



HUMAN CAPITAL IN THE CONTEXT OF ECONOMIC GROWTH

George Cornel DUMITRESCU

Senior Research Fellow, The Institute for World Economy, The Romanian Academy, E-mail: george.cornel@gmail.com

Abstract *In order to increase the capacity of an economy to produce goods and services a country needs to increase the quantity and quality of its factors of production: land, labor, time, information and capital. Along the history, there have always been dominant factors of production. Among these, one of the most important proved to be “man” seen, from the economic standpoint, as “human capital”. Human capital comprises knowledge, skills, talents, abilities, courage, intelligence, experiences, wisdom, health, some inherited and some acquired during lifelong learning (family, school, university, on-the-job learning, and training). Analyzing the literature in the field this paper focuses on the components that best define “human capital”: education, health, leadership, migration and innovation and, using statistical data available, tries to underline how well are these components represented in successful economies.*

Key words:

Human capital, economic growth, leadership education, resources, remittances

JEL Codes:

E24, F22, F24, H51, O4, O32

1. Introduction

The economic theory says that, in order to produce goods and provide services one needs to combine the well-known factors of production (labor, land, and capital, time and information). Money, in this context, is considered capital only if it is used to manufacture goods and provide services. The same goes for the human capital. Human capital comprises all the people involved in an activity which generates goods and services. From a different perspective, human capital can also be seen as the ability of a person to produce incomes from labor.

The role of human capital in the economic growth is very well represented in the specialized literature in the field of economics. Paul Romer (1986) and Robert Lucas (1988) identified human capital as a key factor of economic growth and fighting poverty. Barro and Sala-i-Martin (2004) argue that, the positive effect of human capital on economic growth could reflect disequilibrium in the human capital stock. Such imbalance characterized several the OECD countries in the '50s and the '60s. These states were affected by a decrease in physical capital due to the lives lost during the World War II.

Human capital and physical capital are complimentary in achieving productivity growth and therefore generalized economic growth. The efficiency of investments in human capital depends on how countries combine leadership, education, health policies and physical capital. Joseph Stiglitz (2010) underlined that “investment in human capital and education is also needed to keep the growth engine

running. You get older one year at a time, and no matter what innovations have occurred, that process of ageing has not stopped. So therefore if you don't renew your human capital, it depreciates just like physical capital depreciates ... In economies, you have to run to stay still; that the world is changing, and you have to change even if nothing else is going on.”

In order to understand the role of human capital as a driver of development we need to identify the connections between human capital and other forms of capital. Human capital and the other forms of capital are in most cases complementary. The perfect symbiosis between man and machine is therefore the essential problem we need to address in order to increase productivity, since one cannot say human capital is more important than physical capital.

Robert Lucas (1998) modelled the relation between human capital and economic activity by separating the economy in two sectors:

- Educational, which produces new human capital by means of the existing human capital (teachers, professors, trainers);
- Goods and services, which use both human capital and physical capital.

According to his model, an increase in human capital will determine an increase of national income.

Barro and Sala-i-Martin (1995) argue that, for a certain level of GDP, a raised initial stock of human capital reflects a higher ratio between human capital and physical capital. Human capital enables the absorption of know-how and technology from the developed countries.

The defining elements of human capital are: educational capital, school training and extracurricular activities, leadership, biological capital, and physical and intellectual attributes of individuals measured by health status.

Educational capital takes two forms of representation: on one hand the skills gained during the learning process, certified by diplomas and on the other hand, the knowledge and abilities acquired by people from their own experiences or from their interactions with other people and experts in various fields of activity.

According to Voicu (2004), “the biological capital is defined by intellectual and physical skills of individuals reflected in their health status. Biological capital is influenced by educational capital, in the way that educated individuals will choose better medical services, selecting the right alternatives in order to maintain their good health.

Human qualities, as components of human capital can be classified as follows:

1. The tangible ones (height, physical strength, stamina, eyesight, hearing, health, longevity);
2. The intangibles (psychomotor, cognitive, procedural).

