SIE 2015
6th International Symposium on Industrial Engineering
24th-25th September 2015
FACULTY OF MECHANICAL ENGINEERING
STEINBEIS ADVANCED RISK TECHNOLOGIES
INNOVATION CENTER FME

RE-INDUSTRIALISATION OR THE ROAD THAT MUST BE TRAVELLED

Slobodan Pokrajac[1], Nikola Dondur[1], Sonja Josipovic[1]
[1]Faculty of Mechanical Engineering, University of Belgrade, Serbia

Abstract. *The aim of this paper is to affirm re-industrialisation by strengthening innovation in industry, but wider as well, as the form of new business and developmental culture. Our starting point is that all innovations are welcomed, first of all technological. Hence, we should create the setting in which creative energy of all citizens of our society will be (re)generated and mostly focused towards industry, since it provides the best conditions to materialise innovation in the new (exchange) products and processes. This must be done selectively, first in the sectors where there are best technical, technological, staff, financial and market conditions, and then this should spread to other production sectors as well.*

Key words: *industry, re-industrialisation, innovations, industrial policy, EU*

1.INTRODUCTION

The term re-industrialisation refers to a number of initiatives and programmes for economic and production development of the areas affected by the industrial and socio-economic crisis. Now, more than ever, both Serbia and Europe need their real economy to support growth and the opening of workplaces once againin the new phase of re-industrialisation. Industry still has a strong stimulating effect on the entire economy. There are estimates that a hundred new workplaces in the industrial sector would open up additional one hundred workplaces in other branches of economy. Re-industrialisation has become the centre of attention of the European Union and all other advanced economies as well. In its Communication on the European Industrial Renaissance adopted on 22nd January, 2014, the European Commission called upon all member countries to recognise the vital importance of industry in creating new workplaces and growth, and systematically include the issues connected with competition into all policy areas.[1]

All this speaks in favour of the argument that national states should initially help their economy, especially in the research and development sector (R&D), since the expansion and pace of the whole process of re-industrialisation depends on the efficiency of innovative work. Hence, our primary starting point is that, in Serbia, in spite of the brain drain, there is still enough creative potential, and that the state, not the free market, can and must provide strong support to re-industrialisation. Global and European experiences, in the years of the largest and so far longest world economic crisis, have become an additional inspiration for arguing that the process of revitalisation of the national economy has to start from industry itself.

In our paper, we will endeavour to show that re-industrialisation is not an aim "in itself", but always and just the means for strengthening the whole economic foundation of our society, increasing employment and competitiveness of economy, with industry as its driving power. In addition, we have started from the premise that this is only possible by using the new knowledge and new technologies, i.e. **innovation**. Industry has been selected as the focal point not only because it is the branch in which various innovations (technological, organisational, managing etc.) are created and implemented fastest, but also because our country has already had many developed industrial branches and companies with high global reputation, conquered markets and business reputation. Meanwhile, we went through a period of unprecedented de-industrialisation and catastrophic deterioration of industry. The causes were numerous: poorly implemented privatisation process, physical devastation caused by air-raids, technological obsolescence, economic sanctions etc. However, it is still out belief that there is hope for industry, which implies that much can be done for

[1]http://ec.europa.eu/enterprise/initiatives/mission-growth/index_en.html

the whole economy sector in Serbia if we start from theselectiverevitalisation of our industry. We should begin with those branches where human resources were preserved, i.e. knowledge and creative capital, as well as the markets, especially the foreign ones. This implies that it is neither possible nor necessary to revitalise everything we used to have, but thatcertain production capacities should still be preserved (machine-building industry, textile industry, food industry, certain sectors of chemical and pharmaceutical industry, certain sectors of electrical industry, military industry et al.).

