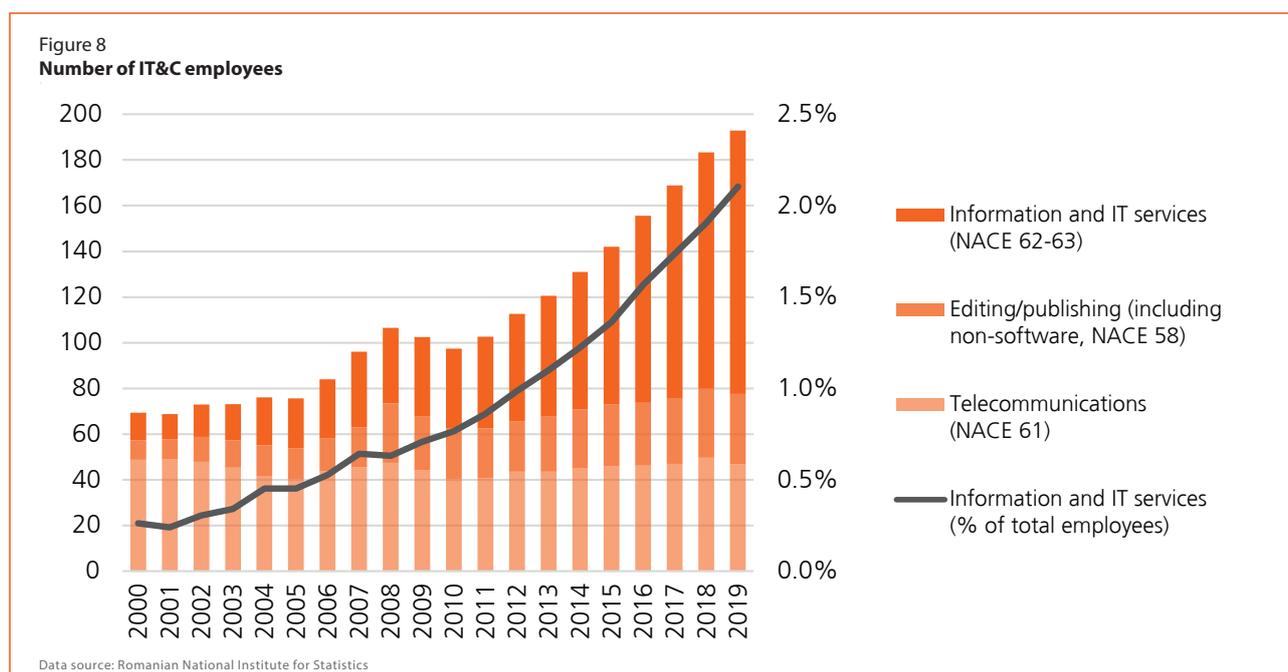
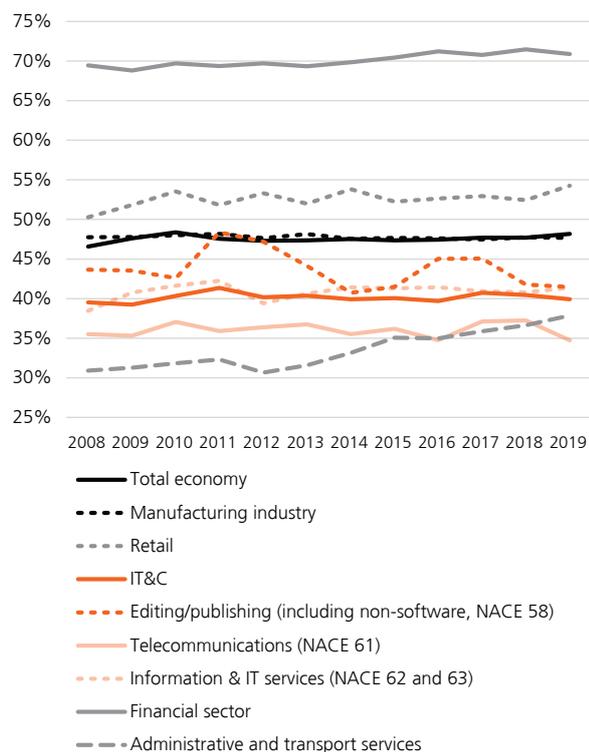


Figure 9
Percentage of women among total employees (%)



Data source: Romanian National Institute of Statistics

at national level the share of employees under the age of 40 was only 40%. At first glance, it can be said that the more general trend of aging to be witnessed in all major sectors of the economy (including manufacturing and retail) does not apply to IT. On the other hand, employees over the age of 40 now account for one-third of the IT workforce, as opposed to just over a quarter in 2008, so here as well we see an aging trend, albeit much less pronounced than in the rest of the economy. This situation is, moreover, as predictable as is possible in a developing sector which requires technical and linguistic skills or a capability and availability of vocational reorientation that are less present among older people.

Contrary to what one would perhaps expect, the aging of the workforce should also be a major topic of discussion in the IT sector. Why? First of all, because it is inevitable. It is hard to believe that the sector will maintain its current growth rates in the medium and long term, and the numerical stabilisation of the workforce will make the phenomenon of aging much more visible. In the end, this can also happen simply for demographic reasons. Given that the dramatic increase in the number of employees in the last ten years has been possible due largely not to a higher influx of new graduates, but rather by attracting and retraining candidates from other sectors of activity, it is expected that manpower reserves for the IT sector will dwindle over time - of course, in the absence of a general demographic turnaround, which for several reasons remains a strictly theoretical possibility, and in the absence of a massive increase in the number of graduates, which is much

discussed, but which is not yet particularly evident. If in the long run the sector proves to be just as technologically dynamic, we can ask ourselves how long young employees in the present day will be willing to undergo professional retraining? And if the appetite for change and the adaptability of employees decreases below the requirements of the industry, what career options will they have? It is not at all easy to find answers to such questions, especially since the numbers involved in the former case are on a much smaller scale: according to Eurostat, in 2019 there were only 2,300 employees over the age of 60 working in IT&C in Romania; moreover, almost 60,000 employees were between 40 and 59 years old. These numbers will increase automatically and rapidly in both categories. It remains to be seen how both companies and employees will manage this transition, which is, at the same time, both an individual and a mass phenomenon.

Another thing we can expect to change with the aging of the workforce is staff turnover. The difficulties of IT companies in finding and, especially, keeping their employees has been front-page headline material for the Romanian business press for years. As stated above, one of the important consequences for the labour market is that many of the new recruits are not licensed in the field in which they work, and companies are willing to waive this requirement to ensure their growth; in turn, many young employees have shown a willingness to retrain professionally, attracted by clearly better opportunities than in other industries. Of course, such a situation would not be possible if the IT sector in Romania mainly consisted of complex and high-tech activities, activities that would often require university training in the field - we have already seen that this is not the case. The high demand for manpower has increased the bargaining power of employees vis à vis employers, giving a strong impetus to salary increases. It is difficult to imagine what the IT sector in Romania would look like in the absence of the staff turnover that has helped define the dynamics on the labour market during the growth period of the last decade. It is equally difficult for today's young employees to maintain their willingness to move frequently from one company to another and to make the necessary efforts to maintain their edge in the labour market (which relates not only to technical skills, but also to acceptance of working conditions less compatible with family life, for example). In one way or another, the aging of the labour force will change the dynamics of the labour market. It remains to be seen exactly when, how and to what extent.

Before looking at the long-term outlook for the labour market, we need to examine what is happening in the short term, especially as the COVID-19 pandemic has turned any previous calculations upside down, with as yet incalculable effects. As mentioned at the beginning of the study, however, the IT sector is said to not be affected by the pandemic and the labour market has remained just as dynamic, the assumption being of course that due to its implications for social interaction in general, the pandemic will further boost demand for IT products and services. Indeed, in the second quarter of 2020 no less than 7.2% of total job vacancies were

Figure 10
Employee distribution by age group

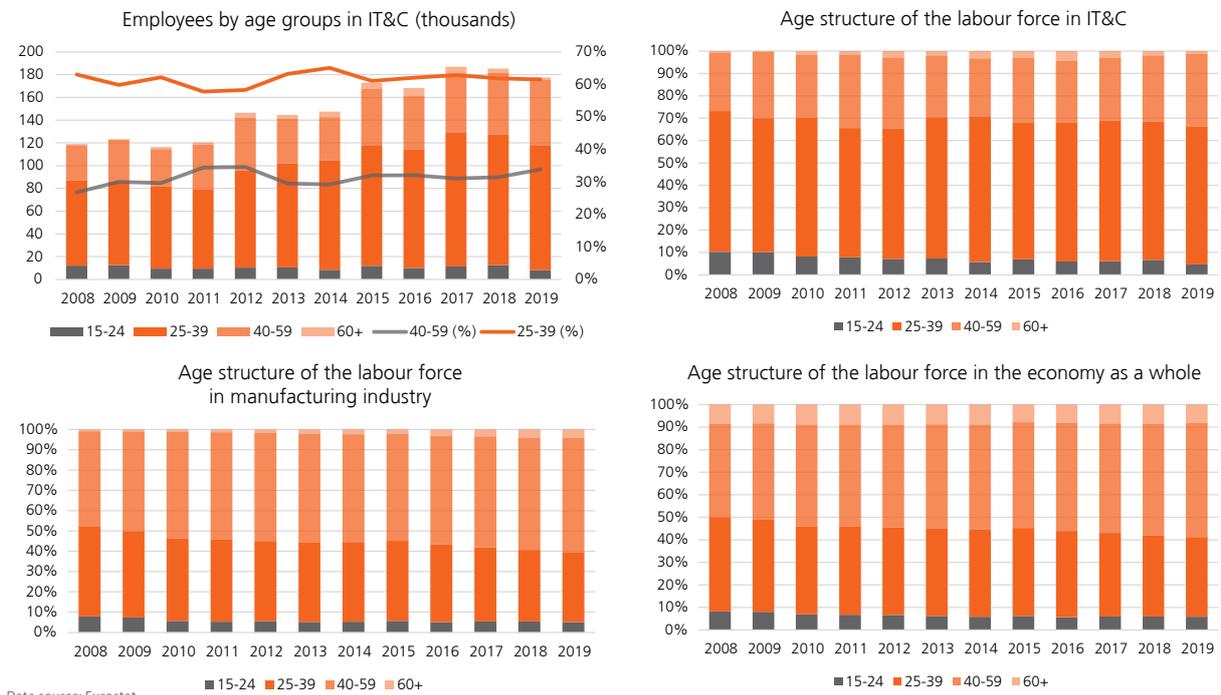
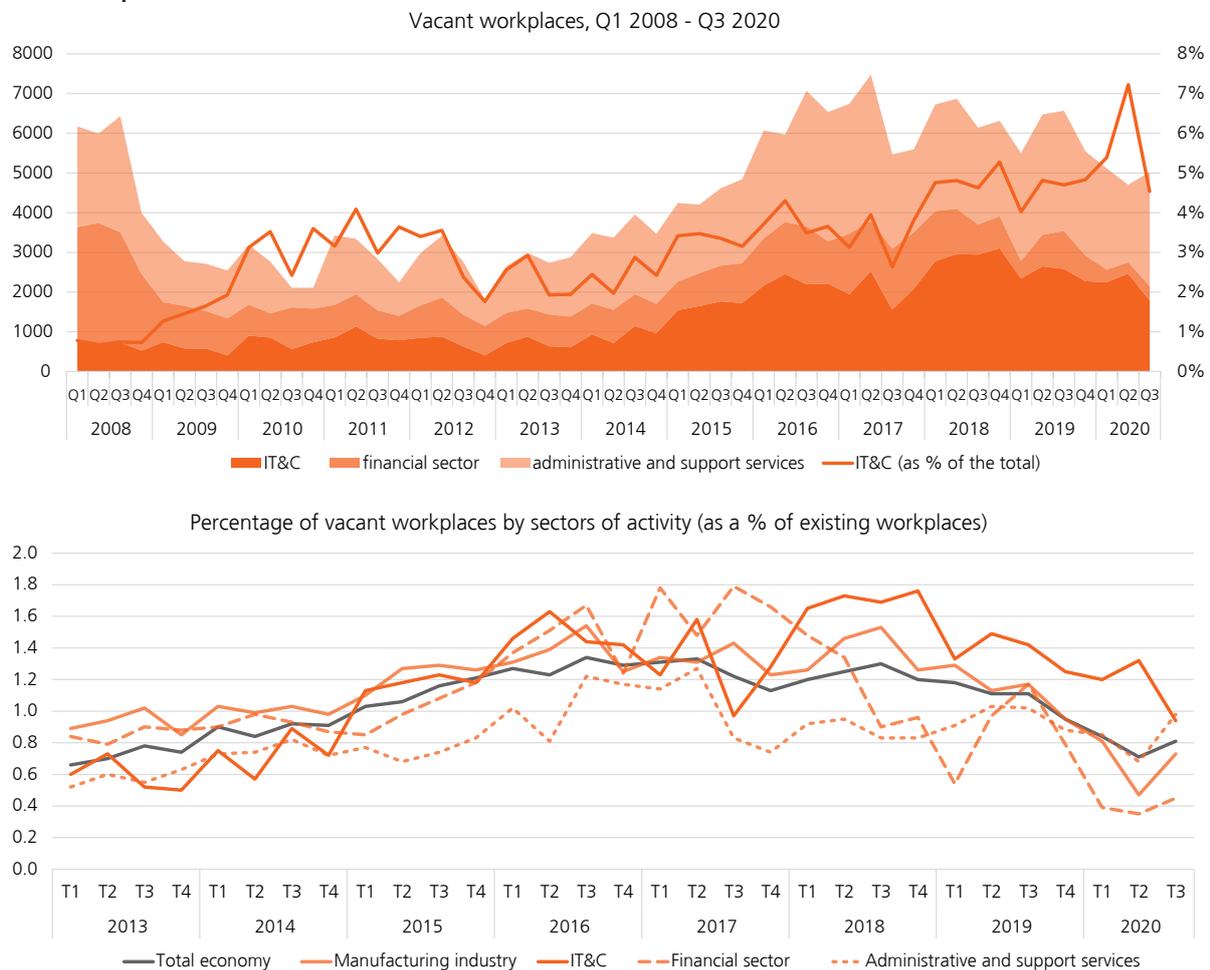


