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“Made in China 2025”: China experience in Industry 4.0

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Abstract. Considering the complexities of the global economic development the leading industrially developed countries approached a consensus in keeping the global economy stable. The latter requires widening the economic collaboration at the global level. China being one of the largest industrial countries in the world declared a new economic initiative “Made in China 2025”. This initiative is aimed to transform the traditional opinion on China as a “global factory” and provide it with a new image – “smart advanced production”. This article is devoted to a thorough analysis of Program “Made in China 2025”, its historical conditions of establishment and implementations prospective. Here it is demonstrated that the program “Made in China 2025” is a new bearing governmental strategy in the national economy which is systematic and aimed to increase the competitiveness of the Chinese economy. It is mentioned that its introduction required solving the following tasks: organic integration of “conventional” and “modern” sectors of Chinese economy; upgrade and optimization of managerial structure of enterprises; development of Chinese industrial standards considering global requirements.

1. Introduction

1.1. Relevance

In the recent decade the world undergoes a new technological revolution and major changes in industrial sectors of economy. Countries charted a course not only toward preserving the global stability but to promoting the economic growth in prospective by setting new reference points in industrial development. The developed countries are developing new strategies in reindustrialization and the developing countries are aiming to speed up and perfect industrialization processes. Development of new long-term economy projects become an important component in China development.

1.2. Subject of study

The economy strategy of China and declared in 2015 governmental target-oriented economic program “Made in China 2025”. Analysis of program tasks. First of all, to eliminate any obstructions for advanced technologies to transfer from developed countries and for development of local innovative industry in China. Secondly, to strengthen its positions as a production country – “global factory”, to increase foreign investments by widening “Reform and openness” policy in most industrial sectors. Thirdly, to simplify documenting and administrative procedures in developing industrial and innovative enterprises and concluding economy agreements.



1.3. Problem definition.

Today there is a tendency of draining foreign investments from China. There occurred a new tendency to transfer production capacities to other countries with relatively low cost of labor. In particular to South and South-Eastern Asia countries such as India, Sri-Lanka, Bangladesh, Vietnam, Philippines, Indonesia. Promotion of a new governmental economy policy “Made in China 2025” has a strategic meaning to transform the Chinese industry and its “quantity-quality” transfer.

1.4. Purpose of study.

To analyze the necessity to develop a new governmental economy program “Made in China 2025” being one of the key factors to stimulate the economy growth of the country. To provide a thorough analysis of Chinese program for a wide range of interested parties.

2. “Made in China 2025” program idea, mechanism and prospective

The program document “Made in China 2025” was published in 2015 on the official site of the Chinese Government [1]. Publication of this document meant that China on a higher level has determined its social and economic development program several decades ahead. Development of industrial sector in the country became the priority direction.

China is not the pioneer in developing its own new industrial initiative pursuant to a quickly changing economic situation and high global competition level. In 2013 the German government decided to introduce a project “Industry 4.0” that contributed to development of the newest technological revolution at the global level [2].

The main component of “Made in China 2025” Program is a compilation of modern informatization and industrialization on the basis of which China has developed ten-year development plan. The plan considers implementation of governmental production strategy in three stages. Stage 1 – till 2025. China shall join the ranks of strong industrial countries. Stage 2 – till 2035. The total capacity of Chinese industrial production shall approach the mean level of the leading global countries. Stage 3 – till 2049 that is 100th anniversary of PRC establishment. The economy power of the country will take the leading position among the major industrial countries of the world. Therefore “Made in China 2025” program is the basis for a further economic development of the country.

The following ten science-intensive and cross-disciplinary industries where China has a vivid advantage were selected as priority development directions. First: new generation information technology industry (integrated circuits, operating systems, software): Second: the highest class smart equipment (numerical control machines, robotic technologies). Third: aerospace equipment. Fourth: engineering oceanography tools and equipment, high technology shipbuilding. Fifth: advanced railway transport technologies. Sixth: energy conservation technologies in automotive industry. Seventh: electric power mechanic engineering. Eighth: agricultural mechanic engineering. Ninth: new materials. Tenth: biomedical and high efficiency medical equipment [1].

From our point of view “Made in China 2025” program has several crucial aspects for long-term economic development of the country. Firstly, the program enables the entrepreneurs to transform their production into upgraded one standing on science-driven technological innovations. This direction is actively supported by the government of the country for new inventions and developments in industrial production [3]. Secondly, considering the growth of high technology production they will push off low technology sectors from Chinese industry. Change of technological priorities will contribute to establishment of highly competitive Chinese industry at the global market [4]. Development of new retail samples of high quality as well as environment-friendly products will contribute to resolving ecology issues in many regions of China.