It is with this respect that the term **re-industrialisation** has been coined, used in this paper as the*terminus technicus*. It encompasses numerous measures, means, methods, policies, participants,all aimed at revitalising industry (some of its chosen sectors). It does not advocate "going back to the past", but instead promotes a strategy of selective industrial modernisation and revitalisation at the same time. By recovering one industry sector, there will be created realistic conditions for gradual recovery (and modernisation) of other sectors in the next phase, and then the next ones etc. This kind of approach, which is a segmental, phase, step-by-step approach (but implemented in every region simultaneously, so that there are many steps and many realised projects at the same time), regardless of its being slow and long-lasting at this moment of raging financial crisis, serious deficit of human resources, impoverished research and development sector, lost export markets and other limitations, seems the only realistic and the only autonomous way of coping with the developmental bog of the current de-industrialisation. At the same time, it relativises the overly high expectations from foreign investments, the so-called strategic partnerships and similar models that inevitably lead towards new massive borrowing, unemployment, lack of research and other effects that turn "our" industry and its capacities into a foreign one. Insatiable passion for selling, along with problematic analyses that seemingly justify this, impose the following question: is it worthwhile for the buyers to buy what we are offering?

In the developed parts of the world, especially in America and Europe, re-industrialisation implies an ambitious plan of building modern and sophisticated, ecologically responsible and energy efficient industries that hire highly trained staff and have the support of top universities. The driving force of change is not the market but the state, which should create the new industrial "state of mind" which implies the new distribution of tasks and fruits of labour among the government, trade unions and employees. The small countries have to settle for harsh conditions and changeable mood of big investors. Serbia and its concept of reforms havedefinitely confirmed this.

2.INDUSTRY HAS NO ALTERNATIVE

We simply cannot do without industry, in its standard meaning [2]. It secures well-paying jobs, commercial innovations; it is a key factor in reducing deficit and strongly contributes to ecological sustainability: it also has the largest potential for sustaining or expanding employment. This is the beginning of the Metropolitan Policy Program, a very important and widely based initiative for revitalisation of the American industry, published in February 2012 bythe Brookings Institution, one of the most respected and most influential American institutes. Almost at the same time, the EU Directorate for Research has started the New Growth Path in Europe andinitiated a grandiose research project focused on the new pattern of economic growth,with the revitalisation of industry as the main goal.

Industry has to become the centre of attention if Europe wishes to remain the global economic leader. The document *Europe 2020* has established a strategy aimed at fostering growth and new workplaces through sustaining and supporting strong, various and competitive industrial basis in Europe that offers high-paying jobs, at the same time becoming less polluting.

Today, Germany creates the lion's share (31%) of industrial value added in the EU. A long way behind comes Italy with a share of 13%, then France with 10%, the UK with 10% and Spain with 7%. In terms of internal value creation structure there are marked differences between the individual countries. In 2012 the industrial share was 23% in Ireland, 22% in

[2]This note bears special relevance since it should point towards some conceptual distinctions. It especially refers to the phrase "creative industry" as the concept that has been used in the Western economic and sociological literature for the past 15-20 years and refers to a wide range of indubitably creative human activities, such as: media industry, publishing, entertainment, marketing, art, museum activities etc., but not to the real industrial sector, which is the focus of attention in this paper. The inappropriate use of the term "industry" creates a terminological confusion in our language, since the traditional meaning of the term"industry" is also wrongly associated with the above-mentioned areas, as well as with other work fields that are lucrative and bring profit (banking industry, tourist industry, entertainment industry…). In our opinion, this is unacceptable and therefore we advocate the understanding of industry as a particular form of productive work, both technologically and organisationally speaking, which creates material goods with a recognisable value in use (food, clothes, means for work, energy, transport means, apartments, medicine etc.). It is clear that the "creative industry" sector is also very important for the entire economic and social life, as well as for industry in its primary meaning, especially for the manufacturing industry, but, in our opinion, it still cannot be treated as the field of classic industry. For more details, see: R. Florida, *The Rise of the Creative Class,* New York, Basic Books, 2002.

Germany, 16% in Italy, 13% in Spain, 11% in the UK and 10% in both Greece and France [1].

All this speaks in favour of the argument that market logic cannot produce the new paradigm, patterns and direction of changes, but that this must be done by the state (and the EU) through subsidies, loans or infrastructure. Therefore, we should not ask whether the state should do it, but how the state should do it. The renowned Harvard economist DaniRodrik argues that industrial policy is a 'state of mind' rather than a series of specific actions.

