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INTERNATIONAL TRADE AND INVESTMENT

The objective of this paper is to analyze the trends of reshoring in the United States, based on the examination of a number of indicators, including the AT Kearney Index, to identify the various forms of reshoring activity of companies. As a result of this research, the author reaches the following conclusions: The dynamics of the US reshoring index suggest that the return of industrial production from China to the US has not yet occurred at a significant scale. At the same time, there is a transfer of production from China, but not in the form of classical reshoring "back to the United States," but to Asian countries proximate to China. The diversification of US industrial imports is becoming increasingly evident. While the share of imports from China is falling, the share of imports from alternative Asian countries (Altasia), including Vietnam, Taiwan, India, Malaysia, Thailand, and others, is rising. At the same time, the value of US industrial imports from Asian countries, including China, is increasing. In addition to the relocation of US manufacturing imports from China to Latin America, there is clear evidence of nearshoring, the transfer of production capacity to countries in the region that are geographically close to the United States. Mexico, in particular, has emerged as a prominent destination for both US and Chinese firms seeking to relocate production. In the context of reshoring, a growing number of companies are adopting a "right reshoring" model, which involves abandoning the search for the lowest-cost locations in favor of "best cost" locations. These locations prioritize sustainability and supply chain reliability in addition to cost. We believe that the trend towards "right reshoring" will intensify in light of the US economic policy in this area, which aims at more active government intervention to support domestic production under the "Made in the USA" label.

ECONOMIC GROWTH AND THE CYCLE

Economic historians nowadays argue that economic growth in the world was extremely slow and unsustainable until the beginning of the Industrial Revolution in the late eighteenth century. This article traces how the efforts of many economists and historians have gradually developed the concept of the "Malthusian trap" to explain the centuries-long relative stagnation of agrarian society. In the case of traditional economies, cliometric studies generally confirm Thomas Malthus's ideas about the compensation of the positive impact of technological progress on per capita income by population growth. Modern scholars supplement them by analyzing the social structure of the society in the Malthusian trap, as well as its inherent institutions of redistribution, and the periodic flourishings and

declines of proto-industry and trade that took place in those times. The article shows the logical interrelation of these elements within the Malthusian dynastic cycle. The concept of Malthusian trap is compared with the Marxist vision of the historical process. It is shown that positive insights of the Marxist approach can be implanted in the modern theory.

Economic science has always been concerned with the catch-up effect: are developing countries really catching up to technologically developed countries, and is the economic gap between rich and poor countries narrowing over the long run? The goal of this article is to test the hypothesis of economic convergence of countries as one of the primary research problems within the field of cross-country inequality. The objective of this research is to gain a deeper understanding of the factors that contribute to economic cross-country inequality. This article seeks to ascertain the impact of country convergence, as postulated by R. Solow in his model of economic growth, utilizing R. Barro's equations for the period from 1992 to 2021/22. The paper reveals the existence of economic convergence, but at a rate that is insufficient for developing countries to catch up to developed countries in a meaningful way. The dynamics of convergence by decade is analyzed separately. It is found that convergence was as slow as possible in the period between 2002 and 2011 and as fast as possible in the period between 2012 and 2022. The economic shocks of 2020-2022 may undermine the catching-up potential of many developing countries, which may result in a slowing of further convergence.

COUNTRY VIEW

This article examines issues and development strategies for transforming the Indian economy into a developed nation by 2047, to which it aspires. We observe that the protectionist development strategy followed in the first four decades of independence could not bring the country out of poverty, and only protected vested interests. In the last three decades, the economy did reasonably well in terms of economic growth as a result of the adoption of the strategy of economic liberalization. The pitfalls of liberalization were realized in terms of increasing inequalities and external dependencies, and stagnancy in manufacturing capacity. COVID-19 exposed the limitations of global supply chains. To lessen the shortcomings of the liberalization, the Indian government introduced the Atmanirbhar Bharat Package. It is expected that the Package will make the economy competitive and enable India to achieve the objective of becoming an inclusive developed nation.

INTERNATIONAL FINANCE

The article examines the issues of competition in the banking sector in the context of the post-crisis policy of international banking regulation. The overarching objective of this policy is to achieve financial stability and minimize the risk of future financial crises. An understanding of the new phenomena of competition in the international banking sector and their interrelation

with the issues of financial stability should facilitate the strengthening of market discipline in the banking sector and enhance the long-term potential of credit institutions as reliable providers of market liquidity. Conversely, achieving equilibrium between banks' compliance to post-crisis regulatory standards and their capacity to establish competitive advantages will not only enhance their resilience in the context of an unstable external environment but will also represent an effective strategy for mitigating systemic risks and systemic stress. A synthesis of studies on the impact of banking sector competition on financial stability (Competitive-fragility hypothesis and Competitive-stability hypothesis) reveals a contradictory effect due to the multifaceted nature of competition. Consequently, there is no definitive assessment of competition with regard to ensuring stress resilience in the banking sector. Increased competition can both contribute to reducing the vulnerability of banking activities to various risks and challenges and become a source of instability. Guided by the primacy of balanced development of the banking sector, we propose to supplement the toolkit of international banking regulation with a quantitative indicator of competition assessment based on the risks of banking activities, taking into account the standards and recommendations of Basel III.

PRESENT AND FUTURE OF THE RUSSIAN ECONOMY

The objective of this study is twofold: first, to evaluate the potential for import substitution in specific sectors of the Russian IT market, based on an analysis of the progress made in the transition to domestic products and developments; and second, to identify strategies for overcoming the challenges associated with this transition. The process of import substitution in the Russian IT sector is gaining pace driven by two key factors: the government's stated objective of achieving technological sovereignty as well as private business's development needs. However, the timing of the transition will vary significantly depending on the market segment in question. The highest rates of penetration of Russian products are observed in information security segment, reaching up to 80%. The lowest rates of penetration are observed in the segment of mobile operating systems, as well as in process management tools, reaching only 25–35%. In order to achieve the stated goals, it is necessary to maintain the state support measures and, in some segments, to expand them and develop new ones. This should be done with the consideration of the initial experience of market participants in import substitution. It is possible that the government may extend the timeframe for the complete transition to domestic products for the public sector and large state-owned companies, contingent on the progress in overcoming the existing barriers to import substitution. At the same time, the longer-term goals, set to achieve the required level of utilization of Russian IT products, will not be revised in a more conservative direction.

REVIEWS

Reshoring in the United States: Features and Prospects

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Abstract

The phenomenon of reshoring, which refers to the relocation of production facilities from a parent company to the country of origin, is a well-known business practice. The current geopolitical climate, characterized by heightened trade tensions between the United States and China, as well as the global pandemic, has significantly spurred the widespread use of reshoring in the global economy. This has also led to a surge in research attention on these processes. The objective of this paper is to analyze the trends of reshoring in the United States, based on the examination of a number of indicators, including the AT Kearney Index, to identify the various forms of reshoring activity of companies. As a result of this research, the author reaches the following conclusions: The dynamics of the US reshoring index suggest that the return of industrial production from China to the US has not yet occurred at a significant scale. At the same time, there is a transfer of production from China, but not in the form of classical reshoring "back to the United States," but to Asian countries proximate to China. The diversification of US industrial imports is becoming increasingly evident. While the share of imports from China is falling, the share of imports from alternative Asian countries (Altasia), including Vietnam, Taiwan, India, Malaysia, Thailand, and others, is rising. At the same

time, the value of US industrial imports from Asian countries, including China, is increasing. In addition to the relocation of US manufacturing imports from China to Latin America, there is clear evidence of nearshoring, the transfer of production capacity to countries in the region that are geographically close to the United States. Mexico, in particular, has emerged as a prominent destination for both US and Chinese firms seeking to relocate production. In the context of reshoring, a growing number of companies are adopting a "right reshoring" model, which involves abandoning the search for the lowest-cost locations in favor of "best cost" locations. These locations prioritize sustainability and supply chain reliability in addition to cost. We believe that the trend towards "right reshoring" will intensify in light of the US economic policy in this area, which aims at more active government intervention to support domestic production under the "Made in the USA" label.

Introduction

In the economics and business literature, reshoring is generally understood as the process of bringing back production facilities that were previously relocated as part of offshoring activities to the country of the parent company. This involves the transfer of certain parts of the production process outside the country of the company's origin. The main reason for companies to move their production abroad is to reduce the costs associated with production factors, especially labor [Volgina 2022].

The phenomenon of reshoring has long been a feature of the global economy. However, it has only recently become a noticeable phenomenon, particularly since the end of the 20th century. This has led to numerous studies and intense debate about the extent and direction of reshoring (see, for example, [De Backer et al. 2016; Vecchi 2017]). The United States initiated the process of reindustrialization, or reshoring, by bringing back the production of manufactured goods from overseas. The intensification of trade tensions between the United States and China has served to accelerate the process of reshoring manufacturing from China (see, for example, [Gereffi 2019; Geneva Business News 2018]).

The global pandemic has brought about significant changes in the development of national economies and the functioning of the global economy as a whole, including the areas of international production and trade. The shutdowns in 2020-2021 have led to significant disruptions in the supply chains of many manufacturing sectors. In response to these challenges, many companies have initiated strategies to bring overseas links in their value chains back to the home country of the parent company's headquarters, increasing the level of reshoring activity. This has stimulated a surge of research interest in explaining firms' reshoring activity in different sectors of the economy as a response to value chain disruption. See, for example, Barbieri et al. (2020) and Chen et al. (2022).

In most cases, these publications were descriptive in nature, which generally precluded the possibility of a statistical assessment of reshoring trends across industries and countries over comparable time periods. At the same time, a number of publications

examined not only the content of reshoring in different countries and regions, but also how it should be measured. The conclusions were quite contradictory. On the one hand, there were those who recognized reshoring as a key contemporary trend in the development of international production. On the other hand, there were those who offered more "soft" assessments of reshoring as one of the possible directions of transformation of the post-crisis economy. The majority of publications focused on the analysis of reshoring trends in the United States, as this was the country where the process of reshoring production from China was most extensive.

The purpose of this paper is to assess reshoring trends in the United States by analyzing a number of indicators, primarily the AT Kearney Reshoring Index, and to identify the different forms of reshoring processes.

The structure of the paper is determined by its logical framework. First, in Section 1, we review various methods of assessing reshoring processes, with particular attention to the possibility of conducting comparative studies based on empirical data from different countries and industries. Section 2 is devoted to the analysis of one of the most widely used approaches to measure US reshoring, namely the AT Kearney index. Section 3 examines the processes of diversification of US industrial imports, with a particular focus on the transfer of production capacity from China to other Asian countries. The potential of Mexico to serve as a conduit for US imports is examined in Section 4. Section 5 discusses the new concept of reshoring as perceived by US executives involved in reshoring. The impact of US economic policy on the reshoring process is briefly discussed in Section 6. The main findings of the study are presented in the conclusion.

1. Methods of evaluation of reshoring processes

We propose identifying a number of methods for evaluating reshoring processes, which it seems possible to classify conditionally as follows: methods based on the analysis of "raw" data; methods based on the analysis of partially processed data; methods based on the processing of statistical data (see Table 1 on p. 8).

Table 1. Evaluation methods for reshoring processes

Methods based on the analysis of "raw" data
Case studies on reshoring described in periodic business literature and supplemented with information from websites, company annual reports, etc.
Collection and systematization of reshoring cases. Projects: Uni-CLUB MoRe (European Monitor of Reshoring), Reshoring Institute, Reshoring Initiative (Reshoring Library), etc.
Methods based on analysis of partially processed data
Surveys of company executives on reshoring activities. Sources: surveys conducted by consulting and research companies Boston Consulting Group, PWC, AT Kearney, etc.
Regional reviews of companies' reshoring activity. Eurostat reviews
Country reviews on reshoring activities of national companies: United States, Germany, Scandinavian countries, etc.
Methods based on statistical data processing
Import intensity indicator: based on the input-output approach

| The indicator *"share of imports in domestic demand"* |
| *AT Kearney reshoring index* for the US |

Source: [Volgina 2022. P. 656].

Let us now examine these methodologies in more detail, paying particular attention to issues of comparability of results.

Historically, the first methodology used to assess or, more accurately, identify reshoring processes was the application of case studies, particularly those related to the reshoring decisions of individual companies. Typically, reshoring cases are documented in periodicals such as the Wall Street Journal, Financial Times, The Economist, Time, Bloomberg, Business Week, and others. These cases describe the relocation of all or part of a company's production to its home country or to neighboring countries. By analyzing the cases, it is possible to assess the motives for reshoring, its orientation, the industry to which it belongs, and other relevant factors. A major drawback of this approach is that the results of different cases of particular companies are not comparable and, therefore, no general conclusions can be drawn. Nevertheless, to date, a significant proportion of research on reshoring is still based on case studies (see, for example, [Moradlou and Backhouse 2016]).

In order to overcome the existing limitations of this approach, a number of projects have been initiated with the aim of collecting and, to some extent, systematizing such cases. To illustrate, we will mention a number of relevant projects. The Uni-CLUB MoRe (European Monitor of Reshoring), the Reshoring Institute, and the Reshoring Initiative are three notable examples of such initiatives.

For example, the Uni-CLUB MoRe project was implemented by a consortium of Italian universities (Bologna, Catania, L'Aquila and Udine) in collaboration with the EU Eurofoundation between 2014 and 2018. The aim of the project was not only to collect data on individual cases of reshoring in Europe, but also to organize them in a regularly updated online database (European Reshoring Monitor).

In the United States, a number of institutions are engaged in the collection of reshoring cases. For example, the Reshoring Institute has been engaged for several years in a project to collect such information in the form of case studies, referred to as "reshoring case studies." The Reshoring Initiative project has resulted in the creation of the Reshoring Library, which contains more than 500 reshoring cases. This resource allows researchers to obtain and interpret information on the reshoring of US companies.

Methods for assessing reshoring based on the analysis of partially processed data aim to minimize the limitations of the approach based on the study and systematization of reshoring cases. These methods include surveys of company executives about reshoring that has occurred, as well as reviews of company reshoring activities at the regional and country levels. CEO surveys are typically conducted by large consulting and research firms such as Boston Consulting Group (BCG), PricewaterhouseCoopers, AT Kearney, and others.

In 2013, the BCG survey found that more than half of the executives surveyed were either planning or considering reshoring. The survey results indicated that reshoring is more prevalent in the United States than in most European countries. In Europe, the average percentage of manufacturing companies actively reshoring was about 4% (ranging from 1% in Eastern European countries to 6% in Belgium or France and up to 9% in Sweden and Ireland). According to numerous researchers, it is difficult to make comparisons between these figures due to different time frames (ranging from two to eight years) and the inclusion of companies that are only considering reshoring in the US surveys [Kinkel et al. 2017. P. 35]. As a result, comparisons of reshoring levels across countries should be interpreted with caution.

A study by PricewaterhouseCoopers estimates that reshoring in the United Kingdom could create approximately 100,000 to 200,000 additional jobs over the next millennium and increase the country's gross domestic product (GDP) by approximately £5 billion to £10 billion (equivalent to 0.3% to 0.6% of GDP) [PricewaterhouseCoopers 2014. P. 6].

In 2015, the consulting firm AT Kearney came to a remarkable conclusion: "Despite the many ifs and buts, it is fair to say that reshoring as a trend is officially dead, at least for now. This is not to say that reshoring has stopped altogether, nor are we suggesting that the predicted wave of reshoring will never happen" [AT Kearney 2015. P. 8].

Regional surveys of companies' reshoring activities are a valuable source of information. Eurostat surveys are the most illustrative example. Eurostat has collected data on European companies' reshoring activity on three occasions: in 2007, 2011, and 2017, for 13, 15, and 16 European countries, respectively. All surveys were carried out on a voluntary basis by national statistical institutes. The main findings of these surveys include an analysis of the factors influencing offshoring and reshoring decisions, the role of countries in international reshoring, the sectoral affiliation of companies, and other related topics.

In addition to regional surveys of firms' reshoring activities, country surveys are an important source of information. These surveys focus primarily on the reshoring activities of US companies but also include data from selected European countries, including Germany, France, the United Kingdom, and the Scandinavian countries. The aforementioned US Reshoring Initiative project not only collects information on reshoring cases but also uses these data to estimate the scale of reshoring activity. The 2016 survey results showed that 59% of the reshoring took place in China, with 13% in other Asian countries, 12% in Eastern Europe, 8% in Western Europe, and 5% in Central and South America [Kinkel et al. 2017. P. 15].

The methods for assessing reshoring discussed above, which are based on the analysis of "raw" and partially processed data, lead to conclusions that are approximate and fragmentary. Moreover, these methods are inadequate for quantifying reshoring processes. A number of approaches, which we describe below, offer the possibility of quantifying reshoring on a comparable basis over time. These approaches use indicators such as global import intensity, the share of imports in domestic demand, and the AT Kearney Reshoring Index.

In this context, M. Timmer and his colleagues [Timmer et al. 2016] present a novel indicator of international production fragmentation, namely "global import intensity."

This indicator is designed to help assess the extent of reshoring. This indicator differs from traditional indicators of vertical specialization (the share of foreign value added in exports) in two important ways. First, it measures the "import intensity" of final products, not just exports. Second, it includes imports at all stages of the global value chain (GVC), not just at the final stage of production.

The results obtained using the global import intensity indicator revealed some interesting insights into the reshoring process. It was shown that after a period of accelerated global fragmentation of commodity production between 2000 and 2008, there was a sharp decline in 2009, followed by a gradual recovery until 2011 and a slight decline thereafter. This may indicate a reorientation or restructuring of global and regional value chains. About half of the increase in import intensity between 2000 and 2008 was due to the fragmentation of international production and changes in demand. Since 2011, both fragmentation and demand-shifting effects have turned negative, each reducing the "import intensity" of world GDP by about 0.5 logarithmic points. Consequently, the decline in global GDP imports by about 50% can be attributed to the fragmentation of international production, suggesting the emergence of reshoring trends after 2011 [Kinkel et al. 2017. P. 40].

An OECD publication [Jaax, Miroudot, and van Lieshout 2023] modifies these conclusions to some extent using OECD.ICIO data. The dataset consists of cross-country input-output tables for the period 2016-2020. The use of a measure of the import intensity of production at constant prices allowed us to separate fluctuations in input prices from changes in trade volumes. A fall in commodity prices reduces the value of trade in intermediate inputs, even if the volume of trade remains unchanged. Constant prices correct for these price effects. A decline in the value of trade in intermediate inputs at constant prices indicates that trade volumes have declined. The authors found that there was a slowdown in the fragmentation of production between 2011 and 2019, but that its level in 2019 was still comparable to that in 2011. At the same time, the authors note that there was no discernible global trend toward reshoring (or nearshoring) prior to the pandemic. This is because the decline in imports of intermediate goods could be accompanied by an increase in the number of domestic stages of value chains.

Nevertheless, signs of reshoring were observed in some countries, notably the United States, where import intensity showed a downward trend between 2014 and 2018. This decline can be interpreted as evidence of reshoring. However, it should be noted that changes in the import intensity indicator may also be the result of the simultaneous effects of other factors, in particular the introduction of new restrictive trade and investment measures following the 2008-2009 financial crisis, as well as in the context of trade tensions between the United States and China, the impact of the COVID-19 pandemic on supply chain disruptions, rising wages in emerging economies and a greater ability to source resources domestically, and the spread of digital technologies and advanced robotics. All of these factors may facilitate the further progress of reshoring processes.

An indicator of reshoring could also be the import share of a country's domestic demand, which should decline as reshoring to that country increases. Empirical evidence

based on the input-output approach suggests that the import share of domestic demand has declined in recent years in some countries, including Japan, Germany, and the United Kingdom. This suggests a growing share of domestic production [De Backer et al. 2016; Timmer et al. 2021]. However, imports from the Asian region, excluding Japan and South Korea, continue to show an upward trend in most countries, despite rising labor costs in China. These results must be interpreted with caution, as one of the limitations of this indicator is the assumption that the entire value of imports was added in the exporting country. In today's globalized economy, this assumption may not always be correct. The Import Share of Domestic Demand indicator is used in the calculation of the AT Kearney Reshoring Index, which tracks the reshoring dynamics of US companies.

2. Dynamics of AT Kearney Reshoring Index

One of the most popular methods of analyzing reshoring processes is the reshoring index calculated by the American firm AT Kearney (see, for example, [AT Kearney 2021, 2022, 2023]). AT Kearney's annual reshoring index tracks whether production is returning to the United States from Asian countries, where significant amounts of industrial production have been moved over the past few decades, creating a large number of jobs.

Several indicators are used to calculate the US Reshoring Index. The first is imports of manufactured goods from 14 Asian low-cost countries (LCC)[1] including China, Taiwan, Malaysia, India, Vietnam, Thailand, Indonesia, Singapore, the Philippines, Bangladesh, Pakistan, Hong Kong, Sri Lanka, and Cambodia (1). The second is the gross domestic output of manufactured goods in the United States (2). The Manufacturing Import Ratio (MIR) is then calculated by dividing (1) by (2).

The US reshoring index is the annual change in the MIR expressed in basis points, where a 1% change is equal to 100 basis points [AT Kearney 2023. P. 2]. In this case, a positive number indicates net reshoring (actually a decrease in the share of imports in US industrial production) compared to the previous year, and a negative number indicates net offshoring. Consider the dynamics of the US reshoring index for the period 2008-2022 (see Table 2 on p. 12).

Table 2. US Manufacturing Import Ratio and Reshoring Index

Year	US Manufacturing Import Ratio (MIR) (%)	US Reshoring Index (basis points)
2008	9.19	
2009	9.50	-35
2010	10.46	-96
2011	10.35	11
2012	10.64	-29
2013	10.64	0
2014	11.22	-57

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[1]   This is AT Kearney's terminology. In our view, this group includes both low-income countries (e.g. Bangladesh) and high-income countries (e.g. Singapore).

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Year	US Manufacturing Import Ratio (MIR) (%)	US Reshoring Index (basis points)
2015	12.34	-112
2016	12.47	-13
2017	12.74	-27
2018	13.06	-32
2019	12.08	98
2020	12.95	-87
2021	14.49	-154*
2022	14.10	39**

Source: [ATKearney 2023].

* Example of calculation of the reshoring index for 2021: 12.95% - 14.49% = -1.54%, i.e. a fall of 154 basis points: the reshoring index is - 154.

** Example of calculation of the reshoring index for 2022: 14.49% - 14.10% = 0.39%, i.e. an increase of 39 basis points: the reshoring index equals 39.

How can we interpret the results based on the dynamics of the reshoring index?

First, a massive return of industrial production from Asia to the US has not yet taken place: this is evidenced by the mostly negative values of the reshoring index over the period 2008–2022, except for a slight increase in 2011 and a sharp increase in 2019 and 2022.

The spike in reshoring in 2019 was mainly driven by the escalating trade tensions between China and the US and the corresponding decline in Chinese imports. However, events in the following two years led to negative scores on the AT Kearney Index.

In 2020 and 2021, the negative reshoring index was mainly related to the lingering effects of the COVID-19 pandemic. From a purely mathematical point of view, this result indicates a resumption of mostly stable, above-average growth in the share of manufacturing imports in US domestic production. At the same time, the 2021 Reshoring Index also reflects the positive momentum of domestic manufacturing activity [AT Kearney 2022. P. 2].

The increase in the 2021 Reshoring Index does not yet indicate a strong movement toward reshoring. However, there are encouraging signs that the reshoring trend will strengthen in the future. For example, the increase in the Index was largely driven by the above-average growth in US industrial production relative to imports of manufactured and semi-manufactured goods from LLC countries. At the same time, the value of US imports from LLC countries increased by 11% year-over-year, topping $1 trillion for the first time in history [Kearney 2023. P. 2].

3. Diversification of US imports of manufactured goods: the role of "alternative" Asian countries

Along with the contradictory dynamics of the reshoring index, there are signs of a shift of US manufacturing imports from China to other low-income Asian countries (see Table 3 on p. 14). This trend appears to be highly sustainable.

Table 3. US imports of manufactured goods, 2018-2021

	2018	**2019**	**2020**	**2021**
Total	2,207 billion dollars	2,169 billion dollars	2,072 billion dollars	2,462 billion dollars
China	24.3%	20.5%	20.7%	20.1%
Other LLC countries	12.6%	14.3%	16.2%	17.4%
Europe	22.8%	24.3%	24.8%	23.7%
Canada	9.8%	9.9%	9.11%	9.4%
Mexico	13.8%	14.7%	14.0%	13.9%
Others	16.7%	16.3%	15.2%	15.7%

Source: [ATKearney 2022. P. 4].

Here, we see that China is gradually and very slowly losing its share in US industrial imports (from 24.3% to 20.1% over the period 2018-2021), Chinese imports are being replaced by supplies from other low-cost Asian countries: the share of these countries increased from 12.6% to 17.4%, respectively, over the same period. At the same time, the shares of other industrial suppliers to the US remained virtually unchanged.

Let us take a closer look at which Asian countries are substituting industrial imports into the United States (see Table 4 on p. 14).

