ROMANIAN ECONOMIC AND BUSINESS REVIEW

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CONTENTS

EVALUATION OF THE IMPACT OF THE 4TH INDUSTRIAL REVOLUTION ON THE LABOR MARKET

Florin Bonciu*

Abstract

The paper explores the content and implications of the 4th industrial revolution, both as a concept and as a reality, particularly from the point of view of the human factor. The analysis highlights the key differences between the current industrial revolution and the previous ones, particularly from the point of view of the labor market. Three characteristics of the 4th industrial revolution are identified: ubiquity, availability and interaction at a global scale. Due to the large disruptive potential of the 4th industrial revolution the paper is focused on the implications and the possible solutions for rethinking the place of the human factor in the economic process but also in society in the context of the large scale use of Internet of Things (IoT), robots and artificial intelligence.

Key words: 4th industrial revolution, labor market, human factor and economic process

JEL classification: O14, O25, O33, O38

The relation between technology and human activities

Technology as a concept may be defined as "the practical application of knowledge especially in a particular area" (Merriam-Webster, 2017). This brief definition can be easily applied to ancient Egypt as well as to contemporary economies and societies. As such, technology implies the pre-existence of a certain knowledge, as well as the practical application of that knowledge. From this point of view technology may be regarded as an interface between science and the real daily life.

Some practical applications of knowledge are useful, but at the same time limited in their impact on human existence. For instance, the lightning rod applies the knowledge about electricity for preventing the buildings from lightning strikes and its principle of functioning was described by Benjamin Franklin in 1749 (Jernegan, M.W., 1928). Such a technology prevents a number of fire hazards and other damages but it is not really changing the economy or society. Different from the technology that represent the foundation for the lightning rod, the technology related to the steam engine, particularly after its improvement by Thomas Newcombe in 1712 and James Watt in 1781, laid the foundation for the first industrial revolution (Whipps, H., 2008) that changed not only the economy of the Western world but also the Western society by creating the large scale industrial production, the development of transport (by railways and also by river and sea), the development of cities and urban life, the change of education and, in the end, the perception about the world and the world economy as a whole.

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The difference between the two types of knowledge and the technologies that apply that knowledge (**evolutionary** and **revolutionary**) is included in the concepts of scientific revolution and paradigm shift proposed by Thomas Kuhn (Kuhn, T., 2012) that challenged the previous belief that progress is mainly a linear process based on accumulation of knowledge and know-how and replaced it with a non-linear process that alternate in an irregular way periods of linearity ("normality) with moments of discontinuity ("scientific revolutions").

When moments of discontinuity appears (the scientific revolutions and their technological replicas) the economy and society passes through significant transformations (that involve work, education, values and many other aspects).

In this context, among many other things, the first industrial revolution raised for the first time in human history the question **of the impact of technology on human labor** not only from the point of view of reducing the physical effort of workers and of tremendously increasing the productivity and output, but also from the point of view of the risk of eliminating human labor because of replacing it with mechanical equipment.

Such was the fear of the risk of skilled workers in textile industry for being replaced by machines that during 1811 – 1813 the so-called Luddites movement took place in Midlands, Yorkshire and Lancashire and manifested by burning factories and smashing weaving machines (Andrews, E., 2015).

In retrospect the fears of the Luddites did not materialize and while the mechanical tools and equipment brought by the first industrial revolution as well as by the second and third ones eliminated certain jobs, many others were created and economy and society dramatically improved and progressed.

The 200 years experience with technology since the Luddites movement has been mostly positive: many human activities are nowadays much less demanding from a physical point of view, many opportunities emerged all over the world and amazing information and communication technologies are widely available. This is why so many people today are techno-enthusiast (sometimes even without being aware of this) and seem to rely on the saying: "Come what may, we shall find a way." Maybe the only widely accepted negative implication related to the large scale use of technology is the one related to the impact of technology on the environment, particularly in relation to climate change.

The impact of technology on economy and society is anyway much more complex and does not limit in any way to the labor market. In this sense a profound observation is that the large scale implementation of technologies determine two opposing forces: **the diffusion of economic benefits** and **the concentration of wealth** (Buckup, S., 2017).

The manifestation of the two opposing forces is **to a large extent sequential**. The large scale implementation of technologies creates jobs, requires larges quantities of raw materials and energy, generates the emergence of new companies, generates new wealth and raises the living standards of large number of people. Due to all these phenomena specific to the early and middle stages of an industrial revolution new social classes and/or political forces may appear and the economic development may lead to social and political developments. In the late (mature) stages of an industrial revolution a concentration of power occurs due to the phenomenon of concentration of capital which is then translated into a concentration of political power. While in previous historical periods the concentration of power took the form of authoritarian regimes, nowadays

especially in the Western world the concentration of power may take the form of gradual adoption of rules of the game (institutions and legislation) that favor substantially the more affluent part of society (Sparrow, J., 2017).

The 4th industrial revolution as a concept and as reality

Industrial revolutions can be regarded as moments of change and disruption in multiple areas related to society and economy. They are based on the evolution of human knowledge and may change values, behaviours, the management of economic activities and the balance of power on a regional or global scale. Industrial revolutions may also significantly affect environment as they require certain resources and generate different outputs, some of them useful, such as products and services, and some of them with a negative impact on the environment, such as waste, air pollution or the climate change.

In this context, Klaus Schwab, the founder of the World Economic Forum and author of a book on the 4th industrial revolution mentioned that: The term "revolution", be it related to industrial area ("industrial revolution") or to science and technology ("technical-scientific revolution") implies "abrupt and radical change", a change that takes place in a sudden way (Schwab, K., 2016, p .11). The key aspect here is **the idea of radical change** which differentiates industrial evolutions (that are mere improvements) from industrial revolutions that are not only allowing the carrying out of economic and social activities on a much larger scale, but also allow the carrying out of these activities in a different way (for instance by means of mechanization, automatization or completely automated processes).

Such revolutions took place either **when new technologies** (such as the discovery of fire or of the wheel or, more related to modern times, the invention of the printing press, the steam engine or electricity) were discovered and implemented on a large scale or **when new perceptions related to the world** (like that determined by Galileo Galilei and Nicolaus Copernicus which replaced the belief originating in antiquity that the Universe/our galaxy is organized around the Earth with the belief that the planets in our galaxy are revolving around the sun) have determined profound changes in the economic systems and social structures.

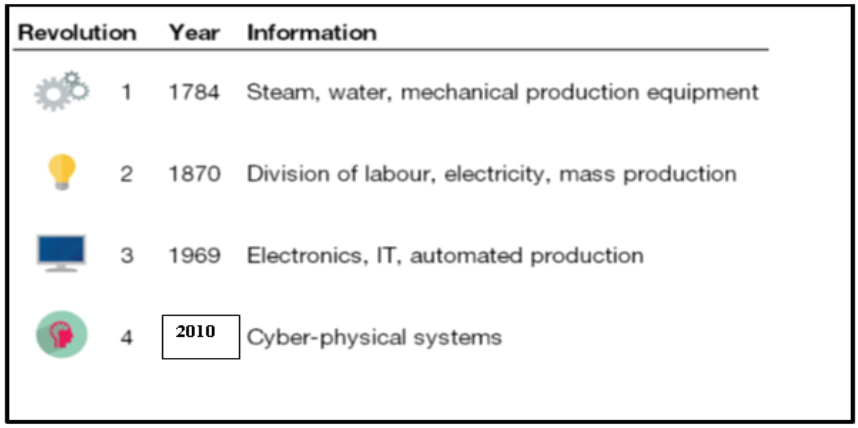
An important observation based on the historical experience is that revolutions are not emerging and affecting the whole world at the same time, given the fact that even in the same country the dissemination of a new perception about the world or of a new technology are not linear or all encompassing processes.

With the exception of researchers and historians that kept record of the successive industrial revolutions, the vast majority of people have been aware only of the 1st industrial revolution that started to manifest in late 18th century because that revolution at the same time changed the previous economic and social order and defined the main characteristics of what we know as the Western civilization. In fact, the impact of that 1st industrial revolution has been so great for the design and maturity of the Western civilization that a reputed historian, Robert Gordon stated that all important discoveries had already been done and what remains are only incremental improvements (Gordon, R., 2016, p.109).

This is why if we analyze the 4th industrial revolution it is useful to frame it in the more general context of the previous ones both as regards the timing and the content and implications for economy and society.

Therefore the time perspective and the brief description/content of the 4 industrial revolutions are presented in Figure 1 below.

Figure 1 The 4 industrial revolutions - their historical periods and content



Source: Adapted from Davis, N. – What is the fourth Industrial Revolution, World Economic Forum, 2016

As industrial revolutions are complex phenomena that affects first knowledge and science, then technology, then business, then education and finally society and its values they can not be related to a single year and a single place.

Some authors anyway tend to indicate a certain year as corresponding to a certain industrial revolution but their intention (which is not always explicit) is to mark the date when a certain scientific and technological discovery was commercially applied for the first time. With reference to the above figure:

- Year 1784 corresponds to the use of first mechanical loom in textile workshops;
- Year 1870 corresponds to the use of first production line in a Cincinnati slaughterhouse;
- Year 1969 corresponds to the use of the programmable logic controller (PLC), Modicon 084;
- And the period since 2010 corresponds to the ever larger use of cyber-physical systems (CPS) or large scale-complex automation.

While the 4th industrial revolution is in its early stages and can not be described in detail, anyway some characteristics can be mentioned:

- the use of artificial intelligence and of robots in an increasing number of areas that are not limited to business, but includes health care, education and even culture;
- the Internet of Things that connects more and more devices both in the business and domestic areas in such a way that almost everybody & everything becomes part of a global network ;
- the capacity to collect and process huge amounts of data beyond human capabilities (the so-called Big Data).

What may be regarded as a specific characteristic of the 4th industrial revolution is that new technologies and a new level of knowledge are available simultaneously to almost all the population of the globe while at the same time all these new technologies and knowledge can connect, communicate and inter-act with each other and, in the process, further generate new technologies and new knowledge.

In our opinion **ubiquit**y, **availability** and **interaction at a global scale** are the three main characteristics of the 4th industrial revolution.

Impact of the 4th industrial revolution on the labor market

A lot of debates took place in the scientific circles and the media on the impact and implications of the 4th industrial revolution on labor and two antagonistic positions could be remarked. One is that the 4th industrial revolution will dramatically impact the labor market and in general the human role in the economic process. The other position is that as humankind already passed through 3 previous industrial revolutions without significant or long lasting disruptions on the labor market, most probably the developments will be similar for the 4th one.

Anyway, a more attentive analysis points out to some differences between the 4th industrial revolution and the previous ones. Following such analysis the conclusion is that the 4th industrial revolution will influence the labor market in a way that is different from the previous ones. In essence, what is different is that the 4th industrial revolution will impact everybody at the same time and will also change the nature of production.

The first industrial revolution disrupted some jobs in agriculture and low value added processing industries but allowed the disrupted workers to find industrial jobs that still had a strong physical component. The second industrial revolution created more industrial jobs and an increasing number of office jobs. The third industrial revolution reduced significantly the number of industrial jobs but more than compensated with jobs created in the office sector (the generic services sector). Therefore in the first and second industrial revolutions the labor had to adapt to different types of physical labor and then, in the third revolution, to adapt more and more to intellectual jobs (jobs based on information processing and knowledge). What the 4th industrial revolution is doing is that it has the potential to eliminate not only physical jobs but also intellectual jobs.

Therefore while in the previous industrial revolutions (one to third) labor has a space to move from one type of activity to another (from heavy physical labor to less demanding physical labor and then to intellectual labor) in the 4th industrial revolution labor seems to be with its back against the wall. There is no new space to relocate. People with a large vision and expertise, as Bill Gates thinks that the promising jobs for the future will be in the fields of artificial intelligence, energy and biosciences (Kincks, J., 2017). The problem is that such areas can not create millions and billions of jobs and the capability to pursue such careers is not open to everyone.

From another perspective, according to Klaus Schwab there are three reasons why the 4th industrial revolution is different and they refer to (Schwab, K., 2016, p.8):

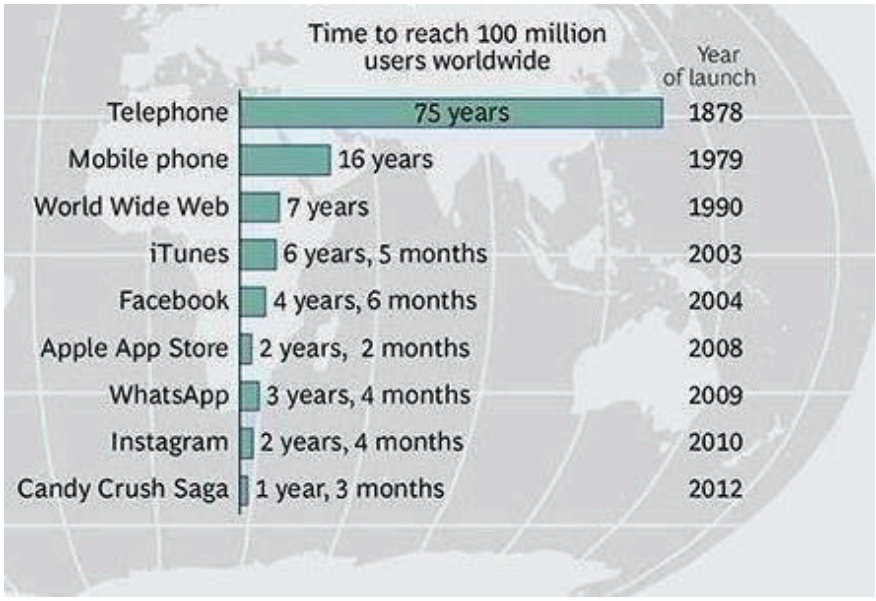
– the speed of propagation;
– the scope of change and impact;
– the impact on economic and social systems.

The speed of propagation of the 4th industrial revolution is remarkable because it develops and disseminates in an exponential pace while the previous revolutions evolved in a linear way. This dramatic increase of the speed of propagation is exemplified in Figure 2.

The scope of change and impact determined by the 4th industrial revolution are also unprecedented because they include all areas of human existence and almost all areas of the globe.

Because the speed of propagation is very high and because almost all areas of human existence are affected the transformations determined by the 4th industrial revolution have the potential to change the way economic activities are carried out, the management procedures and the governance at all levels, public or private.

Figure 2. Time to reach 100 million users



Source: Dreischmeier, R.; Close, K.; Thichet, P. – The Digital Imperative, Boston Consulting Group, April 2015, p. 6

The assumptions that the 4th industrial revolution will have a very significant impact on the labor market are based on the fact that it can automate industrial, services and even creative activities.

The possibilities opened by the technological breakthroughs such as artificial intelligence, robotics, the Internet of Things, autonomous vehicles, 3-D printing, nanotechnology, biotechnology, materials science, energy storage, and quantum computing seem endless and they appear to create a very divisive world: **a limited number of people** will use these knowledge and instruments and **a vast majority** may become more or less redundant.

Some estimations on the impact of the 4th industrial revolution on the labor market generated a lot of reactions. And even if we take these estimates with a grain of salt, they have anyway the potential to rise some preoccupation. In this respect, according to a study made by

Bank of England in the next 10-20 years automation may eliminate about 80 million jobs in USA and 15 million jobs in Great Britain; the mentioned figures represent about 50 % of the workforce in the two countries (Haldane, A., 2015). Other estimates originating with Forbes indicate the elimination of 35 - 50% of the workforce of the two countries in the same time interval (Marr, B., 2017).

World Economic Forum indicated that until 2020 in the main 15 developed and developing countries (which have together 1.9 billion jobs or 65 % of world total) about 5 million jobs will be eliminated by technologies in the fields of genetics, AI, robotics. It is to be mentioned any way that the loss of 5 million results from a 7 million loss and 2 million new jobs created by technology.

A common sense perception would be that the most developed countries could be the most affected by the 4th industrial revolution because we tend to associate the idea of industrial revolution with the most advanced countries. Anyway, in the context of globalization and global inter-connection and inter-dependence the implications are quite different. A recent UNCTAD report together with a World Bank study stated that developing countries may have the main losses of jobs due to the use of robots. For this group of countries the loss of jobs can be as big as 2/3 of total jobs, mainly because in the initial phase the robots will replace low and medium skilled jobs, exactly the types most found in developing countries (UNCTAD, 2016).

Is China a possible model for the pro-active response to the 4th industrial revolution?

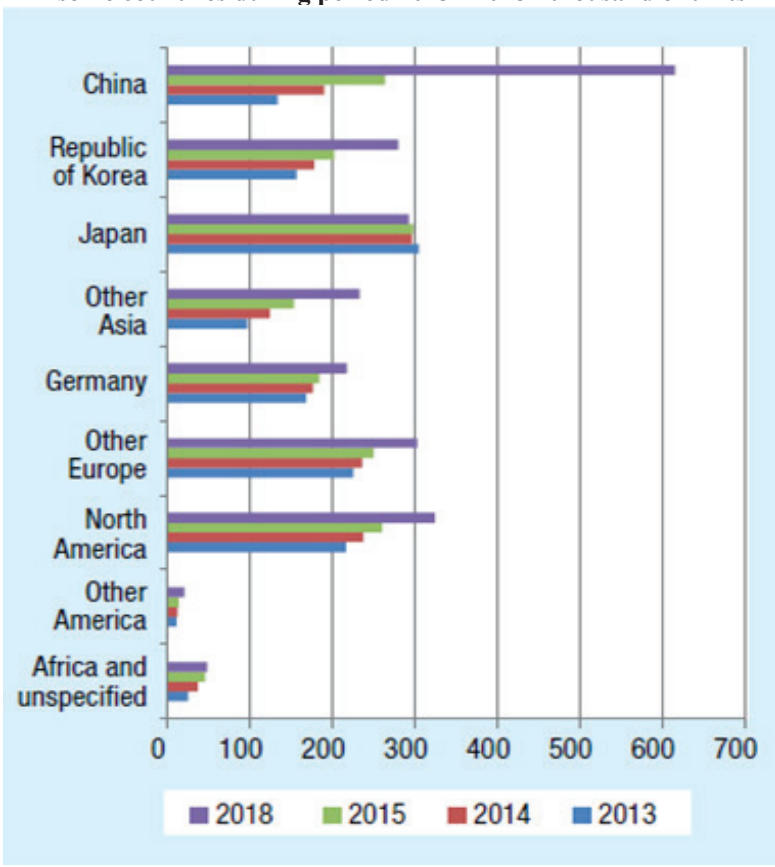
China has the largest population in the world and it is also the undisputed performer of long term economic growth. These two facts make of interest the reaction of China to the 4th industrial revolution which has such a great potential of eliminating jobs. Despite this risk, China seems not to attempt the avoidance or delay of the 4th industrial revolution, on the contrary China seems to accelerate its manifestation.

The Chinese response to the emergence of the 4th industrial revolution took into account primarily the reduction of working-age population and the rising of labor costs. In this context China has started in 2013 a government industrial strategy based on the use of robots, named "Made in China 2025" (Bradsher, K., Mozur, P., 2017). According to UNCTAD since 2013 China has bought more industrial robots than any other country and as result by the end of 2016 China became the world's largest operator of industrial robots UNCATD, 2016) – Figure 3.

Given the large population of China the number of robots per industrial worker will remain lower than in other countries such as Japan, Germany or South Korea but the robotization of Chinese production will compensate for the increase in salaries.

At the same time, as China has as a goal to become a leader in scientific research and technological innovation, the Chinese strategy has in view to transform the country into a major producer and exporter of industrial robots. In this context the Chinese government has in view increase 3 times the annual production of industrial robots by 2020 as compared to 2015, increasing the number from less than 33,000 to over 100,000 (Xinhua, 2016).

Figure 3 .Estimated operational stock of industrial robots in some countries during period 2013 - 2018 - thousand of units



Source: UNCTAD, Policy in Brief, No. 50/October 2016, Robots and industrialization in developing countries

Such coordinated and fast changing movements as possible in China as the economy is to a large extent a market economy but under a tight control of the government and this particular combination allows for concentration of efforts and resources and, at the same time, the avoidance of uncontrolled disequilibria.

Conclusions

The 4th industrial revolution will be pervasive and more challenging than the previous ones because will affect almost all population of the globe, all sectors and human activities, economic, social or otherwise. The speed of adoption of the new technologies is very likely to be exponential and therefore the time for adjusting to change will be limited.

According to almost all estimates and forecasts the impact on the labor market will be significant in a decade horizon and beyond, while it is very likely that about 50% of the existing jobs will become redundant.

At the same time, the large scale use of robots will determine the creation of some jobs either characterized by a high value added or by a high human content. The

downside is that such jobs will be concentrated in a limited number of areas and will require rather specialized skills.