Industrial production that is the foundation of modern civilisation has no limitations and the most developed countries today are those that have a developed manufacturing industry. Although service sector accounts for 50% of gross domestic product in the majority of countries today, it is important to know that most of these services are directly or indirectly related to industry. The growth of industrial production increases theneed for production inputs (raw materials, semi-manufactured goods, energy, workers) and the transport of goods to the customers, which directly increases the demand for transport services, and, in turn, increase in these services makes higher the demand for transport vehicles, warehouses etc. The importance of manufacturing industry has been confirmed additionally and yet again by the current global financial and economic crisis. The struggle to alleviate the crisis and revitalise the economy is basically reduced to preserving domestic production and workplaces in the manufacturing industry. Consequently, the salvation of banking sector has mostly been in order to preserve domestic production and employment.

When it comes to Serbia, the process of de-industrialisation, i.e. the weakening and "destruction" of industry has been going on intensively for over twenty years, causing large damage to the entire economy and the entire society. Among other things, the process has led to the following:

- high reduction ofthe number of employees in industry and the accompanying fields,
- increase in the trade deficit – due to the increase in imports and lowered export capacities,
- the loss and obsolescence of the knowledge necessary to create new products,
- the lack of ability of scientific institutions to produce results useful for the development of the society,
- reducing economy to the colonial position with respect to the multinational companies and creating illusions about life-saving foreign investments,
- the change of the value system of the society – where production and industrial knowledge are appreciated less and less,
- jeopardising the economic and increasingly even the political sovereignty of the Republic of Serbia.

3. STATE'S RESPONSIBILITY FOR RE-INDUSTRIALISATION

De-industrialisation has mostly been the consequence of leaving the national economy to the "invisible hand" of the market in the situation when all clever countries have clear industrial policies and goals. As a matter of fact, industrial policy can create the missing conditions and elements for an efficient, competitive and profitable production in the areas where there is a "critical" number of other conditions. The above-mentioned very influential advocate of industrial policy, DaniRodrik, has stated that "industrial policy can be viewed as a coordination device to stimulate socially profitable investments" [7].Neither the invisible hand nor the private entrepreneurs can replace the role of industrial policy, and this cannot be their role either. Active industrial policy that will be harmonised with regional, educational, technological, financial, monetary and other policies is the foundation of economic growth and social development. The main feature of the development should be the change of structure – the process of taking economic resources from the traditional low-productive branches and transferringthem to the modern industrial branches based on knowledge and cutting-edge technologies. This process cannot be automatic and asks for much more than good market functioning. These facts shed new light on the importance of the factor of innovations and technological modernisation in general, as the condition for preserving successful business functioning and competitiveness. The experiences of numerous countries have shown that all this can be possible if clear developmental goals and the agents of their accomplishment are defined, as well as the deadlines.

The current economic crisis (no economic crisis has ever lasted so long, this one has been going on since 2008) has confirmed the importance of industry for economic stability, employment, innovations, as well as for international success of European economies. The industry accounts for over 80% of European exports and 80% of the innovation sector and private research. Around 15% of workplaces in the EU belong to industry, and, additionally, every workplace in industry creates 1.5 to 2 workplaces in other sectors. Furthermore, industry jobs nowadays are high-quality jobs with an above-average payment. Industry itself is not the goal but a means of employment and preserving a high standard of living and quality of life. If innovations are the key incentive to economic growth, entrepreneurs are the synonym for innovations – which implies that there is no better moment for entrepreneurs' action than the time of crisis. It may sound shocking and illogical, but stepping out into something new, unknown, risky, but at the same time both challenging and potentially extremely profitable, definitely reflects a high measure of entrepreneurs' courage. Hence, it is time to set out resolutely.

