



Bank of Russia

The Central Bank of the Russian Federation

Exchange rate and competitiveness of the economy

Analytical Note
Research and Forecasting Department
The Bank of Russia

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Summary

This policy brief examines the impact the national currency has on quality of life and on the structure of the economy. In particular, the effects on the economy of depreciation or undervaluation of the national currency (as a result of macroeconomic shocks or policies) are analysed. The following conclusions have been drawn:

- The real exchange rate is a reflection of the level of development of an economy and its structure. The strengthening of the exchange rate – the normal process for countries which are "catching up" in terms of development – aims to reduce their backwardness.*
- Competition on the back of the artificial undervaluation of the national currency is known as price dumping, which does not stimulate increase in quality and production efficiency or growth in the welfare of the population.*
- To rely on this policy in the medium and long term means to participate in a wage-lowering race with poor countries that have abundant cheap labour. This will require increasingly strong undervaluation of the real exchange rate and wages, as well as low consumption standards.*
- In today's world of global production chains, the exchange rate ceases to be a source of competitiveness for an increasing number of products. It is a rarity for an industrial product to be entirely developed and produced in just one country. Competition in the modern world has shifted to revolve around the quality, manufacturability and image of goods. A country's attempt to compete on price alone will ultimately lead to an increased technological gap.*
- There is the risk that growth in production during a period of currency undervaluation will not be accompanied by general wealth increase and therefore will be unstable. In the modern world the sustainable growth of the welfare of a country requires its integration into global production chains at an ever higher level of value added creation, where the level of the national currency is of secondary importance.*
- Competition in the cost of labour is still current in relation to goods that are fairly simple but labour-intensive in terms of their production. However, in Russia there are no available labour resources for the development of labour-intensive industries. The country already has an advanced industrial base and a shift towards labour-intensive industries would result in a kind of regression.*

- *"Subsidizing" labour-intensive production sectors comes at the expense of the rest of the economy, thereby limiting its growth potential.*

- *The economy is therefore less interested in stable long-term funding and developed financial markets. Labour-intensive industries are in large part financed by variable expenses and working capital.*

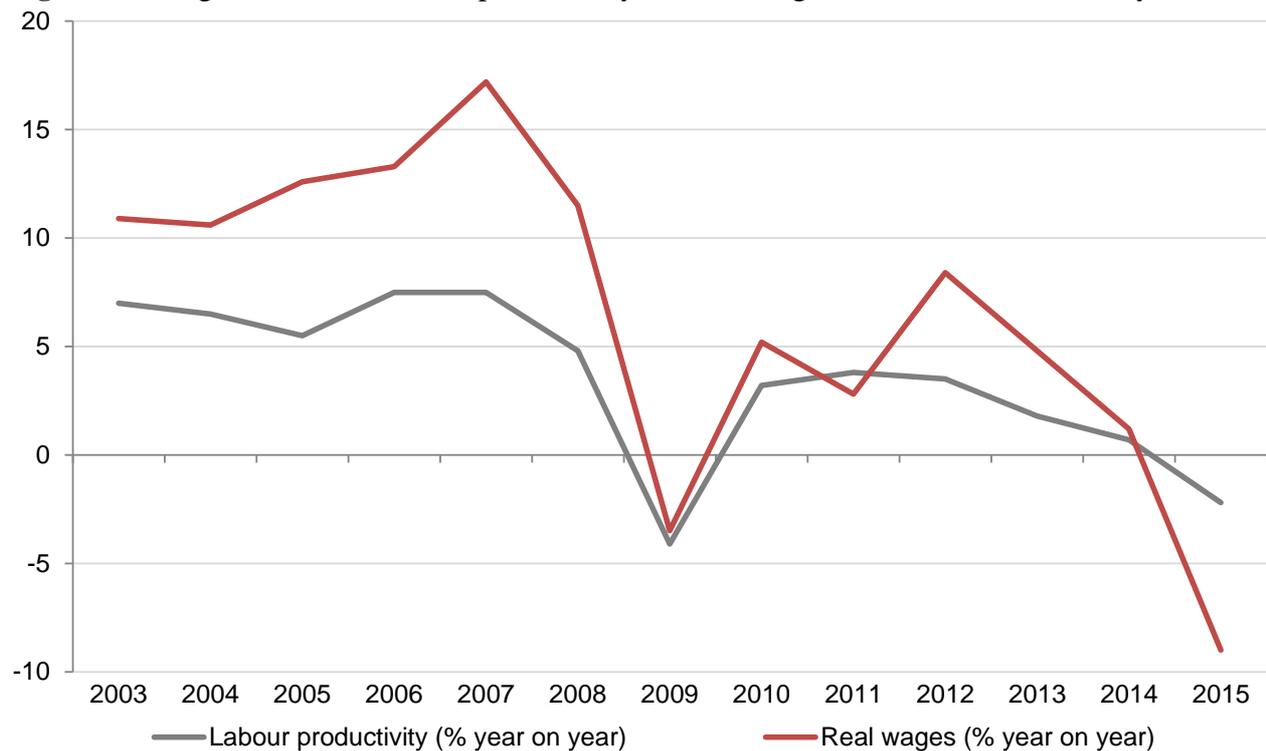
- *China's weak yuan has contributed to the growth of labour-intensive industries during a period of rapid industrialization and urbanization. However, having reached a certain level of industrialization, the undervaluation of the yuan has become a hindrance to economic growth.*

1. The opportunities related to exchange rate manipulation and the impact of artificial weakening of the currency on the structure of the economy

In this section we analyse the consequences the undervaluation of the national currency has for the economy.