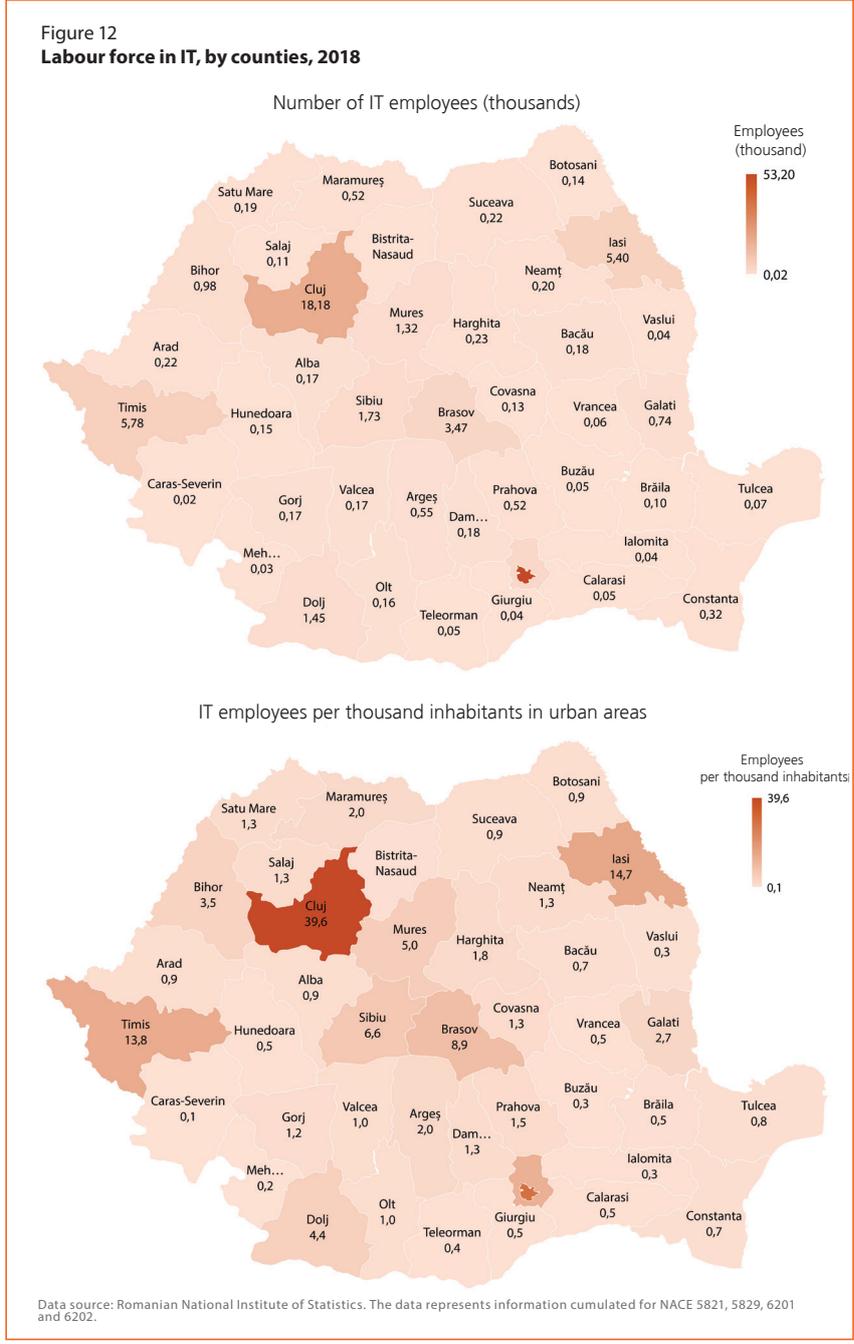
Figure 11
Vacant workplaces



in IT&C, a leap from 4.8% just a year before (Figure 11). Historically, these figures are extremely high: before the economic crisis of the late 2000s, only 0.8% of job vacancies were in IT&C, which shows how much the labour market has changed - of course, the flip side of this transformation is the collapse of job opportunities in other sectors, such as the financial sector and even in manufacturing industry, both in the short term and historically.

The first two graphs in Figure 11, however, show us a slightly more nuanced picture. In absolute terms, the actual number of job vacancies decreased during the pandemic in the IT sector as well, with just under 1,800 jobs being vacant nationwide in the 3rd quarter of 2020, compared to almost 2,600 in the same period of 2019. However, the peak both in absolute terms (number of vacancies) and relative terms (the vacancy rate) was reached in the second half of 2018, with the demand for IT&C workers beginning to fall even before the pandemic hit. Of course, we are still talking about a sector that is growing strongly, but scenarios in which the spectacular growth rates of the last decade can be replicated indefinitely are quite unlikely. It remains to be seen whether the 2008 peak will prove to be a long-term historical one, or whether labour demand will grow again in the future; at least according to data available at the end of 2020, the latter development seems unlikely. Notable in this regard is the fact that in the third quarter of 2020 demand for labour in outsourcing activities (administrative services and support) exceeded that for IT&C for the first time.

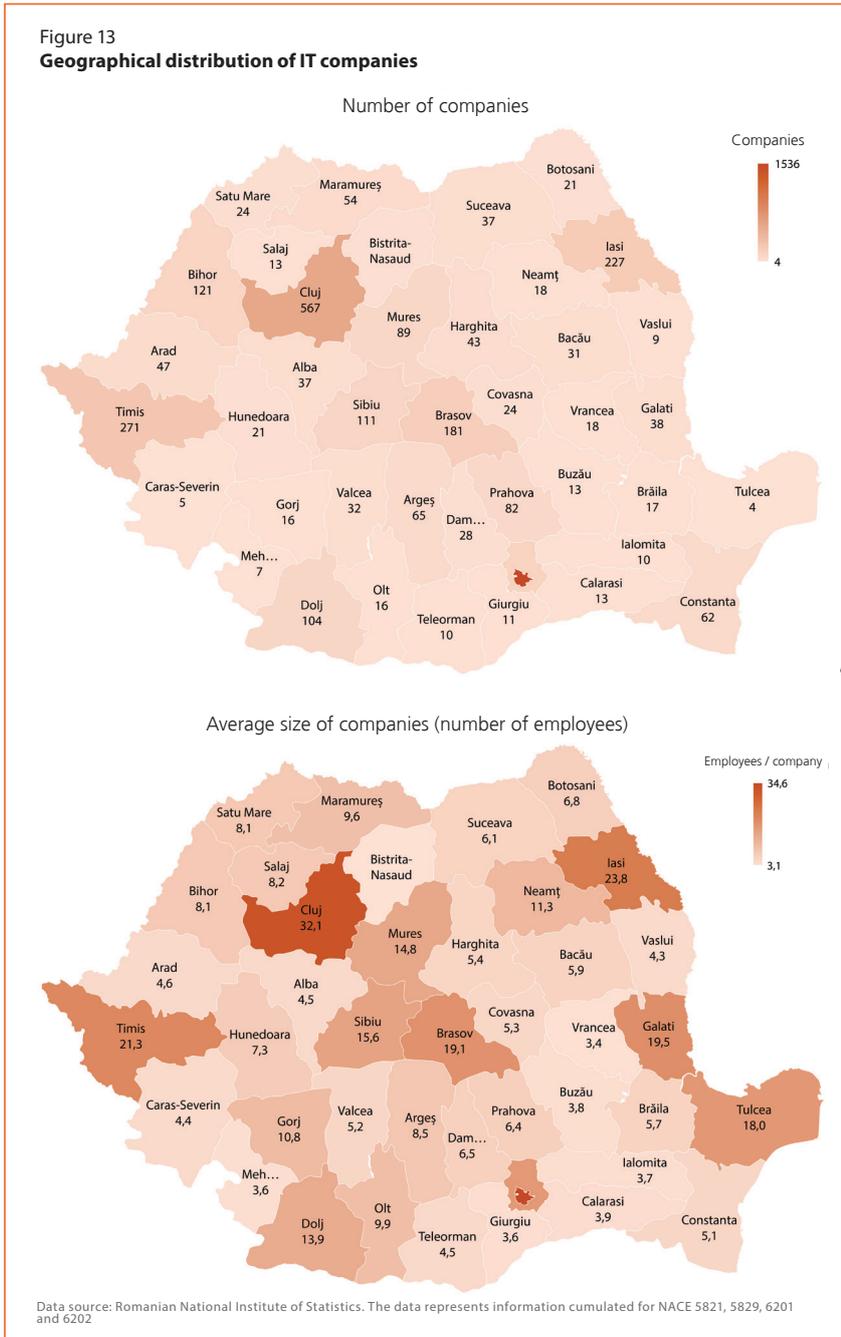
A final relevant aspect regarding the labour market in the IT sector is related to its very unique geographical dynamics. Figure 12 shows the distribution of employees in the IT sector by counties for 2018, thereby employing the strictest possible delimitation according to the NACE nomenclature (categories 5821, 5829, 6201 and 6202). It is well known that the IT sector is concentrated in the largest cities in the country, and especially in Bucharest and Cluj, but it is important to emphasise how big these differences are. With respect to the number of employees, Bucharest leads with more than 50,000 employees working at IT companies, followed by Cluj, with over 18,000, and then Timis and Iasi with over 5,000 staff members. The vast majority of counties do not even have a thousand employees working at IT companies, and in some there are not even a hundred. The



differences become even clearer when we look at the ratio between the number of IT employees and the urban population, with the leader by far based on this criterion being Cluj-Napoca, with almost 40 employees per thousand inhabitants in urban areas, followed by Bucharest with less than 30, Iasi with 15 and Timis with 14 - once again, figures tens of times higher than in most other counties.

If we also take into account the geographical distribution of companies (Figure 13), we can readily conclude that the IT sector is virtually non-existent in poor counties in the southwest, south and southeast, each with only a handful of companies, and these being very small. In contrast, in Bucharest, Cluj-Napoca, Timisoara or Iasi, we see an unusually high concentration of economic activity, a concentration that attracts human and material resources from other regions that are much poorer, thereby

Figure 13
Geographical distribution of IT companies



contributing substantially to upwards-trending income and wealth inequalities in the biggest cities in the country. The city of Cluj-Napoca has become increasingly well-known in the last decade for the dizzying growth of the real estate market there, with prices far exceeding any other large city in the country, including Bucharest. In this city of relatively small size with limited possibilities for expansion, with hundreds of IT companies, many of them large and very large, and 4% of the urban population of the county working in IT (according to statistics on IT employees in 2018) and with salaries far above their fellow citizens, this is no wonder.

3

IT COMPANIES: SLUGGISH GROWTH AND STABILISATION AT A MODEST POSITION IN THE GLOBAL CONTEXT

An analysis of the performance of IT&C companies needs to take into account the great diversity of their locus of activity, business models and value chains. Even worldwide, generalisations made about the information technology sector obfuscate contrasting realities. The term “Big Tech”, for instance, brings together the giants Amazon, Apple, Alphabet (Google), Facebook and Microsoft, companies with a huge market capitalisation which are very attractive to investors due to their association with new technologies. But they are very different at the core: while Microsoft, Facebook and Google have as their main activity the development of Internet programs and applications, Apple combines software development with hardware production, while Amazon is actually more of a trading and logistics company than a software one, if we take into account the fact that most of the over 800,000 employees of the company work in warehouses.

In Romania, the sector is as diverse as everywhere else. In addition to giants in the telecommunications sector, Orange, Vodafone, RCS & RDS and Telekom, other large companies operating in the sector develop software applications for the business environment (Oracle, IBM, Endava, Atos, NTT, Softvision, Luxoft, Stefanini, AROBS) or for a wider audience (Microsoft, Bitdefender), provide services to the telecommunications sector (Ericsson, Nokia), create information systems for the internal needs of some corporations (Amazon, Metro Systems, ING Business Shared Services, EMAG IT Research) or produce computer games (Ubisoft, Electronic Arts, Gameloft). With the exception of Bitdefender and AROBS,¹² the largest companies in the information technology sector in Romania are subsidiaries of multinational corporations.

THE EVOLUTION OF IT COMPANIES BETWEEN 2005 AND 2019

In order to obtain an overview of the trajectory over the last few years, as well as structural economic-financial character-

istics of the main actors in the IT sector, we analysed the 20 largest companies representative of the sub-sectors listed above.¹³ The 20 companies analysed account for over 22% of total employees and more than 25% of turnover in the sector.¹⁴ Of the 20 companies, 17 already existed in 2006, one was founded in 2011 (Atos), one in 2014 (EMAG IT Research) and one in 2018 (ING Business Shared Services). To illustrate how the main companies in the sector have developed in the last 15 years, we leave aside for the moment the three companies created later on. Thus, aggregating turnover, profits, their own capitalisation and the number of employees at these 17 companies (figures 14-17), we can identify a trajectory that has passed through five stages:

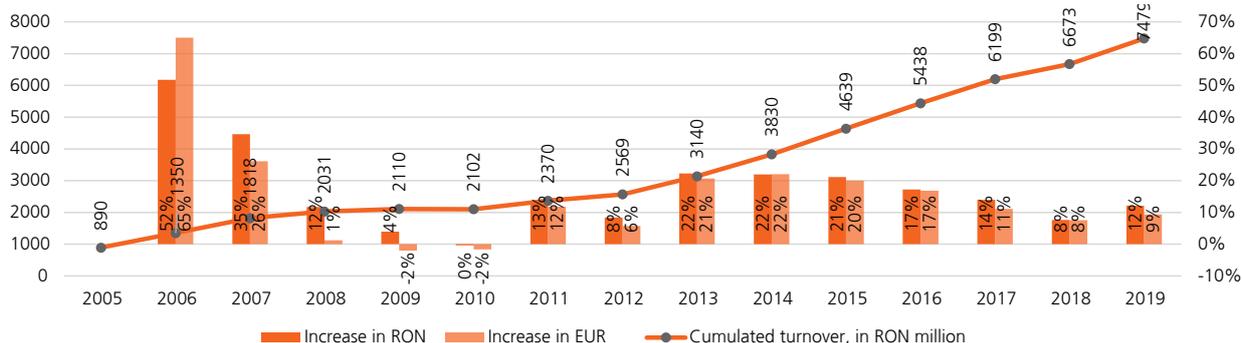
- the entry of large corporations into the Romanian market in 2005-2007, when the rise in sales and number of employees was around 40% per year;
- the crisis of 2008-2010, in which sales stagnated, and at the peak of the crisis in 2009, the cumulative net profit (in euros) decreased by 45%;
- the post-crisis recovery of 2011-2012, when financial indicators began to improve and companies began to hire on a massive scale, with the number of employees increasing by an average of 20% per year;
- a period of accelerated growth from 2013 to 2016, when sales increased on average by 20% per year, and profits by 30%, accelerating the growth of equity as well;
- a relative slowdown in 2017-2019, when sales growth plummeted to just over 10% per year, with some

¹² The company Softvision, founded in Cluj, was bought in 2018 by the American group Cognizant for USD 550 million. See: <https://www.startupcafe.ro/afaceri/softvision-cumparata-tranzactie-cluj-cognizant-it.htm>. Although UiPath is usually portrayed as a Romanian company, it became an American company upon the relocation of its headquarters to New York. We did not include UiPath Romania in this analysis, since the data about this company has no longer been publicly disclosed since 2018.

¹³ These are the companies (1) Amazon Development Center, (2) AROBS Transilvania Software, (3) ATOS IT Solutions and Services, (4) Bitdefender, (5) Electronic Arts Romania, (6) Emag IT Research, (7) Endava Romania, (8) Ericsson Telecommunications Romania, (9) Gameloft Romania, (10) IBM Romania, (11) ING Business Shared Services BV, (12) Luxoft Professional Romania, (13) Metro Systems Romania, (14) Microsoft Romania, (15) Nokia Networks, (16) NTT Data Romania, (17) Oracle Romania, (18) Softvision, (19) Stefanini Romania, (20) Ubisoft.

