THE ECONOMIC IMPACT OF DOUBLING THE NUMBER OF EMPLOYEES IN THE ROMANIAN IT SECTOR

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ABSTRACT
Since the turn of the century, the Romanian IT sector has had a significant positive impact upon the economy of Romania. It created numerous, high-paying, knoladge-based jobs, increase the international exposure and reputation of our nation, positevely contributed to the Romanian exports and attracted significant foreign direct investment. Considering that globaly the tehnology sector is poised to grow faster than any other sector, the present article aims to forcaste the implications of Romania having double the number of IT workers. It will be presented a brief history of the development of the sector in the last decade and how the number of graduates of tehnical expertise has evolved over the same period. Finally, conclusions will be presented on the future of Romanian IT sector and in following papers to be exhibited economic and social forecasts that the country would benefit from.

KEYWORDS: *Economic Groth, IT workers, IT Sector, IT Education*

JEL CLASSIFICATION: *O3, O4, Z1*

THE IMPERATIVE OF ECONOMIC GROWTH

Over the past century, governments throughout the world have developed a keen interest and focus effort in regards to national economic growth as a way to expand their national power, relieve wretched poverty, and create social justice. In fact, the history of the 20th century can be viewed as a fight over the best way for societies to create and distribute wealth as communism, capitalism, and socialism vied for supremacy as national, political, and economical systems. In the late 20th century, specifically since 1989, a consensus seems to have emerged. Free trade, free markets, and international investment are the intellectually anointed paths to prosperity. With a certain degree of caution, it can safely be said that virtually any and all governments of the world are interested in economic growth, or they at least pay it homage with their rhetoric. Economic growth is directly related to basic human needs: when faced with the possibility of consuming more goods versus less, human beings will always choose more. However, national economies differed on the best course of action in achieving economic growth and, implicitly, a higher standard of living for its citizens. Due to ideological, cultural, and circumstantial dynamics, each nation chose – by peaceful or not so peaceful means – the best-suited economic system for its particular case. As a result, today's global

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economy encompasses a plethora of economic systems ranging from capitalism to socialism to mixed economies and a few remnants communistic economies. Nevertheless, they are, for the most part, all interested in economic growth. So the question can be posed very bluntly: What is economic growth and how can a nation achieve it? What follows in this section is a brief and broad discussion on the literature and theories on economic growth as they may or may not include the entrepreneurship factor.

The classical view of economic growth has been: the nation with the highest amounts of the major factors of production (land, labor and capital) had the best chance at experiencing a positive, sustainable economic growth (Smith, 1776). Many historians and economists have pointed to this basic economic fact as the principal reason behind war, imperialism and a number of other less than orthodox practices. In essence, the classical view was that in order to achieve economic growth a nation had to acquire – through peaceful or not so peaceful means – as much land, labor, and/or capital as possible.

However, reality has shown that this theory did not always hold true. The Russian empire of the 17th, 18th and 19th centuries had a larger landmass, but it did not necessarily enjoy much economic growth. On the other hand a nation such as the Netherlands, much smaller in size, did enjoy a positive and sustainable rate of economic growth (Wennekers & Thurik, 1999).

The 20th century economists added significantly to what became widely recognized as "conventional wisdom." The first break-through came in the area of growth accounting, as explained by Denison (Denison, 1985). The second major addition to economic growth thinking came in the form of "the theory of long-run tendencies" espoused by Solow (Solow, 1956). The main drawback of the classical views, in the opinion on the neo-classical economists, was the fact that there were a lot of factors not encompassed by the classical theories. By the turn of the 19th century, it became recognized that there is not a straightforward relationship between the traditional factors of production (land, labor and capital) and economic growth. Economists could cite a number of cases where the opposite was true, especially in the area of "land." So the dilemma at that time was: Is there a 4th factor of production that classical economic growth theory has overlooked or simply did not have the means to measure?

THE GROWTH AND IMPORTANCE OF TECHNOLOGY

The next major factor that economists included in their newly revised theories was technological changes, which throughout the 20th century retained a special prominence as the economic factor that made the other three grow exponentially. For instance, in the traditional sector of agriculture, it was the technological improvements of the late 19th and early 20th centuries that truly added value to an acre of land and its productivity. Thus, in most of the developed areas of the world, technological changes added significant value to land, capital, and especially labor.

The introduction of "mass production" by Henry Ford in the early part of the 20th century is often cited as a major example of how technological changes permanently altered the output of a traditional factor of production such as labor. The mechanization of the labor force was a significant inflection point that forever changed the economic growth theory. For the most part, this change has not been accounted for and has been traditionally seen as "manna from heaven" (van de Klundert & Smulders, 1992).