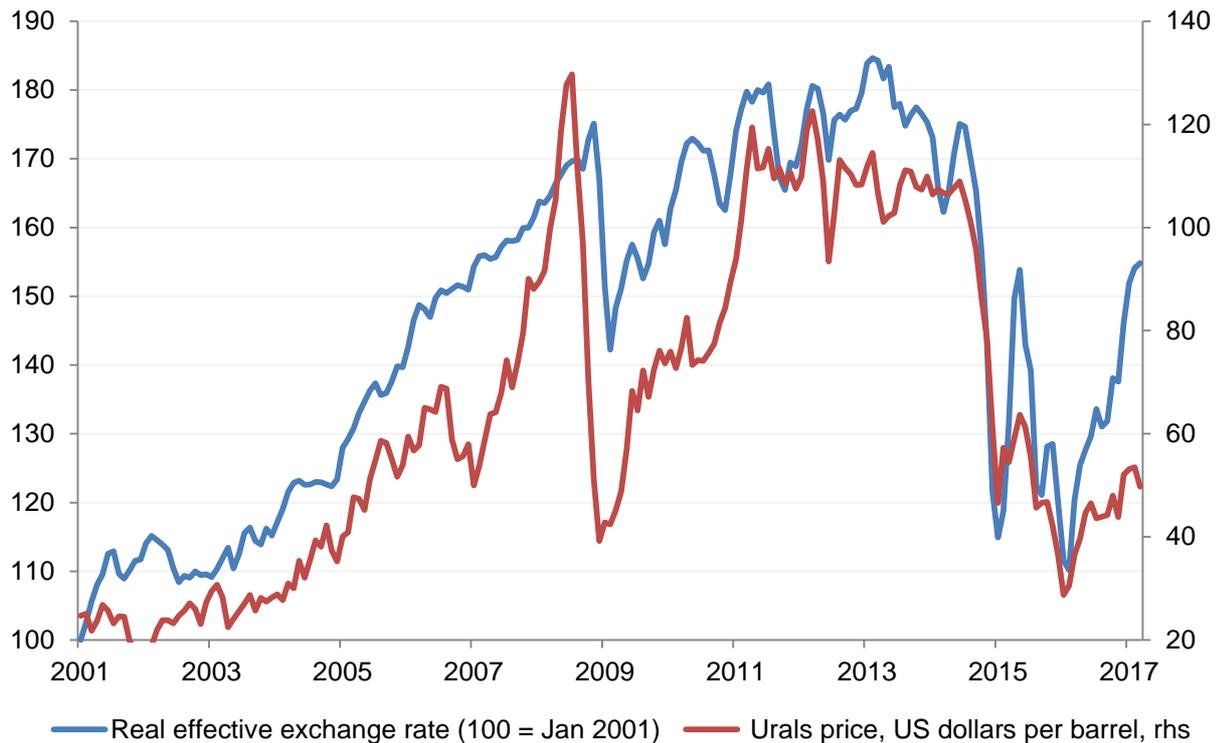
Firstly, from the perspective of macroeconomics, historical experience shows that attempts to undervalue the real exchange rate through operations on the foreign exchange market usually end in failure. The real exchange rate grows stronger nonetheless, but under the influence of a higher rate of price growth (and a higher wage growth rate due to competition for labour from the non-tradable sector). In Russia such a situation was observed in the noughties when, in the context of high oil prices, the Bank of Russia intervened in the currency market by buying foreign currency. As a result of liquidity growth, real rates became deeply negative: the average nominal money market rate (MIACR overnight) in 2004-2007 sat at just 5.8% with average inflation of 10%. This resulted in the growth of wages in the economy outpacing labour productivity growth (Figure 1).

Figure 1. The growth rate of labour productivity and real wages in the Russian economy



Sources: Rosstat, Bank of Russia calculations.

Ultimately, price competitiveness in the medium term still declined and remained unaffected by the Bank of Russia's policy (Figure 2). It is important to emphasize that we are referring to attempts at artificial control of nominal and real strengthening of the ruble. When there is a change in oil prices, an equilibrium adjustment of the exchange rate takes place, causing structural shifts in the economy, as will be discussed below.

Figure 2. The price of oil and the real effective exchange rate of the ruble

Sources: BIS, CEIC.

Secondly, from the point of view of the structure of the economy, the effects of undervaluation are not uniform and manifest themselves differently in different sectors of the economy.

The economy of any country, including Russia, is represented by labour-intensive and capital-intensive industries or parts of global production chains. An indicator of labour-intensity can be, for example, the employment to cost of capital ratio in an industry (L/K). The ratio of these activities forms the structure of the economy and its role in production chains. Industry structure can also be represented according to the production of "tradable" (participating in international trade) and "non-tradable" (not involved in international trade) goods. In the end, the structure of the economy can be represented in a matrix form (Table 1).

Table 1. Distribution of industries into groups (example)

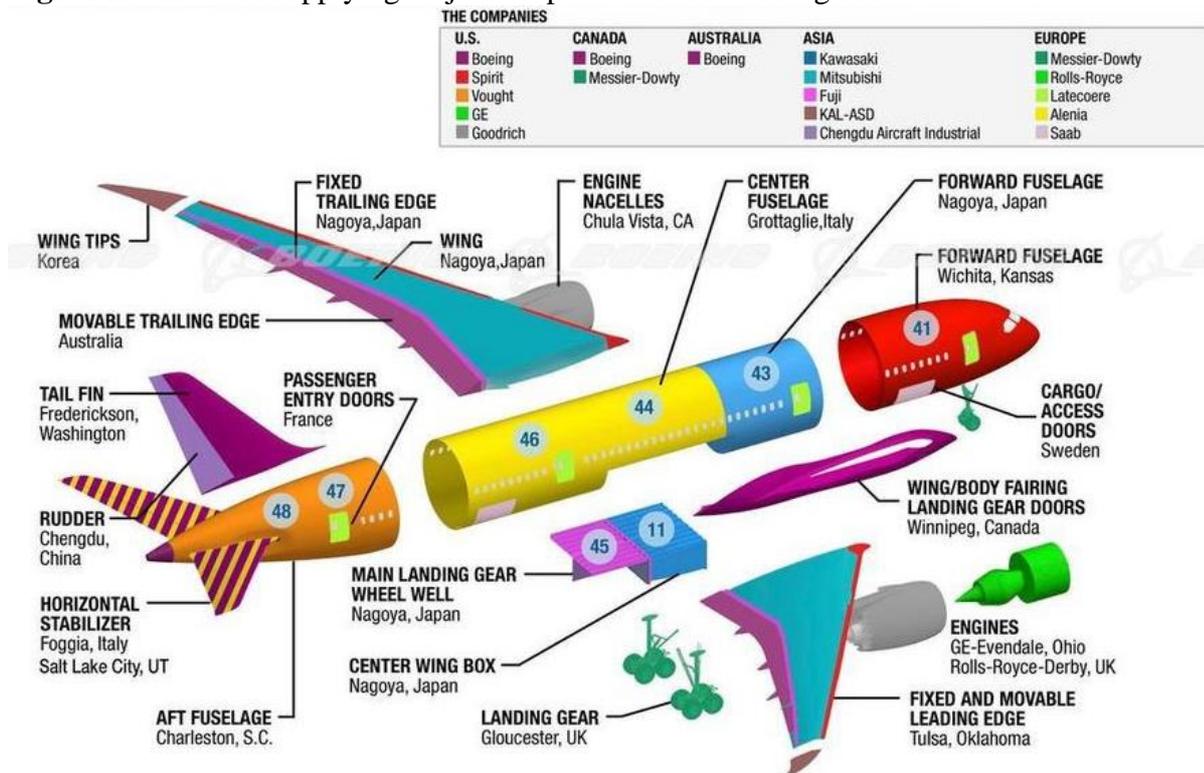
	Labour-intensive industries	Capital-intensive industries
Tradable industries	Agriculture, textile and leather industries	Extraction and processing of raw materials, metallurgy, energy, chemical and food processing industries, timber processing; equipment production, vehicle production (automobiles, trucks)
Non-tradable industries	Services (including social, public and defence), construction	Transport, trade and logistics, generation of electricity, heat and water supply

Sources: World KLEMS, authors' calculations¹.