Table 4. US imports of manufactured goods from Asian countries, 2018-2022

	2018	**2019**	**2020**	**2021**	**2022**
Total	816 billion dollars	757 billion dollars	766 billion dollars	919 billion dollars	1,022 billion dollars
China	535 billion dollars	446 billion dollars	430 billion dollars	491 billion dollars	518 billion dollars
China	65.6%	59.0%	56.2%	53.5%	50.7%
Vietnam	5.8%	8.2%	9.8%	10.6%	11.8%
India	6.2%	7.1%	6.3%	7.5%	7.9%
Taiwan	5.3%	6.9%	7.6%	8.1%	8.7%
Malaysia	4.7%	5.2%	5.6%	5.9%	5.1%
Thailand	3.7%	4.2%	4.7%	5.0%	5.5%
Other countries*	8.5%	9.4%	9.7%	9.5%	10.3%

* Other countries: Philippines, Indonesia, Pakistan, Sri Lanka, Bangladesh, Singapore, and Cambodia
Source: [ATKearney 2022. P. 12].

As Table 4 shows, the decline in China's share of US industrial imports has been "made up" mainly by countries such as Vietnam, Taiwan, India, Malaysia, Thailand, and Vietnam. This means that the relative dependence of the US on industrial imports from China is declining, but in value terms this trend is not so obvious. Moreover, in value terms, US industrial imports from China are higher in 2022 than in 2021. Nevertheless, this allows us to talk about the emerging processes of diversification of US industrial imports. There are

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many reasons for this phenomenon. Among them are the ongoing trade tensions between the US and China, which are creating elements of uncertainty in economic relations. Supply disruptions due to COVID-19 have further exacerbated the risk of over-reliance on a single source of industrial imports—China's share was nearly 25% in 2018. But the main reason, in our view, is China's rising labor costs: average monthly wages in China rose 263% from 2007 to 2018 [Morrison 2019]. This continues to drive supplier diversification and encourages companies to actively seek alternative, lower-cost sources.

A new term has appeared in the economic and business literature: Alternative Asia countries (Altasia). This group of countries includes 14 countries, mainly India, Bangladesh, Thailand, Cambodia, Singapore, Malaysia, Indonesia, Brunei, Philippines, Taiwan, South Korea, Laos, Vietnam, Japan [The Economist 2023]. They do not correspond to the group of low-cost Asian countries according to the AT Kearney classification. The Altasia countries do not include China, Pakistan, Hong Kong, and Sri Lanka, but they do include Brunei, South Korea, Laos, and Japan.[2] We believe that the term Altasia is preferable from a terminological point of view because it clearly identifies countries that collectively represent an alternative to US industrial imports from China. In addition, the inclusion of countries such as Taiwan, Hong Kong, and Singapore in the low-income group (LLC) raises some doubts.

In the future, the Altasia group of countries may contribute to the creation of supply chains as an alternative to the Chinese supplier system that the US is trying to abandon. At the same time, the Altasia countries are beginning to build their comparative advantages and competencies in a number of sectors.

Among the Asian countries that are favorable locations for US reshoring from China is Vietnam, which competes with Chinese industrial exports to the United States because of its relatively low labor costs (50% lower than in China). However, there are few examples of reshoring from China to Vietnam, perhaps because the scale of Vietnamese industrial production capacity is not comparable to that of China.

Taiwan is one of the world's largest semiconductor manufacturers [Global Value Chain Development Report 2023. P. 144]; it accounts for about 92% of the production of semiconductors or processors in the most advanced technology of less than 10 nanometers.[3] The Cambodian government has identified automotive and electronics as priority sectors and in 2022 announced plans to expand these sectors over the next three years, investing more than $2 billion and creating about 26,000 jobs [AT Kearney 2023. P. 13]. India is also beginning to emerge as a serious competitor to China due to the availability of massive amounts of cheap labor and the widespread use of English in business, not to mention its serious positions in the global software market.

However, despite the evolving processes of building the comparative advantage of a number of countries in an alternative supply chain to China, the process of

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[2]   Altasia countries: India, Bangladesh, Thailand, Cambodia, Singapore, Malaysia, Indonesia, Brunei, Philippines, Taiwan, South Korea, Laos, Vietnam, Japan. LLC countries (AT Kearney terminology): China, Taiwan, Malaysia, India, Vietnam, Thailand, Indonesia, Singapore, Philippines, Bangladesh, Pakistan, Hong Kong, Sri Lanka, and Cambodia.

[3]   Nanometer is a unit of measurement in the International System of Units (SI) equal to one billionth of a meter, i.e., 10^{-9} meters.

reshoring to Altasia faces major challenges. The most important difficulty is that none of these countries, by itself, can replace the Chinese supply system in the United States. However, if these countries are viewed as a collection of manufacturing facilities with well-established logistics supply chains, there is reason to believe that they will be increasingly able to compete with China in the future.

Over the years, US companies have built optimal supply chain systems and supplier ecosystems in Asia that are very, very difficult to restructure, especially in the short term. Reconfiguring a supplier system involves not only creating new supply chain linkages, but also disrupting existing linkages and interactions. This entails significant transformation costs. The most striking example of an established supplier ecosystem is the consumer electronics industry: it is well developed, and moving further away from China is not currently possible [AT Kearney 2022. P. 3]. A similar picture can be observed in the textile and apparel sector.

4. Nearshoring to Mexico?

While some US companies are leaving China for Latin America, others are trying to shift production to Latin American countries close to the US, most notably Mexico. Some experts believe that in the near future Mexico will become an attractive location for US nearshoring, which is commonly understood as the transfer of offshore production not back to the home country, but to geographically close countries.

Let us consider some facts that may be indicative of the developing processes of nearshoring to Mexico.

In its recent reports, AT Kearney points to some signs of economic recovery in Mexico that indicate a renewed interest in industrial production in the country—a growing demand for skilled labor, land and real estate in northern Mexico. The three key industrial cities in question are Tijuana, Monterrey, and Juarez, which tend to be the first choice for companies considering reshoring [AT Kearney 2023. P. 11].

Along with the economic recovery, it is worth noting the dynamics of industrial imports from Mexico to the United States (in value and percentage terms). The growth of industrial imports from Mexico to the United States confirms this emerging nearshoring trend. As the data in Table 3 show, Mexico has captured a substantial share of the US industrial import market in recent years (about 13-14%). This is comparable to the share of Asian LLC countries (17.4% in 2021) and exceeds the share of Canada (9.4%). In terms of value, US industrial imports from Mexico increase from $304.6 billion to $402.1 billion over the 2018-2022 period. This represents an increase of $402.1 billion over four years. The commodity composition of US industrial imports from Mexico is also beginning to change, with an increasing share of automobiles, medical equipment, pharmaceuticals, furniture manufacturing, and construction materials.

An interesting fact should be highlighted here. The growth of US industrial imports from Mexico is not only due to the activities of US companies. Increasingly, Chinese companies themselves are moving their production facilities from China to Mexico to serve their US customers and to protect themselves from further deterioration in US–China relations. In recent years, an increasing number of Chinese manufacturers have

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invested in Mexican facilities to supply the US market with manufactured goods, thus attempting to reshoring production from China itself and avoiding US import tariffs wherever possible. The New York Times, for example, published an article entitled "Why Chinese Companies Are Investing Billions in Mexico" [Goodman 2023], which noted that "Alarmed by transportation chaos and geopolitical strife, exporters from China are opening factories in Mexico to maintain sales in the United States." One of the most promising projects is the Hofusan Industrial Park.

The nearshoring trend could be evidenced by the growing volume of foreign direct investment (FDI) from China into Mexico, aimed at creating new operations that have left or are planning to leave China as part of the reshoring strategy. However, statistical data do not yet support this trend. For example, the cumulative volume of Chinese FDI in Mexico increased very little between 2018 and 2021. The total amount increased from $849 million to $1 billion, with a share of 0.18% of total accumulated investment [OECD 2022]. According to AT Kearney, the growth of industrial exports from Mexico to the United States is not yet fully reflected in Mexico's FDI volume, as we are only seeing the first wave of nearshoring, which has largely utilized the existing manufacturing base through third-party contracts for turnkey solutions [AT Kearney 2023. P. 10].

There is every reason to believe that Mexico could become an effective nearshoring location for US and Chinese companies in the near future. The main factors contributing to the relocation of production from China and possibly other Asian countries to Mexico are relatively low labor costs, the availability of labor in the necessary quantities, the ability to ensure the appropriate quality of the manufactured goods, delivery time and logistics costs. This may only be true for some industries, primarily the automotive industry and to some extent the furniture industry. The most important reason for this, in our opinion, is the strong ties (or ecosystem) of Mexican Tier 1 and Tier 2 suppliers with US automakers that have been established over the past 20 years and are a critical component of automotive production in North America.

5. The new concept of reshoring: the right reshoring at the best cost

Data on the dynamics of the AT Kearney US Reshoring Index over the past few years, despite the complexity of its interpretation, show that the US has not recovered manufacturing jobs in any significant way, i.e. reshoring processes have not been active. The shift of production from China has occurred (this is statistically confirmed), but mostly not in the form of classical reshoring "back" to the US, but to Asian countries close to China and Latin American countries close to the US, in particular Mexico, which have the "right" locational advantages both in terms of production costs and the quality of the product produced.

As noted above, surveys of manufacturing executives are one way to assess reshoring trends. Surveys conducted by AT Kearney in March 2023 show that about 96% of US CEOs are considering reshoring their operations, up from 78% in 2022 [AT Kearney 2023. P. 1]. At the same time, there is reason to believe that a new concept is emerging among CEOs. Sometimes it is called "rightshoring," sometimes "best-cost model."

The essence of the new approach is that the motivation for companies to decide where to source industrial products, including intermediate components,

is changing. For decades, a key motivation for offshoring has been the practice of moving production (and thus jobs) to those international locations where it is possible to maximize profits at the lowest cost. The pandemic and growing trade tensions between China and the US have challenged this concept. More and more companies are abandoning the search for the lowest cost location and moving to the search for "best cost," which takes into account not only cost levels but also the sustainability and reliability of supply chains.

The practical implementation of this least-cost-to-best-cost model can take many forms. US manufacturers are seeking nearer supply options, using the concept of nearshoring, which is beginning to work in the case of Mexico and other Latin American countries. There is also a drive to diversify the supply chain to reduce dependence on a single source or location. This is about reducing relative dependence on Chinese supplies, and this trend is already evident (see Table 3, p. 14). Many US companies are considering a "China plus" strategy, continuing to rely on China for most of their industrial import needs and "cultivating" additional trading partners that can reduce the risk of overdependence on a single source [AT Kearney 2021. P. 5].

Full-scale adoption of the new reshoring model will certainly face a number of obstacles that companies will need to overcome.

For example, moving from a low-cost to a best-cost approach requires addressing the issue of labor productivity growth that could offset cost increases, especially if production is moved directly to the United States. Given the relatively high cost of labor, US manufacturing must increase the productivity and efficiency of its workforce to compete effectively with China, Asia, and Mexico.

The pandemic has exacerbated the problem of finding highly skilled workers. Finding or having an adequate pool of highly skilled workers (talent pool) is another important part of the transition to a best cost model. The solution to this problem can and should be tied to the support and development of schools, colleges, and universities that offer training programs (including funding and benefits, job security, etc.) to prepare students to work in high-tech manufacturing [AT Kearney 2022. P. 9].

The solution to the problem of increasing labor productivity while increasing the demand for highly skilled workers is closely linked to the expansion of industrial automation. There are signs that US companies have begun to invest more in automation and robotics, with the automotive industry leading the way [AT Kearney 2022. P. 4]. A study by the American Manufacturing Institute found that "investments in automation and technology are the top priority for manufacturers, outpacing cost-cutting efforts for the second year in a row" [Manufacturing Institute 2020]. Prioritizing such investments has long been recognized as the key to increasing productivity and making domestic manufacturing more competitive with offshore options.

In recent years, automation no longer requires exceptionally large capital investments. For example, the cost of robots continues to fall. According to the Stanford University Artificial Intelligence Index study, the average price of robotic labor has fallen 46.2% over the past five years (2019-2023). Robot density has increased dramatically around the world, including in the US, where there are now 117 robots per 10,000 workers as a result of an 8% compound annual growth rate since 2016. The market for industrial

automation and control systems is expected to grow to approximately $290 billion by 2030, a CAGR of 9.2% [AT Kearney 2023. P. 9].

6. US economic policy as a response to the complexities of reshoring processes

Difficulties in overcoming the obstacles to implementing the right reshoring model have led to an economic policy agenda aimed at increasing US government action to support domestic manufacturing, particularly in areas deemed strategically important to the national interest. This is evidenced by a number of related initiatives, including the Executive Order on American Supply Chains [The White House 2021]; the Inflation Reduction Act [The White House 2022a]; the Chips and Science Act [The White House 2022b]; the Executive Order on US Investment in Certain National Security Technologies and Products in Countries of Concern [The White House 2023].

In February 2021, President J. Biden signed an Executive Order on America's Supply Chains. The Executive Order emphasizes that as supply chains and the industrial base become increasingly vulnerable—whether due to old forces like underinvestment or new forces like climate change and cyberattacks—it is clear that the US Government must work to address these threats to economic resilience and national security.

In addition to making the supply more sustainable, diversified, and secure, the executive order aims to make the US less dependent on foreign sourcing. This will help insulate the US economy from potential shortages of critical imported components, restore manufacturing capacity, increase domestic demand for domestic products, and create good-paying jobs.

Incentivizing domestic manufacturing, along with investments in critical infrastructure and advanced technologies in partnership with world-class, leading US universities, as well as increasing demand for the "Made in America" brand, can help reinforce the trend of reshoring manufacturing to the US.

The Inflation Reduction Act, approved by Congress and signed into law by President Biden in August 2022, combines the goals of reducing domestic inflation, particularly that caused by global energy issues, and combating climate change. The Act provides incentives to increase energy production and reduce national carbon dioxide emissions, which is expected to result in lower energy costs for US consumers. The Act also provides tax incentives for domestic manufacturers of electric vehicles and electric vehicle batteries, which are currently largely imported. Tax credits will be available to domestic manufacturers if they meet the "Made in the USA" criteria. Currently, the content requirement for Made in the USA tax credits is 60%. To incentivize domestic production, this must increase to 65% in 2024 and to 75% thereafter.

The CHIPS and Science Act, signed into law by President Biden in August 2022, is closely tied to the Inflation Reduction Act. The Act is designed to attract investment in domestic semiconductor manufacturing to increase competitiveness and innovation. The US has an ambitious goal to "bring back" the semiconductor manufacturing ecosystem to

the US and mitigate future supply chain disruptions. Historically, the US accounted for 37% of the global semiconductor market, a share that has now fallen to 12%.

In August 2023, the President signed an Executive Order on Addressing United States Investments in Certain National Security Technologies and Products in Countries of Concern. The order authorizes the US Treasury Secretary to prohibit or restrict US investment in foreign companies in three sectors: semiconductors and microelectronics, quantum cryptography, and certain artificial intelligence systems. The measure would apply to private equity, venture capital, joint ventures, and greenfield investments. Technically, the new rules will apply to investments in companies in a number of countries (US adversaries), but in practice will only affect work with the PRC. The announced restrictions will take effect in 2024 at the earliest and will not apply to earlier investments from the US. It is still difficult to talk about the results of such a decree, but the main direction is very clear — to prevent the emergence of new competitors from China in the field of advanced technologies.

These legislative incentives may reinforce the trend toward domestic manufacturing and reshoring in the US semiconductor sector, but US manufacturers will face fierce competition from Asian manufacturers that have built an effective global supply ecosystem in the sector. According to Goldman Sachs Research, it costs 44% more to build a semiconductor plant in the United States than in Taiwan, which is currently the leading location for advanced computer chips [AT Kearney 2023. P. 8].

7. Conclusion

Data on the dynamics of the AT Kearney Reshoring Index over the past few years indicate that reshoring processes have not been active in the US. There has been a shift of production from China, but mainly not in the form of classic reshoring "back" to the US, but reshoring to Asian countries near China.

This has led to a decline in China's share of US industrial imports, which has been compensated mainly by so-called Altasia countries, especially Vietnam, Taiwan, India, Malaysia, Thailand, and a few others. This diversification of US industrial imports does not mean that China is losing its importance. In high-tech industries such as automobiles and electronics, China's position is still very strong and is unlikely to be significantly shaken in the short or even medium term (within 3-5 years).

This is because over the years China has developed optimal supplier ecosystems that are very difficult to restructure, as reconfiguring these systems not only involves creating new production and logistics linkages, but also destroying existing linkages and interactions. This results in significant transformation costs. In addition, none of the Altasia countries individually can replace the Chinese supplier system.

In addition to the reshoring of production from China to neighboring Asian countries, processes of nearshoring to Latin American countries close to the United States, especially Mexico, are also developing. There is every reason to believe that the nearshoring trends will be sustainable, given the fact that these processes involve not only US companies, but also Chinese companies, which are beginning to invest in Mexican companies to supply the US market with manufactured goods, thus attempting to reshoring production from China on their own, as well as circumventing US import

tariffs if possible.

These reshoring trends suggest that companies are gradually developing a new model of "right reshoring" that considers not only low-cost production when locating international production, but also the sustainability and reliability of cross-border supply chains as a whole. The pandemic and growing trade tensions between China and the US have played a significant role. Understanding the trends in international fragmented production, including reshoring and nearshoring trends, is important for economic policy in the US and other countries involved in international production networks.

This study shows that there are no "ideal" indicators or methods for assessing reshoring trends. We believe that further research in this area will develop along several lines. First, a sectoral approach will be increasingly used, as it is clear that reshoring evolves differently in the context of different industries, in particular the high-tech sectors as well as the services sector. Second, additional indicators that could contribute to the understanding of reshoring trends will be increasingly used, such as the ratio of domestic to foreign stages of supply chains in terms of number and value added, the number of foreign affiliates of multinational enterprises, and others. Third, special attention will be paid to country studies, as so-called "global" trends often hide the real processes of international production reorganization.

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Toward a Theory of the Malthusian Trap. Part 2

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Abstract

Economic historians nowadays argue that economic growth in the world was extremely slow and unsustainable until the beginning of the Industrial Revolution in the late eighteenth century. This article traces how the efforts of many economists and historians have gradually developed the concept of the "Malthusian trap" to explain the centuries-long relative stagnation of agrarian society. In the case of traditional economies, cliometric studies generally confirm Thomas Malthus's ideas about the compensation of the positive impact of technological progress on per capita income by population growth. Modern scholars supplement them by analyzing the social structure of the society in the Malthusian trap, as well as its inherent institutions of redistribution, and the periodic flourishings and declines of proto-industry and trade that took place in those times. The article shows the logical interrelation of these elements within the Malthusian dynastic cycle. The concept of Malthusian trap is compared with the Marxist vision of the historical process. It is shown that positive insights of the Marxist approach can be implanted in the modern theory.

The article begins in the previous issue of Contemporary World Economy.

3. Marx and Malthus: viewing from the 21st century

The assertion that the theory of economic development is a good deal predicated on the tenets of T. Malthus may elicit a shock among individuals who have been socialized within the Marxist tradition (and this is still, to some extent, the case in Russia). As is well known, in the Soviet period, the entire history of non-Marxist economic thought was presented as divided into two parts: pre-Marxist (the importance of economists of that time was assessed by whether they had prepared any rational ideas that were later adopted by Marx) and post-Marxist. It was supposed that the theories of the latter era could not be correct simply because there had already been a true, Marxist vision of the relevant issues.

Moreover, the economic concepts of the entire post-classical period (the watershed here was the works of D. Ricardo and his closest followers) were considered "vulgar" at the suggestion of Marx himself. It was assumed that their developers did not even set themselves the goal of a conscientious scientific search. Instead of building cause-and-effect constructions, they either glided over the surface of phenomena, limiting themselves to the consideration of purely functional relationships, or resorted to conscious falsifications.

Malthus did not align with this framework. He lived before Marx and shared many of Ricardo's views, yet Marx's assessments of him were pejorative.[11] The solution to this trouble was found in the assertion that Malthus is one of the earliest vulgarizers of economic science. It implied that Malthus' theory of population, with its harsh assessments, was not merely a biased but also an unscrupulous apologetic of capitalism [Afanasyev 1988].

Marx directly polemicized with Malthus over the regularities inherent in capitalism as Marx himself observed it in the middle of the 19th century. But our study will not address their views on the sources of value formation. Malthus, like Smith before him and Marshall and many others thereafter, was ambivalent on this matter, while Marx demonstrated ideological consistency in defending the principle of determining value by labor. Nor will this study address the interrelationship between economics and demography inherent in early capitalism. (Neither Malthus nor Marx lived long enough to see the end of the demographic transition. They simply extrapolated their ideas about population dynamics into the future and both proved to be wrong. Malthus's assertion that society would continue to have a high birth rate and, therefore, mass poverty would be inexorable did not find confirmation in reality. And Marx mistook in his prediction that the constant reproduction of surplus population in the form of a "reserve army of

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[11] Here is a sample of Marx's judgment of Malthus: "Malthus is characterized by a *profound baseness* of thought, a baseness which only a priest can afford, who sees in human poverty the punishment for the fall into sin and cannot do without the 'earthly abode of sorrow,' but at the same time, having in mind the church income he receives and using the dogma of predestination, finds it very profitable to 'please' the ruling classes to stay in this abode of sorrow. ...Malthus's conclusions on scientific matters are fabricated *'with an eye'* to the ruling classes in general and to the reactionary elements of these ruling classes in particular; and this means: Malthus *falsifies* science to serve the interests of these classes. On the contrary, his conclusions are *resolute, ruthless*, as far as the oppressed classes are concerned" [Marx 1978. P. 122, 125].

labor," i.e., unemployment, would become one of the reasons for the collapse of capitalism as a system.)

The purpose of this study is to gain insight into the periodization of traditional, pre-capitalist societies, and the logic both of their evolution and subsequent industrial transformation, as Marxism and Malthusianism draw them. No doubt, any periodization is based on certain criteria, which means that it is largely subjective. Generally speaking, the more periodizations there are, the better. Their totality allows us to gain a more comprehensive understanding of the object under study.

For instance, the periodizations of the history of the world economy by K. Bucher (who distinguished between the stages of the closed household, urban, and national economies), K. Polanyi (who outlined tribal, archaic redistributive, and modern market societies), and W. Rostow (who traced the path of the economy from the stage of traditional society to the creation of prerequisites for the industrial "take-off," the "take-off" itself, the "drive to maturity," and the "era of mass consumption") do not so much refute as complement each other. All of them, to some extent, emphasize a fundamental milestone in world history, namely the replacement of the agrarian economy by industrial capitalism, and seek to explain these radical changes.

If we consider in such a context the contributions to the theory of historical process made by Marx and Malthus, the former seems to have a clear advantage. He proposed a logical, and still very influential, periodization based on more or less clear criteria. In contrast, Malthus perceived no fundamental distinction between the society of his era and that of previous times. He assumed that the patterns he described were universally applicable.

The analytical framework of the Malthusian trap was developed by economists in the 20th century to retrospectively differentiate between epochs preceding and following the Industrial Revolution. This is not a literal reproduction of Malthus's theory; rather, it is an application and reinterpretation of its rational elements. Nevertheless, the concept of the Malthusian trap remains quite amorphous. Really, it portrays a significant portion of human history as monotonous and homogeneous.

Nonetheless, more than a century and a half has passed since the appearance of Marx's theory. Even in our country, it has long ceased to be perceived as the Sole True Doctrine. With all due respect to Marx, it is both possible and necessary to question the extent to which the approach proposed by him is consistent with the empirical facts accumulated by historical science since his death and with the new theoretical generalizations made since then.

It should be noted at the outset that the term "Marxist periodization of history" refers not to the "five-stage model" (so called "vulgar historical materialism") but rather to the views of Marx himself, as expressed by him in the 1850s and 1860s [Vasiliev 1998]. It is necessary also to make one more important reservation. Marx's understanding of the order in which the stages of social development succeed each other is presented only in the most general form in his main economic works, "A Contribution to the Critique of Political Economy" (1859) and the first volume of "Capital" (1867). He proceeded to outline the historical evolution of social systems, beginning with the primitive system, followed by the Asiatic mode of production, then by the ancient (slave-holding) mode, the feudal

mode, and at last, capitalism. He posited that the latter system would finally be replaced by a communist society.

However, while Marx conducted a comprehensive analysis of the capitalist system, his descriptions of the three pre-capitalist formations were somewhat confined. It is challenging to ascertain Marx's views on the internal organization of traditional societies expressed in the works published during his lifetime. Additional insights can be gleaned from Marx's draft manuscripts and letters to F. Engels. Yet those materials were not intended for a general audience and were likely to be just preliminary hypotheses.

In the 1870s and 1880s, Engels wrote extensively on the topic of pre-capitalist societies. However, his approaches do not entirely coincide with Marx's earlier calculations. This has led then to considerable debate regarding whether Engels excluded the Asiatic mode of production from his periodization of world history in his "The Origin of the Family, Private Property and the State" (1884).

Consequently, numerous pivotal links in the theory of pre-capitalist formations were established only in the 20th century by Marxist scholars who interpreted or refined the ideas of the prophet in a particular manner. This phenomenon bears resemblance to the way in which the concept of the Malthusian trap was developed. In any case, a significant portion of Marx's understanding of pre-capitalist societies has remained opaque, and lively debates on its different points were going on among specialists until the very end of the Soviet era.