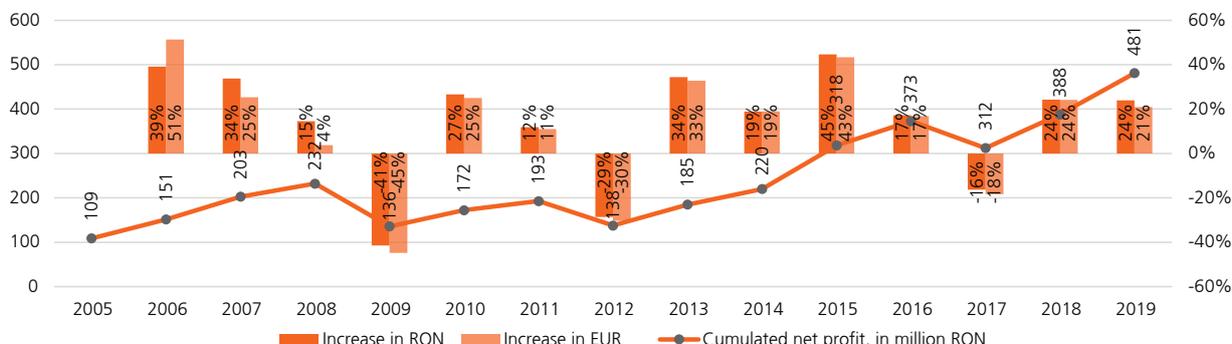
¹⁴ The sector includes the categories CAEN 5821, 5829, 6110, 6120, 6130, 6190, 6201, 6202, 6203, 6209, 6311, 6312, 6391, 6399, from which we excluded the largest telecom companies (Orange, Vodafone, RCS & RDS, Telekom, UPC, Societatea Națională de Radiocomunicații).

Figure 14
Cumulative turnover of 17 IT companies



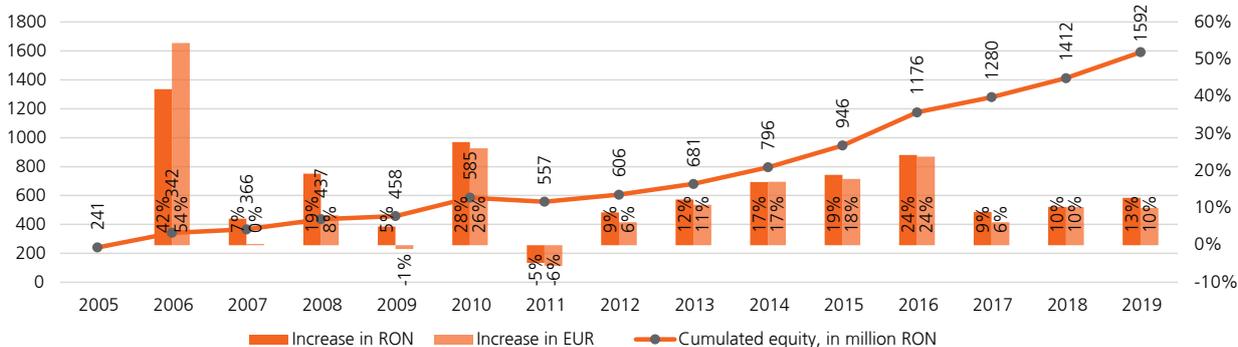
Data source: Company reports, ONRC
Included companies: (1) Amazon Development Center, (2) AROBS Transilvania Software, (3) Bitdefender, (4) Electronic Arts Romania, (5) Endava Romania, (6) Ericsson Telecommunications Romania, (7) Gameloft Romania, (8) IBM Romania, (9) Luxoft Professional Romania, (10) Metro Systems Romania, (11) Microsoft Romania, (12) Nokia Networks, (13) NTT Data Romania, (14) Oracle Romania, (15) Softvision, (16) Stefanini Romania, (17) Ubisoft.

Figure 15
Cumulative net profit of 17 IT companies



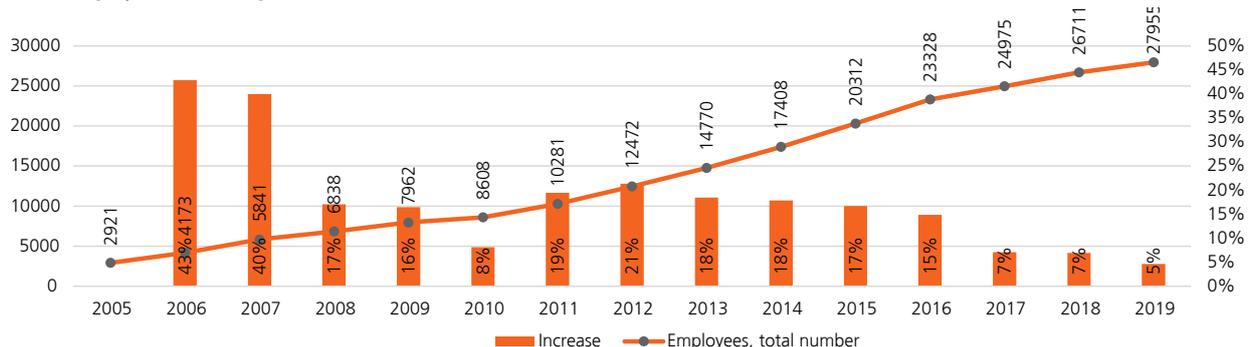
Data source: Rapoartele companiilor, ONRC

Figure 16
Cumulated equity of 17 IT companies



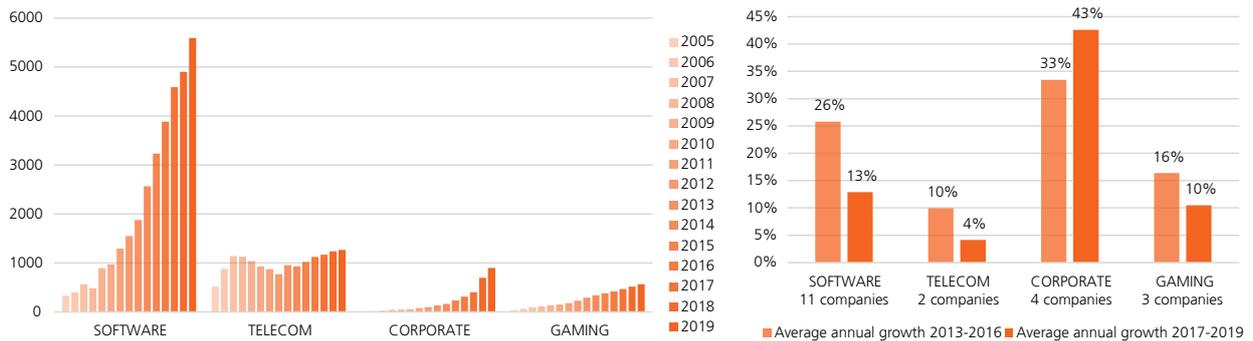
Data source: Rapoartele companiilor, ONRC

Figure 17
Total employees, 17 IT companies



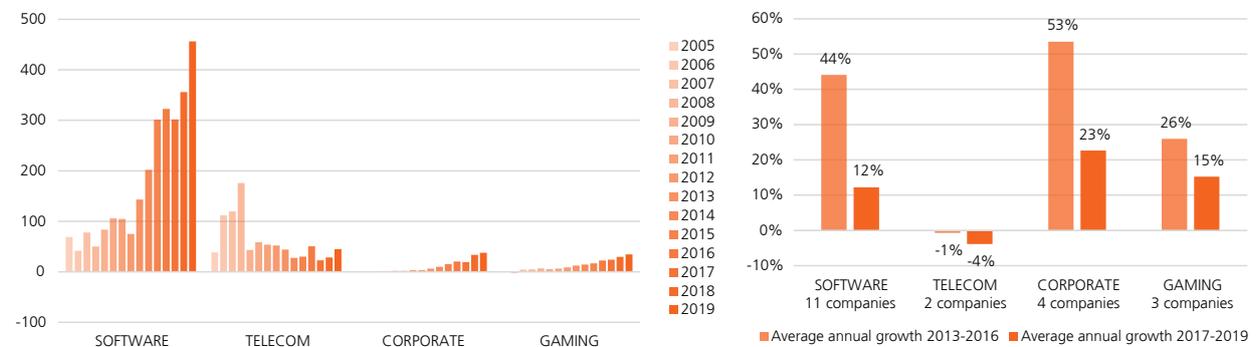
Data source: Rapoartele companiilor, ONRC

Figure 18
Evolution of turnover by sub-groups (2005-2019), 20 companies analysed



Data source: Company reports, ONRC
 Included companies: SOFTWARE: (1) AROBS Transilvania Software, (2) ATOS IT Solutions and Services, (3) Bitdefender, (4) Endava Romania, (5) IBM Romania, (6) Luxoft Professional Romania, (7) Microsoft Romania; (8) NTT Data Romania, (9) Oracle Romania, (10) Softvision, (11) Stefanini Romania; TELECOM: (1) Ericsson Telecommunications Romania, (2) Nokia Networks; CORPORATE: (1) Amazon Development Center, (2) Emag IT Research, (3) ING Business Shared Services BV, (4) Metro Systems Romania; GAMING: (1) Electronic Arts Romania, (2) Gameloft Romania, (3) Ubisoft.

Figure 19
Evolution of profits by sub-groups (2005-2019), 20 companies analysed



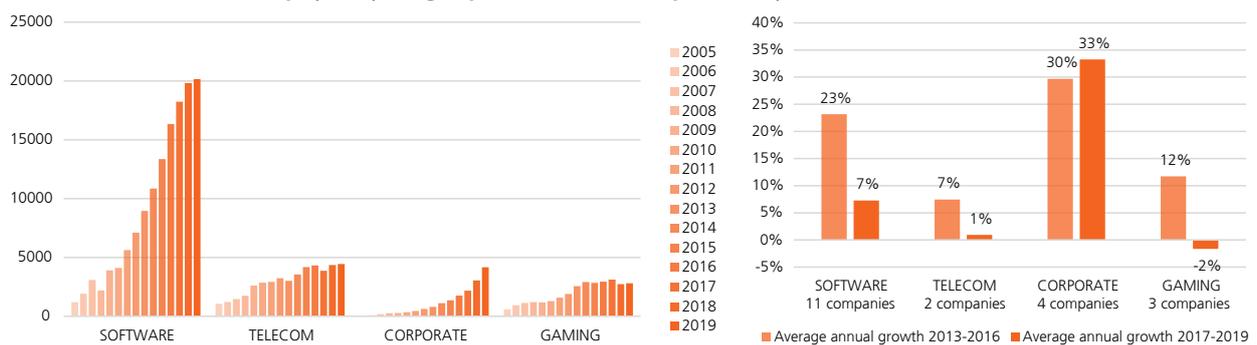
Data source: Company reports, ONRC

Figure 20
Evolution of equity by sub-groups (2005-2019), 20 companies analysed



Data source: Company reports, ONRC

Figure 21
Evolution of the number of employees by sub-groups (2005-2019), 20 companies analysed



Data source: Company reports, ONRC

companies (Endava, Microsoft) experiencing the first negative fluctuations in profit. The growth rate of equity cooled to 10%, while for employment the figure rose to 7% in 2017-2018, but then dipped to only 5% in 2019.

The slowdown in recent years can be explained by several factors. First, companies are approaching a certain level of maturity. Secondly, it is increasingly difficult for companies to hire new employees due to the shortage of skilled labour in the field. Thirdly, the process of wage convergence may limit the appetite of foreign investors when it comes to relocating activities to Romania (fiscal facilities for salaries do not solve this problem).

Moreover, we would also note that not all sub-sectors have experienced a similar trajectory. Among the 20 companies analysed, 11 specialise in the production of software for external customers (SOFTWARE), 4 in the production of software for internal corporate use (CORPORATE), 3 in the production of games (GAMING) and 2 in services for telecommunications companies (TELECOM). Of all the 4 groups, only CORPORATE did not see a slowdown in its growth in 2017-19 compared to 2013-16. This sub-sector is going through another period of dynamic growth, with two of the companies analysed - Emag IT Research and ING Business Shared Services - being founded recently, in 2014 and 2018, respectively. Among the other groups, SOFTWARE has developed the most in the last ten years. Although in 2010 sales of the SOFTWARE and TELECOM groups were comparable, in 2019 the former generated a turnover 4.4 times higher than the latter. Even the SOFTWARE group experienced a slowdown in sales growth, however, from 26% in 2013-16 to 13% in 2017-19. The slowdown is even more obvious in the case of TELECOM and GAMING: from 10% and 16%, respectively, in the period 2013-16 to 4% and 10%, respectively, in the years 2017-19. The decrease in the growth rate of sales was also mirrored by trends in the number of employees: in CORPORATE, employment continued at an accelerated pace (increase of over 30% per year), in SOFTWARE the growth in the number of employees slowed considerably from 23% in 2013-16 to only 7% in 2017-19, while in TELECOM and GAMING the

number of employees has stabilised in the last 3 years. Thus, we can conclude that the four groups are in different phases of development: CORPORATE is going through another period of dynamic growth due to internal needs of other economic sectors (retail and banking), SOFTWARE is in the transition phase to maturity, with the growth rate slowing from year to year, while companies in TELECOM and GAMING are approaching, or have already reached, a certain level of maturity (figures 18-21).

THE ROLE OF ROMANIAN SUBSIDIARIES IN CORPORATIONS

Most large IT companies in Romania are subsidiaries of listed multinational groups, which allows an analysis of the relative position of our country within these groups. Of the 20 companies analysed:

- For the CORPORATE group, the share of Romanian IT subsidiaries in multinationals is of little relevance, because the main activity of these companies - Amazon, Emag, ING, Metro - is not software production as such, but e-commerce, banking and cash & carry; however, in order to illustrate how small the share of the Romanian subsidiary is within the Amazon group, we include this group in the tables.
- Gameloft, Stefanini, Luxoft, AROBS and Bitdefender are not members of listed multinational groups and therefore do not publish any global economic and financial data that would allow the analysis that we have proposed.
- Endava is a special case, as the company was founded in Chişinău, Moldova, even though it is headquartered in London and has subsidiaries in North and Latin America. It has remained an actor with a very strong presence in Eastern Europe, hence the exceptionally large share of Romania in this group compared to the other cases.
- The other 10 companies (Atos, Electronic Arts, Ericsson, IBM, Microsoft, Nokia, NTT, Oracle, Softvision and Ubisoft) are members of listed multinational groups and their financial data is available.