The direction (positive or negative) as well as the intensity of the impact of robotization and the use of artificial intelligence will depend to a large extent on the policies adopted by governments. Such policies should support the digitalization of economy and also the design of new education institutions and techniques that will prepare the young generation for the future types of activities that will be carried out 10 to20 years from now.

The public policies adopted as response to the 4th industrial revolution will have to take into account not only the education and formation of workforce but also what happens to that part of the work force and of the population that may have rather long periods of lack of jobs or of temporary jobs. This responses requires large redistributive mechanisms that are yet to be imagined as well as financial source for them. A possible response may be the taxation of the use of robots. Such a tax will provide the governments with funds for social transfers, for supporting people that lose their jobs due to robots and also for sustaining a decent living standards for the people with low and medium qualifications.

Because of the complexity of this transition to a new type of economy and society any sustainable solution will require a full participation of the private sector and of the population in order to transform into a daily reality the classic concept of long life learning processes.

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ROMANIA-CHINA TRADE AND INVESTMENT RELATIONS AGAINST THE BACKDROP OF "ONE BELT, ONE ROAD" STRATEGY

Sarmiza Pencea*

1. INTRODUCTION

Recent years have put forward two outstanding Chinese initiatives that are prone to trigger major changes at both Eurasian and global level: firstly, the potentially farthest-reaching undertaking, launched in 2013, is China's *One Belt, One Road Strategy* (OBOR) which is, as yet, the only long-term vision thought of by a country for itself, its three-continents extended neighbourhood and for the global economy as a whole, considered a significant "game-changer" of the international relations and a reshaping mechanism of the world economy as we know it; secondly, the *16+1 Platform,* which has institutionalized, since 2012, the cooperation between China and the 16 Central and Eastern European countries (CEE16)[1], hallmarking a new stage in this relationship that focusses primarily on the OBOR goals implementation, especially on enhancing interconnectivity between countries, as a precondition of their accelerated growth and development.

Against this new setting, the CEE16 countries are expected to engage in a win-win partnership with China, so that they meet better their needs for large investments in transport, energy, or communications infrastructure building and also in new manufacturing units, boosting job creation, production, exports and economic growth and catching up sooner with the developed western and northern Europe. On the other hand, China has designed these two initiatives with a view to solving its domestic oversupply problems, its vulnerabilities and reform issues at home, as well as to gaining a stronger foothold in the European markets and getting access to the developed Europe's high technologies, knowledge, know-how, good practices, renowned brands and distribution networks. Obviously, besides the well-acknowledged and documented similarities and complementarities between the CEE16 and China, there seems to exist a considerable mismatch between their priorities, when using the 16+1 platform to implement the OBOR aims. This mismatch of priorities and (inordinate) expectations has led to a sense of disappointment of both parties as regards the accomplishments already obtained under 16+1 and OBOR.

For now, the outcomes of China-CEE16 economic relations are strongly asymmetrical: China obviously benefits more from the bilateral trade growth under the new backdrop, running chronically large and growing trade surpluses with almost all of the CEE16. In the 12 years ending with 2015, the aggregate trade deficit of the CEE16 with China reached nearly USD 260 billion, of which roughly USD 160 billion in the first

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[1] CEE16 = Albania (AL), Bosnia-Herzegovina (BA), Bulgaria (BG), Croatia (HR), Czech Republic (CZ), Estonia (EE), Hungary (HU), Lithuania (LT), Latvia (LV), Macedonia (MK), Montenegro (ME), Poland (PL), Romania (RO), Serbia (RS), Slovakia (SK), Slovenia (SI).

six years of this decade (2010-2015). This was a huge amount for these developing countries, especially at a time when they were trying to catch up with the "developed west" and had to simultaneously undergo the range of severe crises that kept distressing Europe after 2007. The direct train connections between 25 Chinese towns and various European cities – which is the expression of increased interconnectivity, as a building block of the OBOR concept – have only helped flood Europe with Chinese (subsidized?) goods, before leaving back to China almost totally empty (subsidized transport?), displaying a trade pattern which is not at all a win-win one, but on the contrary. Such a pattern, which is not founded on reciprocity, on a level playing field and on fair competition, but it allows, on the one hand, that one party uses subsidies and state intervention to promote its exports while, on the other hand, it restricts access on its own markets and it raises barriers to imports, will never generate a win-win outcome of OBOR cooperation (Pencea &Bâlgăr, 2017).

Similarly, Chinese investments in the CEE16 have also been sensed as disappointing. While the largest, surging Chinese investments of recent years have kept favouring western and northern European countries – where they were seeking access to "state-of-the-art" technologies needed by the innovation-driven economy which China strives to build at home – CEE16 countries have been offered only extremely rigid deals, almost impossible to accept. Chinese investments in these countries had to be covered by sovereign guaranties and had many other conditionalities attached: contracts had to be granted without bidding to Chinese companies exclusively and strictly required that only Chinese equipment, materials and labour were used. In other words, local companies in the CEE16 countries, or in Europe in general, had no chance to compete for Chinese-financed contracts (either design, procurement, or building) and were crowded out from their own former markets; also, these countries could not benefit from job creation, from any multiplying effects in their economies or from a short-term boost of their economic growth. Practically, only their debts would grow, while Chinese money never left China and was cashed exclusively by Chinese companies. Even under such severe terms, only a few, non-EU countries could resort to these investment deals, as the great majority of the 16 countries (the 11 EU members) could not grant sovereign guaranties, or assign contracts without bidding, having to obey the EU pacts and agreements they had signed. As such, CEE16 got more promises than real Chinese outbound direct investments (ODI) and it is relevant to mention that, according to Chinese statistics, by the end of 2015 all of the Chinese ODI stocks in the CEE16 cumulated less than USD 2 billion, which is about 3 times less than France alone, 4 times less than Germany alone and 9 times less than the UK alone have attracted from China.

Against this general landscape, although far from the expectations and the potential, Romania-China economic relationship seems to have progressed relatively better after the establishment of the 16+1 platform and the launching of the OBOR Strategy, both in terms of trade and investments.

2. ROMANIA-CHINA TRADE: ON A SLIGHT REBALANCING TREND

Commercial exchanges between Romania and China registered an upward trend between 2010-2015, both in terms of export and import flows. Obviously, this has determined an upward trend of their total trade, which amounted to nearly USD 4.5 billion by the end of 2015, becoming over 19% larger than in 2010 (Table 1).

Besides this general positive trend, there are some other remarkable developments that occurred during this time span. Firstly, we notice ***a significantly more alert and consistent growth in Romanian exports***, which became +72% larger in 2015 as compared to their level of 2010, while imports were more fluctuant during the same interval.

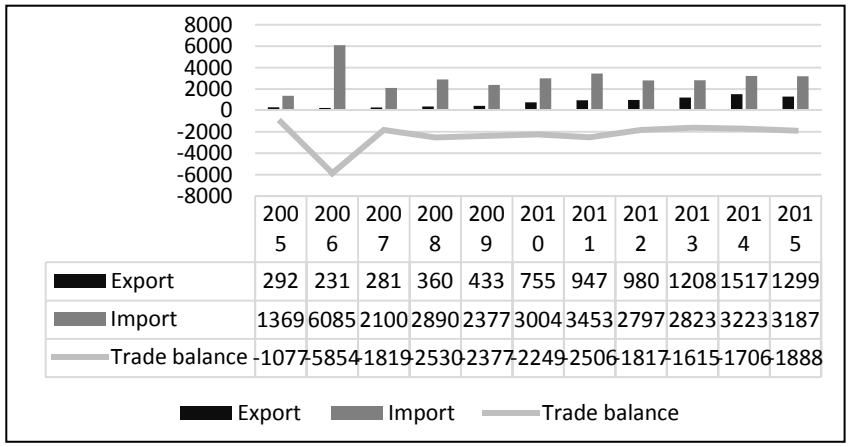
Table 1: Romania-China trade volume, 2010-2015 (USD million and %)

RO-CN trade (USD million)	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2015/ 2010**
EXPORT	755	947	980	1208	1517	1299	+72.1%
IMPORT	3004	3454	2797	2823	3223	3187	+ 6.1%
Total (EXP+IMP)	**3759**	**4401**	**3777**	**4031**	**4730**	**4486**	**+19.3%**
Deficit (EXP-IMP)	-2249	-2507	-1817	-1615	-1706	-1888	-16.1%
EXP:(EXP+IMP)x100	20.1%	21,5%	25,9%	30%	32.1%	29%	

Source: The authors' computations using UN Comtrade Database, https://comtrade.un.org/data.

As expected, this evolution has generated fluctuations of the trade deficit, but overall, a downward trend seems to have set in (Graph 1), so that, ***by the end of 2015, Romania's trade deficit with China was about 16% lower than in 2010*** (Table 1) and the country became one of the few in the CEE16 group that succeeded to mitigate their balance of trade (BoT) imbalance, in this relationship during this time span (along with Hungary, Croatia and Bulgaria, among the EU members, plus Bosnia-Herzegovina and Serbia).

Graph 1: Trade between Romania and China, 2005-2015 (USD million)



Source: The authors' computations using UN Comtrade Database

Nevertheless, ***Romania's trade deficit with China is still too high and steps must be taken to reduce it further***. Our computations based on Comtrade UN Database reveal that, over the entire 2010-2015 interval – that is ***in only 6 years – Romania's aggregate trade deficit with China rose to the impressive amount of almost USD 12 billion.*** If we looked back six more years, the aggregate deficit Romania had been running with China in 12 years raised to nearly USD 26 billion, ranking fourth among the CEE16 countries, in a top established by this criterion (Table 2).

Table 2: Top CEE countries, by aggregate trade deficit with China 2004-2015 (USD billion)

Rank	Country	Cumulated trade deficit with China 2004-2009 (USD, billion)	Rank	Country	Total trade deficit with China, 2010-2015 (USD, billion)
1.	Poland	25.9	1.	Poland	60.3
2.	Hungary	19.3	2.	Czech Republic	29.3
3.	Czech Republic	14.3	3.	Hungary	19.9
4.	**Romania**	14.0	4.	**Romania**	**11.8**
5.	Croatia	5.9	5.	Slovenia	9.0
			6.	Lithuania	7.9
			7.	Croatia	7.1
			8.	Latvia	6.6

Source: The authors' computations using UN Comtrade Database, https://comtrade.un.org/data.

However, as always, data from different statistics don't match. According to the Romanian Ministry of Economy (ME), in 2015, when Romania reported a record total trade deficit of roughly USD 9.3 billion, ***China ranked first among the countries that contributed to this deficit***, followed by Hungary, Germany, Poland, Netherlands etc. (Capital, 2016). As reported by the ME, Romania's trade deficit with China had raised to Euro 2.36 billion (about USD 2.6 billion, much more than the USD 1.88 billion level resulted from the UN statistics), accounting for a direct contribution of nearly 28% to Romania's total trade deficit. To this amount, we might also consider adding ***an indirect Chinese contribution to Romania's trade deficit, which occurs through the re-exporting activity of other European countries, primarily Hungary, which ranks second in terms of contribution to Romania's trade deficit, largely due to its re-exports of Chinese goods to Romania.***

Secondly, another facet of the slight rebalancing trend of the recent years in Romania's bilateral trade relation with China is the ***increasing weight of the Romanian export flows into the total bilateral trade volume, from only around 20% in 2010, to around 30% in 2015.*** This is a significant positive development for such a short time lapse. On the negative side, though, we notice that both exports and imports declined in 2015 as compared to the previous year. We not yet know if this development continued into 2016, but chances are that there was just a temporary fluctuation and not a radical change of trend.

Thirdly, there have also been some notable positive changes worth mentioning as regards the ***Romanian export structure***, too. As illustrated in Table 3, the export structure by the largest SITC rev.3 categories of goods reveals: (i) ***an upward trend in all categories but one*** (*5*, *chemicals and related*); (ii) a more diversified export structure; (iii) ***a positive change of ranking between categories, with category 7*** (*machinery and transport equipment*) ***accounting for over one third of the total exports and regaining, as such, its traditional first position in Romania's exports to China***, while category 2 (*crude materials, inedible, except fuels*) fell to second position, although the exports of the goods included in here (especially, *metal ores and scrap* and *cork and wood*)

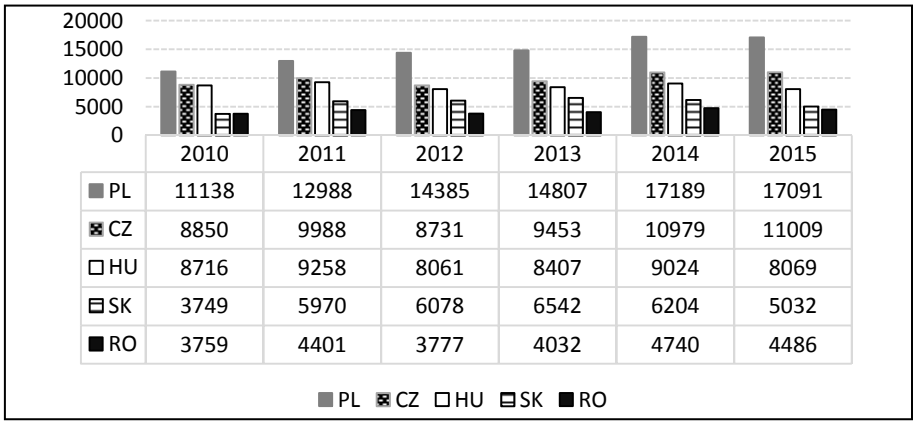
increased in real terms too, but accounted for less of the total, as compared to the 2010 levels (30% in 2015 vs. 39.3% in 2010). (iv) exports of some food items, such as "…pork, dairy and eggs have increased very swiftly, by 95% and 251%, respectively" (Xu, 2016), but it is worth signalling that ***the various sanitary certifications and import approvals required by the Chinese party act as barriers to a larger Romanian food export to China***.[2]

Table 3: Romania-China export structure in 2010 and 2015 (USD million and %)

SITC rev.3	**2010**		**2015**	
	USD million	%	USD million	%
0. Food and live animals	0.4	0.1	3.5	0.6
1. Beverages and tobacco	3.0	0.7	4.3	0.7
2. Crude materials inedible except fuels	161.3	39.2	177.0	30.4
3. Mineral fuels, lubricants &related	0.0	0.0	2.9	0.5
4. Animal and vegetable oils, fats, waxes	-	-	0.2	0.0
5. Chemicals and related	58.3	14.2	46.2	7.9
6. Manufactured goods classified by materials	37.8	9.2	95.9	16.5
7. Machinery and transport equipment	134.0	32.7	198.1	34.0
8. Miscellaneous manuf. articles	15.2	3.7	53.5	9.2
TOTAL	410.1	100	581.9	100

Source: The authors' computations using UN Comtrade Database, https://comtrade.un.org/data.

Graph 2: CEE5 country ranking, by trade volume with China (USD million)



Source: The authors' computations using UN Comtrade Database

Finally, we should note that China has advanced in the hierarchy of Romania's trade partners, ranking now the 11th, while among Romania's partner countries outside the European Union it ranks first (Xu, 2016). As illustrated by Graph 2, after 2010,

[2] In fact, it even seems that, for instance, pork exports from the former Smithfield Food farms in Romania, which are now Chinese property, have indeed grown remarkably fast, while other local exporters meet various red tape requirements for sanitary certification which act as non-tariff barriers restricting their access to the Chinese market.

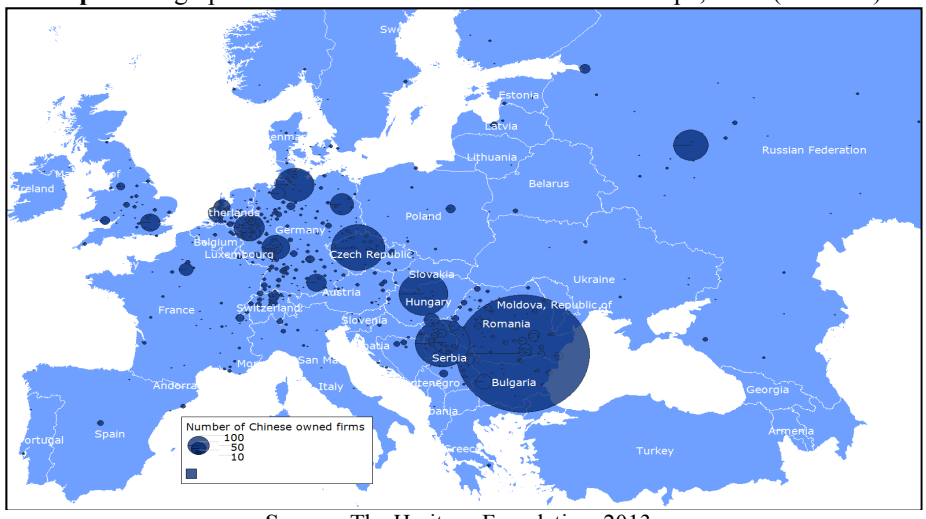
Romania is keeping its 4th position in terms of its overall trade with China among the CEE5, which are China's five main trade partners among the CEE16 countries.

3. CHINESE ODI TO ROMANIA – A SLOW REVIVAL

In the early 2000s, when the „going out" strategy was launched, Romania was a first choice among the targeted Central and Eastern European countries[3]. Not only the official guidelines as to the countries and sectors that had been considered recommendable for outward investments, but also the factual investments of Chinese private undertakers showed, at the time, a bias for Romania: in 2005, Romania cumulated two thirds of the overall Chinese investment stock in Central and Eastern Europe and was considered the „success story" that had substantiated the newly launched Chinese strategy.

This ***first wave*** of Chinese investments in Romania was represented by a large number of small and medium size family companies, having little capital and no support, involved in trade or in low-to-medium complexity manufacturing. Although their economic power and invested amounts were low, their ample presence ***indicated a comparative advantage for Romania which could have been better capitalized on***. This did not happen, because Romania, entirely focussed on meeting the prerequisites for joining the EU, paid no attention to these market signals, not devising, as such, any specific strategy to build on this advantage (Pencea, 2014). This category of investors is still important in Romania, which still hosts the largest number of Chinese companies of the entire continent (around 12 thousands), most of the active ones (around half) operating in Bucharest, predominantly in wholesale and retail trade (Map 1).

Map 1: Geographical distribution of Chinese firms in Europe, 2013 (numbers)



Source: The Heritage Foundation, 2013.

[3] „The official governmental guidance was mainly substantiated into the "*Outbound Foreign Investment Catalogue*" (OFIC) of 2004, a document which indicated the countries and sectors where Chinese companies were advised to invest. In this document, Romania was topping the list of favourite destinations, equal only to Germany, followed closely by Poland, the Czech Republic and Hungary, and then by all the other European destinations." (Pencea S., Oehler-Sincai, I.M., 2014).

According to the Chinese Ambassador to Bucharest, H.E. Xu Feihong, the Chinese companies set up in Romania account for 6% of the overall number of foreign investor companies, but for only 1% of the foreign investment stock, which highlights the shortage of large investment projects. Among the most important production facilities that have been set up by the first wave of investors and that are still successfully functioning, an important bicycle factory in Deva is worth mentioning, as well as other units in tobacco, printing machinery and construction materials industries (Xu, 2016).

The ***second wave*** of Chinese investors is represented by a few larger and substantially stronger high tech companies operating either in the ***information technology*** (ZTE, Huawei), ***renewable energy*** (RE), or, more recently, the ***automotive industry***. The IT companies came to Romania in the early 2000s, but have not committed themselves to very large investments so far, although, in time, they have repeatedly announced sizeable projects. Despite of their announced sizable investment intentions, their factual investments have probably been only in the rage of tens of millions of euros, so far. The Chinese companies in ***renewable energy***, mainly specialized in building and operating solar parks and wind farms, came to Romania more recently, lured by the Romanian Government's green certificate incentive scheme. However, as these companies reacted quite late to the green certificates opportunity, they have almost lost it, because in 2012 the Romanian government abandoned its generous stimulating system. As a result, the companies in the field, the Chinese ones included, had to adjust their investment plans. Anyway, according to our estimations, Chinese finalized investments in Romania's renewable industry are most likely in the range of hundreds of millions of euros. Finally, the „newcomers" to this second investment wave, could be considered some recent companies in the ***automotive industry,*** that decided to invest in auto parts (EUR 45 million factory) and car ornaments (EUR 17.5 million factory) manufacturing. We could also include in this wave some Chinese ***building companies*** which are financing and building residential districts in Craiova and Bucharest.