This separation is quite conditional due to the fact that the modern production of final products is realized mainly through production chains that are characteristic of more complex capital- and labour-intensive goods. As a result of this, forms of production that are time-consuming and capital-intensive can coexist within the same industry (the assembly of final products is a more labour-intensive form of production, while the manufacture of complex parts is capital-intensive and design – knowledge-intensive). For example, the Boeing 787 Dreamliner consists of more than 2.3 million component parts² (from safety belts and plastic buttons to the large parts of the fuselage) that are produced by more than 5.4 thousand suppliers. Of these parts, 70% are produced in plants located in the US, while the remaining 30% are provided by suppliers from more than 60 countries such as Angola, the Bermuda Islands, and Cape Verde) – Figure 3.

The equilibrium real exchange rate is formed on the basis of the structure of the economy, the availability of qualified, high-performing personnel and the capacity for innovation and technological development (the Balassa-Samuelson effect). Reduction in the nominal and real exchange rates (i.e. depreciation of the national currency) creates two effects which impact on factors of production (labour and capital).

Figure 3. Countries supplying major components of the Boeing 787 Dream-liner



Source: Boeingblogs.com.

The first effect. Wages in the production of tradable goods are lower in comparison with other countries. This occurs in the case of structural shocks (such as a fall in oil prices), and in the case of a rate artificially lowered through policy measures. Figure 4 shows wage trends in Russia

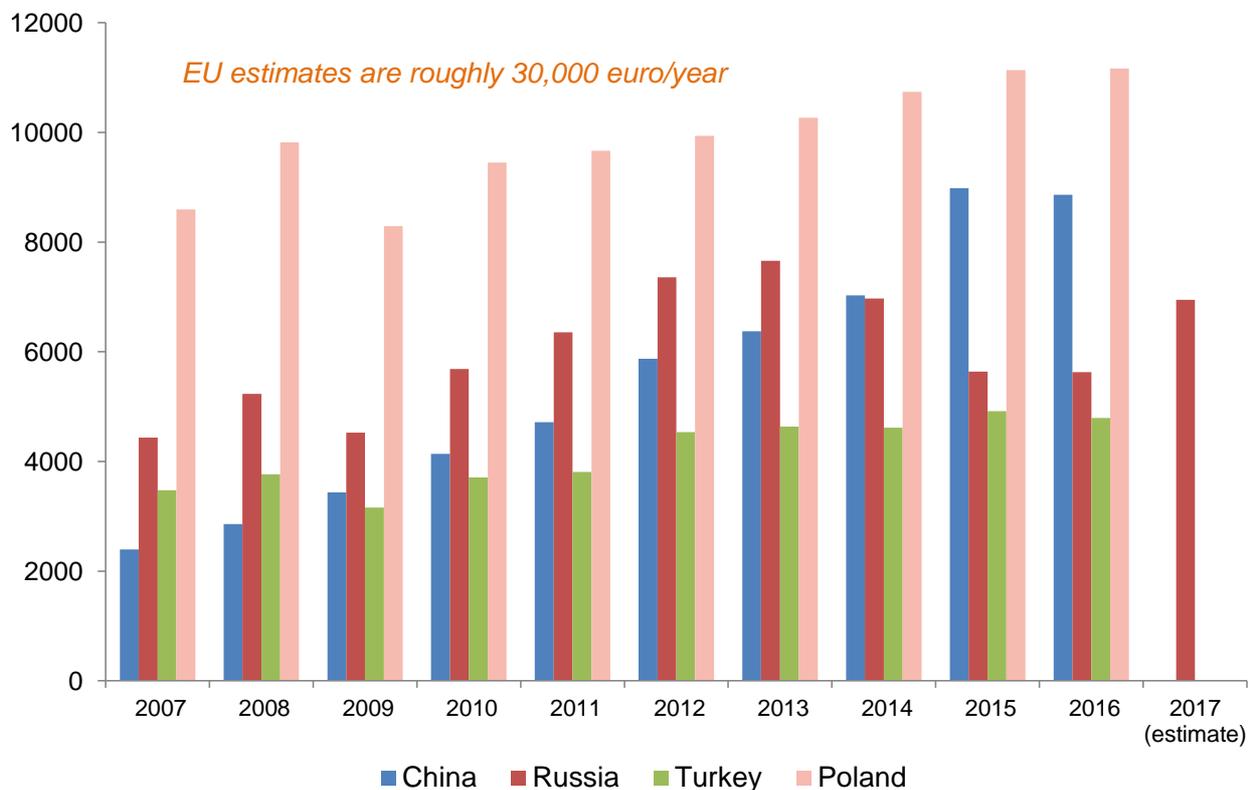
¹ Cells are filled by the authors based on calculations according to the World KLEMS for countries of the European Union (reflecting a strong correlation in a large group of countries).

² Source: [Boeing](http://Boeing.com)

in comparable terms for the years 2007-2016, and an estimate for 2017. After a fall in oil prices and the ensuing depreciation of the ruble, annual wages in foreign currency terms in the Russian manufacturing sector in 2014-2016 declined sharply, to become 37% lower than in the Chinese manufacturing sector. As a result, they became comparable with wages in Turkey.

After a rise in oil prices between the second half of 2016 and early 2017, the strengthening of the ruble led to the fact that wages in the manufacturing sector in Russia, though increased, remain below those in the manufacturing sector in China by 20%, while maintaining a relative competitive advantage based on labour cost. This decline in the standard of living reflects the structure of the economy and is associated with a reduction in oil rent. The growth of production efficiency and labour productivity in such conditions should lead to an increase in wages and welfare. An artificially low rate will create a competitive advantage, but at the expense of the welfare of the population.

Figure 4. Average annual wages, EUR



Note. The statistics used cover manufacturing industries. The preliminary estimate for Russia for 2017 is derived with assumptions of 7% growth in nominal wages in 2017 and an average euro exchange rate of 60 RUR/EUR sustained through the end of the year.