The procedural qualities consists of: (creativity, problem solving skills, flexibility, loyalty, team working, trust, obedience)”.

Gary Stanley Becker (1994) says that training and education are very important during technological change and enable productivity growth in manufacturing and service sectors.

Serge Coulombe *et al.* (2004: p.31) found out that a country with a literacy rate one percent higher than the average registers a GDP growth of 1,5 percent.

In “An Inquiry into the Nature and Causes of the Wealth of Nations” Adam Smith (2005) emphasized the importance of education “The difference between the most dissimilar characters, between a philosopher and a common street porter, for example, seems to arise not so much from nature, as from habit, custom, and education.” Adam Smith noticed that education is more important than the genetic inheritance of individuals. Therefore, a country’s capability to educate its citizens for the jobs required at present is of fundamental importance for its economic future. In this regard, learning institutions play a fundamental role in choosing a curricula that meets the real needs of the labor market.

Table 1. Earnings and unemployment rates by educational attainment in the US

Education attained	Unemployment rate in 2014 (Percent)	Median weekly earnings
Doctoral degree	2,1	\$1,591
Professional degree	1,9	1,639
Master's degree	2,8	1,326
Bachelor's degree	3,5	1,101
Associate's degree	4,5	792
Some college, no degree	6,0	741
High school diploma	6,0	668
Less than a high school diploma	9,0	488
All workers	5,0	839

Note: Data are for persons age 25 and over. Earnings are for full-time wage and salary workers.

Source: Current Population Survey, U.S. Department of Labor, U.S. Bureau of Labor Statistics

Table 1 show how more educated people earn more than less educated one. In the United States, a PhD graduate makes 3.26 times more money than a person having less than a high school diploma and 1.9 times more than all workers.

Therefore, education attained gives you the economic power to meet your goals in life (buy goods and services and invest in various business contributing thus to economic growth).

Table 2. Youth literacy rate, population 15-24 years, both sexes (%)

Country	2011	2012	2015	Education (%) GDP* 2009-2013 Available data	GDP/capita** current US\$ (2013)
Bulgaria	97,8	-	98,0	3,8 (2011)	7.498,8
China	-	-	99,7		6.807,4
Egypt	-	89,2	91,1		3.314,5
Germany	-	-	-	5,0 (2011)	46.251,4
Guinea	-	-	45,2	2,5 (2012)	523,1
Italy	-	99,9	99,9	4,3 (2011)	35.685,6
Liberia	-	-	54,4	2,8 (2012)	454,3
Madagascar	-	-	65,0	2,7 (2012)	463,0

Country	2011	2012	2015	Education (%) GDP* 2009-2013 Available data	GDP/capita** current US\$ (2013)
Niger	-	23,5	26,5	4,4 (2012)	415,4
Romania	98,9	-	99,3	3,1 (2011)	9.490,8
Russian Federation	-	-	99,7	-	14.611,7
Low income countries	71,8	71,8	-	-	-
Lower middle Income countries	83,3	83,3	-	-	-
Middle income countries	90,6	90,6	-	-	-
Upper middle income countries	98,54	98,5	-	-	-

*<http://data.worldbank.org/indicator/SE.XPD.TOTL.GD.ZS>

**<http://data.worldbank.org/indicator/NY.GDP.PCAP.CD/countries?display=default>

Source: UNESCO 2014. More at: <http://data.uis.unesco.org/#>

Table 2 shows that low income countries as Madagascar, Guinea, Liberia register also low literacy rates. On the other hand, Niger invests in education more than Italy but the difference in the GDP/capita is immense. Low income countries economic performance is influenced by other factors such as the size of GDP, corruption, poor infrastructure and transportation, “brain drain”, weak factors of production etc.

Leadership. There are a lot of definitions of leadership in the context of business operations and business management theory. A leadership process happens when at least two people, aspire to common goals or share the work involved in processing common tasks. Leadership is a process of social influence, which maximizes the efforts of others, towards the achievement of a goal.ⁱ Wunderer and Grunwald (1980: p.87) put together a list comprising eleven attributes, which define leadership:

1. Target, results and task orientation;
2. Group processes (involving two or more people);
3. Role differentiation (results expected from a person in a particular position);
4. Influencing processes (power);
5. Social interaction (mutual influence on behavior and attitudes);
6. Development of values and standards;
7. Personal attributes abilities and skills;
8. Conflict processes (conflicts of interests);
9. Information and communication processes.”