Table 9
The share of turnover of Romanian subsidiaries in multinational groups

Turnover	2014	2015	2016	2017	2018	2019	Increase in percentage 2019 vs. 2014
Atos	0.4%	0.4%	0.4%	0.6%	0.8%	0.8%	0.44 pp
Electronic Arts	0.7%	0.7%	0.7%	0.8%	0.9%	0.8%	0.1 pp
Ericsson	0.5%	0.6%	0.7%	0.7%	0.8%	0.8%	0.24 pp
IBM	0.2%	0.2%	0.2%	0.3%	0.3%	0.3%	0.08 pp
Microsoft	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.01 pp
Nokia	0.7%	0.6%	0.4%	0.4%	0.4%	0.4%	-0.24 pp
NTT	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.05 pp
Oracle	0.5%	0.5%	0.6%	0.7%	0.6%	0.6%	0.07 pp
Softvision (Cognizant)	0.1%	0.2%	0.3%	0.3%	0.4%	0.5%	0.38 pp
Ubisoft	2.1%	2.3%	2.5%	2.4%	2.6%	3.5%	1.43 pp
Total 10 companies	0.21%	0.23%	0.24%	0.27%	0.28%	0.27%	0.06 pp
Amazon	0.01%	0.02%	0.02%	0.02%	0.03%	0.03%	0.01 pp
Endava	33.4%	31.2%	37.0%	33.6%	32.9%	33.9%	0.44 pp

Data source: Company reports, ONRC

Ubisoft) are part of multinational groups in which Romania's relative position is more or less similar.

Analysing the data from these latter 10 companies, the conclusion is clear-cut: Romania accounts for an extremely small share of multinationals, and Romanian subsidiaries play the role of cost centres, in which activities are concentrated, with relatively low complexity and low capital intensity in relation to work. Thus, apart from Ubisoft, whose Romanian subsidiary accounted for 3.5% of the group's sales in 2019, at the other 9 groups, Romanian subsidiaries generate less than 1% of the global turnover (Table 9). Cumulatively, Romania's share in turnover of the 9 groups remains extremely modest: after a relative increase before 2017, in the last three years this indicator has stabilised at 0.27%.

Romania's share in the cumulative net profits of IT multinationals is even lower: cumulatively, it accounted for only 0.12% in 2019, and the indicator has fluctuated at around this level since 2016 (Table 10). The figures for Nokia in the period 2016-2019 are not relevant because the Finnish group recorded a loss over the period 2016-2018, while the

Romanian subsidiary remained profitable, as it is a cost centre that records profits structurally. In 2019, the Nokia group recorded a very small profit (EUR 7 million), almost equivalent to the profit of the Romanian subsidiary (EUR 6.3 million): a presentation of the data in the table could create the false impression that the Romanian subsidiary generated almost all the profit of the Nokia group, which is of course untrue. The Romanian subsidiary is not autonomous and does not sell its products to external customers.

When we say that Romania is a low-intensity cost centre of capital in relation to labour we are focusing on comparisons between the share of turnover (0.27% in 2019, Table 9) and the share of own equity used in Romania in total for the group on the one hand (0.11% in 2019, Table 12) and the share of the number of employees on the other. Indeed, the share of employees in the analysed groups is higher than the share of turnover: in 2019 employees in Romania accounted for 1.19% of total employees in the 10 multinationals, with the indicator hovering at this level since 2017 after growing continuously in previous years (Table 11). Thus, an employee in Romania sells on average only 23% of what an average employee of the

Table 10
The share of net profits of Romanian subsidiaries in multinational groups

Net profit	2014	2015	2016	2017	2018	2019	Increase in percentage 2019 vs. 2014
Atos	2.7%	2.1%	1.4%	1.8%	2.0%	3.8%	1.07 pp
Electronic Arts	0.2%	0.2%	0.2%	0.2%	0.3%	0.1%	-0.1 pp
Ericsson	0.1%	0.2%	8.0%	0.0%	-0.5%	1.5%	1.34 pp
IBM	0.1%	0.1%	0.2%	0.2%	0.2%	0.2%	0.12 pp
Microsoft	0.04%	0.04%	0.04%	0.02%	0.01%	0.02%	-0.02 pp
Nokia	0.10%	0.20%	n/p	n/p	n/p	n/p	
NTT	0.1%	0.1%	0.0%	0.1%	0.1%	0.1%	-0.02 pp
Oracle	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1 pp
Softvision (Cognizant)	0.0%	0.0%	0.2%	0.2%	0.2%	0.3%	0.33 pp
Ubisoft	1.4%	1.4%	1.7%	1.6%	2.5%	-2.9%	-4.35 pp
Total 10 companies	0.09%	0.10%	0.12%	0.14%	0.11%	0.12%	0.02 pp
<i>Amazon</i>	<i>-0.32%</i>	<i>0.19%</i>	<i>0.05%</i>	<i>0.07%</i>	<i>0.04%</i>	<i>0.03%</i>	<i>0.35 pp</i>
<i>Endava</i>	<i>38.7%</i>	<i>29.0%</i>	<i>61.0%</i>	<i>36.7%</i>	<i>39.5%</i>	<i>53.3%</i>	<i>14.6 pp</i>

Data source: Company reports, ONRC

Table 11
The share of the number of employees at Romanian branches in the total for groups

Employees	2014	2015	2016	2017	2018	2019	Increase in percentage 2019 vs. 2014
Atos	1.0%	1.4%	1.7%	2.1%	1.8%	2.2%	1.2 pp
Electronic Arts	5.2%	5.2%	5.1%	5.4%	5.1%	5.0%	-0.17 pp
Ericsson	1.9%	2.4%	2.5%	2.2%	2.6%	2.6%	0.65 pp
IBM	0.5%	0.6%	0.7%	0.8%	0.9%	0.9%	0.45 pp
Microsoft	0.3%	0.4%	0.4%	0.4%	0.5%	0.5%	0.17 pp
Nokia	2.3%	2.5%	1.5%	1.6%	1.8%	1.9%	-0.39 pp
NTT	0.2%	0.2%	0.2%	0.3%	0.3%	0.3%	0.17 pp
Oracle	1.9%	2.2%	2.6%	3.0%	3.3%	2.5%	0.63 pp
Softvision (Cognizant)	0.5%	0.5%	0.4%	0.4%	0.5%	0.6%	0.06 pp
Ubisoft	13.6%	11.6%	12.2%	11.6%	9.4%	9.0%	-4.56 pp
Total 10 companies	0.90%	1.04%	1.09%	1.18%	1.23%	1.19%	0.29 pp
<i>Amazon</i>	<i>0.17%</i>	<i>0.16%</i>	<i>0.17%</i>	<i>0.15%</i>	<i>0.17%</i>	<i>0.25%</i>	<i>0.07 pp</i>
<i>Endava</i>	<i>51.8%</i>	<i>49.4%</i>	<i>48.4%</i>	<i>38.6%</i>	<i>39.5%</i>	<i>39.2%</i>	<i>-12.56 pp</i>

Data source: Company reports, ONRC

multinationals under analysis sells - it is obvious from this that **Romania is a cost centre of low value-added activities, or at least the added value that is attributed to Romania through intragroup transfers is small.** Expressed in quantitative amounts, the differences also allow an interpretation of these

data in terms that are easier to understand and that also allow an understanding of the salary level for the sector in our country: while an employee in Romania at the 10 companies analysed makes average sales of EUR 58,000 per year (2019), the global average is EUR 258,000.

Table 12
Ponderea capitalurilor proprii ale filialelor românești în totalul grupurilor

Own equity	2014	2015	2016	2017	2018	2019	Increase in percentage 2019 vs. 2014
Atos	0.3%	0.4%	0.5%	0.7%	0.7%	0.8%	0.48 pp
Electronic Arts	0.4%	0.4%	0.4%	0.4%	0.4%	0.3%	-0.15 pp
Ericsson	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.09 pp
IBM	0.2%	0.1%	0.1%	0.2%	0.2%	0.1%	-0.07 pp
Microsoft	0.02%	0.03%	0.03%	0.04%	0.03%	0.03%	0.01 pp
Nokia	0.5%	0.4%	0.2%	0.2%	0.3%	0.3%	-0.22 pp
NTT	0.01%	0.01%	0.02%	0.02%	0.02%	0.03%	0.02 pp
Oracle	0.0%	0.0%	0.0%	0.0%	0.1%	0.3%	0.27 pp
Softvision (Cognizant)	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.11 pp
Ubisoft	0.7%	0.8%	0.7%	1.1%	1.3%	1.2%	0.51 pp
Total 10 companies	0.06%	0.07%	0.07%	0.08%	0.10%	0.11%	0.05 pp
<i>Amazon</i>	<i>0.03%</i>	<i>0.03%</i>	<i>0.11%</i>	<i>0.09%</i>	<i>0.07%</i>	<i>0.05%</i>	<i>0.02 pp</i>
<i>Endava</i>	<i>24.2%</i>	<i>42.8%</i>	<i>35.1%</i>	<i>37.3%</i>	<i>8.9%</i>	<i>2.0%</i>	<i>-22.2 pp</i>

Data source: Company reports, ONRC

Table 13
Share of fixed assets accounted for by Romanian subsidiaries in group totals

Fixed assets	2014	2015	2016	2017	2018	2019	Increase in percentage 2019 vs. 2014
Atos	0.2%	0.2%	0.2%	0.3%	0.5%	0.3%	0.11 pp
Electronic Arts	1.5%	1.9%	1.6%	1.5%	1.0%	0.5%	-1.04 pp
Ericsson	0.2%	0.2%	0.2%	0.2%	0.8%	0.2%	0.03 pp
IBM	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	-0.05 pp
Microsoft	0.02%	0.03%	0.02%	0.02%	0.01%	0.01%	-0.01 pp
Nokia	1.7%	2.2%	0.9%	0.8%	0.9%	0.5%	-1.19 pp
NTT	0.00%	0.00%	0.00%	0.01%	0.01%	0.02%	0.01 pp
Oracle	0.2%	0.3%	0.3%	0.3%	0.2%	0.1%	-0.07 pp
Softvision (Cognizant)	0.1%	0.1%	0.0%	0.1%	0.1%	0.2%	0.09 pp
Ubisoft	1.8%	2.4%	2.2%	1.8%	1.5%	1.0%	-0.79 pp
Total 10 companies	0.04%	0.05%	0.05%	0.05%	0.05%	0.05%	0 pp
<i>Amazon</i>	<i>0.01%</i>	<i>0.01%</i>	<i>0.04%</i>	<i>0.03%</i>	<i>0.04%</i>	<i>0.03%</i>	<i>0.02 pp</i>
<i>Endava</i>		<i>44.0%</i>	<i>32.6%</i>	<i>37.2%</i>	<i>35.3%</i>	<i>6.3%</i>	

Data source: Company reports, ONRC

Table 14
Share of current assets accounted for by Romanian subsidiaries in group totals

Current assets	2014	2015	2016	2017	2018	2019	Increase in percentage 2019 vs. 2014
Atos	0.4%	0.4%	0.5%	0.6%	0.6%	0.9%	0.53 pp
Electronic Arts	0.2%	0.2%	0.2%	0.3%	0.3%	0.3%	0.14 pp
Ericsson	0.3%	0.3%	0.5%	0.5%	0.4%	0.6%	0.3 pp
IBM	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.03 pp
Microsoft	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0 pp
Nokia	0.4%	0.4%	0.3%	0.3%	0.3%	0.4%	0 pp
NTT	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.04 pp
Oracle	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.06 pp
Softvision (Cognizant)	0.0%	0.1%	0.1%	0.1%	0.2%	0.3%	0.28 pp
Ubisoft	0.8%	0.7%	0.5%	0.7%	0.7%	0.9%	0.13 pp
Total 10 companies	0.08%	0.08%	0.09%	0.09%	0.10%	0.12%	0.04 pp
<i>Amazon</i>	<i>0.01%</i>	<i>0.02%</i>	<i>0.02%</i>	<i>0.02%</i>	<i>0.03%</i>	<i>0.03%</i>	<i>0.01 pp</i>
<i>Endava</i>		<i>34.5%</i>	<i>32.0%</i>	<i>46.0%</i>	<i>15.5%</i>	<i>14.5%</i>	

Data source: Company reports, ONRC

It is interesting to note that in the case of Romania, the sales indicator per employee remained practically stable between 2014 and 2018, with the increase in sales being entirely accounted for by the increase in the number of employees. This would appear to mean that the intensity of work has not increased. In reality, there is a polarising trend at work here that results in a relatively stable average: employment of a large number of young and novice employees, at lower salaries and for less complex positions, reduces the increase in sales per employee for the sector as a whole, although older employees are more efficient and productive.

The rule according to which sales per employee in Romania are lower compared to the average per group is valid for all companies in the sector, although a more detailed analysis shows some differences (figure 23). For smaller companies which sell less expensive software products, such as Cognizant Softvision or Endava, the differences between Romanian media and the global average are less pronounced than for giants like Oracle or IBM. Note also the special case of Microsoft, for which the sales of licenses in Romanian territory make turnover per employee of the Romanian subsidiary appear to be at a higher level compared to the other companies. There are also differences between game producers: sales per employee for the Romanian subsidiary of Electronic Arts are more than twice as high as those of the Ubisoft subsidiary. In this case, this is due to the different profile of the subsidiaries: Electronic Arts Romania is more focused on the development of games, while Ubisoft Romania devotes a more significant share of its activities to the testing of games.

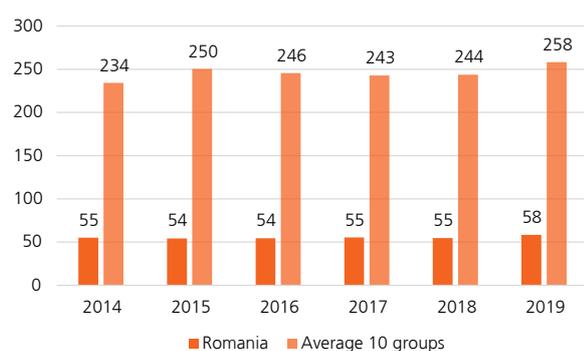
Besides the fact that the Romanian subsidiaries have a marginal position within their groups, the interest of investors in Romania seems to have waned in recent years: for 7 of the 12 companies analysed the share of fixed assets in Romania in group totals decreased between 2016 and 2019 (Table 13). In other words, the rate of investment in fixed assets in Romania is lower than the global rate.