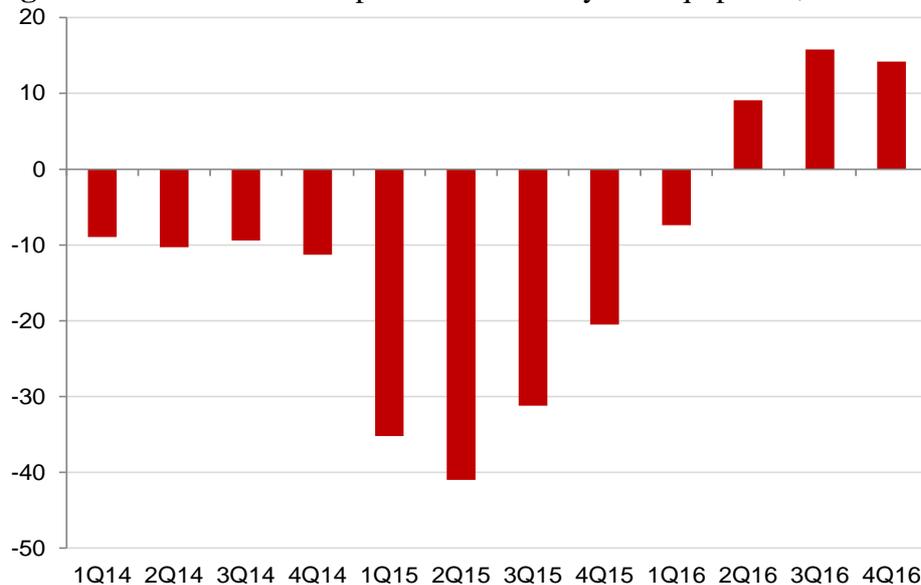
Sources: CEIC, Rosstat, Bank of Russia, authors' calculations.

The second effect of the weakening of the exchange rate is an increase in price and reduction in demand for imported investment goods and components. Investment imports may meanwhile play a significant role in domestic investment in fixed capital. Thus, the imports to domestic production of investment goods (machinery and equipment) ratio in Russia in 2016 amounted to 1.5, that is, 1 ruble of domestic production was accounted for by 1.5 rubles in imports. It is not surprising that the strengthening of the ruble, which took place during 2016 and reduced the unit cost of

imports of investment goods, led to growth in imports and an increase of total investment in machinery and equipment (Figure 5)³.

A capital-intensive industry, if focused on imports of machinery and equipment, suffers more severely from rising prices on imported capital goods than a labour-intensive industry. In recent years many complex products have come to be produced with a large number of imported components in the final stages of the production chain; however, a weak exchange rate negates the benefits of cheaper labour costs and Aside from this, capital-intensive industries produce more differentiated (heterogeneous) products because of the intangibility of the capital. Therefore, price competition in such industries is less significant than in labour-intensive industries.

Figure 5. The volume of imports of machinery and equipment, increase in % per year



Source: FCS, authors' calculations.

In addition to influencing factors of production, the weakening of the national currency leads to a shift in domestic demand from imported goods to non-tradable goods that become relatively cheaper and domestic tradable goods (import substitution). External demand for domestic tradable goods also increases, as such goods become relatively cheaper in comparison with products from other countries (if, of course, price competition is key in the case of such products).

The resulting impact of both factors creates conditions where a weak national currency leads to a situation in which, in general, producers of **labour-intensive tradable goods** are the winners.

2. The medium-term threat of an undervaluated exchange rate

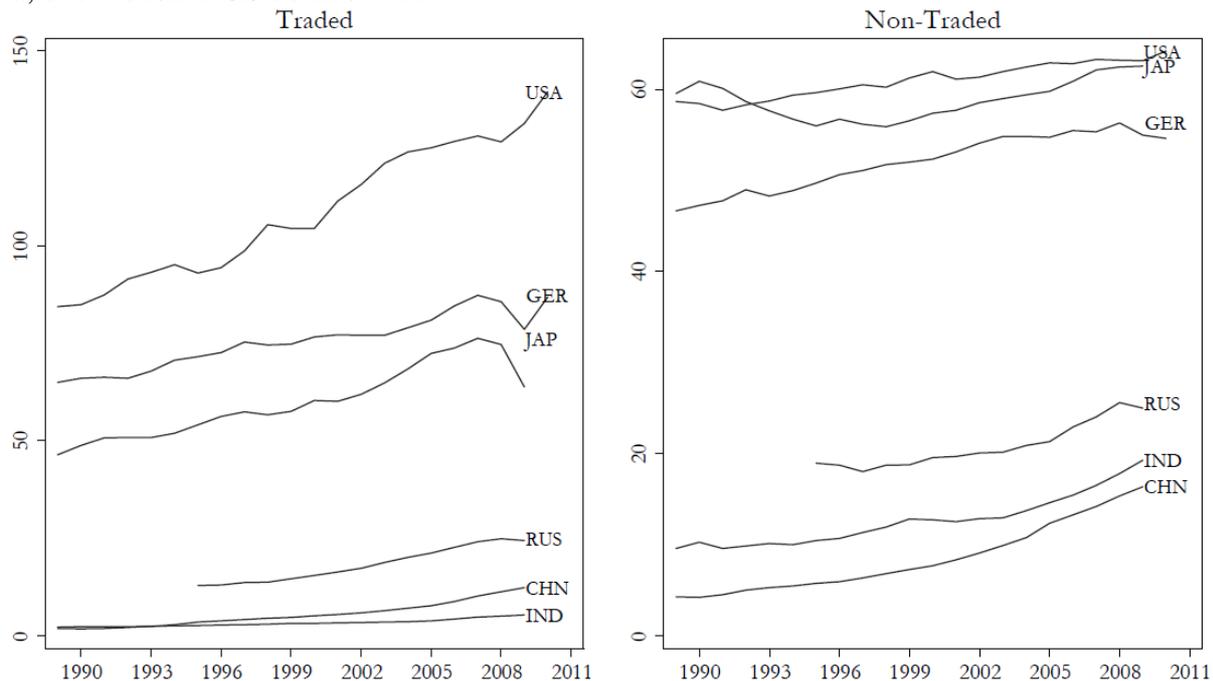
For a country like Russia, a weak currency policy (beyond the highly probable failure of its implementation see Section 1) has more minuses than pluses.

Firstly, a weak currency policy slows down growth in productivity. Labour-intensive industries are typically characterized by lower productivity. In particular, this is due to the fact that capi-

³ Additionally, the domestic production of machinery and equipment also increased in 2016.

tal-intensive industries attract the most productive workers (to service capital intensive production) and are willing to pay them higher wages – which is completely justified by the high productivity of such workers. As shown in Figure 6, in tradable sectors, labour productivity is generally higher than in non-tradable sectors, while in the group of developed countries (USA, Germany, Japan), which have a capital-intensive tradable sector, this gap is more noticeable than in the group of emerging markets (Russia, China, India), where labour-intensive industries are more often tradable.