It can be reasonably assumed that Marx applied the general principles of the dialectical interaction of productive forces and production relations, and of the basis and superstructure, to pre-capitalist formations, as well as to capitalism. It implies that during the ascending phase of the formation, production relations create incentives for the progress of productive forces, and society moves forward. However, technological development eventually generates the need to change institutions. The existing production relations begin to inhibit further progressive shifts in the productive forces. Eventually, the conflict is resolved through a social revolution, during which both the economic basis and the political-legal and ideological superstructures are changed.

It is evident that this perception of the course of history was intended to demonstrate the inevitability of the future collapse of capitalism. The manner in which capitalism, through bourgeois revolutions, overcame the Middle Ages served as an empirical illustration of Marx's algorithm. Yet applying this logic to the way pre-capitalist modes of production functioned and replaced each other is much more difficult.

With regard to capitalism, the starting point of Marx's research was commodity production, and from this he deduced the relations of exploitation. These are the relations whereby capitalists appropriate surplus value created by workers. In stark contrast, in describing the socio-economic structures of the Asiatic, ancient, and feudal modes of production, Marx drew from one or another type of agricultural commune.[12]

With regard to the Asiatic mode of production, he considered a rural commune, where arable plots were already divided among peasant families, but were not private

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[12] "Slavery, serfdom, etc., are always secondary forms, never original ones, despite the fact that they are the necessary and consistent results of property based on the communal system and of labor in the framework of this system" [Marx 1980. P. 491].

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property, and were prone to be periodically redistributed anew. Craft and agriculture coexist within the commune, so it is self-sufficient and naturally closed. The exchange of handicraft and agrarian products contributes only minimally to the development of commodity-money relations.

Such communes are united into a single whole by a despotic state. While the state nominally owns all the land, in reality, land ownership relations are highly complex. Indeed, the state as a whole (represented by the monarch), regional administrators and army officers who receive land grants from the state, the commune, and the individual peasant all have rights to the same plot of land. The institution of private property is nascent. Moreover, the very existence of private land ownership was often denied by Marx in regard to the Asiatic mode of production.

The social inequality inherent in this social system is specific. The exploiters, i.e., the stratum that appropriates a share of the harvest collected by peasants, are not private owners. Instead, they are representatives of the state apparatus. In other words, state land property is realized through a special mechanism of withdrawal of surplus product, in which land rent and tax coincide. Concurrently, the Asiatic mode of production is distinguished by the retention of a substantial role for collective labor, both at the commune and at the macrolevel. The most evident manifestation of this is an extensive irrigation construction, which was accomplished through the mobilization of a vast number of peasants by the state for public works.

It is difficult to ascertain from the context of Marx's statements whether he intended to describe the Asiatic mode of production as a universal stage of development or as a distinctive path of development in the East. Indeed, with Marx's evident Hegelian background in sight, these two interpretations do not appear to be mutually exclusive, since according to the principles of dialectical logic, the general exists not only through the particular but also alongside it.

Yet, since Marx observed the phenomena inherent in the Asiatic mode of production in both the ancient and medieval East, it is not entirely clear how to apply the analytical categories of "productive forces," "production relations," and "social revolution" to this complex phenomenon. For if the institutions of the Asiatic mode of production actually hindered the development of the technological basis of the economy, it would be difficult to understand why the social revolution did not occur, and instead the East found itself in a state of a millennia-long stagnation.

This question is particularly pertinent given that Marx also associated the existence of a slave-holding (ancient) mode of production with a certain geographical area – the Greco-Roman one. He did not provide an explanation of how the supposed revolutionary shift from the Asiatic to the ancient formation occurred. Actually, at the time Marx lived, there was no empirical material for such generalizations. The Cretan-Mycenaean culture, which was really similar to the Eastern ones, had not been discovered yet. In retrospect, it is possible to view the lengthy evolution of ancient Greek society from the decline of Mycenae to the establishment of the classical Greek civilization as a social revolution. Yet Marx's analysis primarily focused on the divergence between Greek and Roman agricultural city-state (or the polis-community) and the Asiatic commune.

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The polis is a city, inhabited not only by artisans, merchants, and administrators, but also by peasants seeking refuge from military attacks behind the city walls. The cultivated land plots in the area adjacent to the city belong to peasants as private property. Nevertheless, the fundamental condition for owning a plot of land is a membership in the commune and the status of a free citizen. Conversely, every citizen was required to be endowed with a plot of land, which was considered to be a guarantee of his economic independence and thus the ability to make free, meaningful political decisions. In order to provide land to new citizens in the polis, there was a public property.

So, the polis system was based on the balance of private and state properties but with a tilt to a private one. The development of monetary relations, due to the separation of crafts from agriculture, gave new impulses to the privatization of land and its market redistribution. The polis was characterized by a democratic political system. However, there was no system of representation; rather, direct rule by the people was exercised. The members of the people's assembly constituted the people's militia, and there was no professional army in the polis.

Still, Marx's analysis of the mobilization of additional labor into prospering farms under the polis system was limited. He did not delve into the specific circumstances that led to the use of slave labor. Marx just focused on two possible variants of human enslavement: i.e., captivity and sale for non-payment of debt.

F. Tokei demonstrated the causal relationship between the polis and slavery "from the contrary." If we assume that in the polis additional labor would have been attracted through free hiring or leasing of land, it would mean that within the polis there would arise a layer of full-fledged free citizens who did not perform the function of private landowners. And that would be inadmissible because of the very foundations of the antique form of property. Then, if serf relations were practiced, it would result in the emergence of a layer of land owners who are not free citizens. (A serf acts as a co-owner of communal land; he owns the plot adjacent to the house, tools, etc.) However, this also contradicts the essence of the polis. The presence of slaves, in its turn, does not disrupt the intricate intrapolitical equilibrium, as the slave is neither a citizen nor an owner; rather, he is an object of appropriation [Tokei 1975].

Moreover, during the classical antiquity period, when slavery reached its zenith, there existed no form of slavery other than a military one. The enslavement of citizens for debt was prohibited in Athens by the reforms of Solon (6th century BC) and in Rome by the reform of Petellius (4th century BC). Nevertheless, for a considerable period, the influx of prisoners of war was almost continuous. Based on Marx's idea of the bellicose nature of the polis, R. Nureyev demonstrated that external aggression was a natural consequence of the self-discovery of the polis structure.

He posited that the ancient form of property, which entailed a relatively even allocation of land to citizens and also the political equality of community members, did not abolish social differentiation. Furthermore, after it ceased to be embodied in debt slavery, "the internal contradiction between rich and poor, between large and small landowners, and between slave owners and urban poor had to be solved at the expense of third parties, and was taken outside the polis" [Nureyev 1979. P. 41]. In times

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of war, internal social contradictions receded into the background, and a successful war increased the labor resources available to the polis.

However, these same circumstances make the polis slave system unstable and unviable in the long term. S. Utchenko traced the development of tendencies inherent in the Roman polis structure that ultimately led to its demise. After the conquest of Italy and the granting of Roman citizenship to all its free inhabitants, the principle of providing land to every person was no longer respected. The participation of all citizens in the functioning of the people's assembly was no longer possible as well.

The desire to expand the polis territory and enslave more people led to further conquests. But the distribution of land in the newly acquired provinces resulted in the concentration of property, leading to a significant increase in wealth inequality within the Roman polis itself. Competition with the crops harvested in large slave-holding estates (latifundia) and with cheap food imports from the provinces undermined the economic position of the Roman and Italian peasantry. The necessity of constant warfare led to the emergence of a professional army, which, in turn, resulted in the principle of the unity of the popular assembly and the popular militia no longer applying.

Ultimately, the undermining of small private land ownership, which was the foundation of political democracy, paved the way for a transformation of the political regime. The republic was replaced by the empire, i.e., by an oligarchic mode of domination by the landed aristocracy. The system entered a state of crisis as its territorial expansion had exhausted and the flow of new slaves had dried up. The state itself perished under the blows of belligerent neighbors. However, even in the last centuries of the Roman Empire, the area of slavery was shrinking in favor of new forms of labor relations, such as peculium (providing slaves with opportunities to have a family and certain property) and colonatus (using dependent, formerly free farmers) [Utchenko 1977].

In these phenomena, the sprouts of the next formation in the Marxist order, i.e., of the feudal mode of production, are often seen. Yet even if we agree, it is still somewhat difficult to acknowledge a social revolution in the transition from antiquity to the Middle Ages. A further issue is whether the evolution of the polis slave system and its subsequent decline can be regarded as an illustration of how productive forces were initially promoted by production relations and subsequently began to be constrained. In essence, this could be better described as a cyclical process, whereby the stages of "origin, blossoming, decline and demise" are identified, as such a process is usually depicted by the theory of regional civilizations.

In any case, Marx himself saw the origins of feudalism not in the transformation of late antique structures, but rather in the evolution of yet another, third, type of agricultural commune, which was inherent in the ancient Germans and which they reproduced in the territories of the Roman Empire. In other words, the genesis of the feudal system was also associated by Marx with a certain region.

Unlike the polis and like the Asiatic commune, the Germanic commune is not urban but rural. The similarity between the Germanic commune and the Asiatic one lies also in their shared naturalness. However, in the context of the Asiatic mode of production, handicraft activity often became the domain of commune's individual members. In contrast, within the Germanic commune, handicrafts are conducted within households.

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Still, the primary distinction between the two types of a commune lies in the ownership of land. The land plots of the Germanic commune are privately owned, while the land remains collectively owned in the Asiatic commune.

Almost no public, collective works are practiced in Germanic communes. Community members do not live in one village; rather, they are scattered over a large territory and come together only to solve issues that are urgent for all of them. Thus, while the Asiatic mode of production was dominated by quasi-state ownership of land, and in the ancient community there was a complex balance of private and public properties, the Germanic commune is an association of private landowners. Marx points that this is already the reason for the formation of income and status inequality in early medieval society.

However, the primary source of social stratification in the emerging feudalism was a specific military-political structure by means of which the state distributed land to professional warriors, the knights, on the condition of service. In relation to the peasants, such representatives of the military elite acted as guarantors of security. In return, the peasants undertook to fulfill their duties and serve this particular lord. This is how the institution of serfdom was born.

Thus, the symbiosis of land ownership by feudal lords and peasants subordinated to them was established. It was large private landowners, feudal lords, who were the recipients of land rent. The transfer of administrative powers and land resources to the lower levels of the state administration system led to political disintegration, to what is commonly called "feudal fragmentation."

This is the typology of pre-capitalist societies in "real" Marxism. The Marxist theory differs from the "vulgar five-stage model" in that it incorporates the Asiatic mode of production as an additional link. Marx's periodization of traditional societies is based on the gradation of types of agricultural communes, and they correspond to this or that form of withdrawal of surplus product.

Yet the path of transitions from one pre-capitalist formation to another has remained largely unexplained in Marxism. It seems that Marx did not mean that progress in world history supposed the sequential road gone by each country from one universal stage of development to another. Marx arranged the pre-capitalist formations in this order, and not in any other, on the assumption that the path from the Asiatic mode of production to feudalism meant the gradual liberation of people, thanks to the progress of technology, from dependence on the natural environment and rigid subordination to the collective.

He associated this sequence with the gradual formation of the institution of private property. Marx posited that this process of liberation was completed under capitalism with the emergence of a combination of personal freedom for the worker, on the one hand, and economic compulsion to labor, on the other. In the future, with the transition to communism, society should be freed further from the restrictions associated with the private form of appropriation.

In other words, Marx's pre-capitalist formations are stages of the progressive development of all humanity, not just of one country. They unfold initially as unique regional civilizations, and later some of them can draw other countries and regions into the orbit of their influence. These are not mandatory stages that every society must pass through. In individual countries, the sequence of evolution can be different, and,

therefore, Marx preferred not to talk about universal mechanisms of transition from one pre-capitalist mode of production to another.

However, it is necessary to determine right now to what extent this intellectual, creative version of Marxism agrees with what modern economic historians know about the past. Two inconsistencies concerning super-long-term trends immediately attract attention.

Firstly, the per capita GDP indicators calculated by A. Maddison for the years 1-1800 demonstrate a certain dose of growth, although in comparison with the trends observed in the 19th and 20th centuries, this growth appears to be relatively modest. Furthermore, these data challenge the basic hypothesis of steady progressive development put forth by Marx, as the tendency of per capita GDP to increase in many countries and regions was often replaced by a tendency for it to decline.

Of course, it is possible to assume that this is the very regularity according to which production relations either contribute to the development of productive forces or hinder it. Nevertheless, even here, the ends do not meet. For instance, during the 1st millennium AD in Western Europe, per capita GDP either decreased or remained stagnant. However, according to the Marxist approach, the newly-formed feudalism, the only system at that time, should have had a favorable impact on technology development.

Secondly, both figures and facts do not support the thesis that the economic leadership of Europe (the West) was consolidated as early as in the ancient, slave-holding era and remained unshakable thereafter, and that it was in this region that transitions to more advanced formations (feudalism and then capitalism) took place. That thesis assumes that the East remained in the Asiatic mode of production, was prone to cyclical fluctuations between political centralism and disintegration of the state, and experienced centuries of economic stagnation from which it could not break through.

In fact, per capita GDP in China and India was higher than in European countries both in 1 and 1000 AD. The invention of paper, gunpowder, the compass, and a variety of agricultural, metallurgical, medical, and other technologies during the 1st millennium AD testifies to China's technological leadership then.

A. Petrov demonstrated that both in antiquity and in the Middle Ages Europe had a deficit in trade with Eastern countries. Europe's ability to import products of proto-industry and spices from the East was constrained by the lack of goods it could offer in return [Petrov 1986]. A. Maddison and numerous other researchers attribute the emergence of the West as a leader in terms of per capita income and the level of technology only to the 16th century. In contrast, K. Pomeranz and other representatives of the "Californian school" argue that even in the 18th century, the East did not look backward at all.

Consequently, the fundamental principles of Marx's periodization and its implicit eurocentrism can be questioned. Moreover, analytical difficulties also arise with the characteristics of more fragmented historical epochs within the framework of the "reference" European version, i.e., with the very socio-economic formations. Even if we accept the fact that it is impossible to depict the transitions from one pre-capitalist

formation to another as social revolutions, each subsequent mode of production still must be higher in terms of the level of productive forces than the previous one, otherwise it will no longer be Marxism. Yet, this does not work either.

It is not possible to connect the emergence of ancient civilization with a higher level of technology than in the East. Modern historians have stated that a certain technological leap in ancient Greece did take place. The Iron Age began there at the turn of the II-I millennium BC, approximately five hundred years earlier than in China. The specialization in the manufacture of iron tools in Greece stimulated the general separation of crafts from agriculture, the development of commodity-money relations, and the privatization of land. But the period of the polis and classical slavery was characterized by a lack of technological advancement [Zarin 1991; Mokyr 1992].

No wonder the decline was a consequence of the use of cheap slave labor, which did not stimulate the replacement of labor by capital. Furthermore, the truly groundbreaking innovations that enabled ancient societies to prevail over their Eastern rivals were institutional ones (civil society, democracy, and protected private property rights) and the related special organization of military affairs. In other words, it can be proven that the competitive advantages of antiquity lay predominantly on the non-economic plane. It is difficult to demonstrate that they were generated by more perfect productive forces than in the East.

The Marxist tradition offers a compelling explanation for the undermining of the polis structure in Athens and Rome. However, modern historians and economists posit that in its later centuries (with the transition from the principate to the dominate), the Roman Empire was not significantly different from the Eastern despotisms. It was also a socio-political structure based on the redistribution of rent revenues through state fiscal channels [Gaidar 2005; Zarin 1991]. So, the very existence of the Roman Empire should be interpreted not as a confirmation of a higher level of ancient civilization compared to the Eastern ones, but rather as an attempt to unite Europe and the adjacent territories. This attempt failed rather quickly. In such a way of reasoning, the collapse of the empire is not perceived as a systemic, inter-formation boundary, or as a transition to a higher type of social structure. Instead, it is viewed as an analog of the cyclical crises of the Eastern states.

If the Roman Empire is a redistributive structure, it is logical that it was fragmented into separate cells corresponding to the levels of the administrative vertical. Ye. Gaidar refers to this phenomenon as "feudalism" [Gaidar 2005], while L. Vasiliev defines it as "political feudalization," which can occur in the context of the Asiatic mode of production as well and should be distinguished from "feudalism" as a socio-economic system [Vasiliev 1998]. However, it is notable that the origins of this process were quite Eastern in Europe. The advent of these phenomena should not be regarded as an indicator that a new, higher level of development was reached in Europe in the early Middle Ages. Rather, it was a phase of the same cyclical dynamics that took place in the East.

Further, with regard to the new forms of labor relations that emerged in the late Roman era, it is important to recognize that they did not appear as a unified phenomenon. The emergence of the peculium can be attributed to two key factors: the undermining of the polis system and the drying up of the influx of new slaves. If military slavery was

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practiced because this was the most efficient way of mobilizing labor resources for the polis, then it is logical to conclude that when the polis system of checks and balances breaks down, the low economic efficiency of slavery becomes more apparent. In light of the declining number of slaves, experiments were initiated to provide them with material incentives to work.

The colonatus, in its turn, can be interpreted as a consequence of the need to keep tax and private rent payers in certain territories against the background of a general decrease in the stock of labor resources due to a reduction in the inflow of slaves, on the one hand, and population decline because of military and political instability, associated with constant invasions of barbarian tribes, on the other. For these reasons, more and more land was released and the possibilities of migration and escape from rent obligations increased.

In this context, the ancient civilization can be considered a "social mutation" [Vasiliev 1998] or "anomaly" [Gaidar 2005] in comparison to the prevailing model of redistributive societies. It did introduce a number of novel elements to the historical record. However, as a result of the erosion of the polis structure, this anomaly was ultimately absorbed into the mainstream. The Roman Empire emerged from a distinctive social organization, the polis, but ultimately became a conventional despotism.

It is evident that not only the transition from the Asiatic mode of production to slavery, but also the transition from antiquity to the Middle Ages cannot be explained within the framework of the "productive forces—production relations" paradigm. In fact, the collapse of the ancient civilization led to a lengthy (at least half a millennium) technological regression, transforming Europe into a raw material and agrarian periphery of Eurasia [Zarin 1991; Meliantsev 1996].

This raises the following question. If the dynamics of the evolution of the Roman Empire, followed by the Frankish empire of the Carolingians, were subject to approximately the same regularities that took place in the Eastern despotisms, then does it make sense to insist on the distinction between the Asiatic mode of production and feudalism? The specificity of the latter is usually seen in the following points:

Firstly, in the political fragmentation, which contrasts with the centralism of Eastern despotisms. However, it is likely that the existence of centralized redistributive empires in the West (such as those of Rome and the Frankish state) is overlooked just due to the prevalence of stereotypes. Indeed, Eastern despotisms also periodically broke down into autonomous entities and disintegrate. So, the cyclical fluctuations inherent in redistributive societies included both centralization and disintegration.

Secondly, it is commonly believed that feudalism, in contrast to the Asiatic mode of production, is a system based on private property. Yet, it should be noted that the primary source of its formation was the granting of state lands to the servile nobility (rulers and military). This occurred both in the West and in the East, and the privatization of land in peasant communities due to the separation of family farms from each other, took place as well in both parts of the world.

Thirdly, it is assumed that the salient feature of European feudalism is serfdom. However, in fact, it appeared from time to time in the East as well, if there was free land where rent-paying peasants could go. Furthermore, when land was a scarce resource, the

redistributive economy could exist without serfdom.[13] One of the systemic similarities between medieval societies of the East and West is the overlapping rights of the state, elite groups, and communal peasants to the same land. Such unspecified property rights could exist with or without serfdom.

Thus, it can be demonstrated that both the East and the West throughout most of pre-industrial history existed according to generally uniform laws of redistributive society. Centralization and feudalization were simply phases in its cyclical dynamics. The "anomaly" of the West diverged from the East for a period of time, but this difference was not sustained. While it did stay a legacy that gave institutional specificity to Europe, by and large, Western societies of the Middle Ages were still typologically similar to Eastern ones.

Indeed, the peculiarity of medieval Europe is not feudalization per se, but the particular instability of centralized empires and their rapid disintegration. In modern literature, this phenomenon is attributed to a number of factors, including the abundance of rivers, the absence of a single irrigation system (that was crucial to agriculture in the East), the remoteness of the region from the locations of nomads, the traditions of Roman law, the autonomy of the church, and so forth [Gaidar 2005; Zarin 1991; Meliantsev 1996; Chirot 1985].

For an individual who was adopted within the writ of the "five-stage model" and was unaware of its distinctions from Marxism in its purest form, the initial step towards "liberation from the morass" is to acknowledge that the "five-stage model" does not apply to the historical development of both the East and pre-Antique Europe. The presence of the concept of the Asiatic mode of production in "real" Marxism appears to resolve this contradiction, that is why this concept was so popular among Marxist intellectuals. But a closer examination reveals more and more inconsistencies, prompting to take the second step: to recognize the fundamental homogeneity of the East and the West both in the pre-Antique period and in the Middle Ages. This entails stating that medieval Europe is also "the East."

Another topic to consider is the emergence of capitalism in Western Europe. This phenomenon is viewed by Marxists as a classic case of social revolution, driven by the incompatibility between the advanced productive forces and the backward production relations of the time.

It is believed that the advent of new craft technologies led to the revitalization of urban economies in Western Europe. This, in turn, caused the integration of the village into the commodity-money exchange. The production capabilities of peasant farms also increased due to the development of more advanced crop rotations. Seeking commercial gain, feudal lords preferred to transfer the peasants from corvée to kind and then to

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[13] "To what extent in agrarian societies a peasant is fixed on his land depends on the circumstances, primarily on the quality of land. If it is a rare and scarce resource, there is no need to enslave the peasant by force of state power—he will not go anywhere himself" [Gaidar 2005. P. 159]. K. Pomeranz formulates the same idea somewhat more ornate: "A relatively 'fully' populated area is one supporting about as many people as it probably could have without a major breakthrough in technology. Such areas are likely to face looming ecological crises and be places in which elites who control a relatively scarce factor of production (land or perhaps capital as well) may be less likely to insist on binding (abundant) labor to themselves" [Pomeranz 2000. P. 355].

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cash levies. The final result of these processes was the liberation of peasants from both serfdom and community control. Thus, the prerequisites for the emergence of a class of personally free wage laborers were created.

But, for this process to occur, there had to be a definitive separation of peasants from ownership of land and tools. This was done partly due to competition between peasant households themselves, which stimulated further increases in productivity but led to the bankruptcies and displacement of many producers from agriculture. It was also due to traditional noble elites taking land from the peasants in search of new sources of income. Thus, according to Marx, the rise of capitalism in a national economy begins with such an upheaval in agrarian relations. Marxism assumes that surplus labor resources waiting to be used in industry are not an attribute of the traditional economy, which existed for thousands of years, but they are a product of social differentiation associated with the development of capitalist relations.

In turn, urban merchants sought to find new avenues for profitable investment, and it led to the direct subordination of craft industries to tradesmen. The differentiation among artisans resulted in one group becoming entrepreneurs and the other becoming hired workers. The previous guild restrictions on workshops limited the realization of the full potential for production, and these were abolished, ceding a space for the operation of competitive forces. As a result of these changes, further shifts in industrial organization occurred (manufactures emerged), and the demand for mechanized technologies grew. Ultimately, this paved the way for the Industrial Revolution, i.e., the formation of the factory system, in which the workers who migrated from the countryside to the city found jobs. The struggle between entrepreneurs and traditional feudal elites for political power took the form of bourgeois revolutions.

Everything seems to be logical. However, a person equipped with the set of knowledge that historical and economic sciences have in the 21st century inevitably remains in doubts. One might inquire whether these processes of agrarian upheaval, the development of craft and manufactory, and the formation of a broad layer of landless rural inhabitants, as well as the development of market relations, the accumulation of capital, the progress of proto-industry, and so forth, were historically unique, whether they manifested in England and some other Western European countries only since the 16th century. In reality, in the preceding history of many countries, these phenomena occurred with cyclical periodicity. Why, then, did this not result in the formation of capitalism as a system?

Marx himself addressed this question, noting that the pre-capitalist forms of social organization had not yet reached their limits then. There was no separation of the mass of workers from the natural conditions of existence and from belonging to the communal collective. In other words, the level of productive forces was not yet high enough.[14] Yet

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[14]   This seems to be the way to understand the following statement of Marx: "...The *mere presence of monetary wealth*, and even the achievement of a kind of supremacy on its part, is in no way sufficient for this *transformation into capital* to happen. Otherwise ancient Rome, Byzantium etc. would have ended their history with free labor and capital, or rather begun a new history. There, too, the dissolution of the old property relations was bound up with development of monetary wealth, of trade, etc. But instead of leading to industry, this dissolution led in fact to the supremacy of the countryside over the city" [Marx 1980. P. 503].

modern interpretations that acknowledge the inherent imbalance between land and labor resources, as identified by Malthus, provide a more compelling explanation for why societies that have advanced significantly in the development of intensive agriculture, proto-industry, and market economy have nevertheless been presupposed to severe socio-ecological crises.