The new growth theory suggests that the main factors of production (technological change now included) would now have a circular effect on economic growth. For instance, a new technological innovation will generate economic growth for a region and that economic growth will, in the long run, contribute to additional technological innovations in the initial, or close to sector. Baumol (1993a pp. 259–260) suggests (Baumol, 1993):

> " . . . that so far as capital investment, education, and the like are concerned, one can best proceed by treating them as endogenous variables in a sequential process – in other words, these variables affect productivity growth, but productivity growth, in turn, itself influences the value of these variables, after some lag. These endogenous influences are, then, critical components of a feedback process."
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> Baumol (p. 260) continues (Baumol, 1993):
> "To some degree, the same story can be told about the exercise of entrepreneurship, investment in innovation, and the magnitude of activity directed to the transfer of technology. These too, clearly, are influenced by past productivity growth achievements and they also, in their turn, influence future growth. Yet it would seem plausible that there is a strong streak of exogeneity in these variables, which can help to account for the outbreak and spread of industrial revolutions and for the relative decline and even for the collapse of economies that formerly were models of success."

Perhaps Baumol best explains both the contributions and the dilemmas associated with the "endogenous growth theory" (Wennekers & Thurik, 1999). The new growth theory seems to favor the already developed regions and economical sectors. In a sense, what the endogenous growth theory is saying is that "like begets like." Testing this theory against the historical record of the 20th century, one would have to concur. It seems that nations, regions and industries that are experiencing high levels of growth and innovation are the areas where one can expect additional growth and innovation.

Utilising the IT sector to grow a national economy: the Irish example

Ireland is an example of a country that has seized the opportunity to use the techonology development in order to become a country where the IT sector can be an important source of economic growth. The techonology sector in Ireland is thriving, with exports and employment in indigineous and multinational technology firms continuing to grow. In the present, the technology in Ireland employs over 105.000 people across an array of diverse companies. The country has one of the highst concentration of ICT activity and employment among OECD countries. The main reasons why the emerging techonology ecosystem has flourished in Ireland are the following intrinsec economic factors (Irish Software Association, 2013): A young, innovative and resourceful workforce, a flexible and pro-business environment, a track record of high education standards, competitive corporate tax rates, political stability and social cohesion, cultural and geographic advantages, a flexible workforce, a proven track record of business development and Ireland's membriship of the EU, acting as a gateway of Europe.

In order to remain a country with an competitive advantage in terms of the IT sectors, Ireland has already started to face the various challenges that the techonology industry is facing at a global level. Its strategy is based on three big segments as it follows (Irish Software Association, 2013):

- First of all, the country aims to improve education by improving the standard of education and increase the uptake of science, technology, engineering and mathematics subjects at all levels in the education system, increase the output of honours level graduates from college level ITC courses, maintain the provision of effective techonology converstion courses, up-skilling the current employees in the technological sector through formal continuous professional development and availability of language skills and the ability to attract skilled workers from outisde;

- In second place, looking at its economy, the country wants to strength the exports, increase its competitiveness, have flexibility for business success and attract new investors;
- Last but not list, the country is looking to create a digital landscape by being a one-stop-shop for technology investments, by building collaboration between multinational and indigenous companies and by developing a digital society.

Looking at the future, the main six directions toward the country is looking to develop are to offer digital services in every business, offer smart infrastructure and smart cities, using analytics and big data, concentrate on apps content and mobility, concentrate on cloud and havind high tech manufacturing (Irish Software Association, 2013).