Robert Wade (2006: p.3) presented three kinds of state:

1. Neopatrimonial state (no separation of public & private domain, leaders and officials use state power to enrich them).
2. Fragmented-multiclass state (populism, soft state) in which public & private domain is separated, but power base is diverse and decisions are fragmented.
3. Cohesive-capitalist state (developmental state, hard state) in which authority is centralized, power base is narrow (serves capitalists only), and state power penetrates deeply. Wade argues that the

states from the 2nd and 3rd categories can implement industrial policies, but not the ones in the first category”.

At a national and global level, leadership, as a feature of human capital, is very important for economic growth. Political stability, government effectiveness, legal system, rule of law, lack of corruption etc., are key factors in creating the conditions needed for economic growth. Leadership is able to provide these conditions. Peter Drucker said: „Management is doing things right; leadership is doing the right things.”

Along the history, there were leaders that changed the destiny of their own countries or even the face of the world. In economy, leadership can make the difference on more and more sophisticated markets. The good leadership of parents gives children the proper environment to grow up strong and healthy, setting up the foundation for a successful productive adult life. The British historian John Keegan (2009) wrote “The political history of the 21st Century can be written as the biographies of six men: Lenin, Stalin, Hitler, Mao Zedong, Franklin Roosevelt and Winston Churchill.”

Wade (2006: p.6) explained why sometimes power concentration is needed “Growth requires a critical mass of mutually enforcing policies. A free hand of the state is needed to mobilize resources quickly and flexibly. Private dynamism is weak in most developing countries. The state must lead initially. If broad participation is allowed, policies are too slow and can’t achieve critical mass due to:

- Power struggle, party politics, interest groups, etc.
- Processes which require patience and compromise, including parliamentary debate and consensus building
- Some groups refuse to cooperate with state purposes.

Two American scholars, Jones and Olken (2005) analyzed how the death of a chief of state, influence the rate of economic growth. They showed that replacing a weak leader with a good

one boosts the GDP by 1,5 percent. During Mao Zedong China registered growth rate of 1,7% per year. After his death, the growth rate increased by 5,9% per year. David Brady, Michael Spence et al. (2010) studied the relationship between leadership and economic growth in the developing countries. In this regard, they took into consideration political stability, government efficiency, legal system, corruption, rule of law etc. They found out that there is a strong connection between the quality of the governance and the level of economic growth.

Health. A good health reduces the depreciation of human capital and therefore has a positive effect on economic growth. Investments in human capital must be made at an early age. A generation of malnourished children deprived of the most basic health services and education, when mature, won't be able to properly perform in a competitive labor market. Any action to remedy the situation then will prove useless in terms of a return on investment. A healthy employee adapts to working environment and conditions and is capable to generate maximum productivity.

Robert Barro (1996) was amongst the first scholars to study the relationship between economic growth and health. He underlined that a good health reduces the depreciation of human capital, therefore has a good effect on economic growth.

Sick leave has a negative impact on productivity and determines an increase in health expenditures, money that could be used for investments or production of goods and services otherwise. Bloom, Canning and Chan (2005:16) point out that "higher education can lead to economic growth through both private and public channels. The private benefits for individuals are well established, and include better employment prospects, higher salaries, and a greater ability to save and invest. These benefits may result in better health and improved quality of life, thus setting off a virtuous spiral in which life expectancy improvements enable individuals to work more productively over a longer time further boosting lifetime earnings."