The advent of the ***third wave*** of Chinese ODI in Romania, consisting of powerful companies committed to very large projects, worth billions of euros, in manufacturing, energy, transport and tourism infrastructure, is still awaited. Many Chinese companies are interested in investing in Romania, but things are moving very slowly. Many projects have been in various stages of negotiation for quite many years, but no one is, so far, ready for implementation. The most advanced is the one concerning the extension of the Cernavodă nuclear power plant with two more units, a project worth about EUR 6-7 billion, which is being negotiated with China General Nuclear Power Corporation (Xinhua Silk Road Network, 2017). Another project worth about EUR 1 billion concerning the extension and modernization of the Rovinari thermal power station is also in a quite advanced stage of negotiations with China Huadian Engineering, (Economica, 2017).

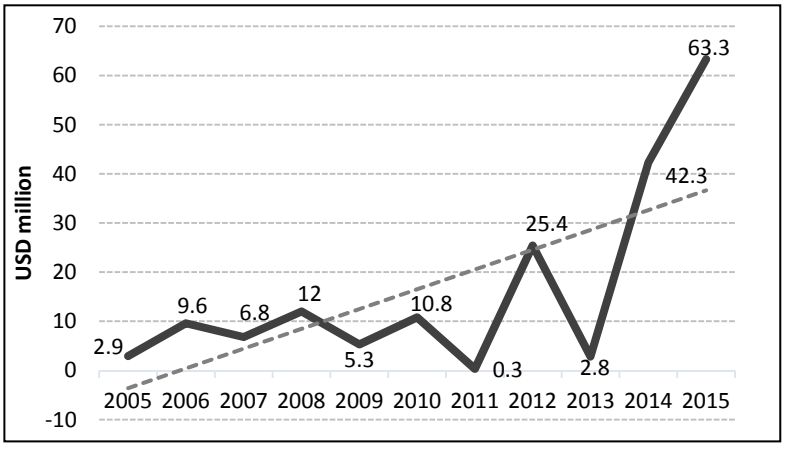
However, as parties are still negotiating the projects of a potential third wave of Chinese investments in our country, ***the Chinese presence in Romania's productive sector is enlarged in an indirect manner and almost without Romanian contribution*** by Chinese companies that are taking over or acquiring large stakes into the capital of multinational companies with production units in Romania. From a Romanian perspective, we could name this relatively recent phenomenon the ***unintentional wave.*** This wave has a different nature, because Romania may benefit only indirectly (job creation, local development,

taxes), and only if, and when, the new owner will decide to make investments in order to expand, upgrade or diversify his business. The unintentional wave includes cases such as:

- The ***Dutch multinational company Nidera***, the largest trader in commodities for agricultural markets with operations in Romania, which was taken over in 2017 by COFCO, China;
- The ***American company Smithfield Foods***, a global leader in pig farms and pork production, with a branch in Romania that manages 46 farms in the counties of Timi□ and Arad, which was taken over in 2013 by Shuanghui International, in the largest ever Chinese acquisition of an American company (over USD 7 billion);
- The famous ***Italian tyre maker***, the world's fifth largest, Pirelli, which was taken over in 2015 by the Chinese state conglomerate ChemChina in a USD 7.7 billion deal, including two factories in Romania;
- The ***Kazakh state company KazMunayGas (KMG) International*** (which had taken over the former Romanian multinational company Rompetrol Grup, in 2009) transferred, in 2016, a majority stake of 51% to CEFC China Energy Company Ltd. which has, therefore, obtaining control over the Petromidia refinery in Năvodari, plus a network of 500 gas stations in Romania and Europe. CEFC China has in view strategic investments in Romania and in the region, in line with the OBOR initiative, including the energy sector, but also in other areas such as finance, infrastructure, equipment manufacturing and agriculture (CEFC China, 2016).

Statistical records show a strongly fluctuating Chinese annual ODI inflow to Romania between 2005-2015, indicating, anyway, an overall upward trend, mainly due to a remarkable jump after 2013 (Graph 3).

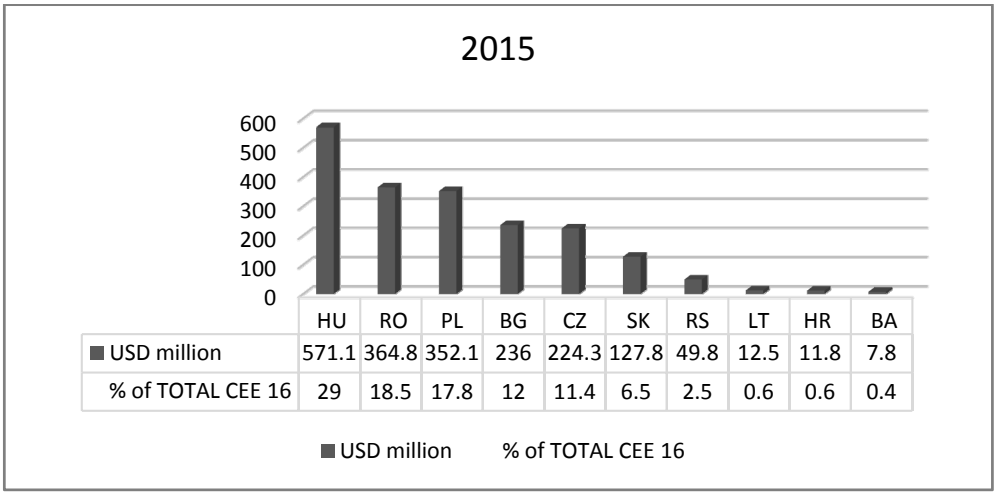
Graph 3: China's ODI flows in Romania, 2005-2015 (USD million)



Source: The authors' computations using *Statistical Bulletin of China's Outward Foreign Direct Investment* (various years), MOFCOM.

Against the backdrop of a significant rise of the Chinese investment stocks in CEE16, Romania's ranking within the CEE16 group fell from the first position held until 2005 and second in 2006, to third position between 2007-2011, to fourth in 2012 and fifth in 2013, before finally changing its descending trend in 2014, when it got back in the 4th position and then jumped to the second one in 2015, following, at distance, Hungary (the leader since 2010) and being followed by Poland, Bulgaria, the Czech Republic and Serbia (the leader among the non-EU states, since 2011) (Graph 4).

Graph 4: Top 10 CEE16, by Chinese ODI stocks, 2015 (USD million)



	HU	RO	PL	BG	CZ	SK	RS	LT	HR	BA
USD million	571.1	364.8	352.1	236	224.3	127.8	49.8	12.5	11.8	7.8
% of TOTAL CEE 16	29	18.5	17.8	12	11.4	6.5	2.5	0.6	0.6	0.4

Source: The authors' computations using *Statistical Bulletin of China's Outward Foreign Direct Investment* (various years), MOFCOM.

4. CONCLUSIONS

At first sight, both the Romania-China bilateral trade and China's ODI to Romania seem to have improved in recent years, following the establishment of the 16+1 platform and the launching of the OBOR strategy. Still, the progress attained is minimal, unstable, unsustainable and far from the potential, and the parties should do more both to capitalize on the existing opportunities, to meet the challenges and to mitigate their potential unwanted consequences.

For now, the outcomes of these two initiatives don't meet the (probably) too high and too misaligned expectations of the parties. Not all the participants have benefitted from the increased connectivity - which is the core building block of the OBOR conceptual design - but on the contrary, in their majority the European countries have seen their imports from, and trade deficits with China surging, while their exports to China's huge market met numerous road blocks. Such developments fuel disappointment, discontent and mistrust and may imperil the entire OBOR project. In our oppinion, both the 16+1 platform and the OBOR strategy may confirm the win-win promise only if all the parties, especially China, give up their maximal goals regarding their own gains and try together to honestly find solutions that consider, to a reasonable extent, all the participants' priority goals and interests.

Also, we believe that bilateral arrangements inside a multilateral platform such as the 16+1, should be avoided, as they are are prone to sap its potential for success by (i) nurturing unhealthy competing attitudes (such as a CEE16 "race to the bottom") and awakening old rivalries among the CEE16, by (ii) risking to divert trade and negatively impact the economic growth in the areas abandoned by transporters and traders, and by (iii) contributing, as such, to the deepening of the local development gaps, instead of helping narrow them. Therefore, although more difficult to obtain, we consider that it is more advisable to strive for projects and cooperation arrangements that involve, in one way or another, all the neighbouring countries in a subregion, considering all their interests and potential risks and trying to find the best solutions for the entire area.

In terms of trade relations, we think China should take clear action to encourage more imports from Romania and from the other CEE countries, to open more its markets, to simplify formalities, technical requirements and red tape that act as trade barriers, to encourage Chinese tourism to these countries, so that it helps them diminish the chronic trade deficits they are running with China. Correcting trade imbalances is beneficial not only for the CEE countries, but it is in China's interest too, if China wants to have partners in this region which are willing and capable to engage in large and expensive cooperation projects and are also able to pay back their implicit debts.

In terms of investments, we think China should offer Romania and the other CEE countries more flexible and varied types of deals, giving up the strictness of the requirements that imply breaking the EU commitments by the CEE countries which are EU Member States. (After all, a potential partner that observes previous commitments should be considered a trustworthy one, and such an attitude should be valued, not submined or underrated!). Also, besides the pattern that it has successfully tried in Africa, but it naturally did not render similar results in the CEE16 area, China should accept more diverse forms of cooperation with these countries, that are better adapted to their specific needs and may generate more advantages for them in terms of job creation and multiplying effects in their economies (greenfield investment, joint-ventures, PPP deals etc.). For OBOR success in this area, besides the Chinese companies, the cooperation projects should involve local CEE/European industries too, and they should have a visible and prompt impact on local labour markets.

OBOR is a grand strategy that theoretically could be beneficial for everyone, provided that all the parties involved, especially the initiator, pay attention to every „detail" of this extremely complex endeavour, making true efforts to always consider mutual interest and reciprocity, and as such, to find ways that satisfy all the parties involved. Intense, well-meaning dialogue, flexibility in negociations, thoughtfulness, willingness and even courage to, sometimes, take the lengthy and more difficult path, instead of the easy, quick one, may be the keys to getting as near as possible (or even reaching?) the win-win goal. And the 16+1 platform may play an important role in this respect.

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SELECTIVE INDICATORS FOR MEASURING AND EVALUATING PERFORMANCE IN THE PUBLIC SECTOR

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Abstract

It has long been considered that in the public sector we cannot talk about performance, arguing that through the very content of the fundamental objective of the public management the possibility of accepting this concept is eliminated, but the limits of such thinking have long been overcome in the public management from developed countries, after a good number of years the subject was in the debate of the theoreticians and practitioners.

In the present paper, I wanted to show that the process of measuring the performance in the public sector involves selecting, defining and applying a set of indicators that quantifies the efficiency and effectiveness of the organization, program, activity, process or service analyzed based on inputs, outputs, results and impact.

The paper aims, in this respect, to analyze these performance indicators, having as reference point the good practices in the field of performance measurement at the level of the Supreme Audit Institutions. I focused on this selective performance measurement group as the issue of performance and performance indicators measurement has been the focus of attention at the level of the European Court of Auditors and other Supreme Audit Institutions, both for audit activities and for non-audit activities, this was in order to measure the progress in achieving the objectives of the annual activity program as well as the strategic objectives of the institution.

Keywords: performance, public management, public sector, performance measurement.

JEL Classification: D61, H00, M42.

1. Introduction

The science of the public management has evolved, and since the last decade of the last century, specialists have demonstrated that the very essence of the public management, its fundamental objective, is the one that must determine the reorientation of the value system in order to appreciate the performances. The primary challenge for public managers should be how to better manage public resources in order to meet the overall social needs and to achieve the best possible performance level, while ensuring an effective functioning of the system from which the public institution is part of.

The experience gained by the public management representatives from the developed countries when practicing the public management based on performance has once again demonstrated that the change in the approach of the public institution and in the role of the public managers in this context is not only an opportune one, but, given resource

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constraints, growth and diversification of the expectations level of the "stakeholders" of public institutions (taxpayer, general public, government, parliament, international financial institutions and other interested parties), becomes absolutely necessary. The performance-based public management represents *the fundamental mutation in the international public management,* which should be implemented in any public management system that simultaneously pursues the satisfaction of the public interests, by considering the economic criteria, in general, and the managerial criteria, in particular.

2. Performance and performance management in public entities

Performance can be defined as "a state of competitiveness of the economic entity or of the organization, achieved by a level of efficiency and productivity that ensures it a sustainable presence throughout the market" and shows the ability to progress thanks to its constant efforts. The notion of performance has an abstract character and its definition is done by making reference to other concepts: performance represents the achievement of strategic objectives; performance is an unstable balance between efficiency and effectiveness; performance implies, as an economic concept, the creation of wealth, of value in the organization (Ilie, E., Romanian Court of Auditors Magazine, No. 5/2014).

Starting with 1970, the interest concerning measuring the public sector performance has increased, along with growing concerns about the public sector spending and the advancement of the new public management (NPM). Evaluating the performance is often represented in rational terms as being something set up in order to ensure the adequate assessment of the publicly funded services in relation to a set of desired objectives. On the other hand, the rise of performance evaluation in the public sector is often associated with economic downturn, increased international competition, and a new set of targets concerning budgetary cuts and with increased efficiency and effectiveness of the public bureaucracy (Lewis, M, 2015).

In terms of performance, *three major orientations* are distinguished in the literature: the definition of performance *according to the level of achievement of the strategic objectives*, the definition of performance *according to creating the value* and the definition of performance *according to the productivity and effectiveness of the organization*. However, the most comprehensive definition of the performance concept is provided by IAS 1: "Presentation of Financial Statements," namely, that of ***global performance***, to measure the performance of an organization it is necessary to make use of not only the financial results, but also of "a global vision of the interdependencies between internal and external parameters, quantitative and qualitative, technical and human, physical and financial of the management ", which constitute the mirror of the future," where the results are found", and of the past," where are the problems are found".

Evaluating the performances is the core activity of the management, conducted in order to determine the extent to which an organization's employees effectively fulfill their tasks or responsibilities and is a systematic and highly complex process that performs analyzes and assessments of both work behavior and the performances obtained by the members of an organization, and also of their potential or their capacity for development.

The performance measurement systems have evolved over the last few years, with two major trends: the integration of non-financial measures and the strengthening of the

links between strategy and the operations carried out at the level of the economic entity / organization. The performance measurement process represents a sequential action adopted inside or outside the organization in order to set the performance standards, to evaluate the performance, and to adopt certain corrections where they are required. The process involves *selecting, defining and applying a set of indicators* that quantifies the efficiency and effectiveness of the organization, program, activity, process or service analyzed, based on inputs, outputs, results and impacts. The performance indicators within an organization must capture, at the same time, at least the following *aspects*: the entity's objectives, its strategy, the effectiveness and efficiency of its activities, and also the ability of the entity to adapt to the requirements of the market in which it operates. *The key performance indicators* are the analytical indicators selected as being the most illustrative when monitoring key activities and processes for organizations, providing an overview over performance and over critical areas. In the public sector, performance evaluation is not only limited to easy-to-measure aspects, but should also consider contextual information and circumstances difficult or even impossible to measure. Improving the public sector performances is an objective that plays an important role in the political agenda of all industrialized countries, as they are generally closely linked to the global economic performance of different countries. Most countries believe that they can improve their public sector's performances by using/adapting the good practices of other countries.

In Romania, the Government Program for the period 2009-2012, published in the Official Gazette no. 907/23 XII 2009, as well as the current Governmental Program, have established as governance objectives "the profound restructuring of the central and local public administration, aiming to achieve an efficient organizational model of the administrative structures, in parallel with the drastic reduction of public expenditures, reduction of bureaucracy and efficiency of public services", having the following main directions of action: i) introducing a system of indicators for evaluating and monitoring the provision of public services and the functioning of all central and local public administration institutions, including human resources management and budgetary implementation; introducing quality standards for public services; ii) reducing bureaucracy, reducing the costs of functioning of the public administration system, and iii) extending the citizens' access to public information of national and local interest, to electronic services, by implementing the electronic government systems (computerization of central and local public administration). At the basis of these performance categories, the conditions of simultaneously respecting the ***three "E's"*** must be placed, respectively: *economy, efficiency, effectiveness* - as defining rules of the new trend of performance-based management. Within the National Strategy for Sustainable Development of Romania Horizon 2020, it has been established as national objective the finalization of the reform process in the public administration and the substantial reduction of the gaps compared to the average level of performance of the central and local administration and of the public services from the other EU Member States; increasing the trust and satisfaction degree of the citizens in their relations with the central and local public administration authorities.

Performance monitoring at the level of the public entities in our country is one of the 25 internal / managerial control standards provided by OMFP no. 964 of July 4, 2005 (republished), for the approval of the internal / managerial control Code, including the internal / managerial control standards for public entities and for the development of the

internal / managerial control systems, with the subsequent modifications and additions, respectively *Standard 10 - Performance Monitoring*. This standard is part of the section (key component) "Performance and risk management", a key element that underpins the management issue related to goals setting, planning, programming, and performance. Also, Law no. 53 of 24 January 2003 concerning the Labor Code, republished on the basis of art. V of Law no. 40/2011, with the subsequent modifications and additions, contains provisions for measuring the performance of the employees of an organization.

3. Measuring and evaluating performance in the public sector

"Both the legislative and the executive need information on measuring and evaluating the economy, efficiency and effectiveness of the programs or activities developed, in order to adopt decisions and to take actions for improving performance. Through performance measurement we understand the process of monitoring, measuring and reporting the achievement degree of the programs or activities at all stages of their implementation."(The guidelines of the performance audit – ISSAI 3000 key principles, point 1.7).

The issue concerning measuring performance with the help of performance indicators has also closely pursued the achievement of other milestones, particularly those related to "Mission, Vision, Values and Strategic Objectives," and "Improving report quality." The European Court of Auditors and some of the European Supreme Audit Institutions have started from the idea that the key performance indicators aim at increasing the institution's internal and external responsibilities as well as increasing the efficiency and quality of the management.

Measuring the performance of a program, project, process or activity is done using the *performance indicators*, which act as measuring tools. It has a permanent character, it is a responsibility of the management of the audited entities and is carried out throughout their course, being meant to serve as a prompt warning system for the management in order to eliminate the deviations from the scheduled objectives and as a means to improve the responsibility towards the audience to whom the activities developed are addressed. Under these circumstances, the performance audit task is to evaluate the performance measurement systems of the government programs and projects, namely to assess the quality of information concerning the performance obtained (performance indicators) and also to assess how these systems are implemented and operated , in relation to the requirement for ensuring the fulfillment of the principles of efficiency and effectiveness.

At present, at international level, ISA employs a wide variety of performance measurement mechanisms, including narrative reports concerning their developments and activities, evaluations in relation to the ISSAI framework, as well as national and international performance assessment frameworks (over 20 such instruments developed by INTOSAI and other institutions). Some of these focus exclusively on ISA, while others review ISA's performances in the context of accounting and auditing or the public finance management. The performance evaluation instruments are used for different purposes, by different interested parties, in different regions, as well as in different ways (self-assessment, peer-review evaluation, external evaluation), which may blur the distinction between the different types of assessments (Mapping of Tools for Assessing Performance of Supreme Audit Institutions, 2012). According to best practices in the

performance measurement domain at the ISA level, **the performance indicators** most used worldwide are the following (Table no. 1):

Tab1e no. 1: Performance indicators at the level of the Supreme Audit Institutions (ISA) used worldwide

The performance indicators most used by the European Court of Auditors (ECA) and by some of the European Supreme Audit Institutions			
Indicators for measuring input's/entries	***Indicators for measuring output/performance***	***Indicators for measuring the impact/effect***	***Other performance indicators at the level of supreme audit institutions***
1. With regard to the timeframe	*1. In terms of quantity*	Implementation by the audited entities of the recommendations made during the audit activities	The share of the chapters verified, in the total number of the most important chapters of the annual state budget
The timeframe used to perform the audit mission	The number of audit actions performed at the level of an institution over a given period of time	The evaluation performed by the audited entity concerning the value of the work performed by the supreme audit institution	The share of the expenditures volume of the state budget verified, in the total volume of the state budget expenditures
The proportion of achieving the audit missions within a planned timeframe	The number and timeframe allocated for the professional training actions and for the seminars organized by the supreme audit institution	The number of cases in which the audit reports of the supreme audit institution are discussed in the Parliament	The share of the state budget chapters that were audited in terms of subsidies in the reported period, in the total number of the state budget chapters with subsidies granted during the respective period
2. In terms of costs	*2. In terms of quality*	Evaluating the Parliament in terms of the value of the work done by the supreme audit institution	The share of the number of government agencies, organizations that benefit from public funds from the state budget, state-owned enterprises and state funds audited in a given period, in the total government agencies, organizations that benefit from public funds from the state budget, state-owned enterprises and state funds available in the respective period.