THE ROMANIAN IT SECTOR

By looking at Ireland example and in the same time analyzing the romanian IT sector, it can be observed that in the recent decades, the IT sector has been Romania's wonder-chil, maintaining steady growth supported especially by large outsourcing companies and the country has a good change to use Ireland model in order to develop. Located in a strategic position, at the eastern border of the European Union, our country became a flourishing techonology hub. Both companies and developers know how to work the system to its best effects, capitalising on various initiatives developed by the government. Even if it doesn't offers the lowest prices in the outsourcing industry, Romania remains a highly competitive country, especially in the level of tehnical profiency and soft skills, being superior to many other outsourcing locations (Popescu, 2013).
In the last 10 years, the number of employees in the IT sector has continued to increase, the same thing being applied also for the IT companies. In 2012, there were 15.726 registered IT companies in Romania (Fiscutean, 2014) and around 120.000 people working in the sector (3% of the total workforce) (Ministerul Pentru Societatea Informaţ ională, 2014). The number of IT graduates is also increasing year by year, in the present Romania having around 7.000 graduates every single year.
In 2013, because of the low salaries of the IT workers compared to the West and their skills they helped outsourcing become Romania's second largest in terms of export, being surpassed only by transportation. Computer and information services exports reached €1.4 billion, 27% higher than the previous year, according to the National Bank of Romania. This means it equates to $99 per capita, more than double of India or Unites States (World Trade Organization, 2013).
Most of the outsourcing companies based in Romania have been hiring during the reccesion, in a constantly growing market. The outsourcing industry is a foundation for building up the country's IT and techonology industries as a whole. In the present, Romania is seen as a complementary location to India as Eastern Europe provides a perfect balance between cost and quality (Fiscutean, 2014). Last year, a third of IT companies in Romania paid their developers ranging from € 1.000 to € 1.500 per month, more than three times the average salary in the country. Moreover, a good 10 percent of IT companies are offering developers a monthly saraly ranging between € 1.500 to € 2.000 (Popescu, 2013).
This year, spending is set to gain momentum as the economy recovers and both consumer and entreprise confidence strengthens. Rising incomes will support retail hardware spending growth, while improvements to telecommunications infrastructure is forecast to accelerate the development of Romania as an outsourcing and cloud computing market. The ongoing transformation of political and economic structures, driven domestically and by EU accession, can also provide new opportunities for the country. Regional economic instability could derail the country's outlook, but the wider region could also drive the market to a higher growth trajectory (Business Monitor International, 2014).
Looking at a SWOT analysis realized by the Business Monitor International, it can be observed that the romanian market still has a high potential of growth (Business Monitor International, 2014):

Strengths:

- Romania is forecast to be one of the faster-growing CEE IT markets over the next few years, with multiple growth drivers;
- Extensive high capacity fixed broadband infrastructure, and increasing coverage of LTE coverage, providing derived demand for IT hardware via web services;
- Popular destination for outsourcing/nearshoring with international firms such as HP, Microsoft, Oracle, SAP, Intel and Wipro all investing in facilities;
- EU membership strengthens business environment and provides structural funds for IT programmes;

Weaknesses:

- Political instability has delayed necessary reforms in some industry sectors;
- Piracy remains prevalent according to the latest BSA survey data from 2011, which is a drag on software market growth;

Opportunities:

- IT investment by enterprises is forecast to make a strong recovery in 2014 after several years of spending cuts;
- One of the lowest household PC penetration rates in the region means there is growth potential for hardware vendors in the first time buyer and multiple device household market;
- Local tablet brands have fared well, particularly Evolio, illustrating sales potential of low cost-low margin devices with local content;
- Local hardware brands are also offering incentives to developers for local content including fees and revenue sharing;
- SMEs and public sector are potential growth areas;
- Outsourcing continues to expand, with opportunities in the sale of higher value services including cloud computing, particularly if the EU passes harmonised rules on data and privacy;

Threats:

- The economic environment remains vulnerable to potential external shocks from the eurozone;
- Insufficient incentives in the IT field and slow progress of government legislation on copyright and other issues;
- Continued price erosion in the tablet market could limit growth in hardware market value;

Doubling the number of IT employees

By looking at the recent trends in the Romanian IT sector, it is obvious that in the following years it will continue to grow. However, by making laws to encourage this sector, there is the possibility that the growth rate among employees in the sector to double, this fact can provide a substantial increase to the economy and the development of the country.

If the number of IT employees in the Romanian sector would double by 2020, there will be many areas of the economy that should benefits from this growth. In order to accomplish this goal there are a number of objectives that the country should reach until the year 2020. Especially focusing on the employment productivity and skills enhancement the following criteria seems essential in order to see an IT sector with a double potential (The World Bank, 2013): Strengthen job creation while fitting policy priorities to demographic imperatives. Policies should include advancing reforms, economic integration and diversification to facilitate firm entry/exit and to create enabling environment for businesses with high potential to thrive and create jobs, make workers more adaptable, develop incentives for work, and encourage more inclusive labor markets, leverage European Structural Funds (ESF) to move towards universal kindergarten education (3-6 years) and

develop conditions to massively increase expansion of provision for the youngest (0-3 years), build a structure for evidence-based policy making at the Ministry, including a data warehouse, put the entire teaching force at the center of future change efforts, benchmark Romanian teacher policies internationally, use ESF to scale up tracer studies and make them mandatory for the entire higher education sector while providing appropriate support for their implementation, ensure that the programs being financed have results frameworks in place that clearly define inputs, activities, outputs, and impacts, undertake rigorous impact evaluations – social policy experiments – to learn which programs are the most cost-effective ones, take advantage of the Romanian poverty map being produced to improve targeting of inclusion programs and strengthen labor market monitoring.
In order to see where the country wants to go, what it should do to get there, and where it actually is, the following table shows the strategy targets of Romania and its situation in 2012 (The World Bank, 2013).