Table 3. Health expenditure, total (% of GDP)

Country	2008	2009	2010	2011	2012	2013
Bulgaria	6,97	7,23	7,58	7,27	7,42	7,63
China	4,63	5,15	4,98	5,15	5,41	5,57
Germany	10,70	11,75	11,55	11,33	11,28	11,30
Egypt, Arab Rep.	4,81	4,99	4,75	4,90	5,00	5,06
Euro area	10,06	10,83	10,76	10,58	10,65	10,62
Guinea	3,08	3,85	4,55	4,20	4,51	4,69
Italy	8,89	9,40	9,41	9,25	9,19	9,09
Liberia	11,83	14,39	13,07	15,59	9,42	10,03
Low income	5,01	5,25	5,56	5,48	5,40	5,53
Lower middle income	4,28	4,37	4,16	4,14	4,19	4,31
Low & middle income	5,29	5,76	5,60	5,60	5,71	5,79
Madagascar	4,30	4,49	4,98	4,01	3,34	4,23
Niger	6,93	7,22	6,66	6,78	6,07	6,55
High income: OECD	11,65	12,60	12,51	12,44	12,56	12,62
Romania	5,44	5,64	5,95	5,60	5,56	5,34
Russian Federation	6,17	7,53	6,92	6,74	6,50	6,55

Source: The World Bank, 2014. Read more at: <http://data.worldbank.org/indicator/SH.XPD.TOTL.ZS>

Migration is a good opportunity for cultural exchanges and knowledge dissemination.

Table 4. Total International Migrant Stock (million)

Year	1990	2000	2010	2013
Total	154	174	220	231
Women	75	85	106	111
Man	78	88	115	120

Source: United Nations, Department of Economic and Social Affairs, Total International Migrant Stock 1990-2013

In 23 years, the world migration increased by 50%. If migrants lived in one country, that country would have been the fifth in the world in terms of population, between Brazil (202 million inhabitants) and the US (325 million inhabitants)ⁱⁱ.

For developing countries, remittances represent the main benefit of migration, through their attribute of incomes from labor exports. Remittances reduce pressure on current account deficit. According to data released by the World Bank, in 2014, at the international level, migrants sent to their countries of origin over \$583,4 billion (\$414 billion in developing countries). For 2016, the World Bank forecasts a level of remittances of \$700 billion. The financial

resources of the migrants are considerable. Therefore, the recipient countries should be more involved in creating the legal framework that stimulate migrants to return home and invest money in productive activities, instead of using it for buying imported goods. Investments in real estate, land etc. in some countries reflects the lack of investing alternatives.

Edward Taylor (2006:9) argues that remittances have a multiplier effect on incomes “One person’s spending is another person’s income. For example, if a village household receives \$100 in remittances, its income increases, in the first instance, by \$100. Suppose that it spends \$10 of this new income on meat from a local butcher, another \$40 paying a bricklayer for a home improvement project, and the rest on building materials purchased in a nearby town. Now the incomes of the village butcher and

bricklayer also increase. The butcher and bricklayer, in turn, spend part of their new incomes at the village store, creating income for the storekeeper, and so on. In this way, the \$100 of remittances creates a local income multiplier, similar to a Keynesian fiscal multiplier, in the migrant-sending economy.”

Adams and Page (2005) emphasize that “on average, a 10% increase in per capita official international remittances will lead to a 1.8% decline in the share of people living in poverty”.

“India received remittances last year (2013) that were almost three times as large as the inward investments made by foreign firms. In Tajikistan, migrant workers sent home the equivalent of 47% (48.8%, World Bank) of the GDP”, (The Economist, 2014)ⁱⁱⁱ.

Table 5. Migrant remittance inflows (US\$)