Table 15
Capital intensity of work in Romania as a % of the global average for groups

	Fixed assets / employee	Current assets / employee	Own equity / employee
Atos	12.4%	41.9%	36.9%
Electronic Arts	10.0%	6.9%	5.3%
Ericsson	9.2%	21.3%	5.5%
IBM	5.6%	13.0%	15.9%
Microsoft	2.8%	5.0%	6.2%
Nokia	28.0%	20.9%	17.0%
NTT	4.7%	16.1%	8.8%
Oracle	5.3%	4.1%	12.1%
Softvision (Cognizant)	39.7%	59.3%	27.1%
Ubisoft	11.3%	10.0%	13.3%
Total 10 companies	3.8%	10.2%	9.1%
<i>Amazon</i>	<i>11.0%</i>	<i>10.9%</i>	<i>20.6%</i>
<i>Endava</i>	<i>16.2%</i>	<i>37.0%</i>	<i>5.2%</i>

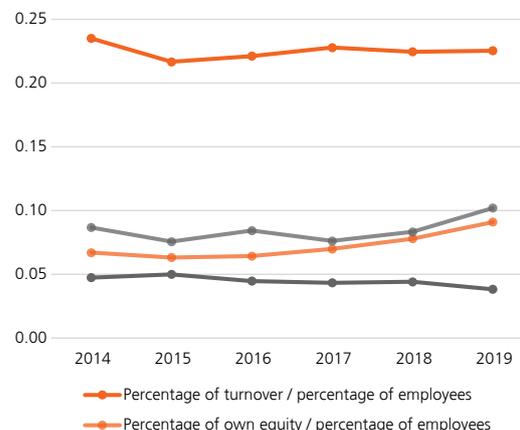
Data source: Company reports, ONRC

Figure 22
Turnover per employee, in thousands of euros



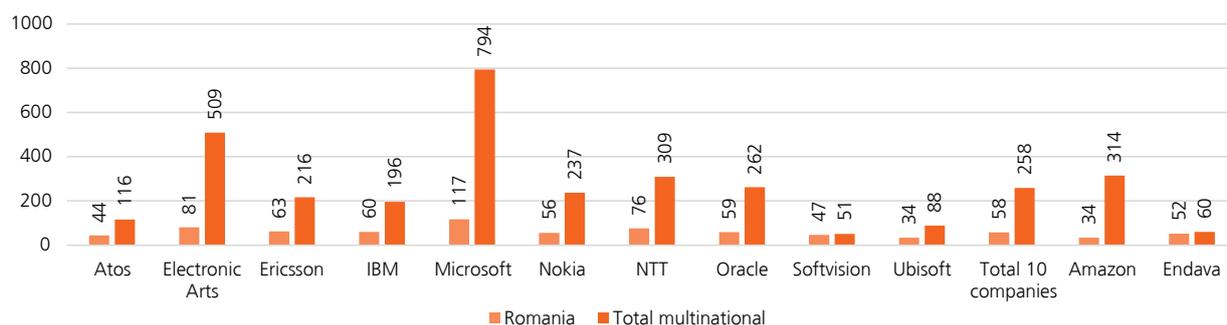
Data source: Company reports, ONRC

Figure 24
The evolution of sales per employee and the capital intensity of work in Romanian branches compared to the group average (10 IT multinationals)



Data source: Company reports, ONRC

Figure 23
Turnover per employee, 2019, in EUR thousands



Data source: Company reports, ONRC

ADDED VALUE, PRODUCTIVITY AND REMUNERATION OF EMPLOYEES IN IT COMPANIES IN ROMANIA

The position and role of Romanian subsidiaries within multinationals influence the financial productivity of employees and their remuneration. Given this, as we have shown, the role played by Romanian subsidiaries within multinationals is that of cost centres, in which functions are concentrated rather than integrated activities, the indicators of added value and productivity are directly influenced by the salary level and margins (cost plus) agreed at the level of corporations.

Thus, out of the 20 companies analysed, for 6 companies the added value accounts for more than 80% of turnover, and for the other 11 companies between 60 and 80% (figure 25). The exceptions, with an added value rate of less than 60%, are only Bitdefender, one of the few large IT companies in Romania with an integrated value chain from product development to product sales to the final consumer and with an added value of only 40% of turnover, along with Ericsson and NTT.

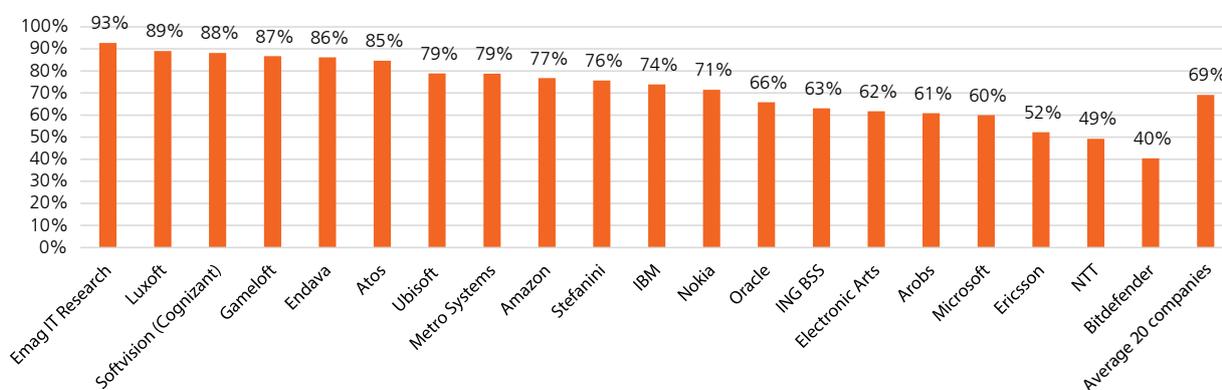
The fact that added value accounts for a high share in turnover means that these companies have few external

expenses, with employees being by far the most important item in the cost structure. In reality, for many companies the dependence is quite the opposite: the increase in salaries, which takes place under market pressure, translates directly into increased sales, as most of the latter are intra-group, and the value of invoices issued by Romanian subsidiaries is directly based on the level of wage costs.

The level of productivity of employees at IT companies, expressed in financial terms,¹⁵ directly reflects this reality. The companies' reports indicate that in 2019 the average annual productivity of employees at the 20 companies analysed is RON 182,000 / employee, with most of the companies lying between RON 177,000-220,000 / employee (figure 26). Microsoft contrasts with this picture, having a particularly high level of productivity, at RON 334,000 / employee, since, in addition to the higher degree of complexity of the activity in relation to the media, the company also has a commercial operations on Romanian territory. The second company with a high level of productivity is Electronic Arts, for whom the indicator is considerably higher than for other gaming

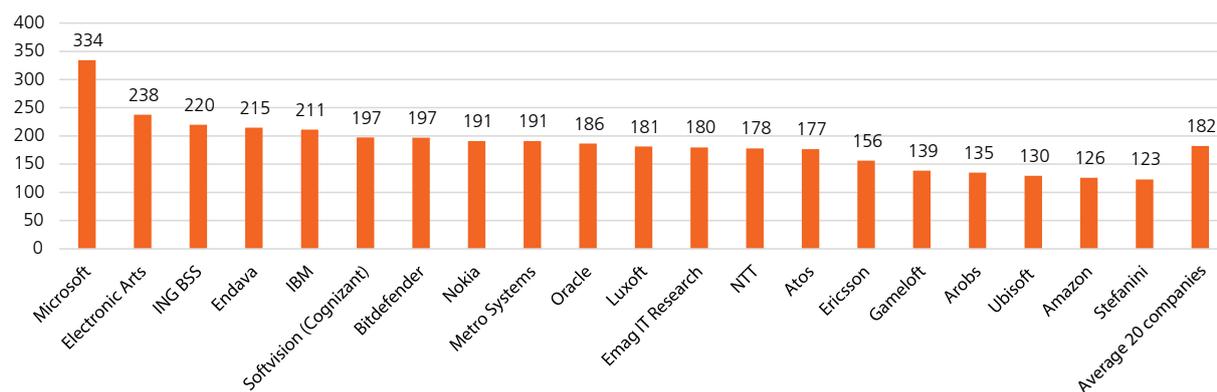
¹⁵ For a broader discussion of productivity indicators as well as the factors that influence productivity expressed in financial terms, see Stefan Guga, *The Question of Productivity: Controversies and Clarifications*, Bucharest, Friedrich Ebert Stiftung, 2020.

Figure 25
Share of value added in turnover, 2019



Data source: Company reports, ONRC

Figure 26
Added value per employee, in RON thousands, 2019



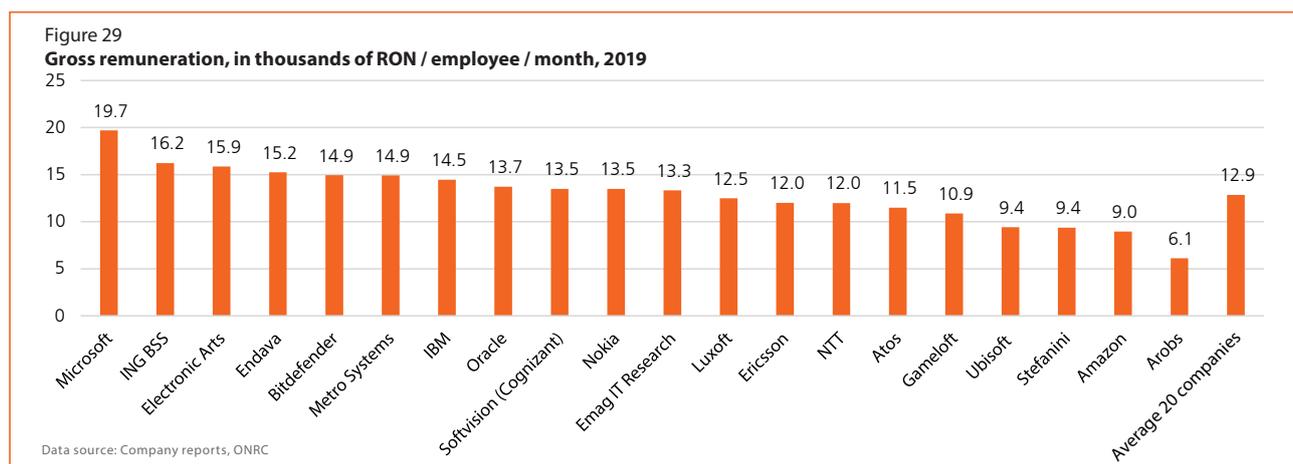
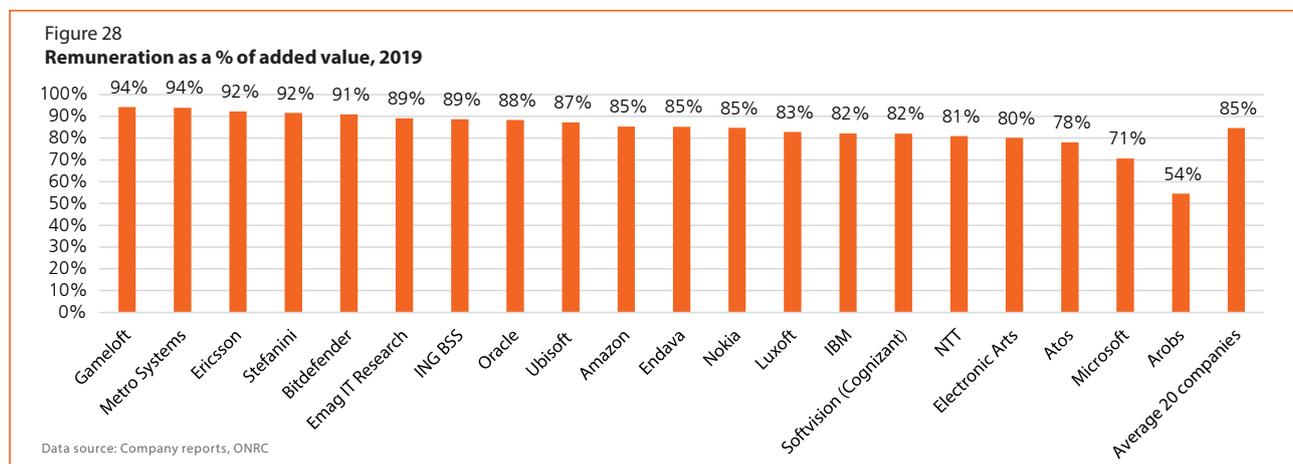
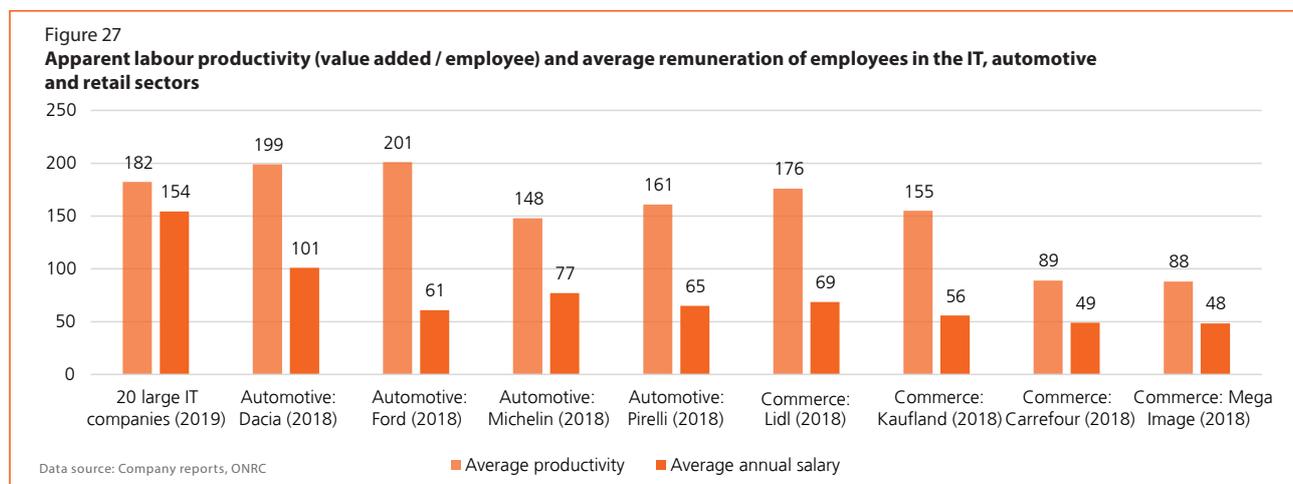
Data source: Company reports, ONRC

companies (Gameloft, Ubisoft). On the other hand, companies such as AROBS, Amazon or Stefanini have low value-added activities compared to the sector average.

When it comes to the IT industry in Romania, a very common opinion is that employees in this sector are much more productive than those in other sectors. But the reality is far from being so clear-cut. **The apparent productivity of employees in the 20 IT companies analysed is in fact comparable to that of employees at Dacia and Ford car factories and even those working in Lidl stores.** It is true that for the analysis of the real productivity of employees at Romanian subsidiaries of IT multinationals, data regarding the entire value chain would be needed (for example, the real

contribution of Romanian programmers to the final selling price of the product, etc.), which are not available. The same is true, probably on a smaller scale, for other sectors as well: in the automotive industry, cars and components produced in Romania are mostly sold to intra-group entities, and in the retail sector many of the costs of Romanian subsidiaries come from entities affiliated with the groups to which they belong.

Although the productivity of employees at IT companies is comparable to that of other sectors, the share of value-added wages in this sector is much higher. Whereas an employee in the automotive industry or retail receives from 30% to 55% of the added value they create in the form of their salary, at the 20 IT companies analysed remuneration accounted for



around 85% of added value in 2019 (figure 28). Under these conditions, IT salaries are among the highest in Romania not only in absolute terms, but also in relation to employee productivity. For the 20 companies analysed, the gross average remuneration of an employee for 2019 was RON 12,900 per month. These values differ considerably between companies: while at Microsoft average remuneration was RON 19,700 per month, at AROBS it was only RON 6,100 (figure 29). However, for most companies the average remuneration of IT employees is between RON 11,000 and RON 16,000 per month, a very high figure compared to average salaries in the Romanian economy.