3. “Made in China 2025” program prerequisites of development and approval

Currently China is the second largest country in the world considering the economic power coming second only to the USA. But in spite of that development of industrial policy and level of development

of some key industrial sectors are behind the ones of the leading global countries from the economical point of view.

3.1. Conditions of establishment.

“Made in China 2025” program as an integrated national innovative and industrial policy has a centralizing and strategic meaning and the conditions of its establishment can be groups as follows:

3.1.1. International situation

The market consumption decreases because of collapse of financial markets and as a result of global economy crisis 2008. These events caused cardinal changes in the economy policy of some countries. The developed industrial countries started reforming the industrial production system that means they launched reindustrialization [5].

The international industrial structure is currently in frequent changing and difficultly forecasted state. Considering the global economic decrease there are some serious geopolitical complexities in Europe and in the United States of America.

As for Europe the fact that the UK leaves the EU will contribute to split of European economy. Additionally an issue of humanitarian crisis caused by massive influxes of refugees from MEA needs resolving. Some countries of the EU have different opinions not coordinated with joint European opinion on this issue. All this creates conditions to establish a more complex and unpredictable European economic integration.

As for the US, then, first of all, it should be noted the possible manifestation of trade protectionism caused by the policy of the new US administration. Chinese-American trade relations have mutually complimentary nature. For many years China accepts American labor-intensive industries with low added value. In its turn the USA mostly exports technologically advanced manufactured products to China [6]. Today these two countries face serious trade problems between each other [7]. They are related in particular to customs rates on import and export of some products, currency exchange rates, increase of American investments for financial and economic activity on the territory of China, licensing of Chinese high technology companies in the USA to trade technological developments.

In such a situation China shall speed up the industrial transformation and renewal to develop the technologies independent from other countries. In this regard a new integrated policy considering the global tendency of social and economic development requires development and promotion. [8]. In this case China can borrow international practices to its innovative activity in technology industry [9].

3.1.2. Industrial system reform

The industrial structure in China has been upgraded and optimized for the recent several decades. The production capacities are great and the production volumes are enormous. But judging by products the level of its production, the industry added value and its competitiveness level at the global market occur to be lower compared to other major production countries [10, 11]. On the other hand the large part of Chinese industry is still occupied by OEM production and processing sectors.

China faces a challenge to find solutions to some crucial issues in the economy sphere: constant increase of labor costs, misbalance between offer and demand of land and raw material resources, lower demand for export products [12, 13].

Equally important is the issue of transfer of foreign enterprises of labor-intensive and consumer goods manufacture from continental China to countries of South and South-Eastern Asia considering relatively favorable conditions on production arrangement.

3.1.3. Assistance to innovative activity

It is necessary to create acceptable conditions to support innovative activity and to protect intellectual property in China [14]. For many years of industrialization aimed to implement “Reform and Openness” economy policy the industrial capacity of the country grows due to general amount of

production [15, 16]. But there is a problem in Chinese high technology production with higher added value but partially depending on import.

Considering increased trade protectionism on the part of economically developed countries many industries in China face some difficulties [17]. Iron and steel industry as well as power industry face superabundance of production capacity. Many traditional Chinese industries use power resources not efficiently that results in environment pollution in many industrial regions of the country [18].

3.1.4. Demographic issue

Fast growth of Chinese economy is mainly determined by availability of low-cost labor resources [19]. According to “Lewis turning point” in the nearest future China may face the issue of lack of low cost labor which came from countryside [20]. Social and economic development of China resulted in abrupt economic stratification of society. As a part of “Made in China 2025” China shall resolve the issue of fare distribution of profits.

To resolve the above mentioned issues the Chinese Government suggested the idea “New normality of the Chinese economy” [13]. On the basis of this idea the program “Supply-side structural reform” was developed in 2016 [21]. It includes several key tasks: structural industry changes, promoting development of production through innovations, urban and countryside construction, agricultural renewal, industrial development in backward regions, “Internet plus”, “Internet of things”, mass innovative and entrepreneurial activity, Chinese yuan internationalization, Belt and Road initiative promotion and much more [22].

4. Conclusions

“Made in China 2025” program is a new reference governmental strategy in the national economy. It is systematic aimed to increase the competitive level of Chinese economy [23]. Its introduction requires solving the following tasks: organic integration of “conventional” and “modern” sectors of Chinese economy; upgrade and optimization of managerial structure of enterprises; development of Chinese industrial standards considering global rules [24, 25].

From our point of view the implementation of “Made in China 2015” Program requires to develop the exemplary industrial zones of advanced production based on ten priority directions indicated above [17]. These zones should be established in economically dynamic regions of China which provide favorable conditions for innovation activity and are based on highly qualified staff and have wide work cooperation experience with foreign investments and technologies.

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