Remittance inflows (US\$ million)	2012	2013	2014e	% of GDP in 2013
World	533.140	557.083	583.430	-
India	68.821	69.970	70.389	3,7%
China	57.987	59.491	64.140	0,6%
Philippines	24.610	26.700	28.403	9,8%
Mexico	23.366	23.022	24.866	1,8%
Nigeria	20.633	20.890	20.921	4,0%
Egypt, Arab Rep.	19.236	17.833	19.612	6,6%
Pakistan	14.006	14.626	17.060	6,3%
Bangladesh	14.236	13.857	14.969	9,2%
Vietnam	10.000	11.000	12.000	6,4%
Lebanon	6.730	7.864	8.899	17,7%
Ukraine	8.449	9.667	7.587	5,4%
Sri Lanka	6.000	6.422	7.036	9,6%
Morocco	6.508	6.882	6.962	6,6%
Nepal	4.793	5.552	5.875	28,8%
Guatemala	5.031	5.379	5.845	10,0%
Uzbekistan	5.668	6.633	5.588	11,7%
Dominican Republic	4.262	4.486	4.650	7,3%
El Salvador	3.910	3.971	4.236	16,4%
Tajikistan	3.626	4.154	3.835	48,8%
Jordan	3.490	3.643	3.757	10,8%
Serbia	3.545	4.023	3.656	8,8%
Yemen, Rep.	3.351	3.343	3.455	9,3%
Romania	3.674	3.518	3.431	1,9%

Source: World Bank (2015).

<http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTDECPROSPECTS/0,,contentMDK:22759429~pagePK:64165401~piPK:64165026~theSitePK:476883,00.html>

In Table 5, remittances count up to 48.8% of the GDP in Tajikistan, 28.8% of the GDP in Nepal, 17.7% of the GDP in Lebanon. Therefore, there are economies that rely on the money sent by their nationals working abroad.

Migration comes also with disadvantages and one of them is *the brain drain*. Most developing countries have to cope with this phenomenon. The elite of engineers, doctors, researchers etc. choose to migrate to rich countries, thus contributing to

their development and welfare, after benefiting from the advantages of home education, This is a problem that should be seriously addressed given the double loss recorded in the system. On one hand, the money states invested to develop the “brains” and, on the other hand, the equivalent of the “brains” contribution to the development of their country if they wouldn’t have left. Romania and other developing countries face the problem of brain drain. Over a quarter of Romanian migrants

are highly educated. For the welfare states, affected by population ageing, immigration is the only way to maintain economic and demographic indicators at a level that ensures the preservation of their living standards. But, for the industrialized countries, an increase in migration over the level of comfort exerts pressure on existing infrastructure (housing demand increases, extra places in hospitals, schools, access to public roads etc.).

Since the introduction of the euro, more qualified workers have left Europe than have newly arrived. According to Campanella (2014) “the 15 countries that adopted the euro currency exhibited, on average, a net loss of around 120,000 postsecondary-educated workers each year. They were mainly attracted by the United States’ higher salaries, world-class universities, and efficient bureaucracy. In the years leading up to the Great Recession, from 2000 to 2008, Italy lost around 1.5 million professionals -- many of them with very advanced skills.”^{iv} Raveesh (2013) argues that “India loses \$2 billion a year because of the emigration of computer experts to the U.S. Indian students going abroad for their higher studies costs India a foreign exchange outflow of \$10 billion annually.”

Technology, technological progress and research and development (R&D) that enables it, are seen, by most of the economic theorists as key elements to economic growth. John Maynard Keynes (1930) emphasized that “From the earliest times of which we have record — back, say, to two thousand years before Christ — down to the beginning of the eighteenth century, there was no very great change in the standard of life of the average man living in the civilized centres of the earth. Ups and downs certainly. Visitations of plague, famine, and war. Golden intervals. But no progressive, violent change. Some periods perhaps 50% better than others - at the utmost 100% better - in the four thousand years which ended (say) in A.D. 1700.” He identified two key factors which led to this stagnation: the absence of technological improvements and capital accumulation failure.

In this sense, the institutions which ensure the necessary framework to technological evolution, research institutes, universities, and relevant government programs, are extremely important in increasing society's ability to engage in the creation and use of new technologies. Innovation, including development and marketing of new products, services, business models and management

techniques, is vital for continued success of companies and states.

The new technologies of information and communication (ICT) enabled the creation and dissemination of a great variety of services: payments by credit cards, banking transactions via the Internet, security solutions, fast information transfer, unified communications, the Internet of things, 3D printing etc. and led to unprecedented development of mass media.