Indeed, any attentive reader of the first volume of "Capital" is likely to experience a sense of ambiguity regarding the genesis of capitalism. It is commonly assumed that the methodology of "Capital" is based on the principle of unity of historical and logical analysis. This book is thus understood to describe both the functioning of the established capitalist system and the process of its formation. However, it is unclear why, if commodity production gave rise to money in ancient times and money had an inherent tendency to self-growth, this aspiration was only realized in modern times as a result of the proletariat selling its labor to the capitalists.

Marx offers a formal explanation. In the 24th chapter of the first volume of "Capital," he presents a detailed analysis of the process of initial capital accumulation. He argues that it was largely achieved through the expropriation of small peasant farms during the late Middle Ages. This expropriation, he adds, was often carried out through violent means. As a result, the peasants who lost their land and some artisans as well were forced to enter the labor market. Yet modern historical and economic science demonstrates that there were numerous historical periods preceding this era with presence of both accumulated capital and a significant proportion of the population ousted from agrarian or handicraft productions. But this did not result in the formation of industrial capitalism; rather, it led to a return to a predominantly subsistence redistributive economy.

It is also noteworthy that both Marx and Engels frequently referred to the "decomposition of the economic structure of feudal society" in their interpretations of the genesis of capitalism [Marx 1983. P. 727; Engels 1986. P. 190, 253]. The founders of Marxism repeatedly rejected the accusation that they derived specific practical conclusions from the laws of dialectics. They argued that, on the contrary, their elaborations on particular questions served as illustrations and confirmations of general laws. In this case, however, one is tempted to conclude that their interpretation of the capitalist genesis is based on a mere pre-supposed typology of formations. According to Marxist dialectical laws, what is called "feudalism" must, in time, cease to exist. If capitalism follows this path, its emergence can be presented as a "negation" of feudal institutions.

Against this background, the other interpretation of the transition from stagnation to MEG appears more persuasive. It treats a breakthrough not as an inevitable historical process but rather as a consequence of a unique coincidence of favorable conditions in a specific region. The most significant factor was not a fundamentally new level of technology, but rather the pluralistic socio-political structure that unfolded in Western Europe. This structure eventually provided an outlet for the positive potential of market relations, which had previously been constrained by redistributive structures, to realize. According to this understanding, capitalism and MEG emerge as a result of a complex interaction of economic, political, socio-cultural, and even geographical

factors, rather than simply according to the logic of the successive phases of economic development. These new phenomena subsequently spread around the world through the mechanisms of positive externalities, as evidenced by the works of Zarin (1991), Lucas (2004), and Chirot (1985).

It is therefore appropriate to consider the period preceding the advent of capitalism as a single entity, encompassing the diverse array of "traditional societies." This framework does not permit the identification of a discernible trajectory of progressive development, particularly not one that is based on the logic of the interaction of productive forces and production relations.[15] Rather, the unfolding concept of "traditional society" represents a complex system, comprising a multitude of pathways and potential outcomes. Ultimately, the way out of the labyrinth was found by humanity only after a long search. The concept of the Malthusian trap is an economic proof of the existence of such a labyrinth. If this concept is still amorphous and imperfect, it only follows that it should be further developed, not rejected as inherently flawed.

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The endeavors of numerous scholars have led to a new understanding of the regularities that were inherent in a traditional, pre-industrial society. Judging from the current state of knowledge, the period of agrarian civilization, which spanned several millennia, cannot be divided into several successive, qualitatively different, yet universal stages of progressive development. This is not only because economic growth in the pre-industrial era was generally very slow, but also because countries that seemed to have already succeeded in creating proto-industry and market institutions were repeatedly thrown back by severe socio-ecological crises.

This mechanism of relative stagnation has come to be called the "Malthusian trap," although it was not T. Malthus who gave its exhaustive description and interpretation. Malthus observed only the initial stages of the British Industrial Revolution and did not perceive a fundamental shift in social dynamics. He believed that the imbalances between land and labor had always existed and would persist. But it is now evident that his understanding of economic and demographic trends is relevant precisely when applied to traditional, agricultural societies.

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[15] In the late Soviet period there appeared concepts that treated the entire array of redistributive agrarian societies as a "single pre-capitalist formation". V. Ilyushechkin developed the theory of "pre-capitalist class society", within the framework of which different types of surplus product withdrawal (land rent, slavery, serfdom, indentured servitude) appeared as one-order, existing in parallel production relations at approximately the same level of productive forces. According to Ilyushechkin, the differences between individual countries in antiquity and the Middle Ages consisted in different combinations of these elements, with the possible presence of a certain leading mode [Ilyushechkin 1990]. Y. Kobishchanov proposed the concept of "large feudal formation" based on the dominance of land rent seizures by both the state and private land owners. Even in antiquity, in his opinion, slavery was only a peripheral mode within the feudal economy [Kobishchanov 1992]. In fact, these concepts were attempts not only to get away from the "five-stages scheme", but also to modernize the Marxist vision of history in general, taking into account the facts accumulated over the 20th century, and also to rid it of the most obvious logical inconsistencies without abandoning the Marxist methodology proper, including the predominant attention to distributive relations. The problem of the relationship between the factors of production (land and labor resources), i.e., the actual functioning of the traditional economy, was at best in a shadow in these studies.

Cliometric studies generally confirm that in the pre-industrial past, increases in per capita income caused by technological progress or the utilization of additional land could be offset by population growth. Still, this did not inevitably result in a convergence of living standards to the minimum of physical subsistence, but rather led to a new equilibrium, which was influenced by many factors, including the "positive and preventive checks" described by Malthus.

The newest models of the Malthusian trap pay more attention to the institutional component. Malthusian society is being perceived as a redistributive one, based on the extraction of land rent by vertical social structures. Conflicts between individual strata of Malthusian society are considered to be integral components of its socio-economic dynamics.

The incorporation of the variables of proto-industrialization and marketization into the models facilitates the elucidation of crucial nuances pertaining to the Malthusian "dynastic" cycle. The concentration of the most of labor resources in the agrarian sector, with its decreasing marginal productivity, allows us to understand why Malthusian economic growth was so slow and unstable. Conversely, the imbalance between land and labor resources and the associated conflicts between the ruling elites and the peasantry explain the periodic plunges of society into a state of turmoil, a war of all against all. Furthermore, the assertion of recurrent "proto-industrial deadlocks" elucidates the nature of the socio-ecological crisis, delineating the specific causes of cyclical regression and the disruptions in the process of sectoral and institutional diversification of the economy.

At first sight, the concept of the Malthusian trap and the materialist understanding of history proposed by Marx appear to be incompatible. It is not merely a result of differences in periodization; it also stems from the divergent value bases. Malthus perceived society as an object of God's Providence. Marx, on the contrary, believed in the ability of people to change the world in a revolutionary way. By studying the past, he tried to confirm his thoughts about the future. However, it should be noted that the concept of the Malthusian trap was born many decades after Malthus' death, and the "five-stage model" of formations is only indirectly related to Marx. If the distinction between the Malthusian trap and the epoch of MEG appears more realistic in the present day studies, it does not follow that the most refined elements cannot be taken from the Marxist concept and implanted into a modern theory.

Primarily, this refers to the Marxist interpretation of the ancient slave civilization as a social structure that for some time represented an alternative to redistributive, "Oriental" ones and partly determined the further historical path of Europe. The models of the Asiatic mode of production and feudalism proposed by Marx also contain many useful insights. Even if the very distinction between these stages of development is controversial from today's perspective, both cases highlight specific mechanisms of functioning of redistributive societies, and even in connection with different regions. It can be said that the concept of the Malthusian trap has lacked such detailing. By integrating this concept with select elements of the Marxist approach, it could become possible to enhance its institutional legitimacy and to elucidate the diverse phenomena of traditional societies across different countries.

Toward a Theory of the Malthusian Trap. Part 2

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Economic Convergence of the Countries in 1992-2022

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Abstract
Economic science has always been concerned with the catch-up effect: are developing countries really catching up to technologically developed countries, and is the economic gap between rich and poor countries narrowing over the long run? The goal of this article is to test the hypothesis of economic convergence of countries as one of the primary research problems within the field of cross-country inequality. The objective of this research is to gain a deeper understanding of the factors that contribute to economic cross-country inequality. This article seeks to ascertain the impact of country convergence, as postulated by R. Solow in his model of economic growth, utilizing R. Barro's equations for the period from 1992 to 2021/22. The paper reveals the existence of economic convergence, but at a rate that is insufficient for developing countries to catch up to developed countries in a meaningful way. The dynamics of convergence by decade is analyzed separately. It is found that convergence was as slow as possible in the period between 2002 and 2011 and as fast as possible in the period between 2012 and 2022. The economic shocks of 2020-2022 may undermine

the catching-up potential of many developing countries, which may result in a slowing of further convergence.

Introduction

The term "convergence" first appeared in ancient Greece in the 5th century BC, as postulated by Heraclitus of Ephesus. He proposed that the world should be conceptualized in terms of the unity and unification of the whole [Dementieva 2021. P. 509]. The concept of "convergence" was first used in the field of economics in the 1960s and 1970s.

In 1961, J. Tinbergen's work "Do Communist and Free Economies Show a Converging Pattern?" was published [Dementieva 2021. P. 509]. In this work, the author posits that under the influence of civilizational processes and in the context of scientific-technological progress and rational management of economic activity over time, disparate economic systems, though fundamentally opposed to each other, converge toward a singular trajectory of development [Dementieva 2021. P. 509]. Subsequently, numerous economists and sociologists, including J. Galbraith (2004), R. Barro and X. Sala-i-Martin (1990), expanded and refined convergence theory. Galbraith identified investment, production expansion, and the development and use of advanced technology as the main drivers of convergence between developed and developing countries [Dementieva 2021. P. 509–511].

The theory of economic convergence is a major area of research in the field of cross-country inequality. The concept of the "catch-up effect" has been the subject of considerable debate within the field of economic theory.[1] Some researchers argue that countries are diverging, leading to a widening of the economic gap between developing and developed countries over time [Pritchett 1997; Mazumdar 2003]. Conversely, others argue that international convergence occurs over time [Barro & Sala-i-Martin 1990; Kónya & Guisan 2008; Jorda & Sarabia 2014].

The question of whether convergence between rich and poor countries is possible remains a topic of debate among economists. Recent calculations, carried out between 2018 and 2023 by researchers affiliated with international organizations, have produced mixed results. K. Daly and T. Gedminas of Goldman Sachs, S.A. Solarin, S. Erdogan, and U.K. Pata—researchers at the OECD—examined the convergence process in different samples of countries and concluded that economic convergence between developed and developing countries is a real phenomenon and that international inequality tends to decrease [Daly & Gedminas 2022. P. 2; Solarin et al. 2023]. However, J. Rebello and D. Young of the World Bank come to a different conclusion, namely that the effect of convergence between countries is slowing down [Rebello, Young 2022]. If economic convergence is indeed a reality, it is puzzling why there have been no significant cases of convergence between emerging and developed economies since the 1950s [Grigoryev et al. 2022.

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[1] The catch-up effect means that developing countries grow faster, as a result of which (and in the course of transformation of the socio-economic system) they try to catch up with technologically advanced economies.

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Chapter 1]. Convergence can also be studied at the regional level. For example, S. Golovina and S. Pugin (2014) tested the hypothesis of convergence for the subjects of the Russian Federation.

As with the question of the reality of convergence or divergence in the world, there is a major debate about the reasons for "why some countries are poor and others are rich," i.e. the factors that directly affect economic divergence among countries. Institutionalists argue that the quality and type of institutions that influence citizens' incentives (e.g., education, entrepreneurship, technology adoption, investment) are the primary drivers of economic divergence [Acemoglu & Robinson 2015. P. 105]. Economic institutions are directly responsible for creating these incentives, but they are highly dependent on political mechanisms and structures, the continuity and stability of which can guarantee the effective functioning of the economic mechanism. It is reasonable to conclude that the quality of institutions depends on the characteristics of public administration. For example, the existence of a centralized democratic system, ensuring the protection of citizens' rights and freedoms, as well as the existence of checks and balances, are factors that contribute to the quality of institutions [Samarasinghe 2019].

The theory of geographic determinism posits that a country's wealth is influenced by its geographic location. Low-income regions are predominantly located in areas with equatorial, sub-equatorial, and tropical climates, while wealthy regions are predominantly located in areas with temperate climates [Diamond 1997]. The theory of sociocultural codes posits that divergent values lead to the development of different principles and approaches to various aspects of economic, social, and political life [Inglehart & Welzel 2009].

Another factor influencing economic disparity and, consequently, cross-country inequality is the discrepancy in income distribution among citizens within a given country [Grigoryev, Salmina 2013. P. 9]. It is observed that the rate of economic growth slows down in countries with high levels of national inequality. This phenomenon can be attributed to the lack of incentives and opportunities for individuals to climb the social ladder [Grigoriev, Salmina 2013. P. 10]. Moreover, technological progress not only improves and optimizes the production capabilities of enterprises but also contributes to the development of technology within the national economy [Romer 1990]. Human capital, which has a higher rate of return than physical capital, has also been identified as a significant divergence factor [Lucas 2015]. In addition, environmental damage during production has been highlighted as a potential impediment to economic growth [Nordhaus 2017].

The aim of this paper is not to study the drivers of economic growth. The objective of this study is to empirically test the convergence hypothesis. This paper aims to replicate R. Barro's equations that test the existence of convergence in per capita income over a thirty-year time horizon, between 1992 and 2021/22.

The first section presents the basic concepts associated with the concept of convergence and provides an overview of R. Barro's seminal work on the subject. Section 2 presents a contemporary discussion of economic convergence. Section 3 presents the empirical test of the hypothesis of convergence of countries since 1992. The paper concludes with a summary of the key findings.

1. History of the concept of economic equalization between developed and developing countries

The study of economic growth recognizes a number of different types of convergence [Galor 1996]. The first type is absolute convergence, which implies that developed and developing countries will eventually converge in terms of per capita income. The second type, conditional convergence, implies that countries will converge provided that a number of other factors remain constant. The structural characteristics of an economy, including the level of human capital and technology and the quality of institutions, determine the long-run equilibrium state of the economy. The greater the discrepancy between a country and its potential equilibrium state, the faster its growth. It is not the case that per capita incomes are equalized in an absolute sense. Finally, club convergence, like absolute convergence, reflects the convergence of countries in terms of per capita income, but not across the whole population, rather within distinct groups of countries defined by one or more specific criteria. These groups of countries, or "clubs," are thus characterized by similar trajectories of economic growth.

In the context of absolute convergence, two different forms of convergence can be identified: "beta-convergence" and "sigma-convergence" [Paprotny 2021. P. 194-195]. The concept of "beta-convergence" is based on the theoretical framework proposed by R. Solow [Solow 1956], according to which poorer countries tend to experience higher rates of economic growth, eventually leading to convergence with developed countries over time. "Sigma-convergence" refers to the equalization of the dispersion of GDP per capita levels in developing and developed countries [Paprotny 2021. P. 194-196].

Expectations of beta-convergence are based on the model of economic growth proposed by R. Solow. The model posits that wealthy economies quickly reach a stationary level of labor capitalization, after which economic growth slows down as it can only be sustained through total factor productivity growth. In contrast, developing economies have the potential to exploit all growth factors, especially capital growth [Solow 1956]. A limitation of the Solow model is its universalist nature. The model assumes that the patterns of economic growth in both developed and developing countries are identical, with the only difference being the quantitative parameters of certain sources of GDP growth [Mozias 2023. P. 44-45]. Therefore, the qualitative, sectoral, and individual parameters of each country are not considered.

A significant contribution to the study of catch-up development was made by R. Barro and X. Sala-i-Martin, who actually established the concept of "beta-convergence," which describes the negative relationship between the rate of economic growth and the initial level of development [Dementieva 2021. P. 511]. The beta convergence hypothesis reflects R. Solow's idea that emerging economies have higher rates of economic growth, which leads to economic equalization over time. Barro and Sala-i-Martin (1990; 1992) used a replication of Solow's neoclassical growth model to analyze economic convergence among countries between 1840 and 1988. The authors constructed a linear regression model from which they obtained a negative coefficient between the rate of economic growth per capita and the initial level of per capita income. As a result, economic inequality between the southern and northern states of the United States has decreased.

The poorer southern states have experienced faster growth than the richer northern states [Barro, Sala-i-Martin 1990, 1992].

In 1991, R. Barro et al. conducted a similar study for 73 European regions in seven countries from 1950 to 1985, and also attempted to calculate the speed of convergence of rich and poor regions across countries. The results showed that the trend of economic convergence in European regions is almost identical to the trend of equalization in US states. "The gap between the typical poor and rich state [in the US] diminishes at roughly 2% per year. We apply the same framework to patterns of convergence across 73 regions of Western Europe… The rate of convergence is again about 2 percent a year" [Barro et al. 1991. P. 108].

In subsequent studies, R. Barro shifted his focus from regional to national-level analysis. In particular, he tested the hypothesis of beta-convergence between rich and poor countries using panel data for 98 countries [Barro 1999]. As a dependent variable, Barro continued to consider the growth rate of real GDP per capita, which is the average for each of the three periods: 1965-1975, 1975-1985, and 1985-1995. The author considered the logarithm of real GDP per capita as an independent variable to identify economic convergence. In addition, the following variables were included as control variables: government consumption as a percentage of GDP, rule of law index, investment as a percentage of GDP, democracy index, and inflation rate.

Barro also found that economic growth slows down when the level of inequality within a country increases. In order to reduce international inequality, it is first necessary to address the issue of inequality within countries. "With limited access to credit, the exploitation of investment opportunities depends, to some extent, on individuals' levels of assets and incomes. Specifically, poor households tend to forego human-capital investments that offer relatively high rates of return. In this case, a distortion-free redistribution of assets and incomes from rich to poor tends to raise the average productivity of investment. Through this mechanism, a reduction in inequality raises the rate of economic growth" [Barro 1999. P. 2]. In other words, Barro noted that the reduction of intranational inequality, by increasing economic growth rates in developing countries, can ensure the reduction of the international economic gap.

2. Continuing the debate on convergence in the 21st century

The debate on economic equalization continues. The "shock distortions" of 2020-2022 raise questions about the ability of developing countries to maintain their rapid economic growth to sustain economic convergence. Grigoryev (2023) identifies four main shocks: (a) The COVID-19 pandemic shock in the form of lockdowns and its impact on the healthcare sector; (b) The shock of unique (in scale and time) anti-crisis responses by governments and central banks in 2020–2021, employing fiscal and monetary incentives; (c) An early recovery in the commodity markets and rising raw material prices under (a) and (b) in 2021–2022; (d) The sanctions shock in 2022 as a global economic issue and the EU energy collapse as a key component of it or as an individual shock.

The differing degrees of vulnerability to external shocks (the likelihood that the country's economic development will be slowed down because of them) experienced by countries in 2020-2022 led to different rates of recovery from the crisis [Morozkina et al. 2024, in press]. In the Morozkina et al. study (in press), three linear regression models were constructed. In these models, economic growth in 2020, 2021, and 2022 compared to 2019 was considered as the dependent variable, while the country's vulnerability index, indicators of macroeconomic stability, social development, and the quality of public administration were considered as independent variables. The model for economic growth in 2020 compared to 2019 was the most successful, while the models for 2022 and 2021 (compared to 2019) demonstrated poor results following the same scheme. This can be explained by the fact that the vulnerability and stability of economies determine only the first reaction [Morozkina et al. 2024, in press]. In other words, it seems likely that developing countries were only able to respond to the first shock (a) (in the form of lockdowns and health initiatives in 2020), which probably did not significantly slow their economic growth rates and thus did not lead to a halt in the convergence of developed and developing countries. However, the shocks (b), (c), and (d) that immediately followed the emergence of the coronavirus, as well as the transition of the global economy into a period of high inflation in 2022/23 [Podrugina, Lysenko 2023], reduced the fiscal and financial capacity of developing countries to cope with macroeconomic shocks, which may have hindered economic equalization across countries.

However, despite the occurrence of macroeconomic shocks between 2020 and 2022, some studies indicate that the trend of convergence between developed and developing countries remains unchanged [Daly, Gedminas 2022. P. 3]. According to the Goldman Sachs report, China, the United States, India, Indonesia, and Germany are expected to become the five largest economies in the world by 2050 in terms of gross domestic product (GDP) at purchasing power parity (PPP). Indonesia is expected to push Brazil and Russia out of the top five. By 2075, Nigeria, Pakistan, and Egypt will also be among the world's largest economies [Daly, Gedminas 2022. P. 2].

An empirical study by Solarin et al. (2023) found that both conditional and absolute economic equalization occurred in OECD countries from 1870 to 2018. Consequently, in order to achieve a reduction in inequality among OECD countries, national governments must continuously invest in education and skills development (human capital investment), thereby reducing the socio-economic gap between their citizens. In other words, the above studies have shown that there is a tendency for income inequality between countries to decrease in the long run [Daly, Gedminas 2022; Solarin et al. 2023], but income inequality within countries increases over time. This poses a significant challenge for future research, as intranational inequality hinders the narrowing of the gap between wealthy and impoverished countries [Daly, Gedminas 2022. P. 2].

Conversely, some studies have questioned the existence of convergence, even before the 2020-2022 crises. For example, the IMF report examined beta-convergence for a sample of 12 EU founding countries from 1960 to 2015, a sample of 19 EU countries from 1990 to 2015, and a sample of 28 EU countries from 1992 to 2015 [Franks et al. 2018. P. 12]. From 1960 to 1992, the EU-12 countries with relatively low GDP per capita experienced

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higher economic growth rates, catching up with more developed economies. However, from 1999 to 2015, the rate of income convergence among EU-12 countries slowed and stalled, coinciding with the introduction of the euro [Franks et al. 2018. P. 11-12]. However, the economic equality of the new EU member states that joined after 2007 with their predecessors was established [Franks et al. 2018. P. 12-13]. Convergence among the EU-19 countries was maintained between 1993 and 2015, while divergence among them was observed between 1990 and 1998. In other words, the hypothesis of convergence among the 12 member states of the European Union was confirmed until the introduction of the common currency. Convergence has continued at a slow pace between the "old" and "new" EU members that joined the Union after 2007. This is partly due to the Maastricht criteria, which serve as a condition, or at least a benchmark, for EU accession.

Pritchett (1997) showed that despite the existence of examples of regional economic convergence (rapid growth of some Asian countries), developing and lagging markets diverge due to the presence of "forces" in poor countries that generate economic stagnation. Using econometric techniques, he demonstrated that "a quarter of the 60 countries with initial per capita GDP of less than $1000 in 1960 have had growth rates less than zero, and a third have had growth rates less than 0.05 percent" between 1870 and 1990 [Pritchett 1997. P. 15].

Mazumdar (2003) came to a similar conclusion using a sociological approach. He conducted a study of the living standards of countries from 1960 to 1995. The author reasoned that the studied developed and developing countries are divergent. "The convergence tests for the indicators reflecting quality of life of human beings, such as, infant survival rate, life expectancy at birth, adult literacy rate, calorie intake as percentage of requirement for the full sample as well as for three income groups indicate that in almost for all the cases for all the indicators divergence is observed rather than convergence" [Mazumdar 2003. P. 29-30].

A recent World Bank study predicts that global economic growth will slow by 2024, potentially hindering the continued progress of emerging economies [Rebello, Young 2022]. The cessation of economic growth can be attributed to the shocks that occurred between 2020 and 2022. Achieving economic convergence between developed and developing countries requires a unified international approach, which is difficult to implement due to prevailing global geopolitical tensions. This is consistent with the findings of Morozkina (2019), who suggests that it is difficult for poor nations to maintain high economic growth rates without financial support from developed nations. In the aftermath of the 2008 global financial crisis, a significant portion of this assistance became conditional.

Examining the impact of shocks in 2020-2022, Morozkina et al. (in press) conclude that "the level of fiscal measures, which has been cited in the literature as one of the main factors limiting the 2020 downturn in advanced economies, has no impact on 2020 economic growth in the sample of developing countries compared to 2019, which is likely primarily due to the relatively small amounts of fiscal support in developing countries." The lack of sufficient resources within the developing countries themselves prevented them from providing the necessary support.

3. Search for convergence in 1992-2021/2022 using the methodology of R. Barro

In this section, we apply Robert Barro's approach to identifying the economic convergence of developing and developed countries to a sample of countries for the period 1992-2021/22 (the sample is presented in Appendix 1). The objective is to test the hypothesis of a negative relationship between economic growth rate and GDP per capita in the base year. The relationship can be expressed as follows: the higher the income of the population in the base period, the lower the economic growth of the country. This confirms the assumption that wealthy countries experience a lower rate of economic growth, as postulated by R. Solow in his model of economic growth.