The average cost of an audit action	The external evaluation of the quality of the audit actions performed at the level of the institution	The number of appearances in the media of the supreme audit institution as a result of the activity carried out	The share of the number of government agencies, organizations that benefit from public funds from the state budget, state enterprises and state funds audited for the first time, in the total government agencies, organizations that benefit from public funds from the state budget to state-owned enterprises and the available state funds in that year
	The internal evaluation of the quality of the audit actions performed at the institution level	The financial impact of the audit activities of the supreme audit institution	The share of the number of new government agencies, organizations that benefit from public funds from the state budget, state-owned enterprises and state funds set up and audited during the respective period, in all these types of newly established entities, etc.
3. Regarding human resources			
Fluctuation of specialist staff			
Allocation of human resources, respectively the number of staff assigned to an audit mission			
Expenditure allocated to staff training			
The number of staff who are members of some professional organization			
Level of staff satisfaction			

SIGMA global indicators of an effective external public sector audit process			
Objective indicators	Subjective indicators		
Number of reports / recommendations made to the audited entities audited and accepted by them	The trust of the parliamentarians in the activity of the supreme audit institution		
Number of reports / recommendations made to the Parliament and accepted by it	The general public perception of the value of the supreme audit institution in the process of assuming the responsibility		
Number and amount of fines / penalties perceived	The evaluation by the beneficiary ministries, especially the Ministry of Finance, of the added value of the external audit		
The amount of savings made as a result of the accepted recommendations			
Correlation: number of audit reports made / staff member			
Number of cases brought to justice			
Performance indicators at the level of a supreme audit institution set up under the PEFA program (*Public Expenditure and Financial Accountability - Public expenditure and financial responsibility*)			
PI – 26 Scope, nature and follow-up of the recommendations of the external audit	PI – 27 Validation of the law of the annual budget by the Parliament	PI – 28 Validation of the external audit reports by the Parliament	Minimum requirements for evaluating and awarding grades from A (the highest level) to D (the lowest level)
			If all (or some) entities belonging to the central government (75% or 50%) are audited annually by the supreme audit institution, covering revenue, expenditure and assets / liabilities

			If the supreme audit institution carries out a full range of financial audits, including performance audits, and generally whether the audit standards are implemented, the focus being made on significant and systemic issues

Source: *Processing after Eliza Ilie, Evaluation of performance within a Supreme Audit Institution*, Romania's Court of Accounts Magazine, no. 5/2014, pp. 25-35.

Going forward, *evaluating the performance* of the entity's programs, projects, processes or activities involves conducting systemic studies within the performance audits in order to assess how they are implemented and run. This is done by examining a wide range of information (on performance and operating context), which makes this process different from measuring performance, both as purpose and as the indicators to which it relates. Evaluation of programs is not involved in the evaluation of the effectiveness of policy or political alternatives (the sphere of politics). The practice of the Supreme Audit Institutions, with experience in evaluating the performance of the programs, leads to identifying the following types of assessments (Performance Audit Manual, 2013):

• ***Evaluating the process*** through which it is appreciated the extent to which a program, project, process or activity functions according to the initial intentions set by the statutory requirements and by the regulations that apply to it, by the structure of the program and by the professional standards. Taking into account that, in general, programs aim to satisfy a public interest, evaluating the program provides a measure of how it responds to the expectations of the population.

• ***Evaluating the result*** that assesses the extent to which a program, project, process or activity reaches the projected objectives. In this case, the analysis focuses on outcomes, final results, including on side effects or unintended effects, thus assessing the effectiveness of the program or project, as well as the quality of outputs seen from the perspective of the end-users.

• ***Evaluating the impact*** consists in assessing the net effect of achieving the program, project, process or activity. The external public auditors will analyze and evaluate the program's contribution to the final results, isolated from external factors that interfere with their achievement.

• ***Evaluations of the cost-benefit or cost-effectiveness ratio*** consisted of a comparison between the outputs or final results of the program and the costs of the resources used to achieve them. The analysis is also used to identify cheaper alternatives for achieving the same goal. Relatively recently (2012), INTOSAI conducted a detailed assessment of 8 instruments and assessment frameworks of the ISA existent at worldwide level, as well as 12 frameworks that cover partially or totally public finance management systems (PFM), according to a methodology for mapping based on a set of 12

comprehensive criteria. None of the evaluated frameworks and instruments fully complied with the mapping criteria, but some of them scored well: the PEFA PMF evaluation framework, IMF Fiscal Transparency ROSC, Open Budget Survey, Gap Analysis on Public Sector Accounting and Auditing, Accounting and Auditing ROSC, EC/SIGMA Assessment Report on External Audit, IDI Capacity Development Needs Assessment Guide, AFROSAI-E Quality Assurance Review (*Mapping of Tools for Assessing Performance of Supreme Audit Institutions, Volume 1: Report*, INTOSAI-Donor Secretariat/the INTOSAI Development Initiative (IDI), 20 May 2012) (Figure no. 1).

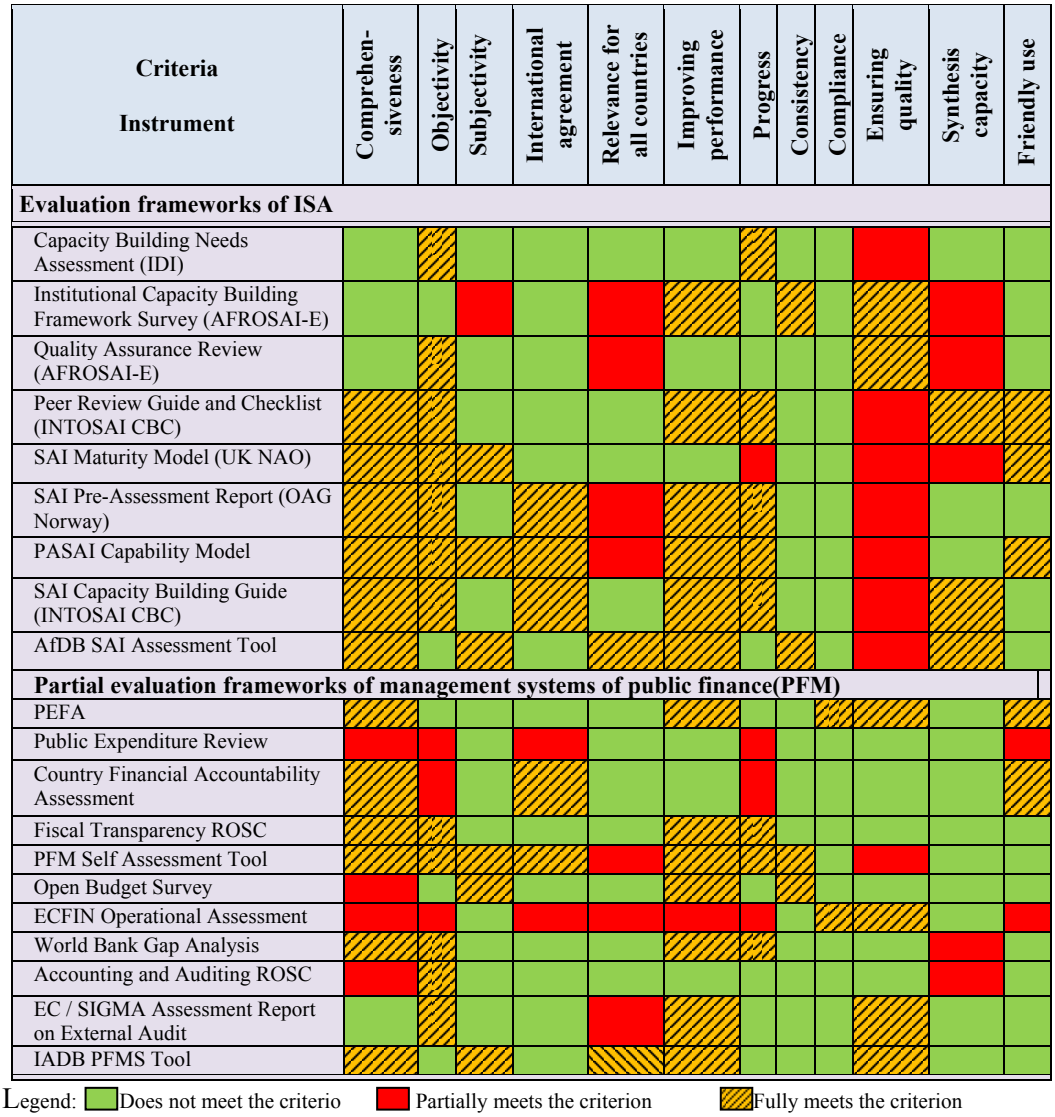

Figure no. 1 Summary of the analysis of the ISA evaluation frameworks at international level

Source: *Mapping of Tools for Assessing Performance of Supreme Audit Institutions, Volume 1*

In view of developing a future ISA global evaluation framework, this assessment has allowed INTOSAI to identify which would be the most relevant tools for evaluating ISA / PMF, its main strengths and weaknesses as well as other possible complementary tools that could be included in the overall assessment framework mentioned.

In conclusion, we can say that evaluating the performance within a supreme audit institution is imposed both by the provisions of the normative acts in force in that country, by the good practice existing at the level of the professional organizations INTOSAI and EUROSAI, and by the fact that this process contributes to (Ilie, E., 2014):

- *instituting an organizational culture of the high performance*, both at the level of the specialized personnel and at the lower management level (team leaders, heads of services) and the middle one (the deputy directors and deputies within the specialized structures);
- *improving the decision-making process at the top management level of the institution,* taking into consideration the fact that it is impossible to identify the best decisions without having a good understanding of the institution's performance and also of the decisional support at all lower levels within the specialized structures ;
- *improving the audit activity* (financial audit, performance audit and compliance audit), both *quantitatively*, *by achieving better and better results, and also qualitatively*;
- *quantifying in monetary terms the impact that the audit activities of the supreme audit institution over the activity of the entities found in competence, increasing the efficiency and quality of the work of the specialized personnel* by providing the necessary information for the decision-making process at all levels of management (respectively the management of the institution, the management of the specialized structures at central and territorial level) as well as at the level of the specialized personnel;
- *improving communication, both internal and especially the external one*, by obtaining feedback from interested parties, namely the Parliament, the governmental administration, the deliberative public authorities of the administrative-territorial units, the general public and, in particular, the entities , as well as from the specialized staff within the institution;
- *increasing the transparency of the specific activity* of the supreme audit institution and *promoting a modern image of the organization,* through a better understanding of the present and future activity of this institution;
- *measuring and increasing the impact that the activity developed by the supreme audit institution* has within the Parliament, the parliamentary representatives, within the government administration, the deliberative public authorities of the administrative-territorial units, the verified entities, the general public and other users of the institution's reports;
- *developing responsibility*, by efficiently redirecting the resources and generating a greater control over all the operations of the specific audit activity;
- *the responsibility* of the management and of the specialized personnel when identifying what works well within the supreme audit institution and what does not;
- *evaluating the results obtained by the specialized personnel*, *as well as identifying the needs for professional development*, by benchmarking the development potential and their professional training needs;

- *facilitating a new individual and behavioral behavior of the specialized personnel, identifying and recognizing in public, respectively within the institution, the best performers, individuals or specialized structures*;

- *enhancing the legitimacy of the supreme audit institution* by showing the general public that they care about maintaining a high level of performance, that performance at the level of this institution is constantly measured and evaluated, and also that it is on time and that it applies modern management techniques.

4. Conclusions

In the public sector, performance evaluation is not only limited to easy-to-measure aspects, but should also consider contextual information and circumstances difficult or even impossible to measure. Improving the public sector performances is an objective that plays an important role in the political agenda of all industrialized countries, as they are generally closely linked to the global economic performance of different countries. Most countries believe that they can improve their public sector's performances by using/adapting the good practices of other countries.

In terms of performance, *three major orientations* are distinguished in the literature: the definition of performance *according to the level of achievement of the strategic objectives*, the definition of performance *according to creating the value* and the definition of performance *according to the productivity and effectiveness of the organization*. However, in my opinion, the most comprehensive definition of the performance concept is provided by IAS 1: "Presentation of Financial Statements," namely, that of ***global performance***, to measure the performance of an organization it is necessary to make use of not only the financial results, but also of "a global vision of the interdependencies between internal and external parameters, quantitative and qualitative, technical and human, physical and financial of the management ", which constitute the mirror of the future," where the results are found", and of the past," where are the problems are found".

Measuring the performance of a program, project, process or activity is done using the *performance indicators*, which act as measuring tools.

At present, at international level, ISA employs a wide variety of performance measurement mechanisms, including narrative reports concerning their developments and activities, evaluations in relation to the ISSAI framework, as well as national and international performance assessment frameworks (over 20 such instruments developed by INTOSAI and other institutions). Some of these focus exclusively on ISA, while others review ISA's performances in the context of accounting and auditing or the public finance management.

In the paper, a series of selective performance indicators, that are applicable in the public sector were analyzed, respectively performance indicators used by European Court of Auditors and by some of the European Supreme Audit Institutions. These were grouped and analyzed into 4 categories: indicators for measuring input's/entries; indicators for measuring output/performance; indicators for measuring the impact/effect and other performance indicators at the level of supreme audit institutions.

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RADICAL PRIVATIZATION: OCEANS, ROADS, HEAVENLY BODIES

Walter E. Block*

Abstract:

In this essay we make the case for privatization, in general, and, then, apply it to some difficult cases: oceans, roads, heavenly bodies

Key words: Privatization, Oceans, Roads, Space

JEL category: L32, L33

I. Introduction

The economic case for privatization is relatively straightforward. Private owners of capital risk their own money when they engage in commercial activity. If they satisfy customers, they enhance their holdings; if they fail to do so, they lose profits and are eventually driven from business, if they fail to see the error of their ways and correct it.

In contrast, when the state provides goods and services, no such market weeding out process occurs. The government can create an Edsel; if no one buys it, or only is willing to do so at a price lower than the costs, there will be a budget deficit. But this will not at all necessarily force those responsible for perpetrating this economic error to reverse themselves. On the contrary, the losses can be offset with increased tax revenues.

This is why it is far more efficient to allow private enterprise to provide for our needs. Not because the government bureaucrat can never be more efficient; sometimes, conceivably, he can. It is, rather, because of this automatic self-correcting feedback mechanism.

If, for some reason, the state has taken control of an industry, sound public policy requires that it be privatized: turned back to individual entrepreneurs and firms. This can be done through auction, through homesteading, through outright gifts of government property to individuals.

When applied to ordinary goods and services, such as housing projects or post offices, air carriers or shipping lines, steel mills or hotels (to mention only a few of the thousands of items sometimes produced in the public sector), such a process may be characterized as ordinary privatization.

But when this analysis is applied to items such as roads, highways, streets, sidewalks, and other thoroughfares for auto and pedestrian; or to rivers, ponds, lakes, aquifers, streams, oceans and other bodies of water; or to the earth's skies, the heavenly bodies and the oxygen that will be needed to keep us alive in these inhospitable environments; we have reached what might be called radical privatization.

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The purpose of the present undertaking is to study radical privatization.

We will explore the positive economic question as to why these resources are widely believed to be beyond the scope of private enterprise. As well, we will consider the moral case in behalf of privatization, the view that the individual is the ultimate sovereign, and therefore ought to be entrusted with the provision of all economic goods and services, including, particularly, those of a "radical" variety. We will analyze the case offered by the socialists in behalf of their view that the only rational way to economically develop them is through centralized, sovietized, state control. We will reject these hypotheses, and maintain that the case for privatization applies in the radical as well as the ordinary domain.

In section II we address roads, streets and highways. The subject of section III is space and in IV, bodies of water. Section V is given over to the process of privatization and we conclude in section VI.

II. Transportation corridors

Most people, even some previously avowed socialists, will nowadays concede the case for ordinary or moderate privatization.[1] The economic success of Margaret Thatcher's program, coupled with the utter failure of such places as the USSR, North Korea and Cuba, has rendered far less inexorable than previously thought the march toward the centrally planned economy. But most commentators still recoil in horror from the prospect of radical privatization (of such things as oceans, roads and heavenly bodies).

When confronted with such an idea, they respond with a welter of objections. These include monopoly,[2] externalities,[3] public goods (rivalrousness and excludability),[4] and the claim that it would be too expensive to establish private property rights. If homesteading is adopted, there is the issue of intensivity or extensivity of settlement; that is, how much land will planting one tree attain for its owner: one acre? one square mile? As well, there

[1] On privatization of ordinary goods and services see Adie, 1999, 1990a, 1990b; Ahlbrandt, 1973; Alston, 2007; Anderson and Hill, 1996; Bennett, 1980; Bennett and DiLorenzo, 1982, 1989, 197; Bennett, and Johnson, 1980; Blair, Ginsberg, and Vogel, 1975; Boardman and Vining, 1989; Borcherding, 1977; Borcherding, Burnaby, Pommerehne, and Schneider, 1982; Butler, 1985, 1986; Chapman, 2008; Clarkson, 1972; Crain and Zardkoohi, 1978; Davies, 1971, 1977; De Alessi, 1982; D'Souza, Bortolotti, Fantini, and Megginson, 2000; Dewenter, and Malatesta, 2000; Fitzgerald, 1989; Frech, 1976; Hanke, 1987a, 1987b, 1987c; Lindsay, 1976; Megginson and Netter, 2000, 2001; Monsen and Walters, 1983; Moore, S., 1987; Moore, T., 1990; Moore, and Butler, 1987; Poole, 1976; Priest, 1975; Savas, 1987, 1979, 1982, 2000; Vining, and Boardman. 1992; White, 1978

[2] For the claim that monopoly does not constitute a "market failure" see Anderson, et. al., 2001; Armentano, 1972, 1982, 1989, 1999; Barnett, et. al., 2005, 2007; Block, 1977, 1982, 1994; Block and Barnett, 2009; Boudreaux and DiLorenzo, 1992; Costea, 2003; DiLorenzo, 1996; DiLorenzo and High, 1988; Henderson, 2013; High,1984-1985; Hull, 2005; McChesney, 1991; McGee, 1958; Rothbard, 2004; Shugart, 1987; Smith, 1983; Tucker, 1998A, 1998B

[3] For the claim that externalities do not constitute a "market failure" see Barnett and Block, 2007, 2009; Block, 1983, 1990, 1992, 1993, 2003; Cordato, 1992; Hoppe, 2003; Lewin, 1982; Rothbard, 1982; Santoriello and Block, 1996; Terrell, 1999.

[4] For the claim that public goods do not constitute a "market failure" see Barnett and Block, 2007, 2009; Block, 1983, 2000, 2003; Cowen, 1988; De Jasay, 1989; Holcombe, 1997; Hoppe, 1989; Hummel, 1990; Osterfeld, 1989; Pasour, 1981; Rothbard, 1997; Schmidtz, 1991; Sechrest, 2003, 2004A, 2004B, 2007; Tinsley, 1999.

is the critique of over optimal or premature settlement. That is, will entrepreneurs under such a legal system develop property before it is economically advantageous to do so? Nor do the advocates of the status quo see any great or compelling reason to establish property rights in such a context.

In all this, I shall argue, the opponents of privatization are in error.

First of all, there are indeed good and sufficient reasons to press for privatization. Take roads, to begin with.[5] For the last 40 years or so, traffic fatalities on the nation's highways have been in the range of 40,000, annually. To put this is some perspective, this is almost the number of U.S. soldiers who died in Viet Nam, in all the years the U.S. fought there (about 50,000). Defenders of the present system of road socialism often claim that highway deaths have nothing to do with statist ownership and management. They maintain, to the contrary, that the causes include such things as drinking while driving, excessive speed, vehicle malfunction, poor weather conditions, driver inattention, etc.

But this is to confuse proximate with ultimate cause. Yes, those are indeed the proximate causes of the highway slaughter of innocent people. But the ultimate cause is the road managers (the government bureaucrats, politicians, police) whose task it would be in a rational world to safeguard motorists. It is they who have been unable to stop the drinking drivers, the speeders, to ensure better vehicles, to force people to proceed with more caution during inclement weather.

Who do we hold accountable for restaurant failure? The chef who cannot cook? The waitress who allows the food to get cold? The sweeper who fails to clean the facility? Not a bit of it. These are merely proximate causes. On the contrary, it is the restaurant owner manager who failed to hire better cooks, waitresses, cleaners, etc., who is the ultimate cause of the business failure. In like manner, we must see the government road manager as responsible for highway carnage. And this applies as well to other transportation problems such as traffic congestion.

How might road privatization save lives? At present, on the nation's highways, there is one rule for speed limits that fits all: 40 miles per hour minimum, and a70 mph maximum. Very few motorists travel at the lower level, but, if you do 70, you will be likely passed by most, who typically proceed at 75 miles per hour without being "served and protected" by the state troopers. Maybe, then, the real cause of accidents is not excessive speed, but the variance thereof? Can we say this with any degree of certainty? We cannot, since the highways in all fifty states have the same exact rules. Perhaps lives would be saved if the standard deviation of speed were radically reduced. Maybe, everyone in the left lane should do 80 miles per hour, no deviations, all in the middle lane, 70, and motorists in the right one 60. Would this reduce the death toll? Again, we cannot say, since the highways in all fifty states have the same exact rules and no such experiment can be introduced. Or, also, plausibly, 75, 70 and 65 would be better. Again, we cannot say, since the highways in all fifty states have the same exact rules and no such experiment can be introduced.