THE PREDOMINANT BUSINESS MODEL FOR THE BIG IT PLAYERS: NEARSHORE OUTSOURCING

Structural characteristics of the main companies in the IT sector in Romania - relatively low capital intensity, low profitability, low productivity of employees compared to the global average for groups, high share of value added in turnover in Romania, an almost direct correlation between remuneration and sales - derives from the predominant business model in the sector: intra-group subcontracting of software production or information service or telecommunications systems. When it comes to this business model, the terms outsourcing (subcontracting) and nearshoring (a place close to the customer, both geographically and in terms of time zone) are currently used in the IT environment. In fact, it is often a matter of outsourcing to nearshore locations, i.e. outsourcing services to Eastern Europe, in close proximity to the European decision-making centres of the groups, which is seen as more advantageous in terms of communication and logistics (but not in cost terms) than outsourcing to offshore countries such as India or China.

In recent years, strong competition between IT companies in Romania and the margin reserves of multinationals (a term which designates the cost difference between an employee in the West and one in Romania) have fuelled a combination of accelerated salary increases and massive staff turnover. However, this phenomenon seems to be reaching its limits: the growth of sales and the number of employees has visibly slowed down in recent years and double-digit annual increases have become a rarity.

As voiced by representatives of the sector,¹⁶ the predominant

¹⁶ Irina Vijoli, "The Romanian IT industry at a crossroads. The perspective of the Romanian IT in lights and shadows", Inaco: "We deliver on request" on some specifications thought of by external clients - project management, software code writing, testing, etc. all preset, often on technologies chosen from outside. [...] Statistics say that we are the first outsourcing country in Central and Eastern Europe, and we are ranked 6th in the world. In Romania, the salaries of IT specialists are still low enough to justify this journey.". Available here: <https://inaco.ro/industria-it-din-romania-la-rasruce-perspectiva-it-ului-romnesc-in-lumini-si-umbre/>
Ovidiu Suta, "What is wrong with IT in Romania?", Today Software Magazine: "It is becoming more and more obvious that the development of our industry cannot (anymore) be done by volume. [...] Most of the work being based on hours (the so-called capacity or outsourcing model), this increase meant in mathematical terms,

business model in the Romanian IT industry favours less complex (low-end) activities, based on application development rather than innovation and with a reduced capacity to capitalise on work results in own products. In other words, the main IT companies in Romania usually sell working hours and not products (of course, with some notable exceptions, such as Bitdefender). Although in the short term this does not pose a risk to the viability of IT subsidiaries of multinationals in Romania - since employees in our country continue to be much cheaper than those in the west - this business model is approaching a point of saturation or maturity in which the number of employees and sales of companies will begin to stagnate.

From a macroeconomic point of view, Romania benefits relatively little from this model. **Although the IT sector is an exporter of services that contributes to improving the trade balance, the fact that a large part of the sector is represented by cost centres, without any decision-making power, without any commercial autonomy and without any products or services of their own in the market, means that in the value chain Romania still has a small part of the added value created by multinationals in the sector.** For multinationals, the fact that Romanian subsidiaries are outsourcing destinations gives them some long-term flexibility - if an activity in Romania is seen as less efficient in the cost-quality-communication equation compared to countries such as India or China, it would be relatively easy to relocate to these countries.

All these considerations suggest that Romanian IT companies face structural vulnerabilities, which are not visible in a public space dominated by an often overblown enthusiasm considering the realities of the sector. In such a situation, we can speak of a perverse effect of the tax breaks offered to the sector: in an attempt to protect these breaks, both companies and employees propagate a rosy image of the sector, praising its economic importance and complexity of the activities carried out. **Paradoxically, such tax breaks can contribute in the medium and long term to stagnation of the sector, accommodating companies with low costs and insignificant investments and favouring the development of low value-added activities.** In the case of the IT sector, we therefore need to think about this vicious circle of competitiveness based on low labour costs.

more people - more hours - more income. ... This type of work mainly involves coding and testing activities and places less emphasis on things like architecture, specifications, design or interfaces." Available here: <https://www.todaysoftmag.ro/article/928/ce-este-in-neregulacu-it-ul-din-romania>

Stefan Brândusescu, "Some personal experiences and a skeptical look at Romanian IT", medium.com: "The needs covered by Romanian companies are the basic, low-end ones, i.e. those parts of software that there (n.n. - in western countries) cost too much. [...] It is most clearly seen in the employers' preference for certain languages. The programming languages (first 3) most searched by employers in Romania are Java, PHP, .NET. How do we read these preferences? In short, enterprise applications, large and mobile applications, phones / tablets. [...] Nothing about cloud computing, some big data, no AI, not the digital part of reality (the Internet of things)." Available here: <https://medium.com/@stefan.brandusescu/c%C3%A2teva-experien%C8%9Be-personale-%C8%99i-o-privire-sceptic%C4%83-asupra-it-ului-rom%C3%A2nesc-be46e0613c19>

4 SALARIES, COSTS, EXEMPTIONS, PRODUCTIVITY

For the wide public, the IT sector in Romania is known especially for high salaries compared to the rest of the economy. The perception that an IT employee easily earns over RON 10,000 per month is quite widespread, and this contributes to the popularity of the sector among the younger generations. While it is true that IT salaries have risen sharply in recent years, in the public arena there is often an emphasis on extreme cases in which some salaries do indeed reach very high levels. In the following we analyse how wages have evolved in the IT industry in recent years, and try to identify the factors that have contributed to their growth. Of course, we also question the relevance of the tax breaks offered by the Romanian state.

Two preliminary remarks. First of all, in this case as well we encounter the methodological problem discussed at the beginning of this study. The National Institute of Statistics publishes aggregate data on the salary level for NACE groups 62-63 “Information technology service activities; IT service activities”, which makes an accurate analysis impossible - as we have shown in previous chapters, a disaggregation of data up to a 4-digit NACE group would have been more relevant. The available data is, however, sufficient to illustrate the overall evolution of wages in the sector, as it is broadly defined. Secondly, any discussion of wages must specify and take into account the difference between gross salary and net salary. In the IT sector this difference is particularly important since in the last 20 years this sector has been granted tax exemptions with a direct impact on the ratio of net to gross salary.¹⁷

In the early 2000s, wages in the IT sector were already higher than the average for the economy, but lower than in the telecommunications or banking sectors. A rupture occurred very quickly, however: the ratio between the average net salary in IT and the average net salary in the economy increased from 1.41 in 2001 to 2.36 in 2004, partly as a result of Government Ordinance no. 7/2001, which provided for a tax exemption for income from salaries as a result of the activity of creating computer programs. In 2004, Order no. 250/2004 regarding the conditions for granting income tax exemption slowed the momentum of salary increases in the sector, with even a decrease of the average net salary being registered the following year. Starting in 2006, a period of growth at a faster pace than the average for the economy followed, against the background of the entry and development of the subsidiaries of multinationals specialised in IT products and services in Romania. This period culminated in a symbolic event in 2011: for the first time, the average salary in IT exceeded the average salary in the “financial intermediation and insurance” sector, where since the 1990s salaries were among the highest in the country. In 2012-13, salaries in the IT sector stagnated, and the ratio between the average net salary in IT and the average net salary in the economy decreased from 2.5 in 2011 to 2.23 in 2013. As we demonstrated in the analysis of enterprise demography, the IT sector in Romania seems quite vulnerable to economic cycles, or at least that is how things look from the perspective of the last decade and a half. A new phase of wage increases began in 2014 and continues to this day: during this period, net wages have increased by an average of 11% per year (figures 30-31).

¹⁷ The main legislative changes that have targeted the IT sector in the last 20 years, summarised in the publication of the National Bank of Romania “Study of the evolutions of the IT&C sector in Romania” from 2017 (p. 16):

- “Government Ordinance no. 7/2001 provides for the tax exemption of income from salaries as a result of the activity of creating computer programs;
- Order no. 250/2004 specifies the conditions for granting the income tax exemption, the occupations specific to the activities of creating computer programs and the list including the specializations that benefit from the exemption;
- Decision no. 797/2012 of 31 July 2012 on the establishment of a State aid scheme to support investments that promote regional development through the use of new technologies and job creation provides that one of the conditions for granting State aid is for investments to be innovative or includes an ITC component of at least 20% of the value of the investment plan;
- Order no. 539/225/1479/2013 regarding the inclusion in the activity of creating computer programs, extends the categories of graduated

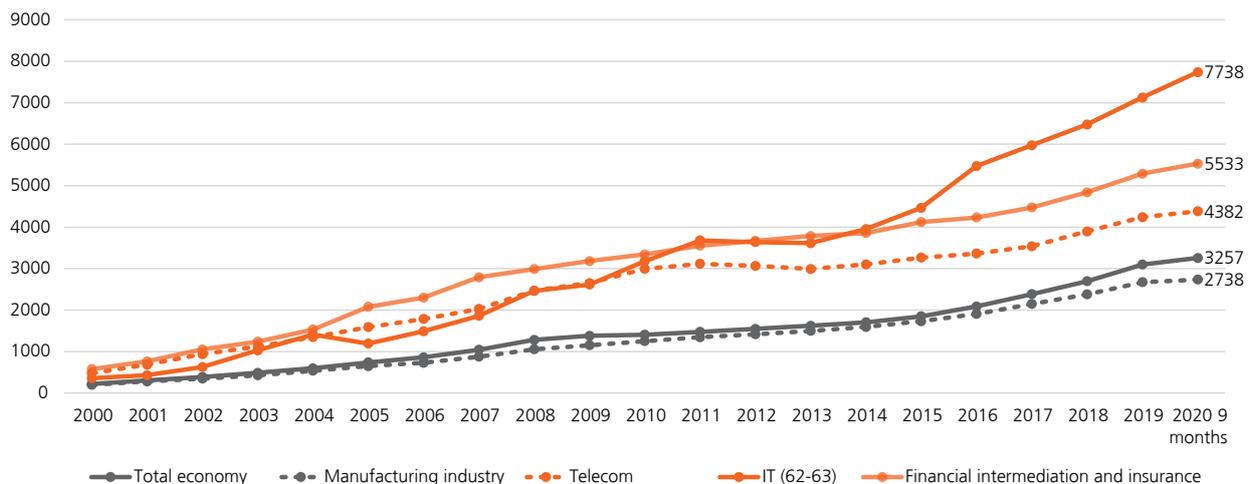
- specializations that can benefit from the income tax exemption;
- Order no. 217/4172/1348/835/2015 on the inclusion in the activity of creating computer programs eliminates the criterion of completed specialization, establishing the need to hold a diploma after completing a form of long-term higher education or holding a diploma after completing the first cycle of undergraduate studies. Additionally, a threshold of \$ 10,000 is provided on the annual income recorded as a result of the activity of creating computer programs intended for marketing on a contract basis, for each employee who benefits from the income tax exemption.
- Order no. 872/5932/2284/2903/2016 on computer program creation provides for the elimination of the US \$ 10,000 threshold. This order was in force from 1 February 2017 to 30 June 2017.
- Order no. 409/4020/737/703/2017 on the creation of computer programs reinstated a threshold of EUR 10,000 in respect of the annual revenue generated by the activity of creating computer programs intended for marketing under contract, for each employee who benefits from income tax exemption. This order entered into force on 1 July 2017.”

Wage increases over the last decade have been largely fuelled by fierce competition among employers in a context of gradual depletion of the labour supply. This competition has generated a high degree of labour fluctuation, with many employees changing jobs very frequently in order to benefit from salary increases, in a situation in which obtaining a higher salary is easier at the point of hiring than by renegotiating an existing contract - it is not uncommon for employees to return to work shortly after leaving, but under much more favourable contractual conditions. For employers, this fluctuation not only means additional salary costs, but also negatively affects operational performance, as the constant loss of a significant number of employees can disrupt activities and reduce the existing skill-pool in the company, while hiring new staff involves periods of onboarding and training, during which the new employees are not fully productive. The problem is specific to growing industries and should not persist in the long run. Most likely, as companies move forward and reach a level of maturity, staff turnover will tend to decrease.

Although wages continue to rise, the IT sector is no longer the most dynamic sector in this respect. Although in the period 2006-2011 net salaries in the IT sector increased on average by 21% per year, while the average increase for the economy as a whole was 12%, in the period 2014-2020 the increase for IT, at 11% per year, is close to the average rate for the macro economy, 10%. Of course, since IT wages have been higher than the average for the economy since the 2000s, a similar percentage increase actually means an increase in the gap in absolute terms (Table 16). In recent years, sectors such as construction, administrative services or the budgetary sectors (public administration and defence, education and health) have seen a higher rate of wage growth compared to information technology. As a result, the ratio between the average net salary in IT and the average net salary in the economy remains around 2.4, a value reached in 2011. Variations have been relatively small in the last ten years (figure 32).