If there is convergence between developing and developed countries, this will be reflected in the linear regression equations for panel data. There is likely to be a negative relationship between GDP per capita for the initial period and the rate of economic growth, as in Barro's equations. Barro used a specific list of independent variables in his papers when examining the issue of convergence between developing and developed countries. Table 1 on p. 50 compares the economic analysis presented in the author's two articles, 1999 and 2013.[2]

Table 1.　　Comparison of two articles by R. Barro on key characteristics of equations

	"Education and Economic Growth" (2013)	**"Inequality and Growth in a Panel of Countries" (1999)**
Time period	three periods (1965-1975; 1975-1985, 1985-1995)	three periods (1965-1975;1975-1985;1985-1995)
Number of observations in complete national dataset	81, 84, 81	79, 87, 84
Dependent variable	Real GDP per capita growth rate. Growth rates averaged per period: 1965-1975; 1975-1985; 1985-1995	Real GDP per capita growth rate. Growth rates averaged per period: 1965-1975; 1975-1985; 1985-1995
Independent variables	• Logarithm of real GDP per capita at the beginning of each period. • The square of the logarithm of real GDP per capita at the beginning of each period. • Average number of years of middle and high school completed by men aged 25 and over. • Government spending, measured by education and defense spending, compared to GDP. • Trade openness coefficient, measured by the relation of the sum of export and imports to GDP. • The sum of private and state investments to GDP. • Rule of Law Index. • Inflation rate (for consumer prices). • Logarithm of the birth rate. • Average growth rate of the terms of trade (export compared to import prices) for each period.	• Logarithm of real GDP per capita at the beginning of each period. • The square of the logarithm of real GDP per capita at the beginning of each period. • Average number of years of middle and high school completed by men at the beginning of each period. • Government spending (excluding education and military spending) to GDP. • The sum of private and state investments to GDP. • Democracy Index. • Latest available value of the Rule of Law Index (1982 and 1985) for the first two equations, and the average value over the period for the third equation. • Inflation level. • Logarithm of the birth rate. • Average growth rate of the terms of trade (export compared to import prices) for each period.

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[2]　Frequently used independent variables in the author's equations. In the present study, two works by Barro 15 years apart were taken as examples: Barro, R., 2013. Education and Economic Growth. P. 306, 313-319; Barro, R., 1999. Inequality and Growth in a Panel of Countries. P. 28.

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Coefficient of determination (examined separately for each time period)	0.62, 0.50, 0.47	0.67, 0.49, 0.41
Resulting equation	Y(1965-1995) = 0.107*log(per capita GDP) – 0.0084*log(per capita) squared + 0.0044*male upper school – 0.157*government expenditures/GDP + 0.0138* rule of law index + 0.133*openness ratio – 0.0137*inflation rate – 0.0275*log(total fertility rate) + 0.033*investment/GDP – 0.0142*openness ratio*log(GDP)	Y(1965-1995) = 0.123*log(per capita GDP) – 0.0095*log(per capita) squared – 0.149*government expenditures/GDP + 0.0173* rule of law index + 0.053*democracy index – 0.037*inflation rate + 0.0072*years of schooling – 0.0250*log(total fertility rate) + 0.059*investment/GDP + 0.164*growth rate of terms of trade

Source: complied by the author on the basis of: Barro, R., 2013. Education and Economic Growth. P. 306, 308; Barro, R., 1999. Inequality and Growth in a Panel of Countries. P. 28, 37, 38.

Thus, by analyzing the various indicators from Table 1 that Barro used in two different equations 15 years apart, we can identify the set of determinants of economic growth that he used. In Table 2 on p. 51 they are compared with the variables used in this study.

Table 2.   Independent variables in R. Barro's articles and in this study

Determinants of economic growth in Robert Barro's articles									
Labor		Capital	Quality of institutions		Economic liberalization		Indicators of macroeconomic stability		
Fertility	Education among men	Sum of private and state investments	Democracy Index	Rule of Law Index	Growth rate of the terms of trade	Openness of the economy	Inflation	Government spending on education and defense	Government spending except education and defense

Determinants of economic growth used in the model of this study					
Volume of fixed capital	Quality of institutions	Economic liberalization	Indicators of macroeconomic stability		
Gross capital formation	Rule of Law Index	Openness of the economy	Inflation	Public expenditure on education and defense	Unemployment

Source: compiled by the author on the basis of: Barro, R., 2013. Education and Economic Growth. P. 306, 308; Barro, R., 1999. Inequality and Growth in a Panel of Countries. P. 28, 37, 38.

There are several peculiarities to note about this study. The first is the time period. Barro's studies looked at data between 1960 and 1995. The present study covers the last 30 years: from 1992 to 2021/22, including the coronavirus shock and the geopolitical crisis of 2022. Additionally, the data in this paper are divided into three separate decades: 1992-2001, 2002-2011, and 2012-2021. The periods have been chosen to cover the full business cycle (rather than the "round" decades in Barro's works). This eliminates the influence of crises, which may have been unevenly distributed across the periods [Grigoryev 2023]. In addition, the 2012-2022 cycle and the panels for the entire period (1992-2021 and 1992-2022) are considered separately.

Another feature is the relatively simplified equation form. In practical works, Barro considered the effect of two independent logarithmic variables on the average growth rate of real GDP simultaneously: the logarithm of GDP per capita for the base period and the square of the logarithm of GDP per capita (see Table 1 on p. 50). In this study, only the log of GDP per capita is used to simplify the explanation of convergence.

Two models are based on panel data for the entire period under consideration (1992-2021 and 1992-2022 models). Another four models are based on spatial data for individual decades (the last decade is represented in the 2012-2021 and 2012-2022 versions).

The dependent variable is the calculated average economic growth rate of countries based on the annual GDP (PPP) in 2017 in constant international US dollars on average over decades: GDP (1992–2001), GDP (2002–2011), and GDP (2012–2021).

The independent variables considered are:
- Unemployment or total employment (% of total labor force).
- Consumer price index (2010 = 100).
- Gross capital formation (% of GDP).
- Openness of the economy (sum of exports and imports as % of GDP).
- Rule of law (-2.5 to 2.5).[3]
- Government spending on education and defense (% of GDP).[4]
- Logarithm of GDP per capita for the base (reference) year.

All independent variables are calculated as decade averages for each country. The independent variable "logarithm of GDP" is given in the models for 1991, 2001, and 2011.

Table 3. Correlation matrix of dependent and independent variables for the period 1992-2021

	Average economic growth rate (y)	Log (GDP 1991)	CPI	Unemployment	Gross capital formation	Openness of the economy	Rule of law	Government spending
Average economic growth rate (y)	1							
Log(GDP 1991)	-0.148*	1						
CPI	-0.063	-0.050	1					
Unemployment	-0.003	0.121*	-0.023	1				
Gross capital formation	0.428***	0.056	-0.109*	-0.044	1			
Openness of the economy	0.156**	0.364***	-0.005	-0.019	0.154*	1		
Rule of law	-0.22	0.707***	-0.091	-0.035	0.073	0.335***	1	
Government spending	-0.076	0.254***	-0.022	0.004	0.095	0.083	0.059	1

Source: calculated by the author on the basis of World Bank data (n.d.).

Note: * $p \leq 0,05$, ** $p \leq 0,01$, *** $p \leq 0,001$.

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[3] Reflects the quality of institutions and mechanisms for governing society in a country as well as the degree to which people trust and abide by rules.

[4] According to Barro's relatively "new" 2013 paper "Education and Economic Growth."

The growth rate of real GDP per capita may be correlated with the explanatory variables "in two directions," creating an endogeneity problem that can lead to low explanatory power of the model and biased estimates. The 1992-2021 panel model passed all tests (Appendix 6) except the cross-sectional dependence test, which confirms the "endogeneity problem." To avoid the "endogeneity problem" in the present study, the models are calculated using two-stage least squares (2SLS) with lagged values (lag of 5 years) of the independent variables used as instrumental variables [Barro 2016. P. 3]. All tests (for heteroscedasticity, multicollinearity, model specification, autocorrelation of residuals, cross-sectional dependence, and serial correlation in panels) are presented in Appendices 2-7.[5]

The 1992-2022 model failed the tests for serial correlation and model specification (Appendix 7). In general, it turned out to be of lower "quality" than the 1992-2021 model. Obviously, the deterioration in the quality of the model is caused by the addition of the crisis year 2022. Moreover, there is a decrease in the estimate of the coefficient of log GDP from 0.09 to 0.08, i.e., a slowdown in convergence. This decrease is not significant, but it can be explained either by the sanctions and counter-sanctions of 2022, which could be a catalyst to slow down the convergence of developing and developed countries, or by the sharp decline in China's economic growth, which showed continuous growth during 2001-2019. The average real GDP growth rate in China from 2001 to 2019 is about 9%.[6] If in 2018 and 2019 China maintained stable economic growth rates of 6.6 and 6.1%, respectively, the country's real GDP growth rates were 2.3 and 3% during the 2020 coronavirus and the 2022 geopolitical crisis, respectively [IMF 2019, 2020, 2022, 2021, 2023]. On average, the PRC's economic growth rate for 2020-2023 was 4.65, compared with 6.62% for 2016-2019.[7]

The results of the regression models are shown in Table 4 on page 54. In all models, the coefficient on log GDP per capita for the base year is significant, confirming the convergence hypothesis.

So why is there no visible success in closing the development gap? The question of convergence is not a question of its presence or absence but of the "speed of convergence" of developing and developed countries [Grigoryev et al. 2022. Chapter 1]. "According to the 'iron law of convergence,' countries eliminate gaps in levels of real per capita GDP at a rate around 2% per year. Convergence at a 2% rate implies that it takes 35 years for half of an initial gap to vanish and 115 years for 90% to disappear" [Barro 2012. P. 3]. Grigoryev and Maykhrovich (2023) have already tried to calculate the number of years

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[5]   Models in which heteroscedasticity was detected by the Breusch-Pagan test are considered taking into account robust errors. For panel models, the Lagrange multiplier test was applied. In the case of the 1992-2021 panel model, the p-value was found to be 0.04, below the 5% significance level but above the 1% significance level, while the other 1992-2022 panel passed the test for any reasonable significance level. Autocorrelation of residuals according to the results of the Durbin-Watson test is not present in the models. The specification of the models, according to the results of the Ramsey test, is correct except for the model for spatial data for 2012-2021, although the 2012-2022 model passed the specification test. There is no multicollinearity of the variables. The series are stationary by the Dickey-Fuller test. Inspection of the Hausman test shows that the fixed effects model has the best quality. Serial correlation by the Breusch-Godfrey test is absent in the 1992-2021 panel series, while it is present in the 1992-2022 model.

[6]   Calculated on the IMF data (World Economic Outlook).

[7]   Calculated on the IMF data (World Economic Outlook).

of lag between developing and developed countries by calculating the number of years needed to double GDP. The poorest countries in the sixth and seventh income clusters (seven clusters in total) need 47 and 100 years, respectively, to double GDP per capita at these average annual GDP growth rates (1.49% for the sixth cluster and 0.7% for the seventh cluster). GDP growth rates are much higher for clusters 3-5, but even they take decades to move to a higher cluster. "Developing countries are growing faster than the most developed countries, but they are 'not catching up'..." [Grigoryev, Maykhrovitch 2023. P. 31, 34].

Table 4. Results of regression model building

	Panel regression using the 2SLS method		Linear regression model built on average spatial data, 2SLS			
	Fixed effects model 1992-2021. Including instrumental variables	Fixed effects model 1992-2022. Including instrumental variables	Model 1992-2001	Model 2002-2011	Model 2012–2021 taking into account robust errors	Model 2012–2022 taking into account robust errors
Constant	0.174*** (0.009)	0.282*** (0.01)	0.058** (0.021)	0.11*** (0.019)	0.119** (0.045)	0.118* (0.049)
Log GDP base	-0.09*** (0.018)	-0.081*** (0.018)	-0.008** (0.002)	-0.005** (0.002)	-0.0089• (0.005)	-0.0088• (0.005)
Gross capital formation	0.197*** (0.02)	0.157*** (0.02)	0.001*** (0.0003)	0.002*** (0.0002)	-	-
Rule of law	0.028• (0.016)	0.026• (0.015)	0.014*** (0.003)	-	0.013* (0.006)	0.014* (0.006)
Openness of the economy	0.082*** (0.023)	0.074*** (0.022)	-	-	-	-
Unemployment	-	0.028• (0.017)	-	-	-	-
CPI	-	-	-	-0.001*** (0.0002)	-	-
Public expenditure	-	-	-	-	-0.0091* (0.004)	-0.0086* (0.004)
N	405	405	115	147	143	143
R^2	0.246	0.188	0.3	0.403	0.197	0.157
R^2_{adj}	0.238	0.178	0.281	0.390	0.180	0.138
Residual standard error	0.057	0.056	0.02	0.02	0.029	0.032

Source: calculated by the author on the basis of World Bank data (n.d.).

Note: significance score *** 0.001, ** 0.01, *0.05, • 0,1.

Comparing the equations by decade, we find a decrease in the coefficient for log GDP per capita in base year in the second decade (-0.005 compared to -0.008) and an increase in the third decade (-0.009). This implies that the speed of convergence of countries has increased in the 2012-2021 period compared to the 2002-2011 period. Perhaps the reason for the slowdown in convergence between developed and developing countries between 2002 and 2011 was the global financial crisis of 2008-2009. Perhaps the subsequent

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strengthening of convergence is attributable to the slowdown in the growth rates of developed countries in the last decade.

The fourth equation for 2012-2022 is not very different from the third equation for 2012-2021. Therefore, the conclusion about the slowdown in convergence in 2022 can only be drawn from the panel series analysis. In the spatial data, the addition of the crisis year 2022 has no significant effect on the slowdown of economic convergence across countries.

Let us also look at the evolution of the contribution of capital investment to economic growth. In two decades (1992-2001 and 2002-2011) it is significant, while in the equation of the third decade (2012-2021 and 2012-2022) it is insignificant. The lack of significance of the factor of gross capital formation in the third decade can be explained by two reasons. The first is the long recovery within 5-10 years after the Great Recession. Gross capital formation "collapsed" during the 2008 crisis, but it was not reflected in the equation until the third period: 2012-2021. "The economic crisis of 2008-2009… posed a challenge to established growth patterns… The reduced rate of accumulation in all major developed economies has not yet resulted in growth rates comparable to those of the 1990-2000s. Perhaps this was evidence of the transition to a new stationary regime, with relatively low growth rates, relatively high volatility, greater dependence of economic dynamics on developing countries" [Grigoryev, Makarova 2019. P. 51].

The second possible reason for the disappearance of the importance of investment in the third period (2012-2022) is the appearance of a significant coefficient before government spending (probably also due to large anticrisis injections in 2020-2022) and its displacement of investment. In general, there is a lot of debate on the issue of private versus public investment and the nature of its impact on economic growth. Barro, for example, found a significant negative impact of government spending on education and defense [Barro 2013. P. 313].

The rule of law factor is significant in 1992-2001 and 2012-2021, and insignificant in 2002-2011. During global recessions, economic decline can have a number of political consequences: an increase in the level of corruption within government bodies, a weakening of institutional mechanisms, and a decrease in support for the democratic order [Gasiorowski 1995]. In 2009, incumbent parties lost elections, including in countries (such as Iceland, Japan) where they had been in power for decades; in Latvia and Greece, distrust of governments and economic regulators led to mass protests [Olafsson 2016; Katada 2013; Aslund 2009; Kanellopoulos & Kousis 2018]. Several large countries, including Brazil and Russia, fell into the middle-income development trap for a long time after the 2008-2009 crisis for institutional reasons [Grigoryev, Makarova 2019. P. 33].

Conclusion

Economic convergence as one of the key issues within the topic of cross-country inequality is currently hotly debated among economists and social scientists: some believe that countries are absolutely divergent, and therefore, the gap between the rich and poor economies of the world will grow over time; others express the opposite view and believe that, on the contrary, countries are converging and the economic divergence between nations tends to decrease in the long run.

This paper has been able to reproduce Robert Barro's equations and illustrate the existence of an economic equalization effect between developed and developing countries over the period 1992-2021 and even 1992-2022. However, convergence does not mean that developing countries are catching up with developed countries. The catch-up effect is not visible in practice because the speed of convergence between these groups of countries is too slow. Barro said the same thing about regions ("...if the histories of the US states and European regions are useful guides, then the convergence process will occur, but only at a slow pace" [Barro et al. 1991. P. 108]). This is even more true for countries where absolute convergence is complicated by differences in institutions.

A separate regression analysis was carried out for ten-year periods. The slowest convergence was observed between 2002 and 2011, despite the impressive growth rates of the leading emerging economies (including the BRICS) in the first half of this period. The main reason for the slowdown is likely to be the economic crisis of 2008-2009. Convergence accelerates in 2012-2021, mainly due to the slowdown in economic growth in developed economies. Economic shocks in 2020-2022 are expected to undermine the catching-up potential of developing economies (especially poor countries), and as a result convergence may slow down in the future.

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APPENDICES

Appendix 1

Countries for which statistical data was available between 1991 and 2001									
1	Albania	26	Chad	51	Haiti	76	Morocco	101	Sudan
2	Algeria	27	Chile	52	Honduras	77	Nepal	102	Sweden
3	Angola	28	China	53	Hungary	78	Netherlands	103	Switzerland
4	Argentina	29	Colombia	54	India	79	New Zealand	104	Tajikistan
5	Armenia	30	Comoros	55	Indonesia	80	Nicaragua	105	Tanzania
6	Australia	31	DR Congo	56	Iran	81	Niger	106	Thailand
7	Austria	32	Costa Rica	57	Ireland	82	Nigeria	107	Togo
8	Azerbaijan	33	Côte d'Ivoire	58	Italy	83	North Macedonia	108	Tunisia
9	Bahamas	34	Cyprus	59	Jamaica	84	Norway	109	Turkey
10	Bahrain	35	Czech Republic	60	Japan	85	Oman	110	Uganda
11	Bangladesh	36	Denmark	61	Jordan	86	Pakistan	111	Ukraine
12	Belarus	37	Dominican Republic	62	Kazakhstan	87	Panama	112	UK
13	Belgium	38	Ecuador	63	Kenya	88	Paraguay	113	US
14	Belize	39	Egypt	64	Korea, Rep.	89	Peru	114	Uruguay
15	Benin	40	El Salvador	65	Kyrgyzstan	90	Philippines	115	Vietnam
16	Bhutan	41	Eswatini	66	Laos	91	Poland		
17	Bolivia	42	Finland	67	Luxembourg	92	Portugal		
18	Botswana	43	France	68	Madagascar	93	Romania		
19	Brazil	44	Gabon	69	Malaysia	94	Russia		
20	Brunei	45	Gambia	70	Mali	95	Rwanda		
21	Bulgaria	46	Germany	71	Malta	96	Saudi Arabia		
22	Burkina Faso	47	Ghana	72	Mauritania	97	Senegal		
23	Burundi	48	Greece	73	Mauritius	98	Singapore		
24	Cameroon	49	Guatemala	74	Mexico	99	Spain		
25	CAR	50	Guinea-Bissau	75	Mongolia	100	Sri Lanka		
Countries for which statistical data was available for the period 2001-2011									
1	Albania	31	Chile	61	Honduras	91	Mauritius	121	Senegal
2	Algeria	32	China	62	Hungary	92	Mexico	122	Serbia
3	Angola	33	Colombia	63	Iceland	93	Moldova	123	Sierra Leone
4	Argentina	34	Comoros	64	India	94	Mongolia	124	Singapore
5	Armenia	35	DR Congo	65	Indonesia	95	Montenegro	125	Slovakia
6	Australia	36	Congo, Republic of.	66	Iran	96	Morocco	126	Slovenia
7	Austria	37	Costa Rica	67	Iraq	97	Mozambique	127	South Africa
8	Azerbaijan	38	Côte d'Ivoire	68	Ireland	98	Myanmar	128	Spain

9	Bahamas	39	Croatia	69	Israel	99	Namibia	129	Sri Lanka
10	Bahrain	40	Cyprus	70	Italy	100	Nepal	130	Sudan
11	Bangladesh	41	Czech Republic	71	Jamaica	101	Netherlands	131	Sweden
12	Belarus	42	Denmark	72	Japan	102	New Zealand	132	Switzerland
13	Belgium	43	Dominican Republic	73	Jordan	103	Nicaragua	133	Tajikistan
14	Belize	44	Ecuador	74	Kazakhstan	104	Niger	134	Tanzania
15	Benin	45	Egypt	75	Kenya	105	Nigeria	135	Thailand
16	Bhutan	46	El Salvador	76	Korea, Rep.	106	North Macedonia	136	Togo
17	Bolivia	47	Equatorial Guinea	77	Kuwait	107	Norway	137	Tunisia
18	Bosnia and Herzegovina	48	Estonia	78	Kyrgyzstan	108	Oman	138	Turkey
19	Botswana	49	Eswatini	79	Laos	109	Pakistan	139	Uganda
20	Brazil	50	Finland	80	Latvia	110	Panama	140	Ukraine
21	Brunei	51	France	81	Lebanon	111	Paraguay	141	UAE
22	Bulgaria	52	Gabon	82	Lesotho	112	Peru	142	UK
23	Burkina Faso	53	Gambia	83	Libya	113	Philippines	143	US
24	Burundi	54	Georgia	84	Lithuania	114	Poland	144	Uruguay
25	Cape Verde	55	Germany	85	Luxembourg	115	Portugal	145	Vietnam
26	Cambodia	56	Ghana	86	Madagascar	116	Qatar	146	Zambia
27	Cameroon	57	Greece	87	Malaysia	117	Romania	147	Zimbabwe
28	Canada	58	Guatemala	88	Mali	118	Russia		
29	CAR	59	Guinea	89	Malta	119	Rwanda		
30	Chad	60	Guinea-Bissau	90	Mauritania	120	Mauritius		
Countries for which statistical data was available for the period 2011-2021									
1	Albania	30	Chile	59	Honduras	88	Mauritania	117	Saudi Arabia
2	Algeria	31	China	60	Hungary	89	Mauritius	118	Senegal
3	Angola	32	Colombia	61	Iceland	90	Mexico	119	Serbia
4	Argentina	33	Comoros	62	India	91	Moldova	120	Sierra Leone
5	Armenia	34	DR Congo	63	Indonesia	92	Mongolia	121	Singapore
6	Australia	35	Congo, Republic of.	64	Iran	93	Morocco	122	Slovakia
7	Austria	36	Côte d'Ivoire	65	Iraq	94	Mozambique	123	Slovenia
8	Azerbaijan	37	Cyprus	66	Ireland	95	Myanmar	124	South Africa
9	Bahamas	38	Czech Republic	67	Israel	96	Namibia	125	Spain
10	Bahrain	39	Denmark	68	Italy	97	Nepal	126	Sri Lanka
11	Bangladesh	40	Dominican Republic	69	Jamaica	98	Netherlands	127	Sudan
12	Belarus	41	Ecuador	70	Japan	99	New Zealand	128	Sweden
13	Belgium	42	Egypt	71	Jordan	100	Nicaragua	129	Switzerland
14	Belize	43	El Salvador	72	Kazakhstan	101	Niger	130	Tanzania

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15	Benin	44	Equatorial Guinea	73	Kenya	102	Nigeria	131	Thailand
16	Bhutan	45	Estonia	74	Korea, Rep.	103	North Macedonia	132	Togo
17	Bosnia and Herzegovina	46	Eswatini	75	Kuwait	104	Norway	133	Tunisia
18	Botswana	47	Finland	76	Kyrgyzstan	105	Oman	134	Turkey
19	Brazil	48	France	77	Laos	106	Pakistan	135	Uganda
20	Brunei	49	Gabon	78	Latvia	107	Panama	136	Ukraine
21	Bulgaria	50	Gambia	79	Lebanon	108	Paraguay	137	UAE
22	Burkina Faso	51	Georgia	80	Lesotho	109	Peru	138	UK
23	Burundi	52	Germany	81	Lithuania	110	Philippines	139	US
24	Cape Verde	53	Ghana	82	Luxembourg	111	Poland	140	Uruguay
25	Cambodia	54	Greece	83	Madagascar	112	Portugal	141	Vietnam
26	Cameroon	55	Guatemala	84	Malaysia	113	Qatar	142	Zambia
27	Canada	56	Guinea	85	Maldives	114	Romania	143	Zimbabwe
28	CAR	57	Guinea-Bissau	86	Mali	115	Russia		
29	Chad	58	Haiti	87	Malta	116	Rwanda		

Appendix 2: Tests for the 1992-2001 model

Heteroscedasticity test

Studentized Breusch-Pagan test

data: model9201_new_2
BP = 7.5072, df = 3, p-value = 0.05737

Ramsey test for model specification

RESET test

data: model9201_new_2
RESET = 2.6331, df1 = 2, df2 = 109, p-value = 0.07643

Durbin-Watson test for autocorrelation of residuals

log	Autocorrelation	D-W Statistic	p-value
1	0.01875309	1.81539	0.354

Alternative hypothesis: rho != 0

Checking multicollinearity

lngdp91	gcf9201	rule9201
2.083574	1.104772	2.012376

Appendix 3: Tests for the 2002-2011 model

Heteroscedasticity test

Studentized Breusch-Pagan test

data: model0211_new

BP = 0.91876, df = 3, p-value = 0.8209

Ramsey test for model specification

RESET test

data: model0211_new_2

RESET = 0.92956, df1 = 2, df2 = 141, p-value = 0.3971

Durbin-Watson test for autocorrelation of residuals

log	Autocorrelation	D-W Statistic	p-value
1	-0.0286838	2.047328	0.758

Alternative hypothesis: rho ! = 0

Checking multicollinearity

lngdp01	cpi0211	gcf0211
1.301415	1.303965	1.020979

Appendix 4: Tests for the 2012-2021 model

Heteroscedasticity test

Studentized Breusch-Pagan test

data: model1221_new

BP = 15.728, df = 3, p-value = 0.001289

Ramsey test for model specification

RESET test

data: model1221_new_2

RESET = 6.751, df1 = 2, df2 = 137, p-value = 0.001599

Durbin-Watson test for autocorrelation of residuals

log	Autocorrelation	D-W Statistic	p-value
1	-0.004291123	2.00379	0.986

Alternative hypothesis: rho ! = 0

Checking multicollinearity

lngdp11	rule1221	gov1221
2.253413	2.216129	1.099163

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Appendix 5: Tests for the 2012-2022 model