There are signs posted to the effect that slower vehicles should "stay to the right." But, this rule is rarely if ever enforced.[6] Sometimes, a "slowpoke" pokes along in the

[5] Block, 2009

[6] "Quasi rule" might be more accurate

left lane at a legal 55 mph. This necessitates numerous lane changes, as everyone else tries to get out in from of this inconsiderate driver. Would heavily penalizing such behavior save lives? Again, we cannot say, since the highways in all fifty states have the same exact rules and no such experiment can be introduced.

The point is, if separate road owners were able to institute slightly different rules of the road, such experiments might point us in the proper direction. This is roughly why we have pretty good pizza, shoes, pencils, computers, air conditioners, etc. But, again, we cannot say for sure in the case of highways, since the highways in all fifty states have the same exact rules and no such experiment can be introduced.

III. Space

There is of course no pressing need to privatize the moon, Mars and other heavenly bodies. We are a long way from settlement there. But it is not too early to begin making the case that private enterprise would be a more suitable vehicle for this effort. Paradoxically, government endeavors in this direction may well have retarded, not enhanced, the march toward the stars. By wasting massive amounts of money on the moon shot several decades ago, the state utilized funds which might have better been devoted to more basic research.

Why would the market be a better means of space exploration and settlement than government? Let us count the reasons.[7] For one thing, there is the tried and true weeding out process. When private companies do not succeed, they lose profits and go bankrupt.[8] In very sharp contrast, but government enterprise fails, for example, the U.S. Post Office, they can keep going, courtesy of taxation, for the long run. This is particularly important in moving to another planet or the Moon, where costs are likely to be as astronomical as the terrain to be covered. For another, there is that little matter of preserving the human race from the depredations of the state. In the last century, governments, apart from the wars they are continually fomenting, have killed some 200 million of their own citizens.[9] One of the most important reasons for spreading out our species to Mars, the Moon, and beyond, is to increase the probability that at least some of our fellow creatures will survive the next paroxysm of the statists. The last thing we need is for more of this virus to be spread around the solar system. So, yes, let us entrust the survival of the species to that institution that leads to life, not death.

IV. Water

Consider now bodies of water. Again, there are numerous problems, only now it is not so much with government ownership as with non ownership, which brings about

[7] For more on this see Nelson and Block, forthcoming

[8] Assuming, that is, they are not "too big to fail" which is a problem of government, not market, failure.

[9] Block, 2006; Branfman, 2013; Conquest, 1986, 1990; Courtois, et. al. 1999; DiLorenzo, 2006; Rummel, 1992, 1994, 1997. Nor does this take into account the tens of thousands of hapless people killed by public roads (Block, 2009) and institutions such as the Food and Drug Administration (Becker, 2002; Goodman, 2011; Gottlieb, 2010; Henninger, 1990; Higgs, 1994; Hoppe, 1993; Kaitlin, et. al., 1987; Kazman, 1990; Klein and Tabarrok, Undated; Newman, 2016; Peltzman, 1973, 1974; 1987A, 1987B, 2005; Sardi, 2007; Steinreich, 2005), or the Drug War (Block, 1993, 1996; Block, Wingfield and Whitehead, 2003; Cussen and Block, 2000; Friedman, 1992; Hanke and Walters, 2016; Szasz, 1985, 1992; Thornton, 1991).

the "tragedy of the commons." Fish stocks are endangered, and whales are close to extinction, not because of a generic "capitalism," nor "greed." These problems stem rather from the fact that as unowned resources, people have no incentive to economize upon them. Virtually the same threat almost overtook land animals such as the buffalo, the alligator, the rhino and the elephant, which (are) were also in the precarious position of non-ownership.

Roughly three quarters of the earth's surface is covered by water. Yet the GDP derived therefrom is disproportionately small compared to that created on the land. It is no exaggeration to say that we are now, with regard to the oceans where we were hundreds of thousands of years ago with regard to the land: merely in the hunting and gathering stages. With minuscule exceptions, we have not yet attained the relatively exalted status of farming or mining in the seas. Water rich countries such as Canada ban the bulk export of this resource. We made no real progress on the earth until the advent of land privatization; before that, the tragedy of the commons debilitated economic development of the earth as it now does the water.

The solution offered by the United Nations is its "Law of the Sea Treaty," whereby all countries would become the common owners of the oceans. But operating the seas the way the Soviets collectivized the farms is exactly the wrong way to proceed. We must instead look in the opposite direction, toward privatization.

How many different firms should own the ocean? We extrapolate from land ownership. If 1 million people own all the land, and the ocean is three times bigger, then 3 million different groups should (initially, that is) own the ocean. Here's where, God forgive us, CR4s and Herfendahl indices come in. How do you demarcate property barriers in the ocean? Lines on a map. There are three ways, and only three ways (note how systematic we're now being) of capturing water for ownership. 1. You own a specific molecule of water, wherever it is: river, ocean, in the air. 2. You own, only, the bottom and sides of rivers, lakes an oceans, and none of the water. 3. You own the bottom and sides of rivers, lakes an oceans, and the water therein, temporarily, only while it is on your "land," subject to the side order condition that you don't fuck with the water while its on your "land." What constitutes fucking in this context? Well, tradition, the past practice. Suppose there's a drought; who suffers? All owners, equi proportionately. Suppose the drought is localized? Then, whoever owns the area that suffers. We don't have to wait, to privatize water, until we have anticipated all possible problems. We'll never do that, even after a 1000 year Reich of water ownership; heck, we've owned land, privately, for more than 1000 years, and we're still facing problems never before anticipated. There are four aspects of oceans (well, all bodies of water). A. the surface (shipping, swimming); B. the water itself (fish, submarines) C. the ocean floor (manganese nodules) D. below the floor (oil). Some creatures, entities, utilize more than one of these, but not all four; three at most, the top three: submarines, whales. Maybe, just the top two, unless they sit on the ocean floor. Do we own the ocean horizontally (4 separate owners for each patch of ocean) or conically? These are all issues to be worked out by a private water-owning industry.

V. The privatization process

At the outset, this would appear a quixotic task. How, after all, does one transfer a road or lake from the public to the private sector? The very idea appears ludicrous.

Fortunately, we do not have to invent the entire wheel: there are some precedents which can guide us. Oil is a liquid, and yet this has not stopped private ownership, at least in the U.S. Railroads are very long and narrow entities (like highways), and yet, at least in the U.S., and, initially, Great Britain, they have long been under private control. And this is true as well of turnpikes. The first of them were built, managed and organized by private stock companies. Nor is this just a matter of history.

How would a massive effort at privatization be conducted? With regard to the moon and Mars, this could easily be accomplished. All that need be done is to recognize that government's proper role is at most[10] limited to adjudication, defense, law giving and recognition and protection of person and property rights. It simply has no business floating around in space. All government satellites need be turned over to private interests. Paths for airlines should be given to those who have homesteaded them. This may be politically difficult, but presents no serious philosophical challenge.

More difficult, conceptually, are bodies of water. For here we deal not only with surface rights of egress (e.g., shipping lanes), but also with ownership of fish and minerals, as well as the ocean floor and even below. Fortunately, we are not without precedents. There is case law concerning low flying planes violating the property rights of the landowners below; there are solutions to disputes over the ownership of oil pools; there are adjudications between surface owners and mining interests on the land.

As well, there are fences. Before the advent of barbed wire, there was branding. The cowboys of screen and song actually constituted "human fences." So far, of course, there are no "water fences," able to keep one person's fish separate from others. But this is because we do not yet have private property rights in the ocean. When and if we did, the presumption is that mankind would then be free to turn his considerable technical knowledge to such a task. If we can land a man on the moon, we can certainly corral a bunch of fish. We already have forms of electrical "fences," but these apply to computers, internets, radio waves, not bodies of water. The contention, here, is that what is keeping us from rationalizing the earth's water resources is not a matter of science or engineering, but of legal philosophy.

We must not of course underestimate the practical problems of radical privatization. They will be many and serious. For example, sailing vessels already criss-cross the ocean.

[10] For the case against governments entirely, that is, in favor of free market anarchism, writes Rothbard (1973): "For centuries, the State (or more strictly, individuals acting in their roles as 'members of the government') has cloaked its criminal activity in high-sounding rhetoric. For centuries the State has committed mass murder and called it 'war'; then ennobled the mass slaughter that 'war' involves. For centuries the State has enslaved people into its armed battalions and called it 'conscription' in the 'national service.' For centuries the State has robbed people at bayonet point and called it 'taxation.' In fact, if you wish to know how libertarians regard the State and any of its acts, simply think of the State as a criminal band, and all of the libertarian attitudes will logically fall into place." For more on this see Anderson and Hill, 1979; Benson, 1989, 1990; Block, 2007, 2011; Block and Fleisher, 2010; Casey, D., 2010, 2016; Casey, G., 2012; Chodorov, pp. 216–239; DiLorenzo, 2010; England, 2013; Gregory, 2011; Guillory & Tinsley, 2009; Hasnas, 1995; Heinrich, 2010; Higgs, 2009, 2012, 2013; Hoppe, 2008, 2011; Huebert, 2010; King, 2010; Kinsella, 2009; Long, 2004; McConkey, 2013; Molyneux, 2008; Molyneux and Badnarik, 2009; Murphy, 2005; 2010, 2013A, 2013B, 2014; Paul, 2008; Rockwell, 2014A, 2014B; Rothbard, 1965, 1973, 1975, 1977, 1998; Shaffer, 2012, pp. 224-235; Sloterdijk, 2010; Spooner, 1870; Stringham, 2007; Tannehill, 1984; Tinsley, 1998-1999; Wenzel, 2013

Fisherman have been plying coastal and deep waters for decades. There are numerous oil wells already located at sea. How will the new property dispensation impact them? How shall conflicts of interest between the various ocean users be resolved?

Fortunately, there is yet another technique to aid us, at least insofar as clarity of thinking is concerned: homesteading. Whenever the practical difficulties threaten clear analysis, we can resort to the following contrary to fact conditional: suppose that homesteading had been utilized from the very beginning. Suppose, that is, we could start from scratch. How might a property rights regime have evolved? This mental experiment can be used to address difficult practical problems: all we need do is explore scenarios where we convert present day reality into closer proximity with what would have evolved had homesteading always been in effect.

As well, there is a wealth of data which can be utilized particularly from the Russian and East European experience with privatization, to say nothing of previous practice in the U.S., the U.K. and elsewhere. Further, there is the tradition of admiralty law, used to resolve disputes among different sea faring nations.

Homesteading implies that those who have been using a resource have the most valid claim to it. According to this doctrine, those who have been working in the U.S.S.R. factories, for example, would be given shares in them after privatization. Margaret Thatcher used a similar principle with regard to council (e.g., public) housing: it was given to the occupants.

But what happens when there are no clear historical users? With regard to Mars or the moon, this presents no real problem: we announce that the ownership rights of the first people to settle there will be recognized. But there will be insuperable problems as far as, say, the hilly regions north of Vancouver, British Columbia, Canada, are concerned. No one, so far, has used them, yet they are very valuable, as they abut extremely high priced real estate. Once announce that they are open for homesteading, and chaos will ensue in a land rush. Here, clearly, it is not easy to see how homesteading can suffice. A better plan might be a giveaway to all citizens, the pattern used in this Canadian province for the British Columbia Resources Investment Company.

VI. Conclusion

What are the benefits of such a study? For one thing, actual lives can be saved. With highway privatization, there is reason to believe that thousands of motorists who might otherwise be condemned to an early death will have their lives prolonged. For another, wealth can be vastly increased; there is no other possibility than a gigantic upsurge in ocean GDP once under the control of private owners. But a study of radical privatization will have other practical benefits as well. For there is still much "ordinary" property still improperly in government hands; making the case for radical privatization will render these other privatizations less "extreme" by comparison. For example, while most land east of the Mississippi is now in private hands, this is not at all true west of this river. On the contrary, an inordinate amount of land in the western United States is still controlled by government, in some states far more than half. With the vista of radical privatization provided by the present study, this may lend new impetus to the sagebrush "rebellion."

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WHERE HAS THE JAPANESE CORE OF "MONODZUKURI" COME FROM, AND WHERE IS IT GOING?

Hiroshi Tanaka*

Abstract

"Monodzukuri" is a buzzword in Japan. It is believed that this "Monodzukuri" could hold the key to relieve the Japanese economy from the current stagnation. The aim of this paper lies in examining this problem. This paper is based on the theoretical framework of evolutionary economics. The paper, first, explains the basic concepts and concerns the analytical perspective and technical terms applied in this study. Second, the historical birth of the Spirit of "Monodzukuri" is analyzed from the viewpoint of effects by the innovation of Japanese new Buddhism. Next it clarifies what kind of social technologies are appropriate for the Spirit of "Monodzukuri", explaining the prototype of integral architecture type of production/product, giving a clear picture that the industrialization after the Meiji Restoration was based on the integral architecture type of production. And finally it identifies that the modern integral architecture type of production emerged and crystallized due to various constraints that the corporate management faced during the postwar economic growth period. The conclusion considers whether "Monodzukuri" in Japan can maintain its competitiveness further in the global market in the future.

Preface

"Monodzukuri" and "spirit of hospitality" are buzzwords in Japan now. However, these terms do not have a proper definition, containing a wide variety of nuances. What can be affirmed now is that many Japanese people believe that "Monodzukuri" has led Japan to a dominant position in the world market. Or they expect a desire that this "Monodzukuri" could hold the key to relieve the Japanese economy from the current stagnation. Is such expectation appropriate? If so, in what sense is it appropriate? The aim of this paper lies in examining this problem and finding the solution or key to solve it.[1] This paper is not based on the academic discipline of studies on Japanese economic and management history, but rather on the theoretical framework of evolutionary economics.

This paper consists of five sections: Section 1 explains the basic concepts and concerns the analytical perspective and technical terms applied in this study for the following elucidation of the Japanese core of "Monodzukuri". Section 2 proceeds to analyze the historical birth of the spirit of "Monodzukuri", which was effected by the innovation of Japanese Buddhism. Section 3 clarifies what kind of social technologies are appropriate for the spirit of "Monodzukuri", explaining the prototype of integral

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[1] The original idea concerning this issue was already presented at the International Conference in Romanian American University on May 19th 2017. This paper is completed based on performing of major corrections and additions to what was presented there. There is no sufficient space to discuss the literature review in this paper.

architecture type of production/product. Section 4 gives a clear picture that the industrialization after the Meiji Restoration was based on an integral type of production. And Section 5 identifies that the modern integral architecture type of production emerged and crystallized due to various constraints that the corporate management faced during the postwar economic growth period. Finally, Conclusion, instead of summarizing, considers whether "Monodzukuri" in Japan can maintain its competitiveness further in the global market in the future of the 21st century.

Section 1 "Monodzukuri" as social technologies : its core and the integral type of production architecture

First, approaching Japan's "Monodzukuri" issues requires us to confirm one important view: "Monodzukuri" is not a natural and ultra-historical ethnic phenomenon, but a historically structured and backed-up substantive one. In order to understand it, we would have to elucidate the historical substance that gave rise to, developed and established "Monodzukuri", and conform historically developed a production system suitable for it. Confirming this for elucidation needs to start with understanding "Monodzukuri" as social technologies below.

According to my understanding of Beinhocker (2006), an economic and business space is a place of combination of social technologies, business plans and physical technologies. Physical technologies are what we usually refer to as the term 'technology'. Technologies are designs and processes to convert substances, media, energy and information in a way that they can become useful for human purposes. Physical technologies are physical means to create design information related to production/products and to transfer design information to the medium.

Social technologies are ways to design and mobilize people by organizing them for one or more goals. Social technologies include all the elements related to organization, such as processes and rules. They are close to institutions that have intensively studied institutional economics. They include both institutions and cultures. However, they do not include strategies in business administration. According to Shiozawa (2010), social technologies cover the structure of enterprise, its role, its behavior, cultural norm, job description, documentation and explicit or tacit rules.

A Business plan plays the critical role in melding both social technologies and physical technologies. This melding is executed under a business strategy. A Business plan seems to be close to what we call a production/management system. The Business plan is chosen for economic reasons, while the other two technologies evolve for their own other purposes. Each of them exits in a unique design space. They have their own fitness functions. Both technologies interact with each other through some business plan. Social technologies and physical technologies, evolving themselves, produce fitness relationships suitable for their own different purposes.

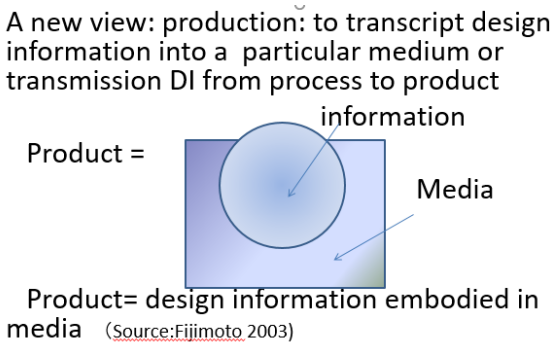
Understanding the above social technologies, business plan, and physical technologies permit us to approach the core of "Monodzukuri", which is considered as the most important constituent of social technologies. Next, for that purpose, it would be important to consider about what production and product are (Fujimoto 2003). The pivot to solve this problem lies in understanding of design information.

Hidalgo defines production as crystallize imagination and create objects that were born as works of fiction (Hidalgo 2015). The imagination and objects that were born as works of fiction correspond to design information.

Defining production based on this concept tells us as follows (See Figure 1); Production is to create design information and transcript it to specific media (materials). This means physical embodiment of information and crystallization of imagination in Hidalgo's terms. Created design information is transferred from a process to a product. In this way, the product is the design information embedded in the media. This definition of production/product concurrently changes production operation (work), product development, production organization, sale, and consumption into new concepts as follows (Fujimoto 2003).

Production operation as a process is to repeatedly transfer design information. Product development is to create and verify design information. Production organization is to carry out consistent procedures from procurement of media to creation of information on production, and to transfer them to the final product. Consumption is defined as follows; What consumers consume is not physical media, but a bundle of design information (or its system) being carried on specific media. Sale means to transmit design information to consumers. One side of "Monodzukuri" could be defined as creating a smooth flow of design information moving towards consumers as customers, and to make this flow circulate efficiently and precisely without distraction.

Figure 1

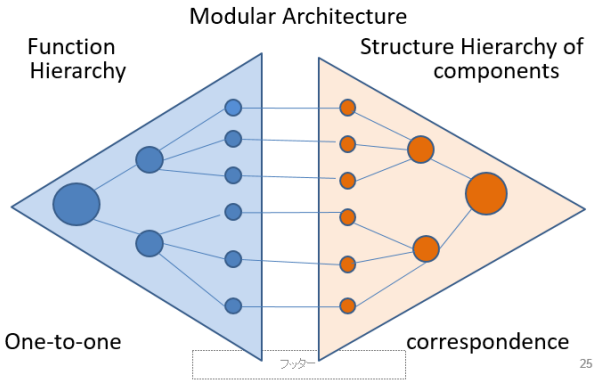


This framework of production/product definition causes us to consider that architecture design is a very important term: Architecture is a specific artificial system, meaning the fundamental approach to mapping the relationship between the function of a system and its structure. The fundamental approach to mapping is to divide the product into components/parts and divide the production into a smaller operation process of production, and then to establish relationship between the divided parts, relationship between the divided operations, and interface between each divided component/part and each divided operation. This relationship and interface between them would be different depending on how to design the architecture. The image of a personal computer (PC) and a passenger car makes it easier for us to understand the differences in designing the architecture.

It should be noted that the nature, form and performance of the product with the same item name would differ if the architecture of production would be different: There are two types of architecture designs: One is a modular type (e.g. PC) while the other is an integral type (e.g. passenger car). Even if PC and a passenger car are compared as a typical type here, they do not mean a real type, but an ideal type abstracted from the real ones.

Figure 2 shows a modular architecture of production/product, while Figure 3 an integral architecture of production/product. The circles inside the triangles on the left half of these two figures depict the overall function – subfunction – sub・subfunction respectively. Those inside the triangle on the right half express the whole product - subcomponent – sub・subcomponent respectively. The line shows the relationship between functions, the relationship between components, and the interface between sub・subfunctions and sub・subcomponents. The lines showing the relationship between the subcomponent and the subfunction are not displayed in these Figures, because they are complicated and difficult to illustrate.