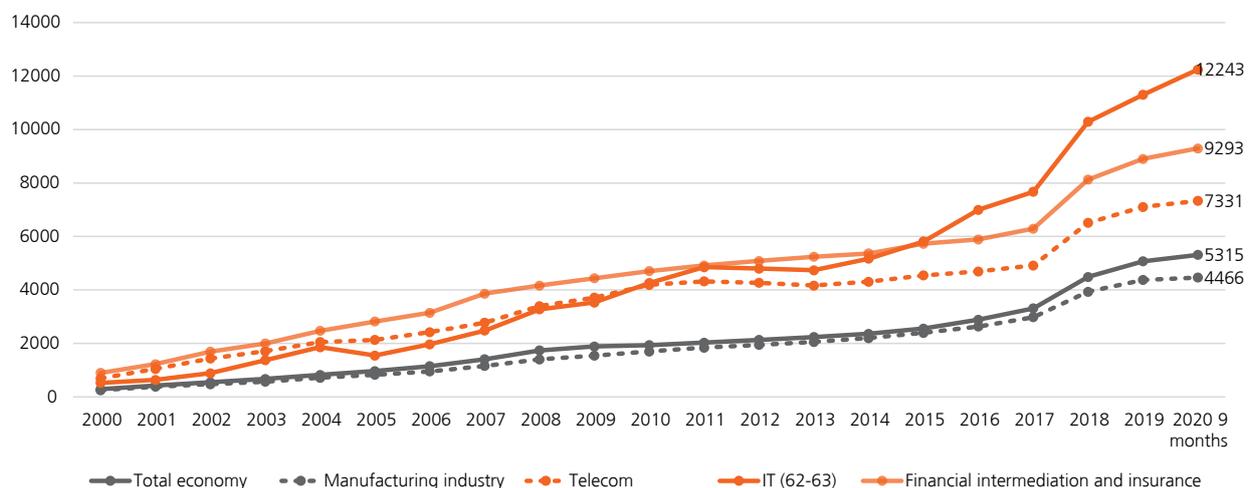
In September 2020, the average net salary for NACE groups 62-63 reached RON 7750, a 9% rise compared to the same

Figure 30
Evolution of the average net salary, 2000-2020



Data source: Romanian National Institute of Statistics

Figure 31
Evolution of the average gross salary, 2000-2020



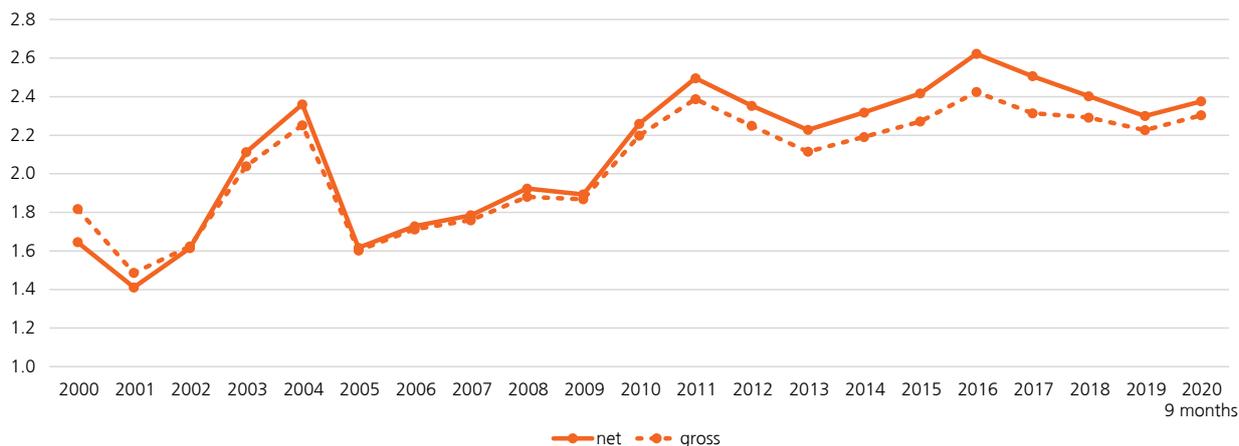
Data source: Romanian National Institute of Statistics

Table 16
Average annual increase in wages by sectors

	Gross			Net		
	CAGR 2006-2011	CAGR 2011-2013	CAGR 2014-2020	CAGR 2006-2011	CAGR 2011-2013	CAGR 2014-2020
Total economy	13%	5%	13%	12%	5%	10%
Manufacturing industry	14%	6%	12%	13%	6%	9%
Manufacturing of motor vehicles	16%	8%	9%	14%	8%	6%
Constructions	13%	3%	13%	12%	3%	13%
Retail	15%	5%	13%	14%	5%	10%
Transport	12%	2%	11%	12%	2%	9%
Hotels and restaurants	12%	1%	12%	11%	1%	9%
Information and communications	15%	-1%	14%	15%	-1%	11%
Editing/Publishing activities	18%	-5%	17%	18%	-5%	14%
Telecommunications	12%	-2%	8%	12%	-2%	6%
IT (62-63)	21%	-1%	15%	21%	-1%	11%
Financial intermediation and insurance	10%	3%	9%	9%	3%	6%
Administrative and support services	14%	8%	15%	14%	8%	12%
Public administration and defence	10%	11%	15%	9%	11%	12%
Education	9%	7%	16%	8%	7%	13%
Health and social work	12%	10%	19%	10%	10%	6%

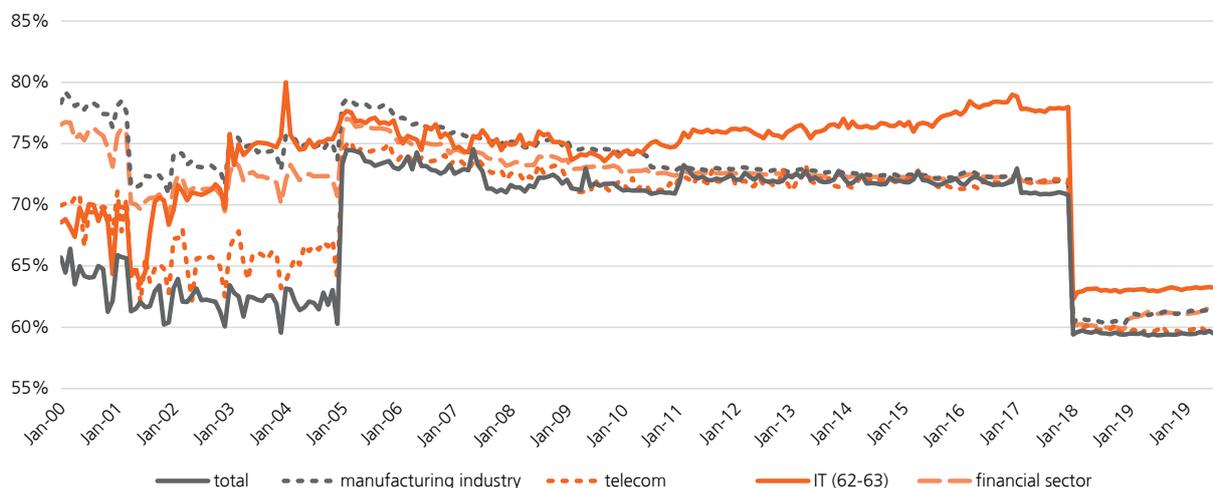
Data source: Romanian National Institute of Statistics

Figure 32
The ratio between the average salary in the IT sector and the average salary in the economy, 2000-2020



Data source: Romanian National Institute of Statistics

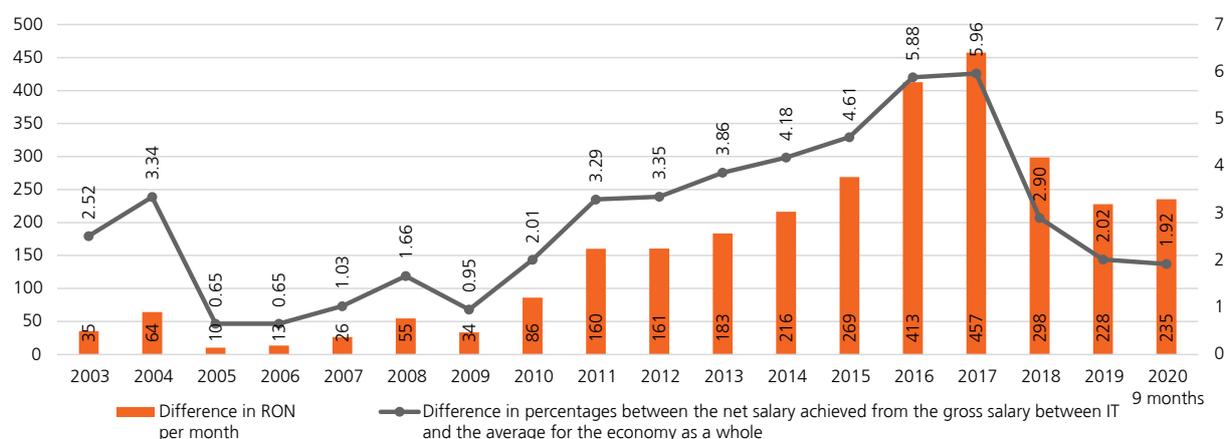
Figure 33
The ratio between the average net salary and the average gross salary by sector



Data source: Romanian National Institute of Statistics

Figure 34

The share of tax breaks granted to the IT sector in gross salary: the difference between the net salary achieved as a % of the gross salary in IT vs. the average for the economy and equivalent in RON, monthly



Data source: Romanian National Institute of Statistics

Table 17

Estimated impact of the income tax exemption in the IT sector on the budget

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Average number of employees (thousands)	31.6	35.3	40.7	47.7	53.3	61.6	74.1	84.7	94.6	104.5
How much larger the wage taxation in IT would be if we were to apply the same rate as in the financial sector (RON per year per employee)	1828	2092	2153	2294	2841	3404	5355	6257	4213	4952
Total difference vs. financial sector (million RON)	58	74	88	109	152	210	397	530	398	517
Estimate of number of exempt employees, average figure (thousands)	12.6	14.1	16.3	19.1	21.3	24.7	44.5	50.8	56.7	62.7
Estimate of exemption per exempt employee (RON per year)	7079	8597	8804	8887	9867	11109	12641	13690	8708	9522
Estimate of exemption impact on state budget (million RON)	89	121	144	170	210	274	562	696	494	597
% of budget revenue	0.1%	0.1%	0.1%	0.1%	0.2%	0.2%	0.4%	0.5%	0.3%	0.4%
% of budget revenue from income tax	0.5%	0.6%	0.7%	0.7%	0.9%	1.0%	2.0%	2.3%	2.2%	2.6%

Data source: Syndex calculations, NIS for wage data, Ministry of Finance for state budget figures. We estimated the share of exempt employees at 40% until 2015 and 60% starting with 2016. According to official data, at the beginning of 2021, 67 thousand employees were exempt out of a total of 110.7 thousand in the industry (NACE 62-63). For our calculations, we estimated that the wages of exempt employees are 15% higher than the average for the sector.

period of the previous year, while the ratio average for the macro economy was 2.33. Expressed in terms of gross value, the average net salary for the IT sector was RON 12,270 in September 2020 and RON 11,297 on average for 2019. The average per sector is thus about 10% lower than the average salaries of the 20 large companies analysed in the previous chapter, which indicates that smaller companies usually have lower salaries than those of the main players in the sector. This is not surprising and is an important element in the dynamics of the gradual concentration of the sector that we have previously analysed.¹⁸ In a labour market where demand is greater than supply, small companies tend to lose even more ground because they cannot compete with large ones when it comes to wages, leading to a quantitative and qualitative shortage of labour, further weakening their competitive position.

Income tax exemptions for employees engaged in activities involving the production of computer programs, introduced by Government Ordinance no. 7/2001 and subsequently spelled out in detail by other Government Orders, have over time created a situation in which employees in this sector perceive this exemption as an inalienable and vested right from a moral and economic point of view. In the first years, the impact of this exemption is difficult to estimate due to

very large fluctuations in the ratio between the average net salary and the average gross salary in the data reported by the NIS (as a result inter alia of the introduction of the so-called single tax rate), but in any case the macro impact was relatively low until 2010 due to the small number of employees in NACE sectors 62-63 (below 35,000), of whom only a small number were eligible for the tax exemption. Starting in 2010, the effect of tax facilities begins to be clearly seen in the difference between the net realised as gross value in IT compared to other sectors, with this difference jumping from 2 percentage points in 2010, the equivalent of RON 86 per month per employee, to almost 6 percentage points in 2017, the equivalent of RON 457 per month per employee. Orders issued in 2013, 2015 and 2016 broadened the applicability of tax breaks specific to the IT sector and contributed to this exponential amplification of their effect. The fiscal reform of 2018, which consisted of a shift in social contributions from employers to employees and a reduction in income tax from 16% to 10%, reduced the effect of the exemption on net salaries,¹⁹ but, expressed in RON per employee per month, the level of the tax break between 2018 and 2020 is comparable to that of 2014-2015 (figure 34).

¹⁹ In the context of the transfer of social contributions, in order to maintain the purchasing power of the employees that benefitted from the income tax exemption, the companies from the IT sector had to increase the gross wages by 28.5%, which meant an increase by 7% of the total employee cost.

¹⁸ For the 20 analysed companies, the average spending for an employee in 2019 was 12859 RON per month.

Starting with the realised value of the income tax exemption,²⁰ average gross salaries and the number of employees in the sector, it is possible to estimate the impact of tax breaks on the budget. As mentioned above, before 2010 the impact was quite low due to the relatively small number of beneficiaries and the small impact of the measure on gross salaries. Starting with 2010, the budgetary impact of this policy measure has grown rapidly: under 100 million lei in 2010, between 100 and 200 million lei in 2011-2013, between 200 and 300 million lei in 2014-2015, over 500 million lei starting with 2016. The fiscal reform transferring employer social contributions to the employee lowered the impact in 2018, but the growth of employment and wages led to another increase in the budgetary impact starting with 2019, when it surpassed 600 million lei. According to data recently made public, it would be of at least 900 million lei in 2021.²¹ In 2019, the total figure comprised approximately 2.6% of the state's total income tax revenues and 0.4% of total fiscal revenues (compared to 0.5% and 0.1% respectively in 2010). In total, over the past five years (2016-2020) the state indirectly subsidized the IT sector by around 3 billion lei via the wage income tax exemption (table 17).

Although the impact on the budget is obvious, one topic remains debatable: who ultimately benefits from the income tax exemption, employees or employers? The answer is not as obvious as it seems at first glance. Although formally speaking the exemption is offered to employees, as it applies to income tax levied by them, in reality employees negotiate net wages with employers in the vast majority of cases, so the additional costs involved in a particular net salary are not immediately visible. Once again, although social contributions are formally paid by employees, i.e. deducted from their gross salary, these are stopped at source and transferred to the budget by employers, which limits employees' awareness of the gross salary and total costs of the employer. Consequently, the difference between the value of the net salary, which is actually negotiated, and the total cost of the employee's remuneration is entirely calculated and covered by the employer, with the latter being the one who ultimately benefits from the income tax exemption. Ultimately, this tax exemption allows companies to offer high net wages to attract labour, thereby fuelling the spiral of visible wage increases in the sector in recent years.

The main arguments forwarded by supporters of the tax exemption in the IT sector are essentially threefold: (1) maintaining Romania's competitiveness in terms of low labour costs to attract foreign investors; (2) stimulating

consumption by IT employees, which fuels growth in other sectors; and (3) IT employees are unusually productive, so it is normal for them to have unusually high salaries. Upon closer inspection, however, all three arguments would appear to be quite shaky.

Regarding the **first argument**, as we showed in the previous chapter, the Romanian subsidiaries of multinationals in the IT field still have sufficient reserves to offer salary increases to compensate for the possible impact of a revocation of the income tax exemption. A possible increase in wage costs would be relatively easily transferred to intra-group invoicing, which is in any case directly derived from the cost of labour. In general, labour costs in the IT sector in Romania continue to be well below the average in the European Union. In 2019, the average hourly cost of an employee in the IT&C sector in Romania was EUR 14.3, the second lowest in the Union (figure 35 - data are for the entire IT&C sector). Convergence with the average salary in Western European countries is only proceeding very slowly: in 2019, the level of remuneration in Romania was only 37% of the EU average, 29% of the French or German average and 39% of the UK average (figure 36). In other words, Romania remains very competitive in terms of costs. This model of competitiveness based on low wages could not be more evident in the IT sector. As we have shown in other studies, overcoming this model is absolutely necessary in order to ensure socio-economic development in the medium and long term.²² If it is maintained, enthusiasm for the labour market and wages will be short-lived, even in the IT sector.