Using data collected from 367 large companies, (Brynjolfsson and Hitt, 1994:11) estimated that “a 1% increase in spending on computer capital is associated with a 0.0126% increase in output, when all the other input is held constant. Because computer capital accounted for an average of 2.18% of the value of output each year, this implies a gross ROI (increase in dollar output per dollar of capital stock) for computer capital of approximately 58% per year, holding other inputs constant. For the full sample which also included non-manufacturing firms, the output elasticity of computer capital was estimated at 0.0169, implying an average ROI of 81%.” Jorgenson and Stiroh (1995: 295-316) found out that from the end of the 1970s to mid-1980s, ICT devices caused an output growth of 0.52% per year, and from 1985 to early 1990s, the contribution was 0.38% per year.

None of the poor countries appears in Bloomberg's top 50 list (Table 5).

The 3D printing industry is expected to reach a turnover of \$8.41 billion by 2020. Printing is the new way of creating prototyping models, furniture and common household items. On the world's 3D printing map there are only three regions that count: Europe, Asia and the Americas. China, the biggest producer of Rare Earth Elements, with a middle class which grows every year by 20 million, will register a big growth in the field of 3D printing, aiming to promote 3D printing as a mean to produce economic goods.

A survey carried out by engineering.com concluded that the entire 3D printing industry will register a strong, steady growth, driven by advances in materials, output quality, speed and overall performance. As professional engineers, they see how things work in the world of manufacturing.^v

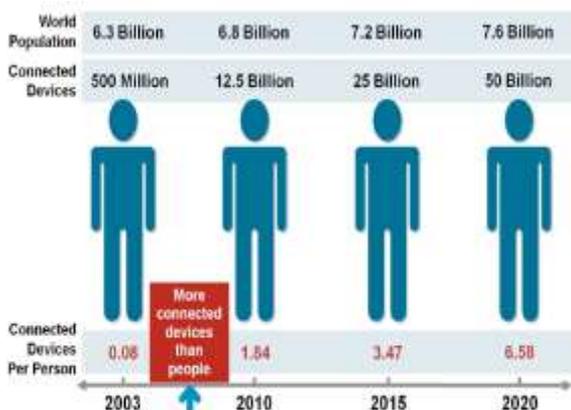
The Internet of Things enables you to connect to the Internet all the wireless or wired devices and to control them from anywhere (security cameras, drones, transportation systems, robots, appliances etc.)

Table 5. Most Innovative in the World 2014

Rank	Country	Total Score	R&D rank	Researcher Concentra. rank	Patent activity
1	South Korea	92	3	6	2
2	Sweden	90	4	8	26
3	United States	91	10	12	5
4	Japan	90	5	9	3
5	Germany	88	9	17	6
6	Denmark	87	6	3	14
7	Singapore	86	17	4	34
8	Switzerland	86	8	22	29
9	Finland	85	2	2	15
10	Taiwan	84	7	5	1

Source: Bloomberg (2014)

Figure 1. The Internet of Things Was “Born” Between 2008 and 2009



(Source: CISCO, 2011:3)

(Cisco 2011:3) predicts there will be about 25 billion devices connected to the Internet by 2015 and 50 billion by 2020.

Two enabling factors are driving this Internet of things: the ubiquity of networks and ever lower prices for the communications modules used to connect devices. According to OECD’s Internet Economy Outlook 2012 “Ericsson estimates that

Table 6. High-technology exports (US\$ billion)

Rank	Country	Value	Year
1	China	560	2013
2	Germany	193	2013
3	United States	148	2013
4	Singapore	135	2013
4	Korea	130	2013
5	France	112	2013
6	Japan	105	2013
7	Netherlands	69	2013
8	Malaysia	60	2013
9	Switzerland	53	2011
10	Mexico	45	2011

Source: World Bank (2015)

<http://data.worldbank.org/indicator/TX.VAL.TECH.CD/country?s?display=default>

there will be 50 billion mobile wireless devices connected to the Internet by 2020, and this could eventually reach 500 billion. For example, incorporating a communication device into each automobile, and assuming a lifespan of ten years, would result in around 700 million “machine-to-machine enabled”^{vi} cars by 2020. Connecting every power socket in North America to a network as part of a smart grid rollout would easily result in 10 billion connections.” The conclusions of a PWC survey of almost 2000 executives show that the innovation is an important vector of economic growth for all companies.^{vii}

The development of industrial parks or concentrated clusters: production companies, their suppliers and customers, research institutes, universities and all related civic infrastructure is very important. Such “areas of intelligence and innovation” will be able to ensure, on a green basis, the continuous progress of modern societies. Collaboration between public and private sectors is essential to achieve a high degree of innovation and for addressing some of the biggest challenges we face.