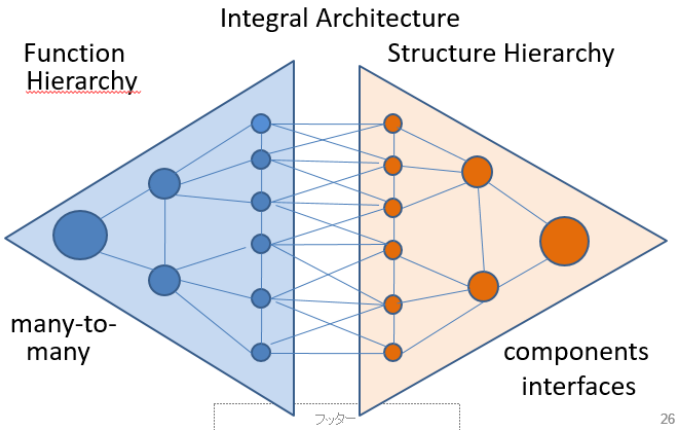
Figure 2



Source: Fijimoto (2003)

Let's look at Figure 2; the modular architecture. This line connects one sub・subfunction to one sub・subcomponent with a single line. This means that the interface between the sub・subcomponents and sub・subfuction is simple. This component is called a modular, containing one function within itself. In the process/operation of such a modular architecture production, it is a simple skill with which workers are required to be equipped. Next, we would like you to look at the integral architecture (Figure 3). That line is complexly mixed, expressing that many sub・subcomponents correspond to many sub・subfunctions. This mixture results in the relationship between the subcomponent and the subcomponent, the relationship between the subfunction and the subcomponent, and the interface between the subfunction and the subcomponent becomes complicated.

Figure 3



Source: Fijimoto (2003)

In the process/operation of integral architecture production, it is multi-skills with which workers are required to be equipped. In this case product developers are constantly required to confirm and verify that interfaces crossing between subfunctions and subcomponents could acquire and maintain fitness. Understanding the difference between integral architecture production and modular architecture production could induce us to recognize that it is not modular architecture production, but integral architecture production that have made Japanese industrial products competitive in the world market,

However, unlike modular architecture production, works based on integral architecture production require "a tenacious and dogged" attitude toward production. This attitude could not be produced easily by economic interest; price, wage, reward or superficial competition. It could be created, selected and retained by organizational routines embedded in production, which are reproduced and sustained at the deepest layers of the enterprise organizations. It could be expressed as organizational capability of evolutionarily developing production. The essential core of what we call "Monodzukuri" in Japan lies in the organizational capability to create and ensure integral architecture production. Japanese type of "Monodzukuri" could be defined as creating a smooth flow of integral architecture production type of design information moving towards consumers as customers, and to make this flow circulate with possibly less distraction, more efficiently and more precisely. This is the Japanese core of "Monodzukuri"

The above explanation could permit us to interpret buzzword: Japanese "spirit of hospitality" that is mentioned in "Preface" as follows: "Spirit of hospitality" is related not with a modular architecture type, but with an integral architecture type of service. Service means design information directly directed and transscripted from the service provider to the service recipient without the media. Transcription is immediate consumption in service. An integral architecture type of service means that the design information of the service created by service provider is very complicated and multilayered, and it is difficult to transfer this design information to the service recipient. An integral architecture type of service refers to a state in

which design information that should be directly transferred and immediately disappear is recursively reproduced in the body and brain of the service recipient.

However, when we return to the main subject, the following question arises immediately: How and when was this integral architecture type of evolutionary organizational capability born in Japan? It is not yet sufficient for economics and business administration to historically and consistently elucidate this issue[2]. This elucidation was one of my intentions of completing this study and paper. Economics treats such organizational capability as accumulated knowledge and knowhow, while business administration understands such organizational capability as "corporate culture". “Corporate culture” cannot be copied easily, and is difficult to transfer across firms and companies. However, the difficulty of transcription and replication of heterogeneous organizational capabilities is not a marvel limited to firms/companies. There are unequally as well as unevenly distributed heterogeneous organizational capabilities as "local culture" among regions and localities, and as "national culture" among national economies.

Then, there further arises the following question: How does the core of “Monodzukuri” as a corporate culture emerge in corporate organizations? It is convenient here to discuss only concerning organizational capabilities between enterprises in order not to spread the problem further. There is one hypothesis as follows (Fujimoto 2003, 198): It is shared strong intentionality, or collective preparedness that nearly all members of one organization are willing to improve their organization's outcome and performance over a period. This attitude of shared collective preparedness is very important. Let's call it the Spirit of “Monodzukuri”. Then, the next question give rise further; Where, when and how the secular, daily production/work activities necessary (forced) for the maintenance and reproduction of livelihood/human body is transformed into production with the Spirit of “Monodzukuri” in Japan? This is a big question as well[3]). Let's approach this question in Section 2.

Section 2 Historical Birth of the Spirit of ‘Monodzukuri’: Innovations in Buddhism

It is in the period from the end of the Heian era to the Kamakura era that historical opportunity and possibility to create the Spirit of “Monodzukuri” came in the Japanese economic history[4]. In the end of the Heian era, natural disasters, huge bad crops, large famine, heavy casualties broken out with epidemics, and much starvation had frequently occurred in various places, in parallel with which the ancient state nation under Ritsuryo system collapsed, and the aristocratic power weakened, resulting in transformation to the manorial system, privatization of the state-owned workshops, and emergence of local market-oriented commerce and industry (Teranishi 2016). People experienced radical changes not only in the

[2] This topic has been studied and researched under the title of ‘Japanese style of management’ (nihonteki keiei). We can find 2050 articles with titles that include the term ‘nihonteki keiei’ in CiNii (http://ci.nii.jp; June 28, 2017)

[3] Economics has defined labor as an endeavor with feeling of mental or physical pains since Adam Smith.

[4] This section is mainly based on Teranishi (2016).

political economic system, but also in spiritual culture, religion and ethics. Under such circumstances New Buddhism had been born out of the Old Buddhism, being systematized to propagate a new Buddhist way of relief among not only oppressed poor, socially vulnerable people, but also newly emerging warrior class and individual residents of urban space.

The New Buddhism had three characteristics; (i)易行(igyo): the easy path via Nenbutsu (Buddhist invocation) to attain enlightenment; (ii)選択(senchaku) :Buddhist choice to pick out only Nembutsu from among many teachings shown by Buddha; (iii)専修(senju): to keep a specific Buddhist practice earnestly without mastering the other practices. The New Buddhism, as reformation of Mahayanist Buddhism, making the above innovations of religious activities, introduced the following two major changes in the common people's daily livelihoods by re-combination with not only affirmative feeling for this present world, but also views to see affinity and continuity between this world and the next world, penetrated in the ancient times of Japan:

(1) The innovation and the re-combination gave people a space in a degree to change occupational life, works and labors of people into a place of training and practice for simulated Buddhist beliefs. Then, adversely, people started to become conscious of seeking Buddhist relief in the improvement of skills and their performance in daily livelihood. Partial dismantling of state-owned workplaces allowed accumulation and diffusion of production techniques and technologies by aristocrats and temples. This was a small, but historical moment when secular production and concentration of consciousness to work combined with individualism aiming for self-realization.

(2) As is mentioned before, in the period after the end of the Heian era, privatization of state-run workshops started, which begun to disperse and spread advanced technologies, and markets at the local levels emerged, while pursuing of pseudo-training was carried out in a narrow living space where others' faces can be seen directly. Emergence of local markets and pursuit of pseudo-training allowed producers to be constantly conscious of others in these narrow spaces. This made people work according to specific requests and wishes given by those living in close in proximity, giving possibilities, to an extension, to realize individualized production and work aiming at self-fulfillment under demand-driven marketization.

However, the small world in the range of "visible face" had a danger of stagnating the quality of production. But this small world was not completely autarchy. Regarding specific goods items, there emerged remote distribution networks that could connect Kyoto and local districts directly and local distribution networks connecting directly between remote places not via Kyoto. It was the merchants who took over these emergences. They could, insufficiently, switch distant customers directly for producers to immediate customers whom producers could see "faces" in daily livelihoods. This connection with remote markets had become a new social technology as well.

Powerful pursuit of self-realization through this secular relief under the development of markets had been fruitful in two areas of producers' activities. One was handicraft industries, like industrial arts and mass production of matchlock "Tanegashima". Another was the provision of services like martial arts and

entertainment such as tea ceremony and flower arrangement. Many of what are called traditional cultures and crafts in modern Japan have their origins in this era.

Section 3 Emerging of Social Technologies suitable for the development of the Spirit of "Monodzukuri"

In the previous section, the emergence of Spirit of "Monodzukuri", and its impact on developing of handicraft industries and service sectors like martial arts and entertainment was examined. However, the large-scale land ownership, the collective responsibility system, and the traditions of production based on large family system, indisposition of people working hard, had disturbed the Spirit of "Monodzukuri" to crystalize entirely on its own features to become concrete. Producers even with the Spirit of "Monodzukuri" could not directly verify the results of realizing their own Spirit of "Monodzukuri"-induced production activities, and, then, could not confirm their final performance each time, whenever their works were completed. A family-based small-scale production system is social technology most suitable for the Spirit of "Monodzukuri". The large family system in rural areas was dismantled in the latter half of the Edo era, while the small-scale family system rapidly progressed (Nakagawa1981). The small family production unit as social technology is called 'Ie' type system in Japan (Okamoto 1979). The 'Ie' type system in the Edo era has been frequently argued and studied from the viewpoint of domestic affairs; especially inheritance of property assets and production means. We will examine it here, however, from the viewpoint of inheritance of production technologies below:

This 'Ie' type of agriculture production system in the Edo era[5] included no employment, no domestic animals, having only a small agricultural land parcel. It consisted of not only agriculture as a main production, but also handicraft and commerce activities as side-work. And despite the small-scale agriculture, they had grown many kinds of agricultural products throughout the year. The combination of upbringing diversified kinds of agricultural products, and handicraft/commercial activities as side-work required detailed adjustments and adaptations between work processes and working times. This combination could be called a family-based integral architecture type of production.

This architecture was possible because the members of the family had the same motivation, concentration, knowledge and autonomy. This self-discipline had become advantageous for the combination between agricultural production and family handicraft/commerce. Therefore, small families were the best unit for a market economy and exchange economy, and could have a strong responsibility to the result and final performance of their works. In such an integral architecture production system, the importance was not time, but time flow. Time flow had key roles. The crucial of management of time flow was to master an efficient way to use time by planning, savings, flexible working time extension. Time flow was not an individual thing, but was understood as belonging to a group or village in which producer families lived.

By the way, there is a doubt about the view that the location of such an 'Ie'

[5] The information below is quoted mainly from Thomas C. Smith (2002)

type of production system was limited only to the space of agriculture and rural areas (Amino 2006)). The producers who lived and worked in rural space were called not farmer nor peasant, but Hyakusho (百姓). This term of Hyakusho, is a symbolic representation to clearly depict an economic actor who was responsible for and performing many occupations, jobs, functions according to time and season, weather and climate, depending on degree of marketization of those products, and refining their multi-level skills,

On the other hand, let's look at the integral architecture production from the perspective of the technologies of highly developed handmade industry in the Edo era. The representative handmade industry in the late Edo era was a striped cotton industry, where there was no qualitative breakthrough in physical technologies. According to Nakaoka (2006) based on Uchida Hoshi's fieldwork research, "technologies complex" could be found in this industry, indicating social technologies combining existing physical technologies, taking full advantage of the social division of labor as is outlined; cotton cultivation by farmers, hand spinning with spinning wheels, indigo cultivation by farmers, indigo dyeing by dye-houses, weaving design by farmers, standardization of small width fabric by shops dealing in kimono fabrics and standard cutting of Japanese clothing at home. This "technologies complex" had realized one smooth flow from production to consumption. The excellent manufacturing technologies, which led to diversified livelihoods, were cultivated not only in a few small number of professional craft groups in urban space, but also in an extremely broad farmer's space. Here is the other evidence that a prototype of integral architecture production was born and expanded in both agriculture and handicraft industries in the Edo era.

Some researchers claim that in the Edo era when such social technologies were created, 'industrious revolution' rather than 'industrial revolution' occurred. However, it did not happen that the development of this handicraft exceeded its technological limits. Nor did it became transfer to modern machinery industry which is the next stage of handicraft industry in terms of physical technologies. The transition to the age of modern machinery industry was impeded by, first, the national seclusion and interruption of international exchanges with the other nations, and, second, the control over production and consumption by the Bakufu-domain system.

What must be noted here is what is called 'Popularized morals' (Maruyama 1999, 2012) that occurred in parallel with the historical birth of the prototype of integral architecture production. 'Popularized morals' used to be diligence, saving, frugality, honesty, good faith, and devoutness under the mixture of Confucianism and others. They drew moral legitimacy, limitless faith and aggressiveness in the place of the activities of daily livelihoods of the people; agricultural, industrial and commercial activities. These morals were the most suitable for small-scale production management where a family owned a means of production, giving rise to norms regulating a daily livelihood in family-based small-scale management. While squeezing with the market economy, family-based small-scale managements became established with independence to survive themselves. On the one hand, these morals became a logic of independence and autonomy of the people based on a paternalistic family system, despite the early modern age the activities of families were constrained by villages and the intermediate organizations as the larger group with

the same family name, while, on the other hand, they also played a significant role in maintaining and supporting the existing Bakufu-domain system. It is claimed that the influential town-people in the early-modern Edo era were initially aware of 'popularized morals', and, then, were accepted in the village communities under the initiative of the wealthy farmers in the late Edo period, and, finally, they spread to more lower-class people in the Meiji era. It would be appropriate to call these morals Ie-type of 'popularized morals'.

Section 4 Traditions of "Monodzukuri" established after Meiji Restoration

The previous section elucidated that before the Meiji Restoration Japan could prepare the historical birth of the prototype of integral architecture production with the spirit of "Monodzukuri", 'Ie' type of production system conformable to this prototype, and 'popularized morals' suitable for it.

However, they had critical obstacles to further develop in the late Edo era: in order to break through these constraints, the Meiji Restoration Government had to liberalize various controls and regulations, cancel the national seclusion, and import materials, technologies and capital goods related to modernization-related information from overseas by cancelling interruption of international exchanges with the other nations. The new measures started to create environments to develop the three integral types of industrialization as follows;

First, by acquiring new industrial materials and domestically produced inexpensive new equipment, handicrafts already developed highly in the Edo era developed in-house based handicraft workshop producing various kinds of small quantity product. This was a mixture of old and new physical technologies, social technologies and business plan, resulting in a full-scale industrialization with profound influence comparable to the industrial revolution (Nakaoka 2013, 26-29,259).

The characteristic of this industrialization was that it required almost no imports of capital goods from abroad, but, on the contrary, it not only satisfied domestic demands, but also could cover the export market from Japan, resulting in mitigation of the contradictions brought about by deterioration in the international and trade balance during the late industrialization. It supported the Japanese economy for about two decades before the modern economy sector started functioning on the base of transplanted technologies by introduction of modern machineries and large capital investments. These traditional industries had close links with the transplanted modern production sectors as upstream industries and the modern infrastructure area. This mutual complementing was an important characteristic of the industrialization in the Meiji era. These links, however, did not give rise to creation of modern mechanical engineering nor modern steelmaking industries.

Second, alongside this national industrialization, the spinning industry as a transplanted industry developed during this period (Nakaoka 2006,420). Transplanting was a combination of imported mechanical equipment (physical technologies), technical instruction and advised by Western European technical advisers (social technologies), and modern company system (business plan) introduced from Western Europe. Infrastructural areas such as transportation, communication, gas, and electricity were also constructed by these connections besides an upstream of manufacturing such as spinning.

Then, how transplanted industries were fostered in complementary relations with traditional social technologies, business plan and physical technologies come into quetion. There were two important flows of improvement of the technology training and education system from the viewpoint of manufacturing development. First, the starting point for the establishment of transplanted industries was the military industry under the threat of strong Western Great Powers. Ran gakusha, Dutch scholars who studied western sciences and technologies through Dutch language, and were mainly samurai in the late Edo era, played a significant role in modernization of military industry (p. 433). But they soon noticed the limitations of partial Dutch Scholars' studies, which compelled influential providential clans and the Edo Shogunate to attempt introduction of full-fledged and systematic technology acquisition through Western-style learning systems and study-abroad systems. Second, these traditions were inherited under the new Meiji government as well: technological schools and supplementary business schools were introduced besides the universities, establishing them as a unique pyramid-shaped system with a large base in Japan. These led to provide empirical-like technicians and experts (groups) trained based on the combination of conventional technologies, workshop experiences in the early Meiji era, and modern transplanted technologies. It is interesting that among them university graduates who were educated based on studying foreign original books entered the industry and manufacturing sectors as engineering engineers without operational experiences, while they became professional technicians who instructed and guided the technical process of production and manufacturing (p.446)

Third, "production site-based principle" management were created. According to Nakagawa (1997), a great gap between modern industrial technologies and traditional industrial technologies developed the original " production site-based principle" management, which is characterized as a basic factor to develop the post-war Japanese corporate management. This principle means to solve problems occurring in the production line/spot through sharing information with engineering supervisors and exchanging them among workers and supervisors on production site, and cooperation among them.

The main task of companies in this era was not how to newly develop modern technologies, but how to introduce, catch up and fix advanced technologies at the factory site. The companies, adopted graduates from industrial/technological schools as apprentice workers and worked on fixing introduced technologies, united with young workers at the work site. Here a unique work method to incorporate collective ingenuities of introducing modern technologies was born. Companies, aggressively adopted university graduate students of engineering, training younger employees as engineers at the cost of the companies, cultivating them as core workers in their manufacturing sectors. The skills acquired here became contextual ones and could not be available across companies. Promotion and raising salary by seniority system, establishment of lifetime employment enhanced Japan's specific employment pattern with technological inequalities among companies, collective ingenuities, and accumulation of skills on "work site principle". This "work site-oriented" management suggests that technologies management information was born and accumulated among production sites. This resulted in gradual abolishment of boss contracting system and the intra-firm subcontracting system born in the early Meiji era. However, it is said that workplace practices/routines, and conventional structures

depending on finishing-workers created during this era remained deeply rooted in the Japanese machinery industry.

Let's think again about the 'Ie-type' of popularized morals established at the end of the Edo era: Modernization and industrialization of the Japanese economy had contracted the role and function of family as an 'Ie system' unit of producer, which means that popularized morals disappeared in the long run. However, on the other hand, it should be noticed that the role and function of family as a unit of small community to maintain their lives and daily livelihoods were not compressed directly and to the same degree in parallel with its contract as a producer. A production site in one company substituted part of the functions and roles of the family. "Production site-based principle" management revived part of 'Ie-type' of popularized morals to maintain producers' lives and daily livelihoods in the production sites, not within a company as a framework of capital ownership.

Japanese modern technologies reached their peak of achievement around 1910s, when Japanese-style manufacturing was established before WWI. It was in this period that Japanese "Monodzukuri" grew the consciousness that it had already caught up with the developed industrialized countries in terms of physical technological level. It, however, had three defects;

First, it had strong dependence on foreign technologies that had spread through the bottom of the Japanese economy. In this case, space of factories and production sites in the foreign countries were the origin to bring about the idea and imagination for the first-grade technician (p. 466). Second, there was a delay in the development of compatibility production in the machine manufacturing sector. Third, there was a definite weakness in the technological development capacity in the newly emerging industries (Nakaoka 2006, 466-467). These defects and problems continued to remain until the defeat of WWII: It became rather worse along with the transition to the wartime economic system of WWII.

Section 5 "Monodzukuri' and successful injuries in the Post-war Period

Reconstruction of the post-war manufacturing sectors, beginning with the introduction of physical technologies and business plan from the United States, was a big trial and error to compress the differences between Japan and the Western world, especially, the United States in the technological level. This compression was different in a sense from the industrialization after the Meiji Restoration. The process promoted explosive economic growth of Japanese manufacturing sectors with full establishment of the Japanese style of social technologies; Japanese style production and management system, and development of corporate-centered morals. It is claimed that they prepared full-scale development of integral architecture production, which became gradually more competitive in the world market after the 1970s on. Almost all factors of these Japanese of social technologies were established on a full scale in the High Economic Growth period in spite that some of their historical origins and prototypes which already appeared in the period prior to them, as are studied above. It is not necessary to trace them again here. Rather, it is of value to focus on the various constraints that might be thought before to bother the postwar economic recovery, but finally proved that they were successful injuries.

They gave rise to the integral architecture production as social technologies. These constraint conditions were as follows;

First, potential demands rapidly expanded during the postwar reconstruction, and required quantitative expansion of products in a brief period, while lack of capitals, economic and management resources under the post war period prevented introduction of a US type of division of labor and factory system.

Second, chronic shortage of capital goods prevented the way to choose technologies that would lead to investment of excessive capital equipment.