Figure 6. Productivity in the tradable and non-tradable sectors of several countries, including Russia, one thousand US dollars at PPP



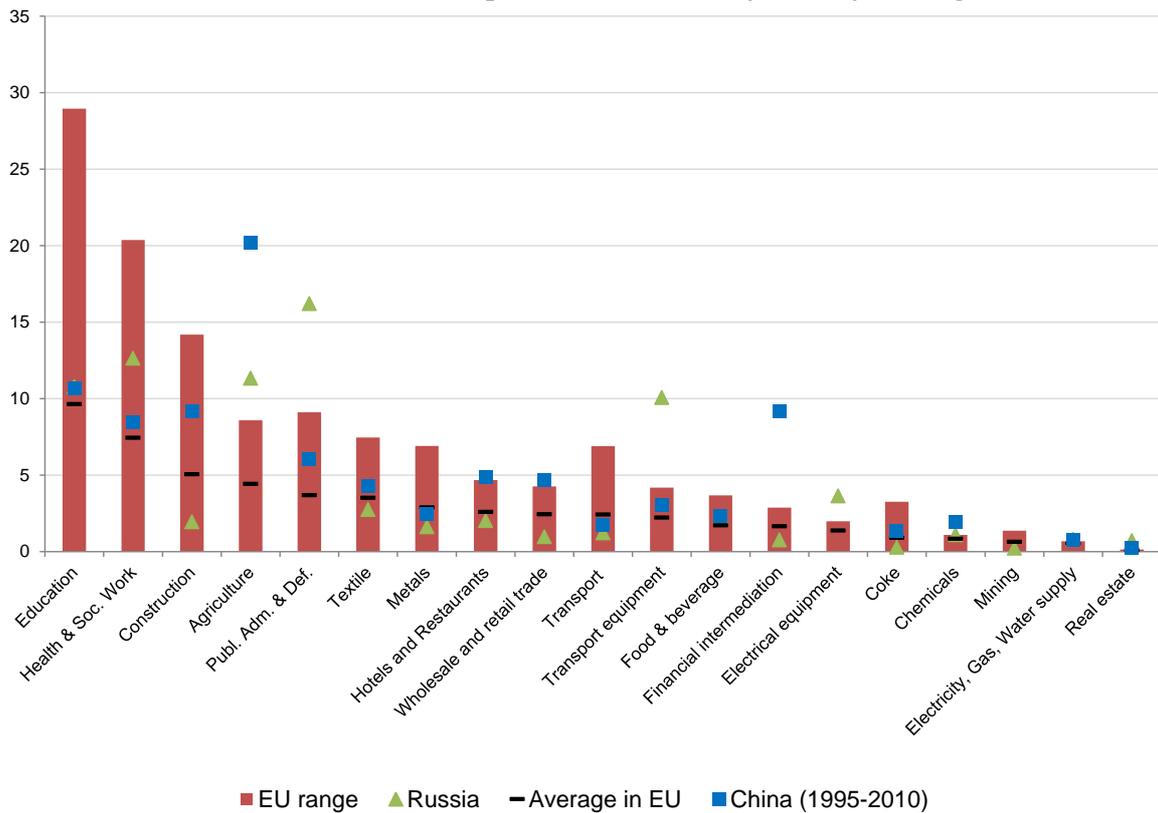
Note: PPP - purchasing power parity, USA, GER – Germany, JAP – Japan, RUS – Russia, CHN – China, IND – India.

Source: Mano, Rui C. and Castillo, Marola, *The Level of Productivity in Traded and Non-Traded Sectors for a Large Panel of Countries* (February 2015). IMF Working Paper No. 15/48⁴.

From this it follows that a weak currency, in supporting the labour-intensive tradable sectors, "subsidizes" low-productivity industries at the expense of the rest of the economy. This, in turn, preserves the structure of production, and does not allow resources to move to more productive labour-intensive or capital-intensive industries. In addition, firms in these industries have low incentive to improve productivity. Thus, a low exchange rate **limits the productive capacity of the economy**.

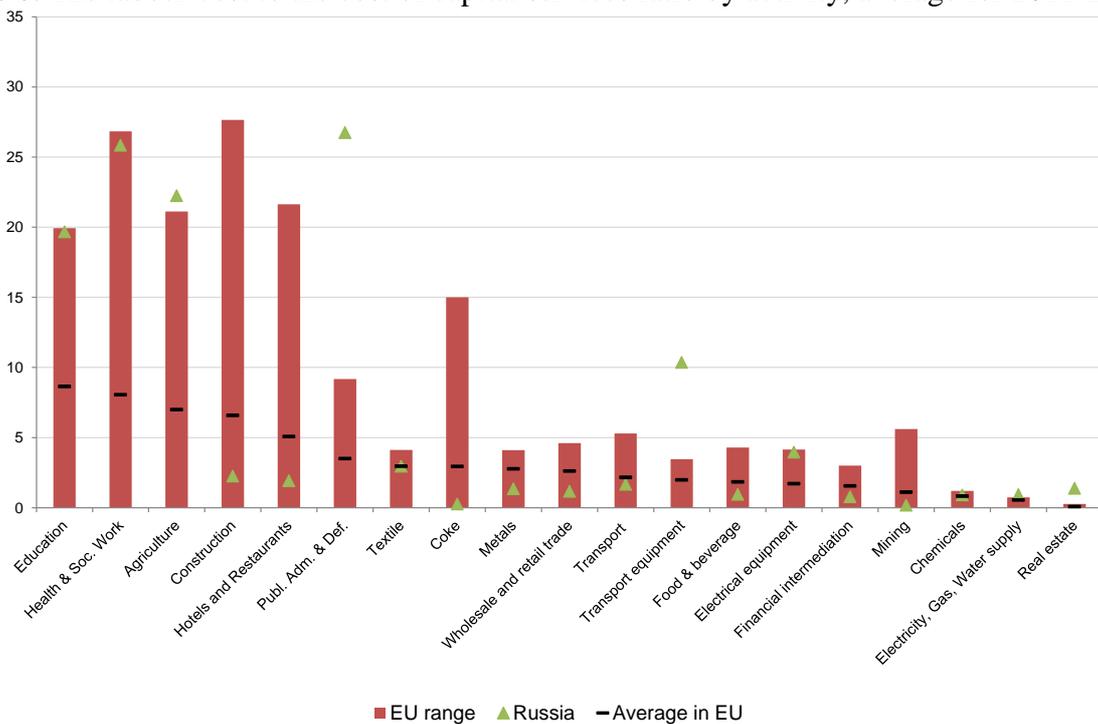
This is evidenced by a comparison of Russia's economy with the economies of the EU and China over the course of 15 years (Figure 7). A number of sectors of the Russian economy are characterized by excessive employment (undercapitalisation): public administration and security, agriculture, production of vehicles and electrical equipment.