Heteroscedasticity test

Studentized Breusch-Pagan test

data: model1222_new

BP = 15.728, df = 3, p-value = 0.003214

Ramsey test for model specification

RESET test

data: model1221_new_2

RESET = 2.0589, df1 = 2, df2 = 135, p-value = 0.1316

Durbin-Watson test for autocorrelation of residuals

log	Autocorrelation	D-W Statistic	p-value
1	-0.01250238	2.019042	0.946

Alternative hypothesis: rho ! = 0

Checking multicollinearity

lngdp11	rule1222	gov1222
2.155528	2.164836	1.069975

Appendix 6: Tests for the 1992-2021 model

Stationarity test

Augmented Dickey-Fuller Test

data: consol$GDPch

Dickey-Fuller = -11.567, Lag order = 2, p-value = 0.01

alternative hypothesis: stationary

Hausman test for model selection with fixed or random effects

Hausman Test

data: GDPch ~ logGDP + gross_capital_formation + trade_gdp + rule_of_law

chisq = 275.13, df = 4, p-value < 2.2e-16

alternative hypothesis: one model is inconsistent

Lagrange multiplier test for heteroscedasticity verification

Lagrange Multiplier Test - (Breusch-Pagan)

data: GDPch ~ logGDP + CPI + gross_capital_formation + trade_gdp + …

chisq = 4.1253, df = 1, p-value = 0.04225

alternative hypothesis: significant effects

Breusch-Godfrey test for serial correlation

Breusch-Godfrey/Wooldridge test for serial correlation in panel models

data: GDPch ~ logGDP + CPI + gross_capital_formation + trade_gdp + …

chisq = 1.7608, df = 1, p-value = 0.1845

alternative hypothesis: serial correlation in idiosyncratic errors

Pesaran CD test for cross-sectional dependence in panels

Pesaran CD test for cross-sectional dependence in panels

data: GDPch ~ logGDP + CPI + gross_capital_formation + trade_gdp +   rule_of_law

z = 23.679, p-value < 2.2e-16

alternative hypothesis: cross-sectional dependence

Ramsey test for model specification

RESET test

data: iv_model_stage_fe

RESET = 2.1535, df1 = 2, df2 = 411, p-value = 0.1174

Durbin-Watson test for autocorrelation of residuals

Durbin-Watson test

data: iv_model_stage_fe

DW = 1.9015, p-value = 0.1552

alternative hypothesis: true autocorrelation is greater than 0

Appendix 7: Tests for the 1992-2022 model

Dickey-Fuller stationarity test

Augmented Dickey-Fuller Test

data: consol$GDPch

Dickey-Fuller = -11.567, Lag order = 2, p-value = 0.01

alternative hypothesis: stationary

Hausman test for model selection with fixed or random effects

Hausman Test

data: GDPch ~ logGDP + CPI + gross_capital_formation + trade_gdp + unemployment + rule_of_law + …

chisq = 155.98, df = 5, p-value < 2.2e-16

alternative hypothesis: one model is inconsistent

Lagrange multiplier test for heteroskedasticity verification

Lagrange Multiplier Test - (Breusch-Pagan)

data: GDPch ~ logGDP + gross_capital_formation + unemployment + rule_of_law + …

chisq = 0.63775, df = 1, p-value = 0.04245

alternative hypothesis: significant effect

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Breusch-Godfrey test for serial correlation

Breusch-Godfrey/Wooldridge test for serial correlation in panel models

data: GDPch ~ logGDP + gross_capital_formation + unemployment + rule_of_law + …

chisq = 81.767, df = 1, p-value < 2.2e-16

alternative hypothesis: serial correlation in idiosyncratic errors

Pesaran CD test for cross-sectional dependence in panels

Pesaran CD test for cross-sectional dependence in panels

data: GDPch ~ logGDP + gross_capital_formation + unemployment + rule_of_law + … trade_gdp

z = 7.8186, p-value = 5.34e – 15

alternative hypothesis: cross-sectional dependence

Ramsey test for model specification

RESET test

data: iv_model_stage_fe

RESET = 45.973, df = 2, df2 = 407, p-value < 2.2e-16

Durbin-Watson test for autocorrelation of residuals

Durbin-Watson test

Data: iv_model_stage_fe

DW = 1.9778, p-value = 0.4057

alternative hypothesis: true autocorrelation is greater than 0

Development Strategy for Future India and Atmanirbhar Bharat: A Way Forward

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Abstract

This article examines issues and development strategies for transforming the Indian economy into a developed nation by 2047, to which it aspires. We observe that the protectionist development strategy followed in the first four decades of independence could not bring the country out of poverty, and only protected vested interests. In the last three decades, the economy did reasonably well in terms of economic growth as a result of the adoption of the strategy of economic liberalization. The pitfalls of liberalization were realized in terms of increasing inequalities and external dependencies, and stagnancy in manufacturing capacity. COVID-19 exposed the limitations of global supply chains. To lessen the shortcomings of the liberalization, the Indian government introduced the Atmanirbhar Bharat Package. It is expected that the Package will make the economy competitive and enable India to achieve the objective of becoming an inclusive developed nation.

Introduction

In future years the Indian economy is poised to become the world's third largest economy, and it aspires to be a developed economy by 2047, when the country celebrates 100 years of independence from colonial rule. A country is termed a developed country if the per capita annual income in it crosses a threshold of approximately USD 14,000, has a world-class infrastructure, and democratic governance. Indian Prime Minister Shri Narendra Modi considers this definition of a developed country too limiting. To have an all-

inclusive development, he considers that the country has three major priorities: ensuring that young people enjoy good health and fitness and equipping them with the appropriate skills; fostering small and mid-sized enterprises and incentivizing them to create high productivity and high-wage jobs; and preparing capital markets and the financial sector to meet investment requirements [Chengappa 2024]. The question therefore is: What will take it for India to achieve all-inclusive and sustainable development?

During COVID-19, the government of India announced the Atmanirbhar Bharat Package[1] (meaning the "self-reliant India" package)[2] as an economic strategy to transform the economy into an economy of collective prosperity, in which equity is at its heart and development is environmentally sustainable. Note that the Atmanirbhar Bharat Package is not designed to discount the importance of markets in development or to replace the liberalization strategy, but to supplement it in order to lessen its ill effects.

Over the last 75 years, the Indian economy has transformed from an economy of shortage to an economy of adequacy. In 1947, India was an economy of severe scarcity and stagnation; poverty and unemployment were abundant; and there was a complete absence of a per capita income growth rate. During this period of independence, the population below the poverty line has declined substantially. In the beginning, the country adopted import substitution and state-owned heavy industry-led development as a strategy for economic development. In 1991, this strategy was replaced with one of economic liberalization, and India said goodbye to the license raj, the system of strict governmental regulation of the economy.

During the past three decades of liberalization, the economy did reasonably well. It progressed at an annual growth rate of 6%, with some ups and downs; a large base of physical and human infrastructure was created during this period. The economy has the potential to grow at an average rate of 8% per annum in the coming quarter-century.[3] However, the progress accomplished was not uniform across various different sectors and regions, i.e., inequalities in the economy have increased.

It has also been observed that during the last three decades, the share of the manufacturing sector in GDP and employment has been more or less constant, raising the question of whether the Indian economy has been facing a problem of premature deindustrialization [Chakraborty and Nagaraj 2020]. Increasing integration of the Indian economy with the world economy has led to an increase in imports of intermediate inputs [Goldar et al. 2016], however, exports of final goods have not increased in that proportion, thus making the country vulnerable to external exigencies. The industrial base has not advanced in the required direction. Technological changes have made manufacturing skill- and capital-intensive, and less and less labor-absorbing [Rodrik and Stiglitz 2024]. The outbreak of COVID-19 exposed the pitfalls of hyper-globalization. Creating high productivity and decent jobs for young people has been the biggest challenge for

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[1]   *Editor's note:* Bharat is the Hindi self-designation of India, which has been increasingly used in political discourse in recent years.

[2]   PM gives a clarion call for Atmanirbhar Bharat. Available at: https://pib.gov.in/PressReleasePage.aspx?PRID=1623391 (accessed 15 January 2024).

[3]   Dev (2021) observes that the Indian economy has the potential to grow at an annual growth rate of 7-8%.

policymakers. Moreover, the country is facing the challenges of the accelerating climate crisis and the need for a just and efficient energy transition.

This paper examines the development strategy transforming the Indian economy from a lower middle-income country to a developed economy by 2047, to which the country aspires. The paper also highlights structural changes and opportunities for the economy. The broad objective of the paper is to assess the factors that need to be critically analyzed to enable India to achieve its stated objective of an all-inclusive and sustainable development.

The rest of the paper is organized as follows: The next section provides an analysis of the development strategy and economic liberalization followed in the country. A snapshot of economic growth and the structural transformation trajectory, especially in the post-reform period, is described in Section 2. Section 3 discusses the way forward and the Atmanirbhar Bharat Package, and the paper closes in Section 4 with some concluding remarks.

1. Development strategy and economic liberalization

India is the fifth largest economy in the world and it has earned this status after a long journey of 75 years. It has a celebrated history of an ancient civilization dating back thousands of years, with periods of high prosperity and a rich cultural heritage. It was a poor and backward country on the eve of independence from British rule in 1947. Over this period, the trajectory of development has evolved through the ups and downs of economic performance [Ray 2016]. After independence, initially, the country followed a state-directed import substitution industrialization strategy with inward-looking bias. This strategy was replaced in 1990 with a more liberalized open economy framework, and much of the credit for today's status can be attributed to this liberalized trade and industrial policy regime. This section briefly discusses the development strategy followed in the country.

Structural transformation is key to long-term economic growth. It involves the movement of economic resources from low-productivity to higher-productivity activities. As a result, aggregate productivity rises, and economic growth happens. To make this transformation a reality, an economic development strategy is a fundamental requirement. This strategy should be accompanied by economic policies and programs that facilitate this transformation [Rodrik and Stiglitz 2024]. Inclusive development involves the movement of people from professions with low to higher productivity; earnings increase and poverty is eliminated or reduced. Therefore, the development strategy should be focused on creating better and more productive jobs, i.e., a well-defined explicit strategy is required for rapid sustained economic development.

In its first four decades of independence, India followed an import-substitution industrialization strategy. Perhaps the key goal was to achieve self-reliance and mimic the development trajectory of developed countries [Ray 2016]. The country engaged in highly complex and resource-intensive activities without any concerns for its natural comparative advantage. To have a socialist pattern of development, Soviet-style central planning was the cornerstone of the development strategy. Though a mixed economy was

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envisioned, the public sector was expected to take the economy to commanding heights. In this strategy, trade was given little attention; trade policy was categorized by ubiquitous import and exchange control regimes. Quantitative restrictions with increasing tariffs were used to protect the domestic industry from global competition in the name of infant industries. For the sake of socialist ideals, monopolies and trade restrictions were imposed to restrict the concentration of economic power; a policy of industrial reservation was used to promote small-scale industries that produced livelihoods and income for the common man; a freight equalization policy was implemented to create regionally balanced economic development; and to ensure the availability of essential commodities such as steel, cement, fertilizers, pharmaceuticals, etc., a policy of price controls was employed. A proactive role of government in the provision of merit goods such as education and health was envisioned.

Though a mixed economy was imagined, a private capitalist class emerged in the country that had vested interests in protecting their businesses from global competition. The strategy of import-substitution and inward-looking development was in perfect harmony with their narrow-vested interests [Ray 2016]. The policy of license-permit raj created a rent-seeking bureaucracy, and the original policy goals took a back seat. The protectionist approach to development generated inefficiencies in the use and allocation of resources. There were no incentives for the manufacturing sector to become globally competitive, and Indian industry became technologically backward and cost-inefficient by international standards. The country had to settle for a low growth rate to the tune of 2-3% per annum, and it was branded as a laggard in terms of global growth [Lal 1988, 1989]. It remained a poor country with very low material capacity despite its rich heritage and vast endowments [Ray 2016]. It should be noted that protectionism is not bad in itself. For example, countries like the US, Germany, and South Korea followed the policy of protectionism to help domestic industry reach the level of global standards. Protectionism was shunned in favour of free trade once industry reached international standards in order to gain access to international markets. In India, domestic industry has not developed to compete at the global level and could not take advantage of global markets [Ravi 2023].

In the mid-1980s, it was realized that India's inward-looking import substitution strategy could not produce the expected results, and that attention should be paid to improving efficiencies in the economy. It was also understood that it would be good for the economy to open its doors to global technologies. Moreover, given the success of the East Asian economies that followed an export-led and outward-looking industrialization strategy, the global scholarship on development strategy was also undergoing a metamorphosis. In this sense, this was the beginning of a shift in the development strategy from inward-looking import substitution to economic liberalization, but the approach was feeble and sporadic [Ray 2016]. In 1991, the country faced a severe balance of payment crisis and from this point, the development strategy shifted from inward-looking import substitution to the liberalization of the economy in order to realize development goals.

The government of India adopted a comprehensive structural reform and stabilization program in 1991 which ushered in a complete paradigm shift in policymaking, emphasizing the liberalization of economic activities from government

control to and moving towards more reliance on market powers. To achieve economic efficiencies, a larger role for the private sector in order to secure economic security and the integration of the domestic economy with the world economy was foreseen. Trade was given due recognition in the growth strategy. In order to promote trade, quantitative restrictions were removed, tariffs were reduced, exchange rates were market-aligned, and an investor-friendly foreign direct investment policy was followed. In the industrial sector, industrial licensing was eliminated, the number of sectors reserved for the small-scale sector was reduced and the role of the public sector was redefined.

As a result of the liberalization of the economy, as stated above, the economy received a substantial boost in terms of economic activities and growth. However, India could not achieve a rapid expansion of labor-intensive manufacturing in the pre-liberalization period due to its autarkic trade policy. It could not achieve this expansion even in the post-liberalization period either. By the time India shifted its policy paradigm, competition in labor-intensive manufacturing had intensified, and India had lost out in the race against East and South-East Asian economies. Moreover, manufacturing has become more skill- and capital-intensive, and less labor-absorbing due to technological changes [Rodrik and Stiglitz 2024].

As an alternative to a protectionist import-substitution strategy, the strategy of economic liberalization seems attractive, but there is a need to be cautious in blindly adopting the beliefs of liberalization. The global financial crisis of 2008 and the outbreak of COVID-19 in 2020 exposed the dark side of the tenets of liberalization as a development strategy.

While the strategy of economic liberalization is based on certain beliefs, it is imperative to understand the implications of the challenges that liberalization poses. The strategy of liberalization believes that markets allocate resources productively and efficiently and it advocates for the minimal role of governments. A liberalization strategy could be beneficial at the aggregate level, but at the same time, it could be harmful for some. Its proponents assume that all growth is good irrespective of how its benefits are distributed. Moreover, they also believe that integration with the global market is beneficial as all countries work in cooperation. However, the major insight of welfare economics is that markets by themselves, in general, do not produce Pareto-efficient optimal outcomes [Greenwald and Stiglitz 2014]. There is a rich record of market failures, and governments have to take specific measures such as having industrial policies which would produce socially desirable results.

The Indian economy did well at the aggregate level during the last three decades (as discussed in Introduction), however, inequalities have widened. They have grown throughout the world, and India is not an exception. The World Inequality Report 2022 shows that the bottom 50% of the global population owns less than 1% of global wealth, whereas the top 10% owns more than 80% of the world's total wealth. The report says that "Contemporary global inequalities are close to their early 20th-century level, at the peak of Western imperialism."[4] The share of the manufacturing sector in employment has

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[4] https://wir2022.wid.world/chapter-2/#:~:text=%E2%80%9CContemporary%20global%20 inequalities%20are%20close,inequalities%20between%20countries%20have%20declined (accessed 26 January 2024).

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been more or less constant for the last three decades and it has de facto declined during the liberalization period, i.e. the manufacturing sector could not create the desired quantum of employment. This has also been the result of technological changes that are increasingly skill and capital-intensive and less labor-intensive. Moreover, the outbreak of COVID-19 and other geopolitical events such as the Russia-Ukraine conflict have exposed the pitfalls of global integration and the vulnerability of global supply chains. It was seen that during these times, nationalism prevailed over globalization.

2. Growth and structural transformation in India

2.1 Economic growth

As stated above, the Indian economy was an economy of severe scarcity and stagnation on the eve of independence. During the first half of the 20th century, the economy grew at an annual growth rate of a mere 0.98% which was below the growth rate of the population. During the first three decades of planned economic development after independence, the economy was able to progress from the economic stagnation observed during the pre-independence era. However, the progress was not sufficient to alleviate the prevailing poverty and provide a dignified life for India's citizens. During these three decades, the economy grew at an annual rate of less than 3.5%. The year 1991 is termed as a year of turnaround in the economy; the process of liberalization was initiated by unshackling the economy from the chains of the license permit raj. Enhancing the productivity and competitiveness of the economy was one of the prime objectives of the economic reforms. During the liberalization period of the last 30 years (1991-2019), the economy grew at an average annual compound growth rate of 6.4%.

Figure 1 (p. 72) displays the trajectory of economic growth as observed in the Indian economy over the last three decades. We use the Hodrick-Prescott (HP) filter to separate the trend from cyclical and irregular components.[5] This filter can also be applied to non-stationary time series [Ravn and Uhlig 2002]. The trajectory shows that the economy has been growing continuously. From 2002 to 2016, the annual average observed growth rate of the economy has been 7.3%. The filtered series reveals that from 2001 to 2006, the Indian economy observed an increasing growth rate, reaching more than 8% in 2006. After that, it followed a downward trend to 2013 and then started moving up; it has again been witnessing a downward trend since 2016. It is observed that from 1991 to 2001, the Indian economy grew at a CAGR (compound annual growth rate) of 5.5% and the CAGR was 7.2% from 2002 to 2013. Over the next three years, the economy progressed at a rate of 7.5% per annum but in the last three years, the annual growth rate declined to 5.9%. Somehow reflecting that the growth momentum of the economy had started fading away even before the outbreak of COVID-19, in the year 2000, the economy observed a decline of about 7%. However, the economy started to recover immediately and in the years 2021 and 2022 its average growth rate was about 8%.

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[5]   We use the HP filter for separating the trend growth in GDP, factor inputs, and TFP from cyclical and irregular components. Therefore in all the figures, the trend growth line of the related variable is based on filtered series of the variable.

Figure 1. GDP growth rate in India, 1991-2019
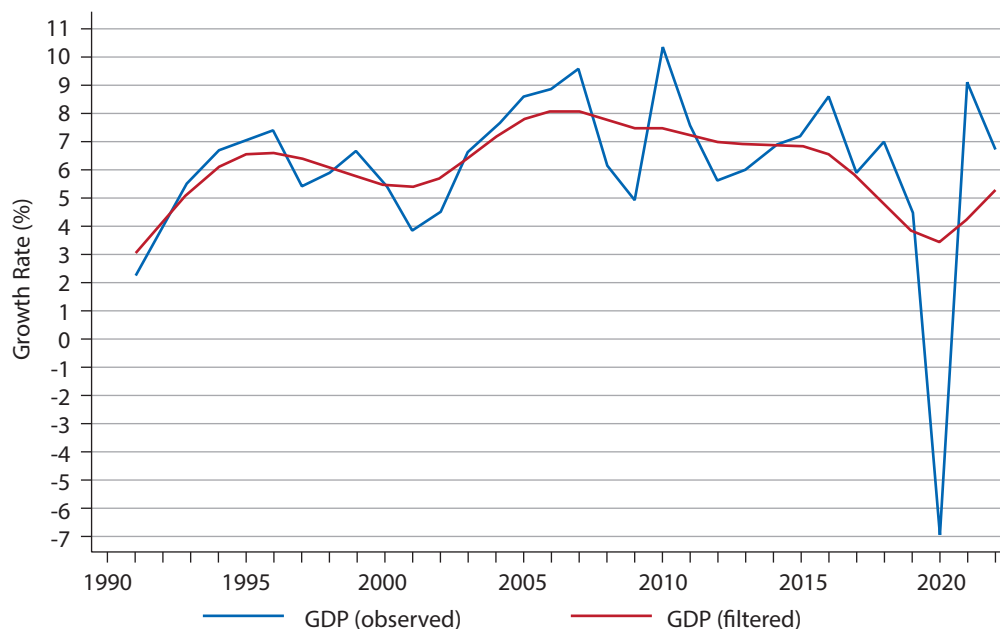
During the years 2017-2019 the economy observed a growth rate of 5.9, 7, and 4.5%, revealing that the slowdown started before the outbreak of COVID-19. In the first year of the pandemic, the economy observed a negative growth rate of -7%, and then recovery began, and the economy grew at a rate of 9.1 and 6.7% in the years 2021 and 2022 respectively.

As stated above, the economy aspires to be a developed nation by 2047 which requires that the per capita income should cross the threshold of USD 14,000 at constant prices, given the current level of per capita income of about USD 2,400. The economy needs to grow at a steady rate of more than 7% per annum in real terms for the coming quarter century, and given the current growth rate and momentum of reforms, it seems doable.

Reducing poverty and unemployment is one of the major concerns of India's economic development strategy. During the post-independence period, poverty in the country declined substantially. Datt et al. (2016) show that poverty has declined in the country, but the decline rate in the post-reform period has been much higher in comparison to the pre-reform period. In the pre-reform period, the decline rate was a mere 0.44 percentage points per year, which in the post-reform period has increased to 1.36 percentage points. The decline rate of poverty was also lower in the initial years of reform; this rate increased in later years. During the period from 1993 to 2005 poverty declined by 0.74 percentage points per year, which increased to by 2.2 percentage points per annum during 2005-2012.

On the poverty trends in post 2011-12, there is a heated debate about whether poverty has in fact been declining in the country. Some studies such as Subramaniam (2019) show

that during 2011-12 to 2017-18, poverty increased, whereas Bhalla et al. show that, the level of extreme poverty measured in terms of PPP$ 1.9 was as low as 0.9% in 2019. Panagariya and More (2023) estimate poverty during the pre-pandemic and post-pandemic periods and show that poverty has continuously been declining in both rural and urban areas, except during the period of strict lockdown in rural areas, during which it increased. In urban areas the reverse trend in poverty decline persisted a couple of quarters beyond the strict lockdown period. Recently released Household Consumption Expenditure Survey data for the year 2022-23 shows that rural poverty has declined to 7.2% and urban poverty has come down to 4.6% in 2022-23.[6]

A recently released discussion paper by NITI Aayog, the Indian government's policy think tank, by Chand and Suri (2024) presents estimates of multi-dimensional poverty in the country from 2005-2006. The paper shows that multi-dimensional poverty has sharply declined from more than 50% to 11.28% in the last two decades. The rate of decline has accelerated especially in the last decade as a result of government initiatives targeted at improving specific aspects of deprivation.

2.2 Structural transformation

Structural transformation is at the heart of economic development. It is defined as a movement of the labor force from lower productive economic activities to higher productive economic activities. In the earlier literature, structural change has been contemplated as a movement of workers from the agricultural to the non-agricultural sector; agriculture is generally considered a low-productive sector in comparison to non-agricultural sectors [e.g. Lewis 1954]. In the subsequent literature, structural change is defined as a shift of resources from agriculture to manufacturing and further from manufacturing to services [Denison 1967; Maddison 1987; Jorgenson and Timmer 2011]. Structural transformation also involves a change in the scale of economic activities. In a broader sense, structural change involves the reallocation of resources from lower productive economic activities to high or higher productive modern activities, as a result of which the aggregate economy improves with a higher standard of living for its citizens. Moreover, it should be noted that given sector or industry heterogeneity, productivity levels may differ within industries/sectors as technological changes occur. This sub-section provides a brief sketch of structural transformation in India over the last three decades.

Tables 1 and 2 (p. 75-77) show the industry share in total value-added and employment in the Indian economy from 1990-91. There is a steady decline in the agriculture sector's share over time; the share of agriculture in value-added has declined from 33.91% to 19.77% from 1990-91 to 2018-19, and agriculture's share in employment (64.30% in 1990-91 to 41.67% in 2018-19) has also declined, consistent with the growth theory which states that, as an economy progresses, there is a movement of workforce from less productive traditional sectors (the agriculture sector) to more productive modern sectors (manufacturing and service). Despite the decline in employment and value-added in the primary sector, it still accounts for 44% of total employment in India.

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[6]   https://economictimes.indiatimes.com/news/economy/indicators/indias-poverty-rate-declined-to-4-5-5-in-2022-23-sbi-research/articleshow/108029519.cms?from=mdr (accessed 28 February 2024).