Third, economic growth under the presence of people's low incomes and income disparities demanded a diversity of product models even within a single sector, urging firms to create a new kind of design information of product appropriate rather for poor consumers. The typical case was the design of 'light vehicle' only in Japan.

Fourth, rapid industrialization after the WWII induced traditional family-run workplaces of cottage industries workplaces with diverse types of small-lot production into small and medium-sized enterprises equipped with modern machineries. Assembly companies as controlling company could make effective use of them as a parts-producing factory. In addition, weakness of management capacities, which used to be the flip of "production site-based principle" management ", promoted, as social technologies, spinning-off some part of companies into a separate company and managing them as an affiliated company.

Conclusion

Late in the 20th century and early in the 21st century, families modernized in the process of Rapid Economic Growth period are going to rapidly disassemble, while production sites are rapidly moving overseas, or began to be managed under a corporate management and governance with a short-term perspective. People are confronted with a harsh reality, like further marketization, globalization and mobilization of labor forces, restructuring and so-called black companies.

Thus, however, in the 21st century, there are expectations to transit from modern families to individual families, where the society holds that a family should accept an image that the main actors of the selection and responsibility should be changed into an individual, while the government supplementarily and complimentarily supports an individual's family and socially vulnerable in institutional and administrative ways. However, neither family nor firms/companies can successfully produce and provide solid and mature living norms and morals appropriate for the new century. Even Japan's conservatism has not succeeded in it. The Great East Japan Earthquake and Fukushima 3.11 disaster made us aware of the importance of ties, especially that of families and small communities. It seems, however, that many Japanese are trying to come through harsh realities by continuing to shut in the current difficulties in their own families.

Let's return to a consideration as to the first issue; whether it is possible to maintain competitiveness of Japanese manufacturing industries in the world market in the future. The beginning of the 21st century of Japan was confronted with such discussions that the Japanese style of 'Monodzukuri' began to face limitations, as symbolized in the recession of Japanese electronics industries and home electronics manufacturers in the world market.

In other words, it seems that the industrial production in the world has shifted to a new phase of greater prosperity of modular architecture production, which is symbolized by development of network-type international division of labor, fragmentation of production, worldwide division of production process, global vale chain(GVC), IoT and Industry 4.0 and so on. Are these trends disadvantages to the integral architecture production/products?

We cannot, however, prospect if these trends would go straight to the simplification of the manufacturing industries and services into the modular architecture production/products in the next few decades of the 21st century. It would make sense that in parallel with this type of simplifying trend, we would be up against increasing sophistication and maturity of the environment, increasing strictness, severity and limitation of the global and the social/regional environment[6]6). They would make further evolution of production/product complexity and more constraints imposed on production. More increased constraints call for more need of new kinds of integral architecture production/product as follows:

1) Relatively rich consumers in emerging market countries as well as individual customers in developed countries will seek higher functionality and more maturity;
2) The desire for people seeking more safety and peace of mind, local environments and global environments in product and service production would impose more stringent constraints on production and products;
3) There are required for more sustainability of production of products and services.

These, surely, lead to the markets being compelled to offer more various kinds of higher quality of integral architecture products and services, where a tenacious and dogged attitude towards production and service would be required at a higher level. We have not yet, however, found a prospect to a new kind of living morns and morals appropriate for higher qualitative and mature type of integral architecture production/product.

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ENVIRONMENTAL REGULATIONS AND THE AUTOMOTIVE INDUSTRY

Vlad Cârstea*

Abstract

The automotive industry and road transport are considered to be one of the most important source of air pollution with CO_2 (carbon dioxide), NOx (nitrogen oxide) and other harmful components. As such, the governments and the competent institutions will implement different regulations that will ensure lower emissions for the entire range of vehicles in order for a better cleaner environment.

Keywords: Environmental regulation, automotive industry, emissions

JEL Codes: F18, F23, F64, O13, Q40, Q53

1. Introduction

During the recent years the environmental protection has become a priority for all the specialized institutions, from national governments, independent institutions, to regional unions' common institutions. The main objective is to improve the quality of life for every citizen, by reducing the greenhouse gas emissions (carbon dioxide – CO_2) and other harmful pollutants, like the Nitrogen Oxide (NOx).

In the European Union's case the set objectives are even more ambitious, as the organization wants to also reduce the noise pollution made by vehicle and the emissions of fluorinated greenhouse gases that are used by the mobile air-conditioning units.

For achieving these objectives the legal infrastructure has to constantly change, to be up to date, with the same rate as technology evolves or even faster.

The most influenced sector by these regulations is the automotive one. It has been a real challenge for all the car manufacturers to constantly create new products that not only have to look good, but perform well and are compliant with all the technical, safety and environmental regulations, and all within a reasonable price.

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2. Emission standards and environmental institutions across the world.

Canada. The Environment Canada (EC) or Environment and Climate Change Canada is the institution responsible for the coordination of the environmental policies as well as preserving and enhancing the environment. Its activity is based on a set of rules, called CEPA 1999 (the Canadian Environmental Protection Act). The regulations are aligned with the American legislation and apply to the entire range of vehicles from passenger cars, to trucks, buses and motorcycles.

United States of America. The emissions standards are managed by the EPA – Environmental Protection Agency. Probably the biggest difference between United States and the rest of the world is the fact that the state of California can issue tighter regulations regarding vehicle emissions. Of course, they have to be approved by the EPA, first, before coming into force. This means that the other American states have two options regarding which environmental regulations will be implemented: either the national ones issued by the EPA, or the ones issued by the state of California.

Europe. The emission standards are defined in a series of European Union's directives staging the progressive introduction of increasingly stringent standards. These regulations are known as Euro norms and they came into force in 1992 with the Euro 1 norm.

The Euro 2 and Euro 3 norms were implemented after 4 years. For the next two norms (Euro 4 and 5) the time gap was a bit bigger of 5 years.

Currently all the automotive manufacturers that operate within Europe must comply with the Euro 6 norm that came into force in 2015.

Japan. The Ministry of Environment is the designated institution that issues and implements the environmental policy.

In 1968 was issued "The Air Pollution Act" which was the first law that regulated all the pollution sources. This set of rules have been constantly updated until 1978.

In 1992, the Ministry of Environment issued another law concerning the air pollution with NOx for 196 communities in the Tokyo, Saitama, Kanagawa, Osaka and Hyogo areas.

It's mentioning the fact that all the cars in use must comply the new car emissions from 1997/1998 which means that those standards are retroactively applied. The respective owners have only two options: either modernize their cars by fitting them with NOx and particle mass (PM) control devices, or replace those cars with newer models.

China. SEPA (China's State Environmental Protection Administration) is the competent institution for this field of activity.

The first regulation that controlled the car's emissions was issued in the year 2000 and it was an equivalent of the Euro 1 norm. Four years later a more stringent emissions standard came into force, and it was the equivalent of the Euro 2 norm.

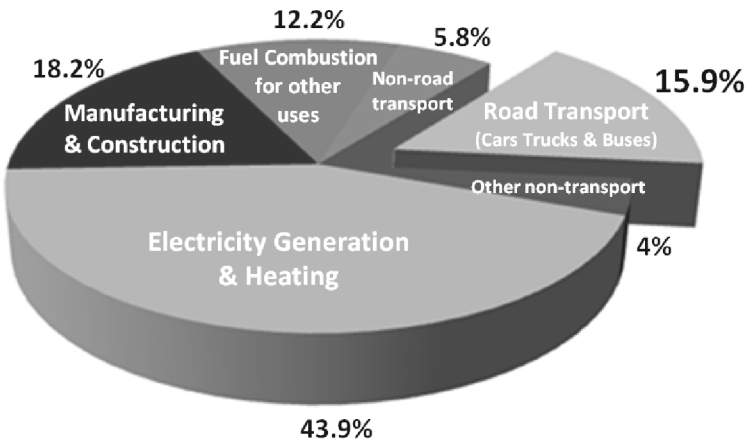
The National Standard III, which the equivalent of Euro 3 norm was issued in 2007 and in 2010 Standard IV.

According to the Chinese Ministry of Environment, the latest regulation, Standard V, began to be implemented in 2016 and will be fully implemented in 2018.

3. Automotive industry overview.

It must be said that the environmental impact of passenger cars and vehicle is not a big one, by all means. The statistics show, that at global level almost 16% of the carbon monoxide emissions come from cars and trucks, while at the European level the figures are a bit smaller, at 13%. By comparison the biggest source of pollution with CO_2 is the energy producing sector.

Figure 1. Global CO_2 emissions by economic sector[1]



The pollution with nitrogen oxides (NOx) and particle mass (PM), as mentioned in the beginning of the article, are the other components regulated by the environmental agencies' laws. Although they are present in all types of cars (whether they are equipped with petrol or diesel engines), the diesel engines' emissions have a higher content of these two pollutants. As a result, during the recent years the diesel technology has been dramatically improved in order to respect the regulation in force.

[1] Organisation Internationale des Constructeurs d'Automobiles – Climate change and CO_2 brochure

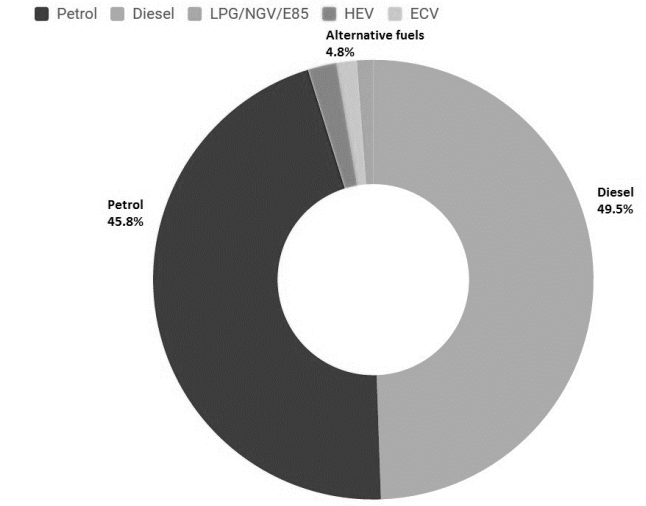
The Dieselgate scandal drew attention in an unwanted manner towards the diesel engine cars, making people think that diesel engines are the biggest pollutant and they cannot be made compliant with the environmental legislation, so they must be banned. This is partly true because the diesel engine must be improved in order to be less pollutant, and to comply with the new regulations. The problem is the time frame needed for implementing this technology. The competent institutions issue tighter and tighter emissions regulations, and the automotive manufacturers do not get enough time to test all this technology.

Of course, this scandal about diesel engines and their emissions is only one side of the story, as the optimistic emissions and consumption rates were issued by the manufacturers, for petrol cars, proved to be difficult, if not impossible, to obtain in real life. The explanation behind this situation is the fact that all manufacturers test their newest cars in ideal situations (minimum traffic conditions, optimum weather, only one passenger and so on). The solution is to change the legislation for the testing methodology that will involve more real testing conditions. Of course, it's impossible to replicate all the conditions that a car will face in its entire life, but a more realistic approach can and it will be applied.

In theory and in real life, as well, the diesel technology is very competitive and in terms of performance, a diesel engine can keep up the pace with the petrol engines with no problem. And it saves fuel, in the process, too.

As a testament of performance, the German car manufacturer Audi released in 2006 a race car that was equipped with a diesel engine and, surprisingly, won all the competitions it competed in, two years in a row. Those victories are even more rewarding if we consider the fact that Audi was the only manufacturer races that raced cars equipped with diesel engines.

Figure 2. Passenger car fleet by fuel type in Western Europe in 2016[2]



[2] Source: European Automobile Manufacturers Association

The consumers' trust in the diesel engine was even further put to the test because during the investigation in the Dieselgate scandal, it was revealed that Volkswagen is not the only car manufacturer that cheated at the emissions tests. Almost all the European manufacturers admitted that one way or another their diesel cars cheated the emissions tests.

Despite that, the diesel engine still has a lot of supporters. For instance, Dieter Zetsche, aka Dr. Z, the chairman of Daimler AG, stated that "it's worth fighting for the diesel engine"[3]. The statement was made in spite the fact that Daimler had to recall over 3 million diesel cars, in order to make them run cleaner.

Statistically, at the European level, more and more people choose to buy a new car equipped with a diesel engine, mainly because of the cost reductions with fuel.

In 2016, the share of new diesel cars bought by Europeans was of 41.3%, higher than the previous year, when 40.97% new diesel cars were sold. An interesting fact is that the share for alternative fuels diminished for 2016, compared with 2015, as more buyers were attracted by conventional fuels (petrol or diesel).

In analyzing the sales figures for Western Europe, one would see that the diesel cars are even more popular, as 49.5% of buyers for new cars will opt for this type of car.

Table 1. Diesel engines vs. Petrol engines

	Diesel	Petrol
Pro	40% more efficient than petrol	lighter engine construction
	more torque at low engine speeds	more power than diesel, but at high engine speeds
	less fuel is used so less CO_2	cheaper to run, in terms of regular maintenance
	no need for tune-ups	lower NOx emissions' levels
Con	heavier construction due to high compression rate	less economical
	higher levels of NOx emissions	higher levels of CO_2 emissions
	less power than petrol engines	

4. Effects.

Due to the Dieselgate scandal, all the environmental agencies in the world are looking very suspicious at the car manufacturers especially due to the fact that even the big names like Daimler or BMW have admitted that they cheated at the emissions tests. The public is also skeptical about the manufacturers' offered solutions for fixing the problems for all the cars they had sold. In the

[3] AutoBild, Romanian edition, no. 16, 03.08.2017

same time applying those solutions for millions of cars sold worldwide is not going to be cheap, given the fact that all those cost will be entirely supported by the manufacturers. As a result, there is a constant fear that the build quality and the reliability for the future cars will not be the same as in the past.

In terms of future solutions for helping the cars run cleaner it's worth mentioning the introduction of new catalytic convertors (which transform all the poisonous exhaust gases into less harmful ones with the help of precious metals) and the introduction of the DPF technology for the petrol cars (DPF stands for Diesel Particulate Filter – it filters all the suspended particles, which are usually soot, that result from the functioning of a diesel engine).

Another technical solution adopted by the manufacturers, is downsizing. Basically this means that the engines are smaller but the performances remain the same if not better than the smaller engines. For example a 1.4 liter engine, with this technology has the same technical specs as 2 liter one. The downsizing option along with the introduction of the start-stop technology (which shutdowns the engine when in standstill traffic and starts it up when the traffic moves) will offer important fuel savings especially for those drivers that use their cars mainly in areas with intense traffic or in urban areas.

De-activating a number of cylinders inside the engine, when the car doesn't need to use the entire potential is the newest technology applied in the automotive industry that is destined to reduce the CO_2 emissions. The downside of this new solution is the unknown impact upon reliability.

Probably the most change in the automotive industry is the adoption of the hybrid technology as a transitional phase towards alternative fuels such as hydrogen or electricity. This trend is going upwards as all the car manufacturers fight to offer the best solutions for hybrid cars in terms of performances and costs. Of course, the government aids in form of bonuses offered for buying new hybrid cars helps customers decide in favor of this type of cars.

5. Conclusions.

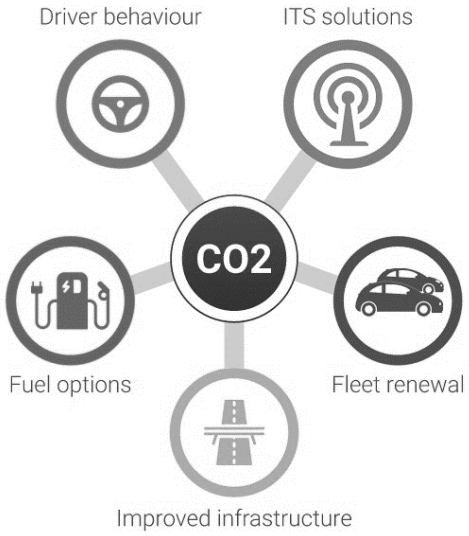
The next period will offer the automotive industry the chance to reinvent itself in order to comply with the tighter regulations. This will translate into huge amounts of capital invested in R&D, which further down the line means a more positive impact on the global economy.

As products, passenger cars and vans do not represent the biggest polluter within EU and at the global level as well.

On the other hand, governments and the competent institutions want to issue even tighter emission standards that will gradually result into the retirement of the conventional powered cars, as they will be replaced by the electric ones. Unfortunately, today's technology does not ensure a comparable range as the conventional cars. Despite the fact that there are some manufacturers, like Tesla that offer a wide range of electric cars that promise a range almost the same as a petrol powered car, the final price of such a car is far higher than average consumers can afford. So the governments offer different

incentives for buying electric or hybrid cars as part of their fleet renewal programs. The scrappage bonuses, as they are known, are offered only if the customer scraps his old car and will buy a new hybrid or electric car. Unfortunately, the bonuses cover up to 10% from the final price, which make these type of cars too dear for most of consumers around the world.

Figure 3. Integrated approach for reducing CO_2 emissions[4]



In order to reduce our negative impact on the environment we need to elaborate an integrated system that will cover not only the reduction of the carbon print in cars, or transportation, but in our entire lifestyle. In "The Stern Review on the Economics of Climate Change", from 2006, the author, Nicholas Stern warns that implementing new and tighter regulations just for the automotive industry is the least efficient way to reduce the CO_2 emissions.

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THE JAPANESE ECONOMY, PAST AND PRESENT

David Flath*

Abstract

The Japanese economy embodies the seeds of its past. During the two-and-a-half centuries of the Tokugawa regime (1603-1868), the Japanese people had become relatively urbanized and literate, and had indigenously evolved sophisticated economic institutions, but had been isolated from the world and were constrained by oppressive controls on their daily lives. The result was a country technologically deprived, but not economically backward. The political changes following the Meiji Restoration in 1868 led to the removal of the very heavy Tokugawa government controls on private exchange and production, fomenting a revolution of markets. Japan's economic status today is a culmination of steady growth since then, interrupted by the devastations of the Second World War, but resumed afterward. Japan's rapid economic growth after the Second World War was not directed by government nor the result of industrial targeting or other such government interventions; it was the result of unfettered market forces. Japan's economy today remains largely free of government direction. Its various peculiar practices and institutions such as the lifetime employment system of its big companies, its myriad of small stores and complex wholesaling channels, and its bank-centered financial system all reflect the same market forces that have made the country prosperous.

A tale of two shrines

Around the corner from the mansion-apartment where I live is the Takamatsu Shinmei shrine. It is a small shrine on the site of the (long-ago disappeared) Takamatsu palace, residence of the Emperor Go-Shirakawa at the time of the Hogen disturbance, 1156, in which Taira no Kiyomori and Minamoto no Yoshitomo (father of Yoritomo and Yoshitsune) fought the emperor's enemies as allies. A few of the local residents visit the shrine at New Year's. I imagine that Go-Shirakawa and his world are far from the thoughts of most of them. New Year's in Japan is a time to focus on the present and on the coming year, not on the past.

There is another small shrine a hundred or so meters to the northwest of our place, the Mikane shrine. It was established in 1883 and enshrines three deities including Kanayamahiko no Mikoto, a deity of metals including gold. Its *torii* is painted gold. At New Year's it attracts hordes, many who come from great distances, hoping that the gold will shine on them. Its popularity dwarfs that of the Takamatsu shrine. Are you surprised by that? I am not.

My point is not that Japanese people are more superstitious or avaricious than others. Quite the opposite. It is that Japanese people today are actually the same as other people of the world in their desire for material comfort, prosperity and an easy life. All of us, including the Japanese, seek such blessings wherever we can. And it is human nature to think we are more likely to find them at a golden shrine than an ordinary one. I suppose it was always thus. But in Japan and elsewhere people have not always been free to act on such impulses. Where people were free, prosperity has followed.

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The origins of Japanese wealth and prosperity

Japan today is among the rich countries of the world. It's per-capita GDP in US dollar purchasing power parity units - according to the IMF - is around $110 per day compared to the world average of $36 per day (and US of $160 per day, Romania $65 per day). Two hundred years ago there were no rich countries; the average per-capita GDPs of all of them in today's prices, were less than $5 per day - comparable to Haiti now.

The economic historian Deidre McCloskey has written (in a short piece for the *Wall Street Journal*, "How the West Got Rich", May 20, 2016) that the "great enrichment of the past two centuries has one primary source: the liberation of ordinary people to pursue their dreams." That idea - with which I agree - should be placed alongside another idea with which I also agree: Economic development is a long, mysterious process with roots in the deep past. Jared Diamond (author of *Guns, Germs and Steel*, 1997) has argued that the fundamental reason the "West got rich", and other nations did not, is that the superior bio-geographic endowment of Western Eurasia (its great number of indigenous, domesticable plants and animals) allowed its Neolithic transition from hunting and gathering to agriculture to be millennia earlier than elsewhere. The long, slow process of economic development had a head-start in the West, which eventually led to its early embrace of the liberal political institutions that allowed people to amass riches. Where does Japan fit in this narrative?