⁴ The database for calculations is available at: <https://sites.google.com/site/ruimano/home/ManoCastillo2015>.

Figure 7. The labour cost to the cost of capital services ratio by activity, average for 1995-2011.

Sources: World KLEMS, authors' calculations.

Over this period the lack of capitalisation in these sectors has not changed significantly, and even increased in some sectors (Figure 8).

Figure 8. The labour cost to the cost of capital services ratio by activity, average for 2011-2014

Sources: World KLEMS, authors' calculations.

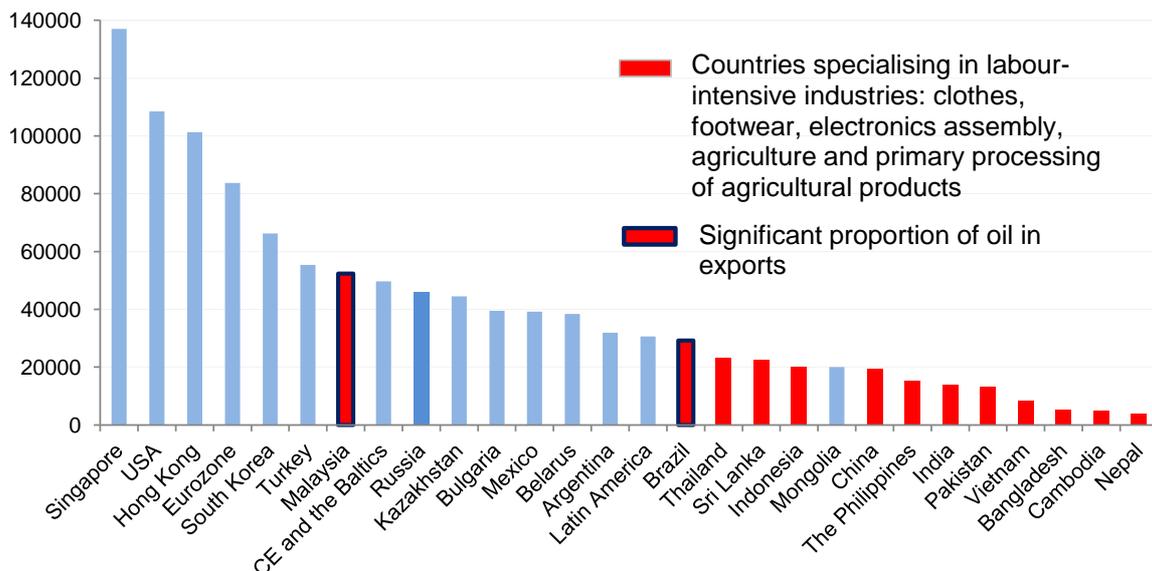
Continued overemployment, in the face of declining oil rents in these industries, forces them to pursue a policy of competition for wages and to dump costs. However, the competition on the back of this low exchange rate does not encourage companies to reduce costs, but rather perpetuates inefficiency.

Secondly, labour-intensive tradable industries have low growth potential due to demographic constraints. Therefore, in Russia the growth of labour-intensive industries is limited, in contrast to China, where demand for labour for the past 20 years has been met by increase in the working age population and migration of rural population to cities (urbanization). The latter factor continues to be in effect to this day.

Thirdly, the global nature of the labour market allows labour-intensive production to move to countries where labour is cheaper. As a result, production is usually located in poor countries which are in the initial stages of capital formation and with the predominance of youth in the workforce. In these countries the wage level is low. Therefore, the preservation of competitiveness in labour-intensive sectors in the more developed countries **requires that wages, and thus also living standards, be retained at a low level.**

Dumping wages by lowering the exchange rate and the focus on labour-intensive production requires the Russian economy to enter into the wage-lowering race with poorer nations with abundant cheap labour (Figure 9). Encouraging the development of this kind of production in Russia would lead to a deteriorated structure of the Russian economy, pushing it in the direction of less productive sectors, and would face limited supply on the labour market, which would require a sustained decrease (undervaluing) in wages and living standards.

Figure 9. Value added per worker at PPP, US dollar (in 2011 prices), 2011-2014 average



Source: World Bank

Fourthly, due to the wide geographical distribution of production and the distribution of value chains, the exchange rate exerts little influence on the competitiveness of modern high-tech prod-

ucts, as the final product contains a lot of components imported from many different countries⁵. The exchange rate ceases to be a measure of price success in a market where final products are manufactured on cross-country production chains.

A country attempting to compete on price, producing goods only domestically and possibly lacking the most modern technologies will be required to decrease wages and other costs and will eventually face a growing technological gap. That is, there is the risk that increased production will not lead to growth in the population's welfare, and will be unstable. On the contrary, the richer a country is, the more likely it is to embrace those parts of the production chain which provide the greatest value added (as a rule, these are the most high-tech or design-heavy components). Therefore, in the modern world a higher level of integration in global production chains is required for growth in the welfare of a country⁶. This necessitates the development of human capital and the availability of qualified personnel.

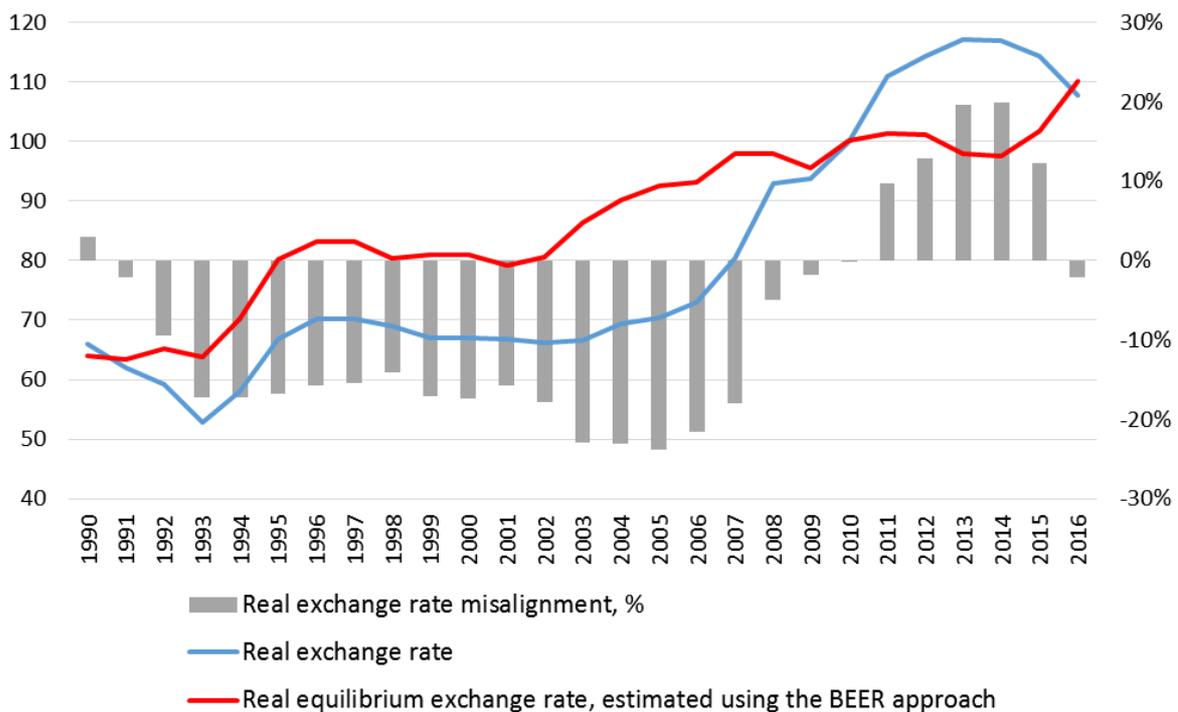
⁵ Empirical evidence is provided in [Ahmed, S., M. Appendino and M. Ruta \(2015\): "Depreciations without exports? Global value chains and the exchange rate elasticity of exports", World Bank Policy Research Working Paper, no 7390, August.](#)