However, the decline in employment in the agriculture sector is not absorbed by the manufacturing sector, since the employment share in the manufacturing sector increased marginally from 10.68% to 11.16% during the same period. Moreover, the share of manufacturing in value-added has decreased from 19.60% to 16.35% in total value added to the economy. There is literature discussing whether premature deindustrialization is happening in India. Amirapu and Subramanian (2015), using state-level information, show that most Indian states have improved in terms of share of manufacturing in GDP and employment in the 1990s. Only Gujarat has achieved a share of about 25% of the state's gross domestic product. But Chakraborty and Nagaraj (2000) reveal that though there is stagnation at the aggregate level, some structural changes have been taking place within the manufacturing sector.

Most of the decline in employment in the agriculture sector is absorbed in construction. The share of employment in the construction sector rose from 3.7% to nearly 12% during this period. The absolute number of laborers involved in the agriculture sector has been in decline since 2005-06 and the construction sector was able to absorb a large proportion of this decline till 2011-12, varying between 50 and 90%. The absorption in the construction sector has been low during the period 2012-12 to 2017-18, not exceedingly more than 31% in any single year. The decline in the absorption rate may be attributed to the slowdown in growth in the construction sector. The other sector that could absorb the labor force released from the agriculture sector was the trade sector, a sub-sector of the service sector. Its share has varied in the range of 10 to 13% during the period of 2005-06 to 2017-18.

This reveals the fact that the unskilled labor force has not been absorbed in semi-skilled jobs in manufacturing entities, but rather ends up moving to unskilled construction jobs. However, the value-added of construction saw a rise from 4% to 8% over the same period implying a decline in labor productivity, measured as value-added per unit of labor, in construction. However, this does not imply a decline in labor productivity in the agriculture sector though labor productivity in the agriculture sector continues to rise over time [Kumar 2022]. Part of the reason behind the consistent rise in labor productivity in the primary sector can be explained by two factors: one, the movement of surplus labor from agriculture to the construction sector increased the labor productivity level of the existing employees, and two, the mining and quarrying industry experienced a tremendous rise in labor productivity which boosted the labor productivity of the primary sector.

Within the manufacturing sector, industries that have shown a declining trend over time in terms of value-added are manufacturing, nec (not elsewhere classified); recycling, other non-metallic minerals products, and transport equipment. Industries like chemical and chemical products and basic metals and fabricated metal products show a rising trend in value-added share over time. The industries that gained employment share over time are manufacturing, nec, recycling, basic metals and fabricated metal products, electrical and optical equipment, rubber and plastic products. On the other hand, traditional sectors within manufacturing industries like textiles and wood products lose the share of the workforce that shifts to modern manufacturing industries. Food products and textiles constitute nearly 50% of employment in the manufacturing sector.

The service sector has been a major contributor to value-added since the 1980s; the share of the service sector in total value-added rose very sharply from 43% to 56%; within the service sector transport and storage, education, post and telecommunication constitute nearly one-fourth of the total contribution of the service sector in aggregate value-added of the economy. Despite having a big share in value-added, all three industries lost their contribution in value-added to the service sector; transport and storage reduced from 12% to 5%, post and telecommunication reduced from 6% to 1.5% and education shrank from 7.45% to 4.35%. Trade accounts for a major employment share in the service sector over time (7.34% to 11.32%), while industries that gained a share in employment are transport and storage, financial services, business services, hotels and restaurants, and public administration and defense.

Table 1. Industry shares in aggregate nominal value added (%)

Industry/Industry groups	1990-1991	1995-1996	2000-2001	2006-2007	2011-2012	2015-2016	2018-2019
A. Agriculture, Hunting, Forestry and Fishing	**33.91**	**31.40**	**28.75**	**23.76**	**23.51**	**22.67**	**19.77**
Agriculture	29.47	26.82	23.69	18.34	18.53	17.71	17.58
Mining and Quarrying	4.45	4.59	5.06	5.42	4.98	4.96	2.20
B. Manufacturing	**19.60**	**21.26**	**18.18**	**19.00**	**17.18**	**17.14**	**16.35**
Food Products, Beverages and Tobacco	1.95	1.96	2.01	2.39	2.07	1.70	1.93
Textiles, Textile Products, Leather and Footwear	2.93	2.76	2.31	2.28	1.89	2.39	2.10
Wood and Wood Products	0.50	0.76	0.59	0.29	0.27	0.28	0.27
Pulp, Paper, Paper products, Printing and Publishing	0.66	0.70	0.42	0.46	0.48	0.43	0.42
Manufacturing, nec; recycling	1.04	1.10	1.12	1.92	0.97	1.56	0.53
Coke, Refined Petroleum Products and Nuclear fuel	0.97	0.86	1.09	0.51	0.56	0.64	0.90
Chemicals and Chemical Products	1.19	1.23	1.03	1.11	1.18	0.97	2.42
Rubber and Plastic Products	3.07	3.32	2.63	3.33	2.83	1.85	0.60
Other Non-Metallic Mineral Products	1.76	1.82	1.33	1.37	1.55	1.11	1.04
Basic Metals and Fabricated Metal Products	0.94	0.92	0.78	1.07	1.01	0.95	2.13
Machinery, nec.	1.49	1.91	1.31	1.43	1.64	1.86	1.15
Electrical and Optical Equipment	0.39	0.48	0.50	0.45	0.44	0.74	0.88
Transport Equipment	2.70	3.44	3.05	2.39	2.30	2.66	1.98
C. Construction	**3.38**	**4.76**	**4.79**	**5.85**	**5.92**	**5.78**	**7.87**
D. Services	**43.10**	**42.58**	**48.28**	**51.39**	**53.39**	**54.41**	**56.01**
Trade	1.04	1.06	1.35	1.39	1.35	1.55	11.39
Transport and Storage	12.15	10.44	10.03	8.57	9.36	9.60	4.70
Financial Services	1.44	2.09	2.12	2.13	2.51	2.59	5.57
Business Services	2.90	2.56	2.59	3.31	3.22	2.34	8.14
Electricity, Gas and Water Supply	1.17	1.74	1.97	2.12	1.55	1.89	2.63
Hotels and Restaurants	1.63	2.07	4.13	5.78	5.54	7.62	1.05

Industry/Industry groups	1990-1991	1995-1996	2000-2001	2006-2007	2011-2012	2015-2016	2018-2019
Post and Telecommunication	6.00	5.54	6.70	5.32	6.06	5.82	1.50
Other services	2.34	2.38	3.10	2.86	3.30	3.72	8.95
Public Administration and Defense; Compulsory Social Security	6.29	5.76	6.86	9.17	9.59	7.88	6.09
Education	7.45	8.15	8.49	9.60	9.79	10.40	4.35
Health and Social Work	0.68	0.78	0.95	1.14	1.11	1.01	1.65
Total	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

Note: nec: not elsewhere classified

Source: Computations based on KLEMS data, Reserve Bank of India.

Table 2. Industry shares in aggregate employment (%)

Industry/Industry groups	1990–1991	1995–1996	2000–2001	2006–2007	2011–2012	2015–2016	2018–2019
A. Agriculture	**65.30**	**63.49**	**59.94**	**55.03**	**48.42**	**44.65**	**41,67**
Agriculture, Hunting, Forestry and Fishing	64.59	62.81	59.30	54.46	47.87	44.19	41.25
Mining and Quarrying	0.71	0.68	0.64	0.57	0.55	0.46	0.42
B. Manufacturing	**10.68**	**10.47**	**10.93**	**11.49**	**11.77**	**11.52**	**11.16**
Food Products, Beverages and Tobacco	2.34	2.48	2.51	2.30	2.41	2.16	1.95
Textiles, Textile Products, Leather and Footwear	3.42	2.95	2.93	3.26	2.92	2.89	2.55
Wood and Products of wood	0.90	0.94	1.13	1.05	0.82	0.69	0.61
Pulp, Paper, Paper Products, Printing and Publishing	0.28	0.27	0.32	0.35	0.33	0.36	0.39
Manufacturing, nec; recycling	0.86	0.84	0.83	1.09	1.29	1.16	1.18
Coke, Refined Petroleum Products and Nuclear fuel	0.03	0.03	0.03	0.03	0.03	0.04	0.05
Chemicals and Chemical Products	0.43	0.46	0.45	0.45	0.43	0.46	0.49
Rubber and Plastic Products	0.14	0.17	0.18	0.19	0.25	0.25	0.28
Other Non-Metallic Mineral Products	0.89	0.85	0.86	1.00	1.05	0.94	0.85
Basic Metals and Fabricated Metal Products	0.77	0.77	0.86	0.86	0.97	1.02	1.08
Machinery, nec.	0.18	0.23	0.31	0.33	0.40	0.53	0.64
Electrical and Optical Equipment	0.23	0.25	0.26	0.31	0.53	0.65	0.73
Transport Equipment	0.23	0.23	0.24	0.27	0.34	0.37	0.38
C. Construction	**3.73**	**3.90**	**4.52**	**6.64**	**10.33**	**11.21**	**11.93**
D. Services	**20.30**	**22.14**	**24.61**	**26.83**	**29.49**	**32.61**	**35.23**
Trade	7.34	8.02	9.08	9.70	10.06	10.66	11.32
Transport and Storage	2.57	2.82	3.34	3.76	4.12	4.69	4.97
Financial Services	0.51	0.58	0.57	0.75	0.95	1.07	1.22
Business Services	0.30	0.41	0.65	1.06	1.62	2.34	2.83
Electricity, Gas and Water Supply	0.32	0.29	0.28	0.30	0.34	0.41	0.42

Industry/Industry groups	1990–1991	1995–1996	2000–2001	2006–2007	2011–2012	2015–2016	2018–2019
Hotels and Restaurants	0.91	0.95	1.17	1.43	1.70	1.87	1.94
Post and Telecommunication	0.18	0.24	0.33	0.42	0.37	0.39	0.37
Other services	3.14	3.76	3.86	4.01	4.56	4.79	5.23
Public Administration and Defense; Compulsory Social Security	2.84	2.64	2.47	1.90	1.76	1.71	1.71
Education	1.62	1.85	2.15	2.65	3.01	3.50	3.87
Health and Social Work	0.56	0.60	0.72	0.86	0.99	1.18	1.36
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Note: nec: not elsewhere classified

Source: Computations based on KLEMS data, Reserve Bank of India.

The declining or stagnating share of manufacturing in value-added and employment raises the question of whether Indian manufacturing is experiencing premature deindustrialization, or whether this is an optical illusion. In the post-reform period, the effective protection of manufacturing vis-à-vis services has come down [Das 2016]. It is also possible that during this period the ratio of prices of non-traded to traded goods might have increased. In this kind of situation, the trends in nominal value-added (current prices) understate the true growth in manufacturing vis-à-vis service sectors [Oda and Strap 2003; Ross and Skott 1998; Sell 1988]. Goldar et al. (2016) observe that computation of value-added in manufacturing and services with proper deflation raises the share of manufacturing in gross value-added in the economy. Moreover, the declining trend in the employment share of manufacturing vis-à-vis services may be due to the splintering of services from manufacturing [Goldar et al. 2018; Banga and Goldar 2007, Bhagwati 1984].

The above discussion reveals that though the share of the agriculture sector both in employment and value-added has been declining, most of the decline in labor share has been absorbed by the construction sector rather than manufacturing. The share of the manufacturing sector in employment and value-added has been more or less constant throughout the period under consideration. The share of the service sector in value-added has substantially increased, but the share of employment has not increased in that proportion. It is worth noting that though there is no structural change as far as the manufacturing sector is concerned, some structural change has been occurring within the manufacturing and service sectors. For example, the share of chemicals and chemical products, basic metals and fabricated metal products, and electrical and optical equipment subsectors, which are generally considered modern sub-sectors, in the manufacturing sector both in terms of value-added and employment has increased.[7] Similarly, the share of trade, financial, and business services has substantially increased in the aggregate value-added, but the contribution of transport and storage,

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[7]   Formalization of informal manufacturing is an important aspect of structural transformation in India and this aspect is not visible in the KLEMS data, but it is vital for understanding the dynamics of Indian economic growth.

telecommunication and postal services and education services has declined over the period. In terms of employment, the share of almost all service subsectors has increased, but the rate of increase is not uniform across sub-sectors.

3. Atmanirbhar Bharat and a way forward

India needs an alternative development strategy that on the one hand, would bring the benefits of market efficiencies and on the other hand, take care of national interests. This strategy should lead to an economic state in which the country achieves not only the status of a developed country, but also in which development is inclusive. Market forces do not work in a vacuum. The success of markets in generating efficiencies is linked to the creation of institutions and their enforcement. Government expenditures in infrastructure, regulations, and policies shape markets. This implies that the Indian development strategy should be accompanied by fundamental capabilities, so that the country can achieve the status of an inclusive, developed country by 2047.

During COVID-19, the vaccine war between developed and developing countries exposed the pitfalls of liberalization-based globalization. National interests triumphed over humanitarian needs. It revealed that in desperate and extreme circumstances, globalization conflicted with national interests, rather than enabling cooperation. India could vaccinate more than a billion people on account of its domestic production of and research into COVID-19 vaccines. This made the country rethink its national interests related to self-reliance, harvesting market efficiencies, and globalization [Ravi 2023]. It should be noted that India was already witnessing a decline in its manufacturing base, growing income and wealth inequalities, and climate change challenges. Given the pre- and post-COVID-19 worlds, in May 2020, the Indian government came out with an economic strategy known as the Atmanirbhar Bharat (self-reliant India) Package[8] that aims not only to make the country self-reliant but also enable it to realize the benefits of a market economy which is globally integrated.

It should be noted that the new strategy of self-reliance is different from the protectionist strategy followed in the past in the name of fledgling industries. The country paid a high price for earlier self-reliance in the form of low economic growth and a high level of poverty. This new kind of self-reliance is different from being self-centered or autarky [Ravi 2023]. The new definition of self-reliance is based on the concept of *vasudhaiva kutumbakam* (the world is one family) which considers Indian economic progress as part and parcel of the progress of humanity.[9]

The Atmanirbhar Bharat Package relies on five features: *economy, infrastructure, system, vibrant demography*, and *demand*. In terms of the economy, it says that given the size of Indian society, every solution should be scalable, so that economies of scale are realized and the economy becomes cost-competitive. As stated above, markets do not work

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[8]   https://pib.gov.in/PressReleasePage.aspx?PRID=1623391 (accessed 15 January 2024).

[9]   When announcing the Atmanirbhar Bharat Package on 12 May 2020, Indian Prime Minister Shri Narendra Modi clarified that Atmanirbhar (self-reliance) does not mean being self-centered. The new definition is based on Indian culture, which considers the world to be a family, and sees Indian economic progress as closely interlinked with the progress of the rest of the world.

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in a vacuum, fundamental capabilities shape markets and enhance their efficiencies. There is a need to make huge investments in modern infrastructure. Infrastructure investments involve lock-in characteristics. For example, once an investment is made in fossil-fuel-intensive infrastructure, it will continue to operate for a long period, and this will be problematic in terms of meeting climate change challenges. This implies that the country should make huge investments in creating modern infrastructure that is energy efficient and less fossil-fuel energy intensive. India is a constitutional democracy and the new development strategy should utilize the latest technologies. An economic system based on modern technologies creates trust and enhances economic efficiencies and progress. Such a system is just for all. The Atmanirbhar Package is designed to create a modern, technology-based, efficient system. It is said that demography shapes the challenges and opportunities that a society faces. India not only has the largest population in the world; the population is diverse and young. If good health and fitness are ensured and young people are equipped with the appropriate skills, then the country will be able to garner the demographic dividend, i.e. the country needs to focus on health and education.

In a recent paper published in Econometrica, Goldberg and Reed (2023) show that in a world in which national interests prevail over humanitarian needs, it is the size of the domestic market that determines the path of economic development. A large domestic market allows countries to exploit economies of scale. Therefore, in the new development strategy, emphasis has been put on strengthening demand and supply chains to full capacity, which involves all the stakeholders in the supply chain in order to increase, as well as achieve, demand. In the package, emphasis has been given to the factors of production and institutions as well as to various sectors including cottage industries, MSMEs, laborers, the middle class, and industry, among others.

In the past years, several measures were taken to lessen the supply-side constraints in the economy. These measures include an easy, rational, strong, and digital financial system, supply chain reforms for agriculture, a simple and rational tax system, straightforward and clear business laws, capable human resources, and reforms of labor laws. An efficient and strong financial sector is required to meet the financial and investment needs of the country. These reforms will promote businesses, attract investments, and further strengthen the manufacturing policy, "Make in India." It is expected that the Atmanirbhar Bharat Package coupled with the fundamentals that remove supply-side constraints will increase efficiency in various sectors and make the country competitive on the international market. It is also expected that such kind of growth will be more socially harmonious.

Given the objective of the Atmanirbhar Viksit Bharat (self-reliant developed India), during the lockdown period, the government of India, rather than handing out grants, decided to spend on infrastructure to spur growth and create jobs. In the last decade, spending on infrastructure has increased about five times. Moreover, along with focusing on the conventional sectors through the "Make in India" initiative, the need to leapfrog into modern technology-oriented sectors has been realized. Projects on mastering quantum computing, semiconductor chip manufacturing and artificial intelligence, and strengthening collaborations with major countries such as the US have been launched [Chengappa 2024]. The country has become an exporter in the areas in

which it was dependent on the outside world, such as mobile phones and drones. The space sector has also been opened up to the private sector; the synergy between the private and public sectors is breaking past taboos and helping the country to achieve its desired goal.

In the last few years, the Indian economy has been on a path of resilient growth. Job creation and employment have increased continuously; the unemployment rate has declined to 3.2% in 2022-23 from 6.1% in 2017-18. A manageable current account deficit (CAD) coupled with controllable inflation is a reflection of a healthy macroeconomic situation. Trade-oriented external dependence reflected in terms of CAD is manageable. In the economy, large-scale digital public infrastructure has been created and digital payments have been taking place. The financial sector which was suffering from the problem of twin-balance sheets[10] has become healthy and meets the financial requirements of the economy. Gross non-performing assets as a ratio of gross advances have declined substantially from about 11% in 2017-18 to a only about 3.2% in 2022-23 [Ministry of Finance 2024]. Increasing indirect tax revenues may be considered as an indicator of enhancing economic activities. Moreover, we find that in recent years, there has been a huge boost in the creation of physical infrastructure in the economy. Figure 2 (p. 80) displays growth in India's transport infrastructure over the last decade.

Figure 2. Improvement in physical infrastructure
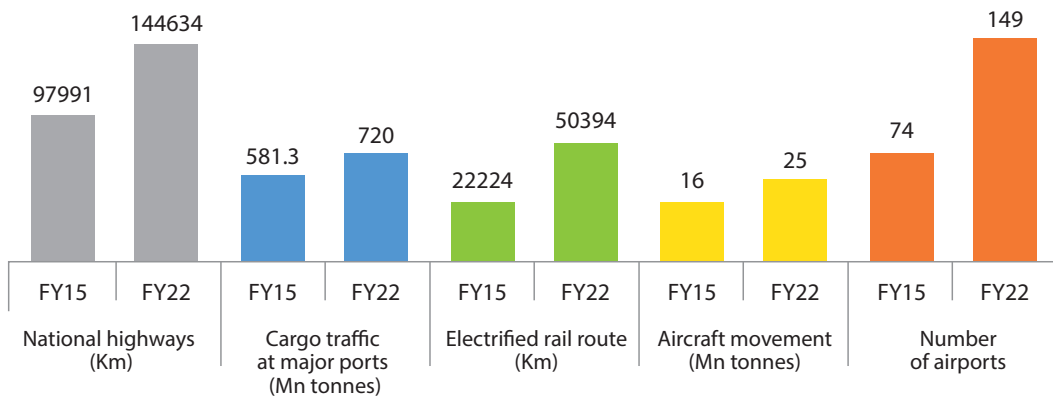
Source: Key features of Budget 2024-2025 (https://www.indiabudget.gov.in/doc/bh1.pdf as accessed on 24 February 2024).

As outlined above, the Indian economy was slowing down even before the outbreak of COVID-19, and it was supposed to be one of the most vulnerable economies due to the global pandemic. In the pandemic year, it declined by 7%. As a result of the short- and long-term measures taken during the pre- and post-pandemic periods and the development strategy followed, the economy has not only recovered from the setbacks of COVID-19 but has been doing reasonably well, and is termed as one of the fastest-

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10   *Editor's note:* The issue of corporate leverage and the high proportion of non-performing assets on banks' balance sheets.

growing major economies in the world. A recent report shows that post-COVID-19 growth is inclusive as the bottom 20% were able to recover relatively more as shown in the Figure 3 (p. 81).[11]

Figure 3. Post-COVID-19 inclusive recovery in household income. Average annual household income in Rs Lakh, 2011–12 prices

Source: https://timesofindia.indiatimes.com/india/incomes-up-since-covid-but-poorest-20-still-below-fy16-level-study/articleshow/107124541.cms?from=mdr
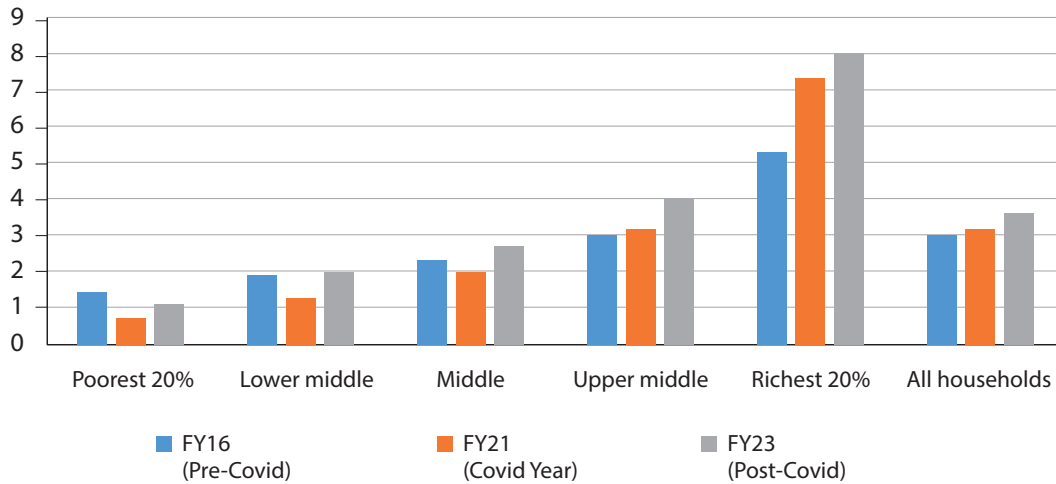
4. Concluding remarks

The country aspires to be a developed nation by 2047; to achieve this status it needs to grow at a rate of more than 7% per year in real terms. Achieving this status in an inclusive way necessitates that this growth, not merely at the aggregate level, should take place across all sectors and sections including the cottage industry, MSMEs, laborers, the middle class, and industry, among others. Such growth requires both structural transformation and the development of the fundamentals (e.g., physical and human infrastructure) of growth that facilitate structural transformation.

COVID-19 and recent geopolitical events have revealed the pitfalls of globalization-based liberalization; national interests have prevailed over the global common good. This means that sustained and inclusive development requires a strategy that on the one hand, enhances competitiveness and economic efficiencies in the economy and, on the other hand, reduces its external dependencies. India's experience in the agricultural sector shows that sustained growth requires self-reliance and not autarky. The country has achieved self-reliance in agriculture by adopting the best available technologies, following farm-centric government policies, and cooperating with farmers, rather than continuing to import foodgrains.

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[11]   https://timesofindia.indiatimes.com/india/incomes-up-since-covid-but-poorest-20-still-below-fy16-level-study/articleshow/107124541.cms?from=mdr (accessed 27 January 2024).

Over the last 75 years, the transformation of economic activities from low- to high-productive economic activities has been observed. The share of the agriculture sector in output and employment has significantly declined, however, the share of primary activities, especially the agricultural sector in employment is still very high. In the last three decades of economic liberalization, the economy did reasonably well in terms of aggregate growth, but the growth across sectors and sections of society is not uniform. During this period, economic growth has been accompanied by increasing economic inequality and external dependencies. A productivity increase across the sectors is required, and the country cannot afford to ignore any sector in terms of structural transformation in order to achieve the status of a developed nation.

In 2020, the Indian government launched the Atmanirbhar Bharat Package, which is designed to enhance competitiveness, facilitate enabling economies of scale, focus on innovations and modern technologies, judiciously employing all productive resources, especially human resources, and augment domestic markets by increasing people's purchasing power. This kind of development strategy is expected to bring the required structural transformation and develop the fundamentals that facilitate that transformation. The economic achievements of the last three years testify to the significance of this development strategy.

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Banking Sector Competition: A Roadmap for Financial Stability?

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Abstract
The article examines the issues of competition in the banking sector in the context of the post-crisis policy of international banking regulation. The overarching objective of this policy is to achieve financial stability and minimize the risk of future financial crises. An understanding of the new phenomena of competition in the international banking sector and their interrelation with the issues of financial stability should facilitate the strengthening of market discipline in the banking sector and enhance the long-term potential of credit institutions as reliable providers of market liquidity. Conversely, achieving equilibrium between banks' compliance to post-crisis regulatory standards and their capacity to establish competitive advantages will not only enhance their resilience in the context of an unstable external environment but will also represent an effective strategy for mitigating systemic risks and systemic stress.