All the countries that, like Japan, have today achieved a high standard of living, experienced at some point in their history the beginning of a process called "modern economic growth" - a sustained rise in the standard of living made possible by the continual application of scientific advances to the technology of production. This was first noted, and named, by the economist Simon Kuznets, Nobel laureate and originator of the principles of national income and product accounting that measure the economic performance of countries (Kuznets, 1971).

The first country to experience modern economic growth was Britain, beginning with the Industrial Revolution of the late 18th century. Japan began to experience modern economic growth in the late 19th century, 100 years later than Britain. The Table 1 shows some facts about the beginning of modern economic growth in Japan and other countries, listed in order from the most recent to the earliest. Japan used to be called a "late developer" - it is the first country listed in the table.

Why did the process of modern economic growth begin when it did in Japan? The precipitating event was the 1868 Meiji Restoration that ended the Tokugawa regime which had prevailed for more than two centuries. The Meiji oligarchs quickly set about dismantling the Tokugawa political and economic controls. Those changes had the effect of further opening Japan to trade and communication with other countries in the world. It also freed people in Japan to trade among themselves and choose their occupations and move about freely, as well as engage in private economic activity, free of government interference and the constraints that had been there during the Tokugawa period. But the sustained economic growth triggered by the Meiji era "revolution of markets" was also rooted in a long, mysterious process of economic development that preceded the Meiji era. Japan at the end of the Tokugawa period, although isolated from the new technologies of the industrial

revolution, was economically advanced compared to many developing countries of today. It was ripe for modern economic growth.

The Tokugawa legacy

In the late 19th century, Japan experienced a revolution of markets, a freeing of the market forces that had been bottled up for the previous two centuries. That said, Japan in the late 19th century was ready for modern economic growth. The famous Harvard economic historian Alexander Gerschenkron argued that the process of economic development in Western countries followed some coherent patterns. The patterns were related to the degree of economic backwardness of the country at the time at which its modern economic growth began. Gerschenkron (1962) argued that some countries were more economically backward than others at the time of their first rapid growth. By economic backwardness, he meant a variety of different things. Indicators of economic backwardness include: low per capita output, small extent of urbanization, low degree of literacy, and absence of sophisticated business institutions and practices like double-entry accounting systems and wholesale markets. By these indicators, Japan by the end of the Tokugawa period, and before the Meiji Restoration and before the opening of Japan in 1858, was not economically backward.

The Table 1 shows, for example, the degree of urbanization and adult literacy in Japan, compared to other countries at the time of their initial modern economic growth. Japan was not economically backward. But Japan was technologically backward in 1868, the year of the Meiji Restoration. That technological backwardness was simply the result of Japan's isolation from the rest of the world. One of the observations of Simon Kuznets, the inventor of the idea of modern economic growth, is that all the nations that experienced their first modern economic growth were open to trade and communication with other countries. No country that was completely closed off from the outside world, experienced modern economic growth. That's not to say it could never happen, but historically, there were no examples.

Japan, as you probably know, was closed to the outside world from 1640 by order of the rulers of the country, except for a small concession in Nagasaki, a small island (Dejima, in Nagasaki harbor) where the Dutch were allowed to reside. Also, there were Chinese traders. Trade was very limited: one ship coming from the Netherlands every year or so. Some traders came from China, also. It was very much controlled by the government authorities. A few people in Japan knew what was going on in the world, but the wider effects of that on the way people lived their lives were limited.

Japan's isolation ended in the mid-19th century. It happened when America's warships came to Japan, demanding that Japan end its isolation and precipitating the start of negotiations between Japan and America. Japan concluded a treaty with five nations as trading partners. However, closure to foreign trade was not the only sort of closure of the country during the Tokugawa period.

Japan, under the regime of Tokugawa, had a caste system, where most of the people - 80% - were farmers. Samurai made up 7% of the population, and were a higher class than farmers. Below both of them, most of the remaining population

was classified as merchants, being the lowest, and artisans somewhere between farmers and merchants. However, you belonged to the caste that you were born into, and low-ranking samurai were sort of government bureaucrats of that period.

The samurai income was based on a tax system that depended on the amount of rice collected and redistributed. Many of the lower-ranking samurai were, of course, government functionaries. They had jobs to perform – duties of collecting and enforcing rice taxes. Under this kind of caste system, there were interferences with the choices people could make in their daily lives, occupations, where to live and what to do. The government under the Tokugawa has been described as feudal in the sense that the country was divided into separate units called *han*, where a kind of powerful samurai had some degree of autonomy. They had exclusive rights to collect rice taxes from people in their domain. Those *han* were like separate countries, with rules governing trade with other *han*, for example. Awarding monopoly rights for the production of selective goods and collecting fees to protect that interfered with trade, also.

With the political revolution culminating in the Meiji Restoration, a new oligarchy displaced the Tokugawa, and completely changed the system. Where before there had been many *han*, or separate countries within a broader country, prefectures were established as common units. The protectionist policies and interference with trade were abolished. For samurai, pensions were terminated. The rice taxes that previously had financed the income of 8% of the population, who were samurai, could now be diverted to other purposes. The old system of collecting the rice taxes in which farmers were assigned to particular villages and particular pieces of land and obliged to pay roughly 40% of whatever rice and crops they were growing there to samurai was abolished and replaced by a land tax. So now, for the first time, these people were legally recognized as having private land ownership. Farmers were free to move to different places to find their most advantageous occupations.

The changes following the Meiji Restoration freed people to pursue their own economic activities. That is why Japan's modern economic growth only began in the late 19th century and not earlier. However, Japan's economic development more resembles that of Britain than of the countries that Gerschenkron, the economic historian, identified as economically backward, like Russia.

We can understand that Japan of the Meiji period was and had been isolated from the rest of the world. Nevertheless, it was not economically backward. People were literate. Cities were large partly because of government policies requiring samurai families to stay in the capital, Edo, later renamed Tokyo. This made them quasi-hostages. Edo became a large city of samurai, consuming a great deal. At that time, Osaka became a city of merchants, also indirectly serving the nation. There evolved sophisticated market institutions like fractional-reserve banking, a futures market for rice, and wholesale networks. There were many ways in which the economy of the Tokugawa period, although constrained by the government, had evolved in a very sophisticated way.

There is more. The establishment of the Tokugawa regime in 1603 was the end to centuries of civil wars in Japan. It was the beginning of peace under these fairly heavy government constraints. The population of Japan grew rapidly. From 1600 to 1700, it grew from about 20 million to 30 million. People responded to the stability of the Tokugawa system. In particular, samurai leaders, who had the most

to gain from the expanding production of rice, were secure in their ability to tax and be active, reclaiming and establishing irrigated rice as the population expanded rapidly. But from 1700 to the mid-19th century, the population hardly changed at all. It stayed constantly at around 30 million. What happened?

The country reached the point of subsistence where the population could be supported with the technology of the time. There was also evidence of deliberate population control by a variety of different methods including delayed age marriage and so on. Population control was induced indirectly by the Tokugawa command and control scheme, including the caste system and other aspects, which contributed to the latent economic development of the country.

That is why people attained a degree of literacy that was relatively high for the time by the 1860s. Sophisticated market institutions of one kind or another evolved, requiring that villages take some kind of responsibility for managing their own affairs. How a village apportioned responsibility among its residents for remitting 40% of the village rice crop to the samurai was up to the village to decide. They worked things out. All these things made Japan a country that had developed reliable ways of doing things, given the standard of technology.

Meiji era "revolution of markets"

With the opening of Japan in the 19th century and the end of that regime of controls, the country began to experience modern economic growth. Gerschenkron's point about economic backwardness had an important conclusion. He argued that the countries that were the most economically backward yet did develop and experience modern economic growth did it only with some kind of active direction by a government or quasi-governmental units. So Britain, the least backward economically at the time of its industrial revolution, did not have central governmental direction or large banks managing companies. Industry was directed by private companies. France, which in Gerschenkron's analysis was slightly more backward and later to develop than England, had large banks that were active in lending. In Germany, still more backward and still later to develop, banks not only lent to private companies, but set them up and organized them. The most backward country to develop was Russia. The Tsarist government enterprises - in major industries like rail, steel and so on - were characteristic of Russia's modern economic growth.

The link between economic backwardness and the role of government has to do with things like whether there is trust in the market place: will loans be paid, is there a disciplined workforce that can be reliably employed and endeavor with long-term payoffs, can funds be raised from a wide range of people voluntarily? If it's an economically backward country, you cannot do that, because banks and companies could not be trusted or were not reliable. In this way, Gerschenkron argued, economic backwardness meant that if there was to be economic growth and development, it would require the government to tax people and set up more organized enterprises themselves. In less backward countries, some large enterprises such as those in Germany could do the same thing. But in the least economically backward countries, having private initiative in the market place was enough. This was Gerschenkron's thesis that seems to explain the experience of European countries.

Gerschenkron's student, Henry Rosovsky studied Meiji Japan to see if his thesis also applied to Japan. He found that it did, but only if you recognize that Japan in the 1860s was not economically backward (Rosovsky, 1966). Its process of development more closely resembles that of Britain than Russia. It was not economically backward because people were literate, organized, disciplined, skilled and sophisticated in many ways in institutions that facilitated market trade. It fits Gerschenkron's thesis because Japan's rapid growth in the Meiji period was not a result of government enterprise, government directed investment, or control of industry by large banks. Cotton spinning was one example of growth that did not result from government enterprise. Russia in the 19th century never had the financers and joint stock companies with many small shareholders. So Rosovsky argued that Japan's economic growth fits Gerschenkron's thesis. Japan's economy, which was not economically backward at the time, experienced modern economic growth without active direction by the government. And Japan's absence of economic backwardness was not itself the result of any particular government policy. It reflects the long history of the nation, even predating the Tokugawa period.

Japan's postwar recovery - return to steady-state growth

With modern economic growth comes industrialization. The growth of manufacturing in Japan was gradual but persistent, surpassing agriculture only around 1930 or so. Agriculture too, was growing over this time. As shown in Figure 1, the real gross national product of Japan grew persistently from 1885 to 2000, through the first part of the 20th century. If you extend this back before these data, you see that the same process could not have been going on long before 1885. Japan began modern economic growth in the 19th century. There was a big valley: the Second World War. Then, following the war, there was more rapid growth and a sort of leveling off a bit around the mid-1970s.

For six years and eight months after the war, the government of Japan was completely subservient to that of the United States. This was the period of the American Occupation. The Americans drafted a new constitution that permanently established democracy, dissolved the zaibatsu, redistributed agricultural land, and enacted laws legitimizing labor unions.

Additionally, the Americans allowed or directed the continuation of wartime price controls and rationing, embargoes on foreign trade, and inflation-financed subsidies of industrial firms. Japan's postwar recovery did not begin until these disastrous policies were suspended as part of America's "reverse course" from a punitive toward a reconstructive Japan policy, beginning in 1949. The rapid economic growth of the Japanese economy, from this time until the mid-1970s, is a triumph of unfettered capitalism. The ongoing process of saving and investment eventually restored the stock of wealth that Japan had dissipated in the war.

The economy follows a steady-state path. Growth in Gross National Product is partly a reflection of the accumulation of capital stock, which means buildings, machines and tools. Japan's capital stock was essentially destroyed during the Second World War, but was rapidly replaced. Japan experienced a very rapid recovery from the war. By 1956, the gross national product of Japan retained its pre-war level of the 1938 high. That was not the end of the recovery. You could say it

was not the end because it was not yet a return to the path projected from pre-war times. Japan did not fully recover until 1964 or so, when it reached the old steady state path. In the year of the Tokyo Olympics, Japan rejoined the world community somehow. Its recovery from the war was somehow complete. Nevertheless, Japan's economy still kept growing, surpassing the pre-war path and continuing for another 10 years to the mid-1970s to reach a higher path than before the war.

There are questions about why the path of Japan's growth was higher after the war than before the war. One reason was a higher savings rate. Japan was accumulating wealth more rapidly and accumulated a larger capital stock after the war than before, partly because of the demographic profile of the country. Saving in the country is a result of the fact that young people are working, saving for their future retirement. Because it has relatively more working people, those who retire from work have higher savings. They are drawing from their wealth to continue with their lives. A country with more young people saves more, as long as they are secure that in the future they will be allowed to enjoy the fruits of that sacrifice. That's another element of the higher savings rate, I suppose, after the war. Security of the future raises the rate of savings.

However, there is a point that is somehow more important than that. Table 2 shows the growth in population and in real GNP and growth in real GNP per person, 1885-2000. Now, an economy grows when it accumulates capital and its labor force is expanding. So, if it has more workers that are better equipped with tools, it can produce more. However, that's not the only source of economic growth. In fact, it's not even the most important. Growth in labor and capital are not the most important factors for economic growth. Knowledge is the most important.

An economy will grow as its productive resources expand including labor, but the standard of living only rises when labor become more productive. The fact that GNP per person has steadily risen is an indication of the technological advance over the last century in Japan and prior to that. It was very persistent. The population growth of the last 100 years is about 1% a year, but GNP per person has grown 3% per year. That 3% per year increased the standard of living, if I can put it that way. It has a very powerful effect. There is what is sometimes called the "Rule of 72." It is a useful rule of thumb. It says if anything is growing at a certain percentage per year, like in this case 3% per year growth of GNP, divide 72 by that number, 3. That's a good approximation of the number of years that it will take for growth to double. If something is growing by 3% per year, and you divide 72 by 3, you get 24 years. That's four times in a century. Doubling four times is a 16-fold increase of the standard of living. That 3% per year is enormous.

That cannot be attributed to the accumulation of buildings, machines and tools. That's improvement in knowledge of how to use these things and how to apply human effort. Knowledge is the key to economic growth. It dwarfs everything else. And those are things like the business cycle, periodic financial crises that seem to inflict countries like the United States and Japan. They are small compared to this 3% per year. The Nobel Laureate economist, Robert Lucas once argued convincingly that if you wave a magic wand and completely eliminate the business cycle, you could completely eliminate recession and financial crises. But that might be equivalent to a one-time GDP increase of 1% forever. Technological advancement has been raising Japan's

GDP by about 3% per year for the last 100 years, so compared to addressing the business cycle, technological advancement is huge.

Conclusion

Japan has flourished because its people are free to pursue their own happiness and because preceding generations of Japanese have begotten to the present one a social and political framework that allows ample exploitation of the gains from trade. This legacy of the past is the result of a long, mysterious process, obscured by the passage of time. Yet its fruits are visible all around in Japan today.

Japan's economy today is largely free of government direction. Its various peculiar practices and institutions such as the lifetime employment system of its big companies, its myriad of small stores and complex wholesaling channels, its bank-centered financial system, and industrial groups all reflect the work of market forces. All of this is described in my book *The Japanese Economy*, which I invite you all to read.

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Table 2.1. Conditions at the start of modern economic growth, Japan and selected other nations

	First 50 years of modern economic growth [a]	Per capita GNP in first year of modern economic growth [b]	Adult illiteracy near the start of modern economic growth		Urbanization near the start of modern economic growth [e]		Annual average growth rate in real per capita GNP in first 50 years of modern economic growth [b]
		(1985 US$)	(%)		(%)		(%)
Japan	1886–1936	738	50[c]	1890	13.1	1887/90	1.8
Canada	1870–1920	1,347	n.a.		18.8	1871	1.7
Denmark	1865–1915	1,461	< 30[d]	1850	13.8	1860	1.2
Norway	1865–1915	1,148	< 30[d]	1850	5.3	1845	1.3
Australia	1861–1911	2,954	n.a.		22.1	1861	0.8
Italy	1861–1911	1,153	75–80[d]	1886	25.2	1861	1.1
Sweden	1861–1911	1,110	10[d]	1850	7.6	1860	1.5
Germany	1850–1990	1,050	< 30[d]	1850	26.8	1849	1.4
USA	1840–1890	1,461	n.a.		8.5	1840	1.5
Belgium	1830–1880	1,053	51[d]	1843	5.4	1846	1.6
France	1830–1880	1,077	53[d]	1832	11.2	1836	1.0
Great Britain	1780–1830	1,210	46[d]	1800	21.3	1801	0.4

a. Dating of modern growth phase based on Simon Kuznets, *Economic growth of Nations: Total Output and Production Structure*, Harvard University Press, 1971, p. 24, table 2; and Ryoshin Minami, *The Economic Development of Japan: A Quantitative Study*, London: Macmillian, 1986, table 1.1, p. 13.

b. GNP(based on International Comparison Project estimates for 1985 projected into the past) and population from Angus Maddison, *Dynamic Forces in Capitalist Development*, Oxford University Press, 1991, appendices A and B.

c. Japanese illiteracy rates from Koji Taira, "Education and Literacy in Meiji Japan", *Explorations in Economic History*, vol. 8 (July 1971), pp. 371–94, at p. 377.

d. Adult illiteracy rates of European countries based on Carlo M. Cipolla, *Literacy and Development in the West*, Harmondsworth, Middx (UK): Penguin, 1969: Denmark, Norway, and Germany, table 23, pp. 113–14; Sweden and Italy, table 24, p. 115; Belgium and France, table 25, p. 117. (illiterates among army recruits); Great Britain, p. 62 (% newly married persons unable to sign their names).

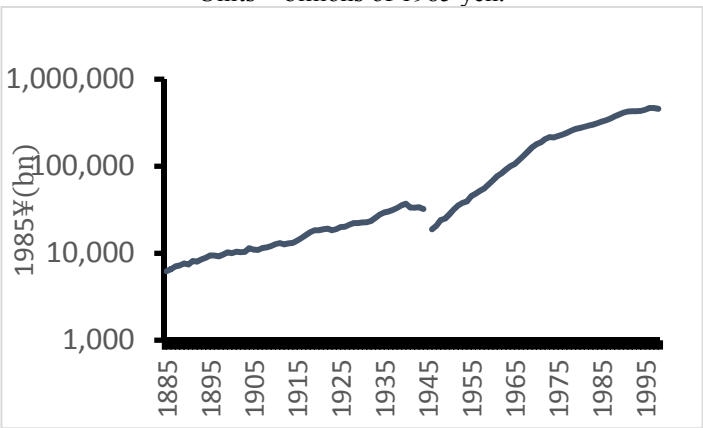
e. Urbanization rates (% of population residing in cities of 10,000 inhabitants or more, except where otherwise noted) from Adna F. Weber,*The Growth of Cities in the Nineteenth Century; A Study in Statistics*, New York: Macmillan (for Columbia University), 1899: Japan, p. 129; Canada (cities larger than 1,500), p. 130; Denmark, p. 113; Norway, p. 112; Australia (capital cities), p. 139; Italy (cities larger than 6,000), p. 118; Sweden, p. 119; Germany (Prussia), p. 82; USA (cities larger than 8,000), p. 22; Belgium, p. 116; France, p. 71; Great Britain (England and Wales), p. 43.

Table 4-1. Average annual growth rates in real GNP and population, Japan, 1885-2000.

Years	Annual growth rate of real GNP[a]	Annual growth rate of population*	Difference= annual growth rate in per capita real GNP
1885-1895	4.25%	0.82%	3.43%
1895-1905	1.54%	1.16%	0.38%
1905-1915	2.43%	1.24%	1.19%
1915-1925	3.67%	1.25%	2.42%
1925-1935	3.91%	1.49%	2.42%
1885-1935	**3.15%**	**1.19%**	**1.96%**
1935-1946	-4.89%	0.82%	-5.71%
1946-1955	10.56%	1.84%	8.72%
1955-1965	9.51%	0.96%	8.55%
1935-1965	**4.38%**	**1.17%**	**3.21%**
1965-1975	7.85%	1.31%	6.54%
1975-1985	4.41%	0.78%	3.63%
1985-1995	2.97%	0.39%	2.58%
1995-2000	0.83%	0.22%	0.62%
1885-2000	**3.82%**	**1.05%**	**2.77%**

*Government of Japan, *nihon tōkei nenkan* (statistical yearbook of Japan).

Figure 4-1. Real gross national product of Japan, 1885-2000.
Units = billions of 1985 yen.



Sources: 1885-1954: Ohkawa and Shinohara, Patterns, nominal GNP (1885-1940): Table A1. pp. 251-253, and (1941-1954): Table A8, pp.269-270; GNP deflator (1885-1940): Table A50, pp. 387-388, and (1940-1954): Table A51, p. 389. 1955-2000: Cabinet office, 1968 sna.Figures are on a calendar year basis, 1885-1944, and a fiscal year basis 1946-2000. Note that the Ohkawa and Shinohara GNP deflator, 1941-1954, differs somewhat from that reported by the Japanese government. In linking the prewar and postwar GNP deflator I have preserved the Ohkawa and Shinohara estimate of annual percentage increase in real GNP 1954-1955.