2. Conclusions

This paper assessed several growth drivers for the modern economy. We focused on the ones that better define human capital: education, health, leadership, migration and innovation. We emphasized that high levels of human capital are found in developed countries which invest more in health, education, research and development. Education is associated with higher earnings and gives the people power to buy goods, services and invest in various business contributing thus to economic growth. Leadership is also important especially in our times in which big geostrategic and economic project are reshaping the world economy (Silk Road Economic Belt, the expansion of the Suez Canal and its Economic Zone, etc). In this context, it is worth mentioning that Jones

and Olken showed that replacing a weak leader with a good one boosts the GDP by 1,5 percent.

People in poor health can't be very productive. A good health reduces the depreciation of human capital, therefore has a good effect on economic growth.

Sick leave has a negative impact on productivity and determine an increase in health expenditures, money that could be used for investments or production of goods and services otherwise. Most developed countries allocate an important percentage of GDP for health expenditures (over 10% in Euro area and less than 6% of the GDP in low income countries).

For some countries, remittances represent a high percentage of GDP (48,8% in Tajikistan, 28,8% in Nepal, 17,7% in Lebanon), being sometimes bigger than the foreign direct investments.

"Brain drain" is a phenomenon that affects poor or developing countries. Significant amount of money is spent to educate specialists who after graduation, for various reasons choose to migrate to developed countries. The countries of origin register a double loss. First, the money they spent for their education and second the value of the contribution these specialists could have made to local economy.

Developed countries are leaders in the field of R&D, patents and researcher concentration. Most of the high-tech devices used today (smartphones, notebooks, 3d printers etc.) are made in these countries. The conclusions of a PWC survey of almost 2000 executives show that the innovation is an important vector of economic growth for all companies.

Improving human capital should be, and in many countries is, a priority for the policy makers. Education, health, good leaders, R&D, capital, work, land, information and time are the values which characterize modern economy.

Investment in human capital alone is not sufficient to generate economic growth, but a judicious combination and correlation between human capital and other forms of capital represent the right way to follow.

References

1. Adams, R. & Page, J. (2005). Do International Migration and Remittances Reduce Poverty in Developing Countries? *World Development* Vol. 33, No. 10, pp. 1652, Elsevier Ltd.
2. Barro, R. & Sala-i-Martin, X. (1995). *Economic Growth*, New York, McGraw-Hill.
3. Barro, R. (1996). *Health and Economic Growth*, Harvard University, November, 1996, p. 5.
4. Barro, R. & Sala-i-Martin, X. (2004). *Economic growth*. 2nd ed. Cambridge, MIT Press, p. 258.
5. Becker, G., S. (1994). *Human Capital: A Theoretical and Empirical Analysis*, with Special Reference to

Education, 3rd Edition Paperback, The University of Chicago Press, Ltd., London.

6. Brady, D., Spence, M., et al. (2010). *Leadership and Growth*, Commission on Growth and Development, The International Bank for Reconstruction and Development / The World Bank, Washington.

7. Coulombe, S., Tremblay, J.,F., & Marchand, S. (2004). Literacy scores, human capital and growth across fourteen OECD countries. *Statistics Canada, Dissemination Division, Circulation Management*, 120 Parkdale Avenue, Ottawa, Ontario K1A 0T6.

8. Lucas, R. (1988). On the Mechanics of Economic Development, *Journal of Monetary Economics*, 22, North Holland, p. 3-42.