The second argument, that of stimulating consumption as an engine of economic growth, does not explain why only employees in the IT sector should benefit from this break, as basically all employees in all economic sectors use their money for consumption and contribute to economic growth. It can also be argued that, if the income of workers in the IT sector far exceeds what is needed for a decent living,²³ much of this income does not contribute to economic growth because it is saved or invested in luxury goods and services (real estate assets, tourism abroad, etc.), excessively stimulating, among other things, the real estate markets in Cluj-Napoca, Timisoara, Iasi or Bucharest. Although demand for housing supports the construction sector to some extent, money invested in apartments is not productive, or in any case less productive than money invested in business or transferred to the budget for infrastructure investments.²⁴

²⁰ Romanian authorities do not publish data on the real-world implications of the tax exemption measure. In order to assess the impact, we took wage taxation in the financial sector as a reference, together with an estimate of the number of exempt employees and the average wage in the IT sector.

²¹ See Hotnews, Deputatul PNL Florin Roman a vrut să afle numărul salariaților IT scutiți de impozitul pe venit și impactul acestei scutiri la bugetul de stat. Răspunsul Ministerului de Finanțe. Available at: <https://economie.hotnews.ro/stiri-telecom-24667737-deputatul-pnl-florin-roman-vrut-afle-numarul-salariaților-scutiti-impozitul-venit-impactul-acestei-scutiri-bugetul-stat-raspunsul-ministerului-finante.htm>

²² See Syndex Romania, The situation of employees in Romania, annual study, available online: <https://www.syndex.ro/situatia-salariaților-din-romania-studiu-anual>. Stefan Guga, The question of productivity: controversies and clarifications, Bucharest, Friedrich Ebert Stiftung, 2020.

²³ Stefan Guga, Adina Mihăilescu, Marcel Spatari, The minimum monthly consumption basket for decent living for the Romanian population, Friedrich Ebert Stiftung, September 2018, available online at: <https://www.syndex.ro/sites/default/files/files/pdf/2018-11/Cosul%20minim%20de%20consum%20pentru%20un%20traie%20decent%20pentru%20populatia%20Romaniei.pdf>

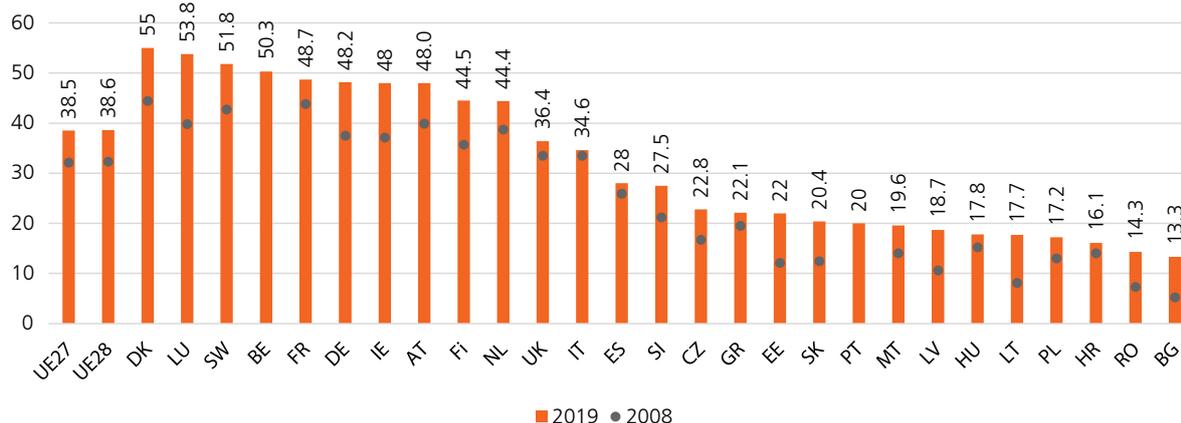
²⁴ On the issue of productivity in relation to investments, see Stefan Guga, The question of productivity: controversies and clarifications, Bucharest, Friedrich Ebert Stiftung, 2020..

As the sector matures, the relevance of these tax breaks wanes. In fact, the purpose of these breaks stated from the very beginning was to stimulate initial growth of the sector, and certainly not to provide permanent exemptions to a part of the population that earns much above the average income. Their permanence not only has negative effects on the state budget, but also maintains a social inequity in which the

highest-income employees in Romania actually pay the lowest taxes as a percentage of their salaries. Looked at from this angle, we are actually dealing with a regressive system of taxation.

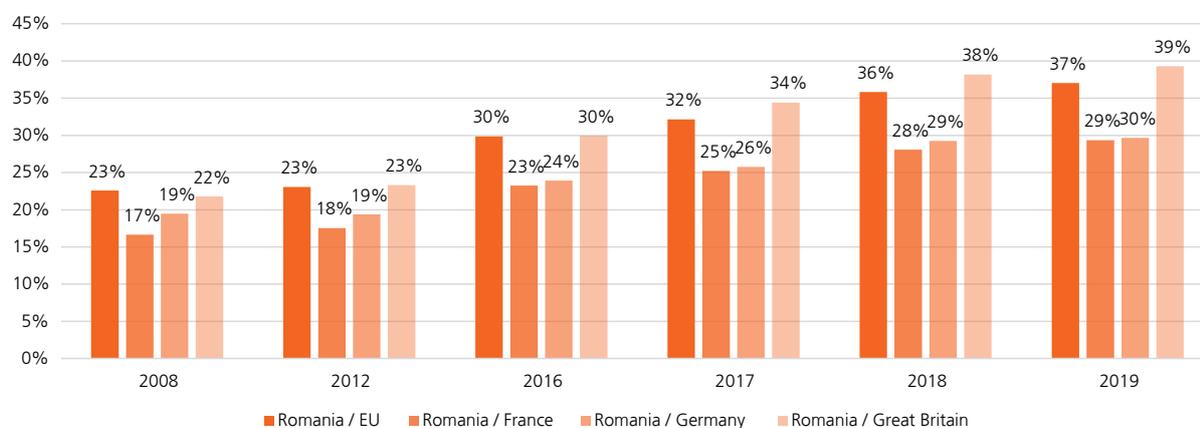
Finally, the **third argument** is also problematic. Of course, in absolute numbers the productivity of IT employees is

Figure 35
Remuneration of employees in the IT&C sector, in EUR / hour



Data source: INS

Figure 36
Convergence of remuneration of employees in the IT&C sector in Romania with the European average, France, Germany and the United Kingdom



Data source: INS

Table 18
Wage-adjusted productivity (added value / labour costs)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
competitive economy	221.1	197.8	211.7	206.8	205	214.7	208.7	184.7	182.3	178.7	181.8
manufacturing industry	193.8	176.3	195.3	185.4	184.7	179.7	189.8	167.7	165.5	158.9	174.6
automotive industry	182.4	167	169.9	123.3	168.6	167.3	174.7	165.5	169.4	161.4	175.2
retail	237.1	202.9	206.7	203.4	195.4	195.1	199.8	197.5	217.2	207.1	205.8
transport and storage	176	157.5	182.2	204.5	192.8	189.2	196	187.4	172.9	170.7	161.2
professional, scientific and technical activities	214.9	181.5	178.6	167.1	167.9	181.4	172.2	163.4	152	159.8	159.2
administrative services and support	168.6	159.6	155.2	158.5	153.3	157.4	151.4	137.2	133.7	137	137.9
editing/publishing software (NACE 582)	163.3	145.2	141.6	132.4	136.8	133.1	143.6	140.4	140.7	132.5	141.4
customer oriented software (NACE 6201)	150.9	136.7	149.6	136.5	135.9	131.2	133.5	124.1	122.7	123.4	124.8
information technology consultancy (NACE 6202)	135.3	160.7	151.5	130.1	136.2	132.2	146.8	137.4	132.5	132.7	127.1

Data source: Eurostat

relatively high, but if we compare this productivity to the cost of labour, the situation is exactly the opposite (Table 18). If in the economy as a whole productivity adjusted to salaries was 181.8% in 2018 (in other words, an average salary yielded 181.8% in added value), in the IT sector it varied from 127.1% to 141.4%. Only in the administrative and support services sector was wage-adjusted productivity lower. From this point of view, workers in industry, retail or transport are significantly more productive than those in IT. Of course, a proper interpretation is much more complicated.²⁵ We can very well say that in fact productivity in the IT sector (but also in the administrative services and support sector) is not a real productivity and that the business model practiced only makes accounting productivity rise as salaries increase. This is as valid as could be in other sectors of activity dominated by foreign capital (hence, both industry and retail) and not only there (among other areas, it is by definition also valid for the budgetary sector). So there can be no question of productivity being underestimated only for IT. What we can certainly say is that, in terms of productivity, IT wages are higher than in most other sectors of activity, a situation which results more from the exceptional situation on the labour market, and less from the exceptional qualities of the labour force in IT. The problem is not that IT wages are necessarily too high in absolute terms, but that in the rest of the economy wages are too low, hence the rapid growth of income inequalities and, through real estate markets in big cities, of inequalities in wealth. Above and beyond the fascination brought about by the truly spectacular developments in the IT sector over the last decade - a fascination that in the more or less near future will prove to be temporary - the longer-term solution is the same as for the rest of the economy: overcoming the model of development based on low labour costs and increased labour productivity through investment and technological advancement. Paradoxically, it would seem, in Romania even the most technologically advanced sector of activity is caught in this trap.

²⁵ For a detailed account of this issue, see Stefan Guga, *The Question of Productivity: Controversies and Clarifications*, Bucharest, Friedrich Ebert Stiftung, 2020.

CONCLUSIONS

Is the fascination we discussed at the beginning of this study justified, or is it merely self-delusion and a smart PR move by the IT industry? The most apt answer would be: a little of both. We cannot deny that the IT sector has seen rapid growth, especially in the last decade, as today's landscape is unrecognisable to anyone looking at the present from the perspective of the 2000s. Growth rates are indeed spectacular even when viewed from the perspective of the rest of the economy, which for its part saw significant development throughout this period. Certainly, the IT sector has gone in less than 15 years from being an insignificant part of the Romanian economy and society to becoming an increasingly key one. At the same time, we have seen that most of the figures circulating in the public realm regarding the importance of the IT sector are at least exaggerated, resulting either from confusion (this is no doubt partly due to the complexity of the sector and the difficulties of statistical accounting), or advertising pitches. At a more general level, we have seen that the IT sector in Romania is not structurally different than the rest of the economy: what primarily matters is foreign investment in search of cheap labour for low-complexity, low value-added activities and minimal investment. Nothing exceptional, from this point of view.

On the other hand, the exceptionalism of the IT sector in Romania is real and is evident to most people when it comes to what ultimately matters: pay and working conditions. Indeed, the position of employees in the IT labour market is particularly advantageous, manifesting itself in wholly exceptional salary dynamics for Romania in recent years. We have shown that this is somehow natural given the early stage this sector was in a decade ago and the accelerated pace of technological development globally. However, we also showed that we are already seeing the first signs of stabilisation and maturity (not only of companies, but also of the labour force), which will significantly moderate both dynamics in the labour market and wage increases. Once these developments play out, it will become evident that the IT sector is actually facing the same dilemmas as the rest of the economy: lack of strategic control and internal resources to increase productivity and ensure sustainable revenue growth in combination with competitiveness on foreign markets strictly by virtue of the low cost of labour. At least in part, the state's tax subsidisation policy for the IT sector has so far hidden this problem, while fuelling a huge increase

in inequalities between different professions. As is the case with low-cost development, this is a major and extremely difficult issue for society as a whole. In both respects, solutions cannot even be sought without a radical change in intention and vision.

One starting point should be the elimination of any direct incentives of a fiscal or non-fiscal nature for the IT sector. Of course, we are talking first of all about the tax exemption for salary incomes in the sector. The tax exemption may have made sense in the 2000s, when the development trend in the sector was still uncertain, although this is also highly debatable - the IT sector has developed similarly, if not faster, in neighbouring countries, without similar incentives. But at the point at which it became clear that the early stages of the sector's development had been passed, the tax exemption should have been removed - this was the initial intention, but was quickly forgotten both by the industry and the government. At present, the tax exemption is in fact a subsidy granted directly to this business sector, a sector whose major problem is not lack of growth, but rather lack of resources (human resources in particular) to ensure long-term sustainable growth. Given the competition between employers in the labour market, the elimination of the tax exemption for employees should only have a negative impact on net income in the short term at most.

In any case, maintaining a tax exemption for the highest-income employees is clearly unfair. In addition to directly contributing to the fiscal poverty of the Romanian state, this exemption also has an indirect negative effect, namely further undermining the already weak motivation for fiscal compliance.²⁶ Overcoming this condition of fiscal poverty is ultimately much more important to ensuring long-term economic development, including for the IT sector. In the early 2000s, the initiators of the tax exemption measure were concerned not only with the general idea of developing the sector, but also with the very concrete problem of emigration of specialists. Meanwhile, income is no longer the main problem: the skilled workforce in the IT sector is paid several times better than most other employees. In this very particular case (if the other employees had salaries

²⁶ See Cornel Ban and Alexandra Rusu, Romania's fiscal poverty. What explains it and what can (still) be done, Bucharest, Friedrich Ebert Stiftung, 2019.

similar to those in IT, the problem of mass emigration of the workforce would probably be solved to a very large extent), emigration is motivated, rather, by the impossibility of ensuring a certain level of quality of life in conditions characterised by the advanced stage of degradation of public institutions and services at local and national level. This last aim is difficult to achieve if public policy remains mainly focused on tax exemptions for high-income earners, subsidies for activities already thriving and a general reduction in costs.

Even if it seems impossible in the current ideological and political context, eliminating tax breaks for the IT sector would be an easy task compared to the changes that need to take place to ensure long-term sustainable development. From this point of view, the IT sector is no different than other sectors dominated by foreign capital. Of course, there is a lot of talk about the need to stimulate innovation and high value-added activities, but how these things can actually be done is extremely unclear given the general

direction of the last two decades. As this study shows, the problems are not too difficult to identify: the subordinate position in transnational value chains, the predominance of activities involving execution of work dictated from elsewhere, dependence on low labour costs, or modest productivity are integral parts of a development model perfectly applicable to IT and patented by those sectors of activity that have grown the most in the last twenty years. In a generic way, the solutions are to be found in a reversal of all these things: development of research and development activities (and, more generally, those with high added value), competitiveness based on quality (not cost), and accounting and fiscal transparency. The fundamental question is not about diagnosis or final solutions, but rather about how socio-economic development can be directed towards these solutions. The identification of the latter implies a real paradigm shift and requires a major public debate, which is impossible if we persist in deluding ourselves about the condition and qualities of economic activities in Romania, in IT and beyond.

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THE EXCEPTION THAT PROVES THE RULE: EVOLUTIONS IN ROMANIAN IT



The accelerated growth of the IT sector from the last period seems to slow down, as the market is stabilising and the stage of incipient growth is over. The maturity of the sector will most probably temper labour market dynamics and wage evolutions



Ensuring a long-term growth needs a change of vision and structure similar to those needed in other sectors. Overcoming the condition of economic dependency on the grounds of reduced labour costs must be a central objective for the IT sector.



To date, public policy has subsidised labour costs in the sector through income tax exemption. This measure has had a questionable impact from the very beginning and is now certainly outdated, contributing to the deepening of existing problems.

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