Table 1: Europe 2020 Strategy Targets – State of Play

Overall Targets	Romania Targets	Romania, 2012[1]
75% of the population aged 20–64 should be employed	70%	63.8%
3% of the EU's GDP should be invested in R&D	2 %	0.48% (2011)
The share of early school leavers should be under 10%	11.3%	17.4%
At least 40% of 30–34-year-olds should have completed tertiary education	26.7%	21.8%
Reducing the number of people at risk of poverty or exclusion by 20 million in the EU	Reducing by 580.000 the number of people at risk of poverty and social exclusion, by 2020, as compared to the year 2008, meaning a reduction by approx. 15% of the number of people living in poverty[2]	-240.000 people (23.4% in 2008 compared to 22.2% in 2011)

Source: European Commission (http://ec.europa.eu/europe2020/europe-2020-in-your-country/romania/index_en.htm)

As it can be observed, Romania still has a lot of work to do in order to achieve Europe 2020 Strategy Targets. Because of the IT and other powerful sectors though, the work is not impossible and doubling the growth of the IT sector will do nothing but help.
So that doubling the growth of the IT sector may become a reality, there are solutions that have already been implemented and already start to bear the first fruits. The example of the informal IT school which already has a first generation of graduates in Cluj and which soon will open its doors in Oradea, with the wish that in the near future this will start to function also in cities like Iaşi, București and Timiş oara. This kind of project was demarated by the Informal Education Association which is a non for profit entity that aims to increase the degree of absorption in work of graduates of secondary education institutions and/or universities, by creating and developing a program of trainings alternative to the state education system and which are characterized by a better practical ability, a greater degree of objectivity in assessing the students, modern and effective teaching methods (including components such as "online learning") and a careful selection of professors, lectures and trainers, based on criteria that focus on both qualifications and experience, but also based on the key behavioral components which any modern professor: confidence, motivation to teach, responsibility, teamwork, communication and networking.

The impact upon the national economy

If Romania would indeed manage to uphold the IT sector helping to double its growth, the impact would be felt in a variety of economic factors such as GDP, exports, and also employees' salaries. GDP growth could revolve around 3-5% every year for the next 5 years and reach a pick of 13%, while net exports should continue to represent and act as the main driver of economic growth in the following years. In the same time, the number of jobs could go up by about 11 percent, this fact having in important impact also on the amount of money people in the IT sector earn. In January of 2014, the average salary in the Romanian IT sector was around € 850, with an increase of about 11% compared with the previous year, and almost three times higher than the national average. By doubling the growth of the IT sector, the level of IT employees could increase even more, this fact having later implications in the level of consume.

Regarding the full implementation of the strategic vision for the ICT sector in Romania that will meet the objectives specified for Romania will require a total investment of about € 2.5 billion. The table below shows the investment required for each field of action in order to meet specific objectives for the Digital Agenda for Europe 2014-2020.

Table 2 Necessary Investment for the Operational Program

Source: Adapted from (Ministerul Pentru Societatea Informaţ ională, 2014)

Operational Program	Investition (EUR)	%
E-Government and Interoperability	100.000.000	12%
Cloud computing and social media	30.000.000	3%
ITC in Education	85.000.000	10%
ITC in Health	50.000.000	6%
ITC in Culture	15.000.000	2%
ITC in E-commerce	70.000.000	8%
ITC in Research and Innovation	5.000.000	1%
Broadband	495.000.000	58%
Total	850.00.000	100%

CONCLUSIONS

Economic growth is an aspect that in the 21st century is already well established, after it started to develop during the last century. Every nation is in a hot pursuit of economic growth and this thing is possible also due to new industries and sectors that are relatively new. Due to the various technological changes, today the world is evolving more and more in a technologized one. Because of this, the IT sector has started to be used by a large number of countries as an engine for economic growth. Ireland is a very good example regarding this aspect, but Romania has even a bigger potential. By encouraging the doubling of the IT sector growth, there is a huge possibility that the country will achieve an unprecedented economic growth.

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