9. Raveesh, S. (2013). Brain Drain: Socio-Economic Impact on Indian Society. *International Journal of Humanities and Social Science Invention* ISSN (Online): 2319 – 7722, ISSN Volume 2 Issue 5, pp.12-17.

10. Romer, P. (1986). *The Journal of Political Economy*, Vol. 94, No. 5, 1986. The University of Chicago Press, p. 1002-37.

11. Smith, A. (2005). *An Inquiry into the Nature and Causes of the Wealth of Nations*. Pennsylvania State University, Electronic Classics Series, Jim Manis, Faculty Editor, Hazleton, PA 18202, p. 31.

12. Wunderer, R. and Grunwald, W. (1980), *Führungslehre: Grundlagen der Führung*, Walter de Gruyter, Berlin.

13. Voicu, B. (2004). Capitalul uman: componente, niveluri, structuri. *România în context European, CALITATEA VIEȚII*, XV, nr. 1–2, București, p. 137–157.

Internet

1. Brynjolfsson, E. and Hitt, L. (1994). "New Evidence on the Returns of Information Systems," Revised Sloan School WP: 11, available online at http://pdf.aminer.org/000/326/299/is_information_systems_spending_productive_new_evidence_and_new_results.pdf.
2. Bloom, D., Canning, D., & Chan, K. (2005). Higher Education and Economic Development in Africa. HARVARD UNIVERSITY. p. 16, available online at http://siteresources.worldbank.org/EDUCATION/Resources/278200-1099079877269/547664-1099079956815/HigherEd_Econ_Growth_Africa.pdf
2. Evans, D. (Cisco 2011). "The Internet of Things How the Next Evolution of the Internet Is Changing Everything", available online at https://www.cisco.com/web/about/ac79/docs/innov/IoT_IBSG_0411FINAL.pdf
3. Jones, B. & Olken, B. (2005). Do leaders matter? National leadership and growth since World War II. Northwestern, available online at:

<http://www.kellogg.northwestern.edu/faculty/jones-ben/htm/leaderspaper.pdf>

4. Keynes, J.M. (1930). Economic possibilities for our grandchildren. The Nation and Athencœum, available online at

<http://www.econ.yale.edu/smith/econ116a/keynes1.pdf>

5. Keegan, J. (2009). The political history of the 20th century can be written as the biographies of six men: Lenin, Stalin, Hitler, Mao Zedong, Franklin Roosevelt and Winston Churchill, available online at <http://www.rjgeib.com/thoughts/britain/winston-churchill.html>

6. Remittances and growth, Gone missing, The Economist, August 1 st 2014, London. Available online at <http://www.economist.com/node/21606607/print>.

7. Wade, R. (2006). Leadership, Political Regime, and Economic Development. Available at <http://www.grips.ac.jp/forum/pdf07/07FebUK/attach3.pdf>

8. Taylor, E. (2006). International Migration and Economic Development, available online at http://www.un.org/esa/population/migration/turin/Symposium_Turin_files/P09_SYMP_Taylor.pdf

ⁱ Available online at <http://www.forbes.com/sites/kevinkruse/2013/04/09/what-is-leadership/>

ⁱⁱ Available online at <http://www.worldometers.info/world-population/population-by-country/>

ⁱⁱⁱ Remittances and growth, Gone missing, The Economist, 1 August 2014, available at <http://www.economist.com/blogs/freeexchange/2014/08/remittances-and-growth>

^{iv} Campanella, E. (2014). Come Home, Europeans, Europe's Brain Drain Problem Is Becoming a Major Crisis, , available at <http://www.foreignaffairs.com/articles/142218/edoardo-campanella/come-home-europeans>

^v Available online at <http://www.engineering.com/3DPrinting/3DPrintingArticles/ArticleID/5232/CHART-Readers-predict-3D-printings-future.aspx>

^{vi} OECD. (2012). OECD Internet Economy Outlook 2012. Available online at <http://www.oecd.org/sti/ieconomy/internet-economy-outlook-2012-highlights.pdf>. p.7

^{vii} Available online at <http://www.pwc.com/gx/en/innovationsurvey/index.jhtml>