⁶ On this topic, see [Kevin Cheng, Sidra Rehman, Dulani Seneviratne, and Shiny Zhang, Reaping the Benefits from Global Value Chains, IMF Working paper, 2015.](#)

Box 1. China's experience in maintaining an undervalued yuan

For 15 years China followed a policy aimed at the development of labour-intensive tradable sectors. Increased global competition forced the country to maintain a low wage level in foreign currency terms in order to ensure growth in employment in response to the growing supply of labour. The yuan was undervalued from the beginning of the 1990s until the Global financial crisis of 2007-2008 (Figure 10).

Figure 10. The real equilibrium exchange rate in China, estimated using the BEER approach, the real exchange rate in 2010 = 100



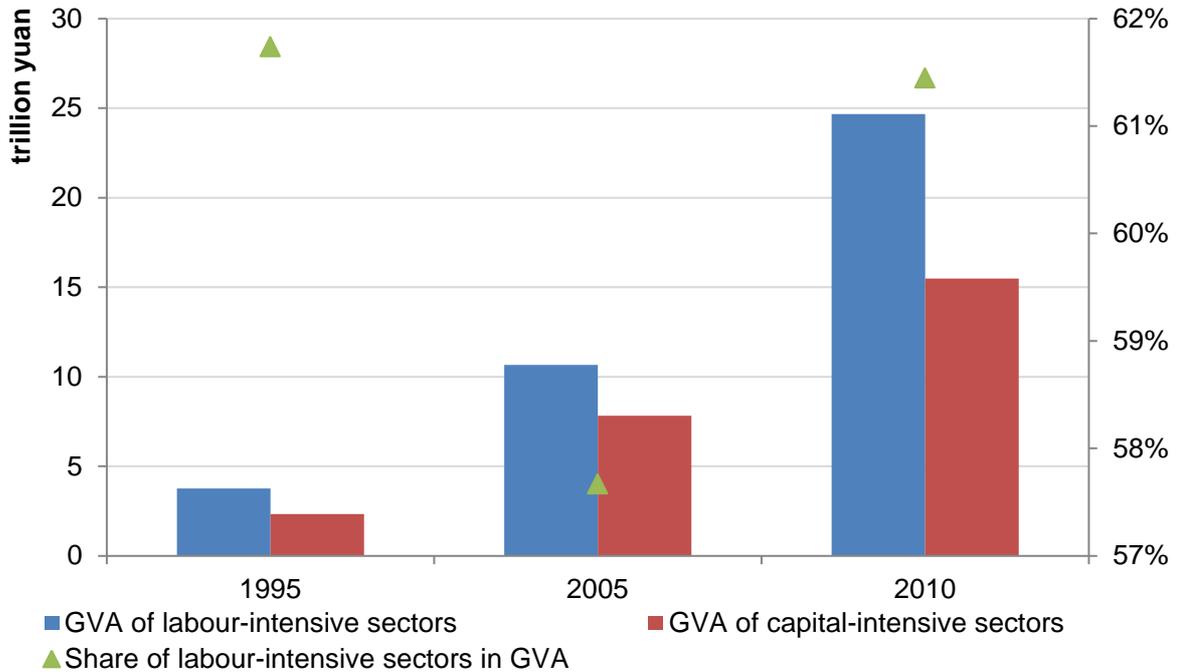
Sources: World Development Indicators and Zhang and Chen (2014) – the World Bank database, authors' calculations (2013 to 2016).

This policy reduced wage growth in foreign currency terms, but ensured stable growth in exports of industrial goods during the period under review, at the expense of consumption growth (especially of imports and related non-tradable goods).

Despite this policy, the share of value added of labour-intensive (traditional) sectors in the overall gross value added (GVA) of the Chinese economy declined from 62% in 1995 to 58% in 2005 (Figure 11). This occurred in the context of outrunning productivity growth and wages in capital-intensive sectors (Figure 12), as well as a growing share of high-tech (by the World Bank's definition) products in total merchandise exports from China (Figure 13). This structural pressure, in turn, required an even greater depreciation of the yuan to support the demand for labour from the traditional sectors of the economy. At the same time, the development of capital-intensive industries required the prior accumulation of capital and constraints on the demand for labour.