For successful innovation, at least three key elements must be provided:

1. there have to exist the technologies that will enable the realisation of innovative ideas,
2. there has to be the need, that is, the market, i.e. people who are ready to use or buy the innovation, and
3. there have to exist the possibilities for transforming the innovative idea from the available technological components into a usable product or service.

In this process, we must avoid the so-called "European paradox", i.e. the fact that Europe is at the very top of scientific achievements, but lags behind in economic growth, i.e. that high science does not automatically produce either new technologies or economic growth. Therefore, we need an *innovation policy* starting from the tenet that R&D is the necessary but not a sufficient condition for the development of technological changes. Hence, it is necessary to replace the linear model of innovations on which scientific policy is based. In addition, the neo-classical model of growth must be replaced with an **interactive model of innovations**. According to this model, innovation can occur in any of the five phases of an innovation cycle (discovery, research market, design and testing, redesign and manufacturing, distribution), and does not necessarily include scientific research.

4. CONCLUSION

This paper has shown that Serbia must vigorously and urgently revitalise and strengthen the production sector of economy, by focusing on the world of labour and quality production intended for export. It must rely primarily on its own growth sources, activate domestic savings (deposits in banks over ten billion euros and a couple of billions more in home depots) and reduce the burden of overpriced foreign loans that often imply acceptance of humiliating conditions of foreign investors and creditors. A similar model of *endogenic growth* was implemented by some Asian countries several decades ago, and it has provided astounding economic results today.

As the most organised and the most powerful social institution, the state has been analysed not only as a catalyst of the re-industrialisation process, but also as a very active, and even the most responsible participant in re-industrialisation. After all, the state does bear the biggest responsibility for a tragic, expensive and harmful de-industrialisation. Furthermore, following an example of good practice of all countries of the European Union, our country should also create and implement active industrial policy. Serbia must create its own model of industrial policy in such a way as to take into account some of the facts that refer to joint EU industrial policies, especially the ones referring to the strategy Europe in 2020. As an EU candidate country, Serbia must pay attention to the fact whether joint industrial policy has become a vital part of the strategy of the sustainable development of industry and the politics of re-industrialisation explicitly advocated by the EU. This would clearly indicate that industry is a source of development and progress of the EU since it contributes most to the growth of productivity of all economy sectors.

REFERENCES

1. *Europe's re-industrialisation: The gulf between aspiration and reality,* EU Monitor European integration, November, 2013
2. Fitzgerald, E.,Wankerl, A., Schramm, C., (2010*), Inside Real Innovation: How the Right Approach Can Move Ideas from R&D to Market — And Get the Economy Moving*, Imperial College Press, London
3. Florida, R.,*The Rise of the Creative Class,* New York, Basic Books, 2002
4. Josipović, S., Pokrajac, S., Dondur, N., D. Belović, *Иновације као кључни фактор привредно граста и развоја Србије [Innovations as the key factor of economic growth and development],* ЦД РОМ са Конференције ЈУПИТЕР, Машински факултет у Београду, окт. 2014.
5. Петровић, П., *Четврти талас индустријализације: технолошка димензија и будућност коју не можемо да занемаримо [The fourth wave of industrialization: the technological dimension and the future that we can not overlook]*, Зборник "Могуће стратегије развоја Србије", САНУ, Београд, 2014
6. Покрајац, С., *Реиндустријализација и предузетништво као путеви и начини опоравка српске привреде [Re-industrialization and entrepreneurship as the paths and the means of revitalization of Serbian economy],*Зборник „Могуће стратегије развоја Србије", САНУ, Београд, 2014., стр. 673-684
7. Rodrik, D., (2007), *One economics, many recipes: globalization, institutions, and economic growth*, Princeton University Press
8. Rodrik, Dani, (2009),*Normalizing Industrial Policy*, John F. Kennedy School of Government, Harvard University
9. Tidd, J., Bessant, J., (2009), *Managing innovation: Integrating Technological Market and Organizational Change*, 4E, John Wiley & Sons
10. Zoltan J. Acs and Wim Naudé, *Entrepreneurship, Stages of Development, and Industrialization,* UNU-WIDER, Working Paper No. 2011/80, November 2011