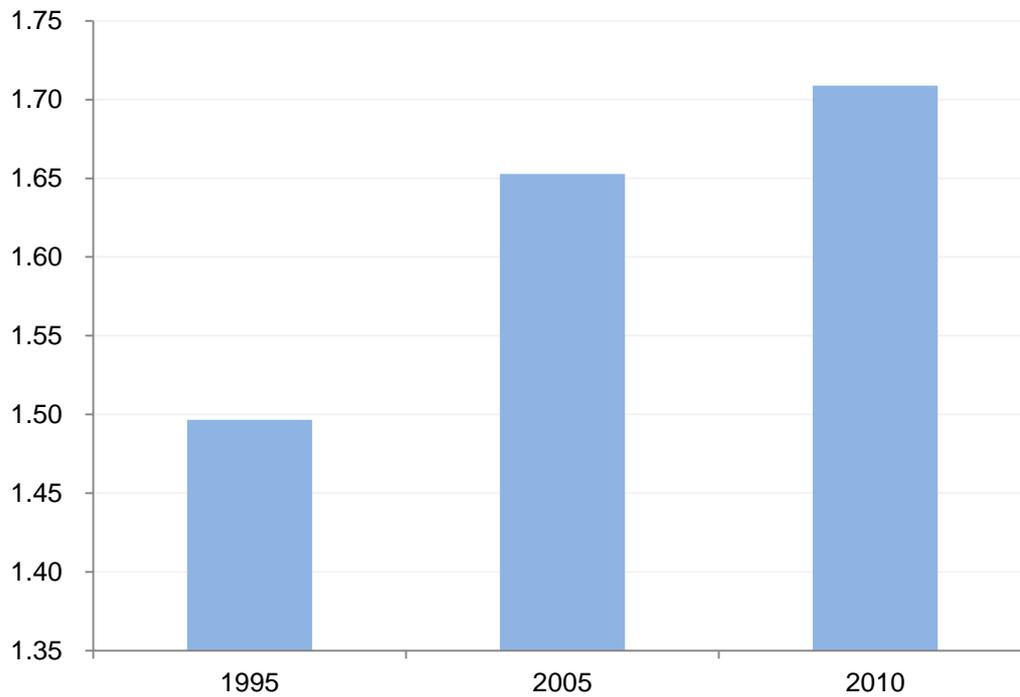
Therefore, the development of these industries conflicted with the policy supporting labour-intensive industries.

Figure 11. Gross value added in labour-intensive and capital-intensive sectors of China's economy



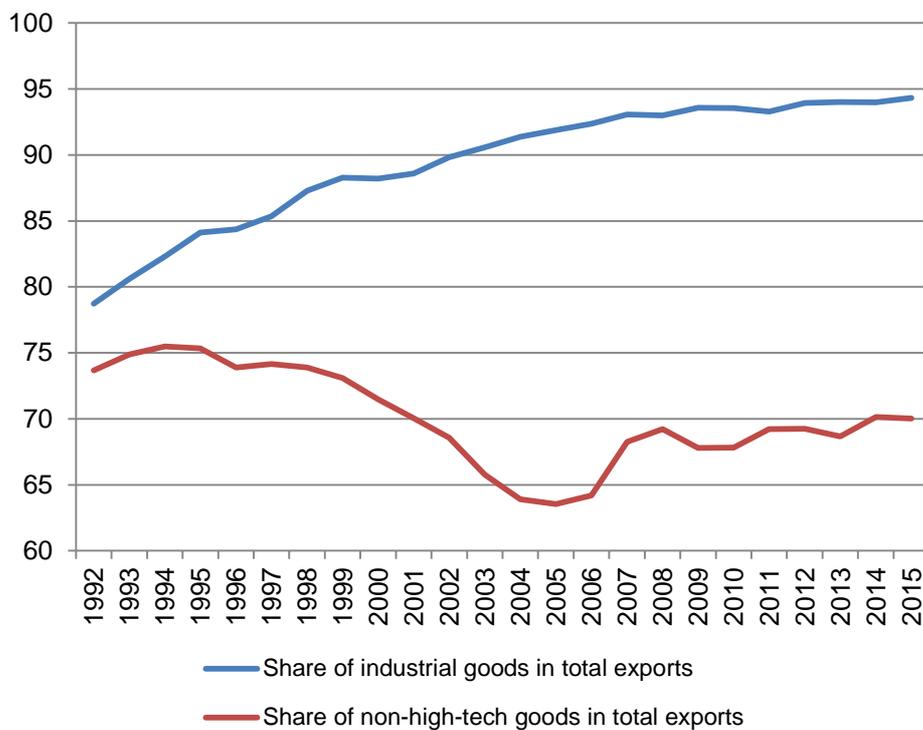
Sources: World Bank, authors' calculations.

Figure 12. The ratio of wages in capital-intensive sectors of the Chinese economy to wages in labour-intensive sectors



Sources: World Bank, authors' calculations.

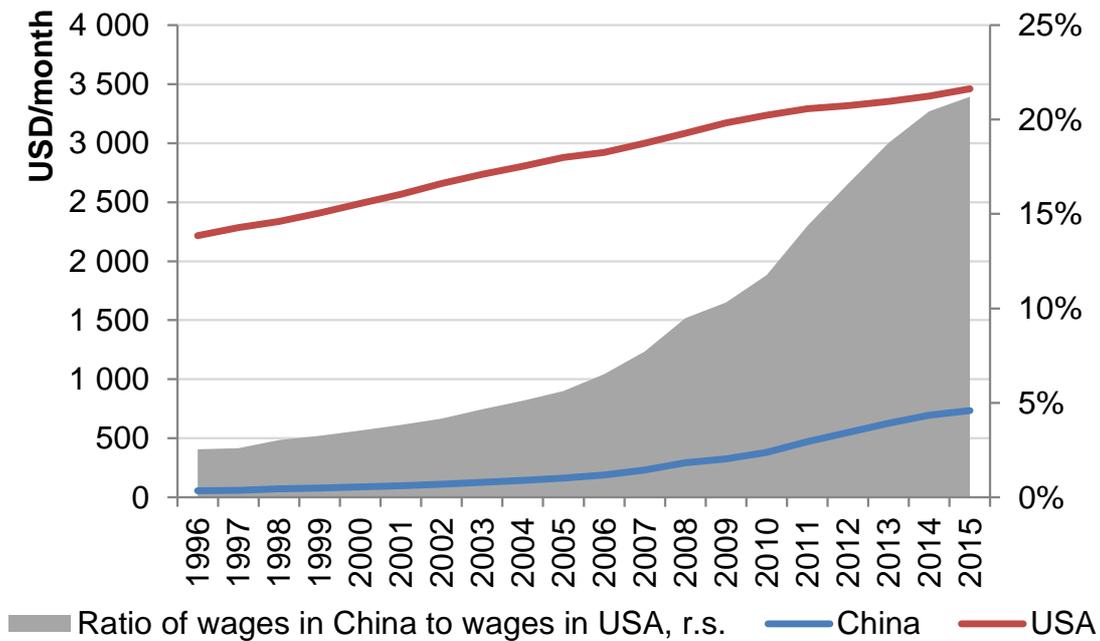
Figure 13. The share of industrial goods in China's exports



Sources: World Development Indicators Database, World Bank.

Subsequently, China gradually began to abandon the previously held policy. Since 2005, the gap in wages between China and the United States has begun to decrease quickly; however, it remains significant (Figure 14).

Figure 14. The ratio of wages in manufacturing industries of China to those in the United States



Sources: BLS, CEIC, authors' calculations

The weak exchange rate of the yuan has helped China to cope with problems arising from its primary industrialization and rapidly growing labour supply. However, over time, it has ceased to meet the needs of further national development.

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