A synthesis of studies on the impact of banking sector competition on financial stability (Competitive-fragility hypothesis and Competitive-stability hypothesis) reveals a contradictory effect due to the multifaceted nature of competition. Consequently, there is no definitive assessment of competition with regard to ensuring stress resilience in the banking sector. Increased competition can both contribute to reducing the vulnerability of banking activities to various risks and challenges and become a source of instability. Guided by the primacy of balanced development of the banking sector, we propose to supplement the toolkit

of international banking regulation with a quantitative indicator of competition assessment based on the risks of banking activities, taking into account the standards and recommendations of Basel III.

Introduction

The issue of competition in the banking sector has consistently been a central focus of research. Competition and the factors influencing its state and prospects have assumed particular significance in the wake of the 2007-2009 Global Financial Crisis. This crisis brought into sharp focus the fact that the new regulatory paradigm, which represents the most rigid mechanism of all the previous ones, places banks in fundamentally new conditions of performance. The effectiveness of their activities, therefore, significantly depends on their ability to adapt to the post-crisis requirements of prudential banking supervision.

Concurrently, the number of factors affecting the competitiveness of banks is on the rise, and the very concept of competition has recently taken on an ambivalent connotation in the context of achieving financial stability. There is a plethora of opinions on this issue, each of which is supported by compelling arguments for and against increased competition as a contributor to financial stability.

The multifaceted nature of banking sector competition in the context of new requirements to ensure financial stability urges particular attention from macrofinancial authorities, including financial regulators. The extant regulatory apparatus is devoid of any supervisory standards that would facilitate the quantification of competition. Nevertheless, it is already evident that a comprehensive mechanism for ensuring banks' stress resilience and minimizing the risk of future crises cannot be implemented without an interrelatedness between competition and financial stability.

1. Post-crisis bank regulatory policy objectives and banking sector competition

Groundbreaking and large-scale changes in the area of international banking regulation in the post-crisis period have brought fundamental shifts in understanding the factors of financial stability, which is one of the pillars of sustainable growth of the global economy. One of the key outcomes of regulatory reform has been the capacity of banks to withstand stress, irrespective of the macro-level dynamics. This should mitigate the risk of systemic stress, enhance the predictability of key performance indicators within the banking sector, and reduce the probability of new financial crises. The efforts of international and national regulators to guarantee the continuity and efficacy of the financial intermediation function are devised with the objective of fortifying the economic resilience of banks to external challenges and, ultimately, to reinstate their role as a facilitator for economic growth.

The post-crisis regulatory transformation, also known as the Basel III reform, has caused substantial shifts in the banking industry. In the context of heightened regulatory compliance requirements, the market discipline of banks has been reinforced. This has been facilitated by a more pragmatic approach to the selection of organic and inorganic growth paths, ideas about the scale and diversification of operations in financial markets, and the transition to a fundamentally new operating model. In this model, the priorities of banking activities have shifted from short-term benefits to ensuring a "healthy lifestyle" and minimizing costs, regardless of the extent to which the external environment is aggressive. The evolutionary selection of banks that successfully adapted to the new supervisory requirements created the prerequisites for ensuring the stress resilience of the banking sector as a whole.

The issue of financial stability, which is at the core of the post-crisis regulatory mechanism, has brought the issue of banking sector competition to the fore. Without a clear understanding of this issue, efforts to strengthen market discipline in the banking sector may be undermined in the contemporary economic environment. While there are currently no quantitative assessments of competition in the international banking regulatory mechanism, it is imperative to subject its status and prospects to close scrutiny in order to minimize imbalances and fragmentation in financial markets and further enhance the efficiency of international financial intermediation.

Despite the crucial role of competition in maintaining financial stability, the precise nature of its relationship with other factors remains a topic of ongoing debate, particularly outside the realm of regulatory policy. This may be because international regulators primarily assess the sustainability of the banking sector in terms of capital adequacy and enhanced supervision of credit risks. It is also possible that the state of competition in the banking services market has no discernible impact on banking efficiency [Fungáčová, Pessarossi, Weill 2013; Yin 2021], or even contributes to its improvement [Duc-Nguyen, Mishra, Daly 2023; Bayeh et al. 2021]. However, there are other opinions on this issue [Mirzaei, Moore 2014], including the opposite [El Moussawi, Mansour 2022].

In addition to the well-known factors influencing competition (such as the structure of the banking sector, capital concentration, the share of state-owned and foreign-owned banks, infrastructure, and regulation of financial markets), Basel III expanded the list of factors by addressing the issues of banks' adaptation to the requirements of the new regulatory paradigm. The process of adaptation introduced a regulatory dimension to the theory of competition. The processes of competition in the banking sector was complemented by the peculiarities of the banks' operating model, which at the same time had to comply with the established supervisory requirements. In this regard, in order to fulfill the necessary and sufficient conditions for the formula "both the sheep are safe, and the wolves are fed," it is necessary to achieve a balance between the banks' ability to ensure regulatory compliance and their ability to form competitive advantages that would allow them to effectively perform the function of financial intermediation. Such contradictions may exacerbate systemic risks, thereby limiting the efficacy of regulatory efforts to achieve financial stability.

Conversely, post-crisis regulatory policy should facilitate the establishment of a level playing field and ensure equal opportunities for all participants in the banking

sector. Notwithstanding the direct correlation between the growth of competition and the exacerbation of crisis developments in the financial sector [Fernández, González, Suárez 2013; Hirata, Ojima 2020; Abou-El-Sood, Shahin 2023], the priority of regulation should focus on the minimization of the risk of weak competition environment in order to balance the development of the banking sector. This should be done in a manner that is consistent with the search for criteria and factors that would strengthen the relationship between competition and financial stability.

The issues of competition and competitiveness in the banking sector have been extensively researched in both domestic and foreign economic literature. Nevertheless, the potential of competition assessment as a tool for international regulators to advance towards financial stability has yet to be explored in academic research. The majority of research in this field is confined to the evaluation of competition in relation to the operational and market activities of banks. The limited number of studies that have attempted to establish a link between competition and capital adequacy have not addressed the conceptual aspects of the relationship between competition and regulation, which is critically important to understand how to achieve financial stability as an overarching objective of the post-crisis regulatory order.

This article contributes to the existing economic literature by considering the nexus between competition, Basel III, and financial stability. The aim is to further improve the efficiency of international financial intermediation, including by strengthening stress resilience in the banking sector. It is proposed that a competition indicator be developed and introduced into the toolkit of banking regulation. This indicator would be based on a quantitative assessment of banking risks while taking into account the post-crisis requirements of prudential banking supervision. It can be concluded that the expansion of supervision will enhance the efficacy of regulation and serve as a guarantor of regulatory-competitive synergy, which is a crucial factor in achieving a state of "competitive-operational" equilibrium in the financial market. The paper puts forth proposals for optimizing banks' competitiveness in the context of the internationalization of banking regulation and financial globalization.

2. Macrofinancial aspects of banking sector competition

In 2014, the G20 countries identified the promotion of fair competition as a priority issue for sustainable economic development. This recognition was based on the understanding that competition based on market principles encourages cost reduction and leads to higher efficiency. The topic of banking sector competition, including its dependence on macroeconomic conditions and dynamics, has been extensively covered in extant economic literature. A number of papers on the relationship between prudential banking supervision and economic growth indicate a direct correlation between economic growth and financial stability [Asteriou, Spanos 2019; Nasreen et al. 2020], between economic growth and competition in the banking sector [Nasreen et al. 2018], and between competition and financial stability [Li, Kang, Xu 2022]. Conversely, we assume that a lack of competition impedes economic growth, primarily

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due to the costs associated with monopolization in the financial market. This, in turn, gives rise to higher prices for financial products and services, a reduced level of their diversification and accessibility to consumers, and finally leads to a less competitive financial sector.

A new impetus for research was provided at the turn of the 2010s in the context of investigating the underlying causes of the Global Financial Crisis. The results of empirical studies have been found to be somewhat contradictory. On the one hand, increased competition in the financial sector has been observed to contribute to the growth of banking sector efficiency and the quality of financial products and services. This, in turn, has been seen to result in greater accessibility of financing instruments for end consumers [Sun 2011. P. 3]. On the other hand, non-banking financial institutions are able to provide relatively inexpensive resources to potential borrowers in the non-financial sector, which significantly reduces the debt burden of the latter [Rajan, Zingales 1998]. As a result, increased banking sector competition ensues. Furthermore, heightened competition urges banks to undertake a greater volume of high-risk operations, which are frequently characterized as openly speculative [Claessens 2009]. A similar phenomenon is observed during periods of instability and crises [Noman et al. 2022].

A significant body of literature examines the nexus between banking sector competition and financial stability. On the one hand, as competition within the industry intensifies, the likelihood of financial and banking crises increases. On the other hand, economic history is replete with examples and techniques of restricting competition in the banking sector or, conversely, stimulating it. This has been done, among other things, for the purpose of overcoming crisis developments and minimizing the risks of instability.

If the objective of banking sector competition is to maintain a level playing field for financial market participants, then the inevitable consequence of competition management is to modify, or more accurately, to optimize banking activities and enhance the quality of banking products and services. It is evident that as competition intensifies, the accessibility of credit for the economy expands, while the costs borne by borrowers decline [Li, Peng 2024]. Concurrently, the economic function of competition is the rational allocation of banking assets and the formation of market-based prices for banking products and services, which is one of the factors of financial stability. However, excessive competition is fraught with the risk of increasing banking risks due to decreasing operating profits [Canta, Nilsen, Ulsaker 2023] and increasing lending [Canta, Nilsen, Ulsaker 2023; Biancini, Verdier 2023], which would inevitably lead to instability [Yuan et al. 2022]. This ultimately diminishes banks' potential in their pursuit of cost reduction, higher returns on capital and investment, and increased attractiveness to financial sector consumers.

Thus far, market relations in the financial sphere have proven ineffective in overcoming the contradictions inherent to competition. In light of the above, it becomes evident that the management of competition constitutes an indispensable factor of financial stability. This function could be attributed to the purview of bank regulators, yet it has not yet received the requisite attention from them.

3. Evaluation of banking sector competition as a tool to ensure financial stability

3.1 Macroeconomic aspects of competition

In contemporary economic literature, numerous works have been dedicated to examining the nexus between competition in the banking sector and financial stability. It must be acknowledged that there is no definitive correlation between competition and financial stability, particularly in terms of whether the two exert unambiguously positive or negative effects on each other. In fact, the level of competition determines the boundaries of the banking sector performance [Claessens, Laeven 2005]. Furthermore, competition contributes to the growth of banking sector efficiency in the short term. However, in the long term, the influence of competition on financial stability is multidirectional [Allen, Gale 2004]. A number of papers have identified a direct relationship between economic growth and financial stability [Asteriou, Spanos 2019; Nasreen et al. 2020], between economic growth and competition in the banking sector [Jayakumar et al. 2018], and between competition and financial stability [Li, Kang, Xu 2022; Noman, Gee, Isa 2018]. An increase in competition contributes to macroeconomic stability, including a reduction in credit risk [Noman, Gee, Isa 2018]. However, a weaker competition environment impedes economic growth, primarily due to the costs associated with monopolization in the financial market, including higher costs of financial products and services and a reduction in diversification. Findings suggest that competition may positively influence the stability of smaller banks, contingent on their involvement with high-risk instruments and in the context of weaker corporate governance [Jeon, Lim 2013]. Conversely, numerous studies have reached the opposite conclusion, namely that heightened competition intensifies the risks associated with financial crises [Yuan et al. 2022] and precipitates an increase in the volume of non-performing loans [Guidi 2021]. However, a higher level of capitalization mitigates the adverse effect of competition on financial stability [Ernaningsih, Smaoui, Temimi 2023]. Additionally, studies have indicated a correlation between heightened risk-taking in banking and reduced competition, as well as a shift in banks' operational priorities towards higher-risk instruments [Akins et al. 2016]. Conversely, increased concentration enhances bank profitability [Tan, Floros 2014] and serves as a stabilizing factor in financial markets, particularly during crises [Ali, Intissar, Zeitun 2018], not necessarily leading to increased competition [Park 2009].

3.2 Regulatory aspects of competition

Despite the abundance of studies on the impact of interbank competition on the achievement of financial stability, the issues of the relationship between the post-crisis mechanism of international banking regulation and banking sector competition in the context of financial stability remain under-researched. It is established that the post-crisis regulatory transformation, which has resulted in a credit contraction [Hasan et al. 2022], has caused an imbalance in the competitive environment. Another impediment

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to competition is the difference in banks' adaptation to post-crisis supervisory requirements, including those pertaining to minimum capital adequacy. It is noteworthy that in countries with lower level of banking sector competition, economic growth is impeded when bank capital is calculated using the IRB approach[1] [Hasan et al. 2021]. This is due, in part, to a number of shortcomings in the methodology developed for internal rating by banks, as well as somewhat ambiguous criteria for the applicability of the IRB approach in comparison to the standardized approach. Concurrently, the rise in minimum capital adequacy standards during the post-crisis era is a pivotal element in both fostering fair competition [Barrell, Karim 2020] and ensuring financial stability, irrespective of the level of competition. However, in the context of heightened competition, financial stability may be attained at the cost of constraints on banking activities [Noman, Gee, Isa 2018].

However, competition is inevitably linked with the risk-built processes, which, in the absence of competition-related supervisory instruments, will reduce the efficacy of regulators' efforts toward financial stability. This underscores the imperative for regulatory optimization of banking sector competition which would be based on its quantitative assessment[2] while taking into account the level of risks in the banking sector. As competition intensifies, the volume of high-risk bank operations rises [Bolt, Tieman 2004]. Nevertheless, given the multidirectional macro-level dynamics and the volatility of global financial markets, achieving "competitive equilibrium/sustainability" by means of regulatory mechanism appears to be a task with multiple, currently unidentified, determinants. Achieving financial stability will require regulators to develop a system of competition assessment parameters that is understandable for investors and acceptable for banks. This system should take into account not only the risks of individual banks, but also the threat of micro-level risks becoming systemic.

4. Issues of competition in the context of financial stability

The above review of studies reveals a divergence of findings regarding the impact of banking sector competition on financial stability. The practical implications of these studies are that, irrespective of whether the level of competition increases or leads to monopolization/concentration, the consequences for the competitive environment may be unexpected for both market participants and financial regulators, particularly in the context of the efficiency of the financial intermediation function. These contradictions of competition require further study in order to gain a deeper understanding of the prospects for macrofinancial management of competition. In contemporary economic literature, a substantial body of works has been focused primarily to the issues of competition which can be broadly classified into two conceptual frameworks:

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[1]   Internal ratings-based approach is an approach to credit risk assessment based on banks' own methodology developed by them subject to approval by the financial regulator. It differs from the standardized approach in that the latter is based on Basel II methodology and uses credit ratings established by international rating agencies.

[2]   On the need to introduce macrofinancial aspects of governance in banking sector competition, see, for example, https://www.bankingsupervision.europa.eu/press/speeches/date/2017/html/ssm. sp170622.en.html

Competitive-fragility hypothesis and Competitive-stability hypothesis. The former pertains to the instability of banks and the banking sector when competition intensifies, whereas the latter opposites the former in that competition positively contributes to stress resilience of banks and financial stability (see Table 1 on p. 92).

Table 1. Selected research results within the framework of the concepts of the relationship between competition in the banking sector and financial stability

Competitive-fragility hypothesis (increased competition has a negative impact on financial stability)	Competitive-stability hypothesis (increased competition has a positive impact on financial stability)
• The deterioration of the banking sector is a consequence of increased competition in financial markets with relatively tighter restrictions on banking activities, low level of systemic risks, developed securities market infrastructure, deposit insurance system, and transparency of banking activities [Beck 2008]. • The highly competitive environment forces banks to shift their priorities towards operations with high-risk instruments to maximize profits [Allen, Gale 2004; Beck, Demirgüç-Kunt, Levine 2006] and, in addition, to reduce control over the financial conditions of borrowers, which increases the risks of banking crises [Beck, Demirgüç-Kunt, Levine 2006]. • Highly concentrated banking systems are less prone to the risk of instability than highly competitive ones [Anginer, Demirgüç-Kunt, and Zhu 2014; Berger, Klapper, and Turk-Ariss 2009]. • Bank regulatory policies aimed at reducing banking sector competition can provoke crisis developments in the banking sector [Anginer, Demirgüç-Kunt, and Zhu 2014]. • Weak supervision and monitoring of banking activities, the dominance of state ownership of bank capital, and government policies restricting competition contribute to the banking sector's fragility to external shocks and crises [Fu, Lin, and Molyneux 2014]. • The high level of concentration in the banking sector and deposit insurance requirements contribute to the banking sector's fragility to adverse macro-level dynamics [Soedarmono, Machrouh, and Tarazi 2013]. • Strict prudential capital adequacy requirements for banks in an insufficiently competitive environment are not sufficient to ensure financial stability [Matutes, Vives 1996] because they do not incentivize banks to reduce the volume of operations with high-risk instruments [Agoraki, Delis, and Pasiouras 2011]. • Instability in the banking sector is one of the factors that increase volatility in the financial markets of countries whose banking sectors are characterized by a relatively high level of banking sector competition [Fernández, González, and Suárez 2016]. • A high level of capital concentration in the banking sector has no effect on competition, which, in turn, may cause liquidity shortages in financial markets and, consequently, instability, with the level of instability depending on the degree of interconnectedness of different segments of the financial market [Hellmann, Murdock, and Stiglitz 2000].	• Increased banking sector competition leads to a reduction in the cost of credit, which positively affects the profitability of borrowers, reduces the risk of non-performing loans, and ultimately contributes to financial stability [Schaeck, Cihak, Wolfe 2009]. • Mergers and acquisitions (M&A) processes lead to a reduction in the number of market players and therefore have a positive impact on the stability of the banking sector [Keely 1990]. • In a highly competitive environment, capital adequacy is higher, which usually covers the risks of volatility of banking activities and positively affects financial stability [Lee, Hsieh 2014]. • The high level of banking sector competition encourages banks to diversify risks, which reduces the banking system's exposure to external shocks and crises [Beck, Demirgüç-Kunt, and Levine 2006]. • Increased competition due to the introduction of stricter capital standards reduces the negative impact of financial liberalization on financial stability [Amidu, Wolfe 2013]. • Competition promotes financial stability if interest and non-interest income of banks from diversification of its activities tends to grow [Smith 1984]. • Increased competition leads to a more even distribution of credit resources among banks and, consequently, to a lower probability of default in case of an increase in the risk of non-performing loans [Tabak, Fazio, and Cajueiro 2012]. • Increased competition among conventional commercial banks, as opposed to Islamic banks, has a greater effect on achieving financial stability [Kabir, Worthington 2017]. • The effectiveness of credit risk mitigation due to increased competition in the banking sector is higher for banks in the middle median quantile group than for banks in the lower and upper quantile groups [Chen 2016]. • The trend towards homogeneity in the operating models of cooperative banks, along with increased banking sector competition in this segment, enhances their resilience and thus has a positive impact on financial stability [Fiordelisi, Mare 2014]. • Increased banking sector competition enhances financial stability in banking sectors by means of minimization of systemic risks [Kouki, Al-Nasser 2017].

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Competitive-fragility hypothesis (increased competition has a negative impact on financial stability)	Competitive-stability hypothesis (increased competition has a positive impact on financial stability)
• The application of post-crisis capital standards is not sufficient to minimize the risks of banking activities if there are no regulatory restrictions on the marginal interest rate on deposits [Delis 2012]. • Liberalization of financial markets reduces the competitiveness of banks in developed economies, which increases systemic risks and the probability of crises in the financial sector [Mishkin 1999]. • Large banks in a highly concentrated and "under-competitive" banking system receive centralized financial assistance more quickly during crisis than other banks, thereby continuing the policy of carrying out operations with high-risk instruments in relatively larger amounts, contributing to increased instability in the financial area [Boyd, De Nicolo 2005]. • Increased competition in the financial sector does not encourage banks to accumulate capital beyond the minimum acceptable level of its adequacy, while exacerbating systemic risks [Chen 2016]. • Increased banking sector competition contributes to the growth of banks' operations using higher risk instruments [Canta, Nilsen, and Ulsaker 2023], which exacerbates volatility in the banking sector [Leroy and Lucotte 2017]. • The protection of creditors' rights in bank failures leads to increased competition, which nevertheless contributes to a decrease in stability in the banking sector [González 2023]. • The intensification of banking sector competition contributes to the aggravation of systemic risks, regardless of the specifics of the post-crisis banking regulatory mechanism [Bátiz-Zuk, Lara-Sánchez 2023]. • Compliance of global systemically important banks (G-SIBs) with market discipline contributes to increased competition in financial markets [Dzhagityan and Orekhov 2022].	• Increased competition in the banking sector contributes to the decrease of the loan volumes and higher interest margins on loans [Sääskilahti 2016], which reduces the risks in lending and bank insolvency [Agoraki, Delis, and Pasiouras 2011]. • Regulatory constraints on banks' activities in an environment of increasing levels of banking sector competition reduce both lending and bank insolvency risks [Agoraki, Delis, and Pasiouras 2011]. • Mergers and acquisitions (M&A) in the banking sector lead to increased competition and strengthen the competitiveness of banks, but only if the M&A targets are banks that are unable to adapt to the post-crisis mechanism of banking regulation and supervision [Dzhagityan 2016]. • Increased banking sector competition contributes to macro-level stability by reducing the volatility of GDP, lending volume, and the probability of default of banks [Khan 2022], which in turn is a key contributor to financial stability [Brei, Jacolin, and Noah 2020]. • The growing level of competition in countries that do not apply macroprudential regulation tools contributes to the countercyclicality of lending processes [Olszak, Kowalska 2022]. • Post-crisis regulatory rigor helps to reduce the negative impact of banking sector competition on financial stability [Borauzima, Muller 2023]. • The negative impact of competition on stability in the banking sector decreases as the level of capitalization of banks increases [Ernaningsih, Smaoui, Temimi 2023].

Source: compiled by the author.

In summary, the two hypotheses can be considered as follows. The Competitive-fragility hypothesis posits that, in a highly competitive environment, banks tend to ease lending standards in order to expand the range of potential borrowers and prioritize high-risk instruments, which may ultimately result in a reduction of asset quality and, consequently, increased fragility. Furthermore, transmission of risks (risk contagion effect) contributes to the fragility of the banking sector, especially when financially unstable banks face difficulties in attracting additional liquidity, which exacerbates their vulnerability to insolvency and bankruptcy.

The Competitive-stability hypothesis is based on the premise that competition is the primary mechanism for ensuring financial stability, which ultimately leads to a reduction in the cost of credit for borrowers. Consequently, the probability of investment in high-risk assets is reduced, which in turn results in a decrease in the level of non-performing loans. Furthermore, banking systems with a low level of concentration (i.e., without domination of "too-big-to-fail" banks) are less susceptible to manipulations in financial

markets due to the absence of potential assistance from macrofinancial institutions, which consequently reduces banking risks.

Both hypotheses necessitate the identification of a so-called "pragmatic middle ground" between the optimal level of competition and efficiency in the banking sector, which is essential for the long-term potential of banks in the context of financial stability. Despite extensive academic and expert discussions on this topic, a consensus has yet to emerge, with conclusions often in stark opposition to one another. Considering the paramount importance of this issue for the minimization of future crises, it is imperative that the macrofinancial approach to competition management take into account the international principles of effective banking supervision and the specifics of national banking sectors. It seems probable that the efficacy of the competition management mechanism will depend on two factors. The first is the systematization of the determinants of a "pragmatic middle ground" in terms of competition. The second is the understanding by financial regulators of the importance of structural changes of banking sectors, which would contribute to the achievement of a "pragmatic middle ground." However, this task will most likely be fraught with the search for an optimal model of banking activity.

5. Contradictions in the assessment of banking sector competition

The multifaceted and contradictory nature of competition in the banking sector complicates the search of quantitative tools for assessing its current state and dynamics. The matter is that some of the indicators of competition[3] are based on a set of interrelated factors, yet the individual indicators employed in this assessment do not fully account for the mutual influence of these factors. This lack of comprehensive consideration may be a key reason why the domain of competition falls outside the scope of banking regulation and supervision. The existing instruments, such as the Herfindahl-Hirschman index, do not measure competition in a meaningful way. Rather, they assess the maximum permissible level of concentration in the banking sector, which is an administrative measure rather than an economic one. Furthermore, the regulatory assessment of competition is influenced by the macro-level dynamics, the specifics of fiscal policy, financial legislation, and established banking practices. These areas and factors are difficult to integrate into separate indicators or standards of competition due to their inherent complexity and the challenges associated with bringing them together.

Conversely, the pursuit of a specific level of competition should not be regarded as an absolute, imperative objective. At the same time, the banking sector's operational framework must align with the specific characteristics of the competitive landscape to fulfill the requirements of prudential banking supervision. This should serve as the

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[3]   For example, the ratio of net interest margin to total assets; the Lerner index (an indicator of the degree of market positioning (influence), as well as the market share of individual corporations, including credit institutions); the ratio of net profit (net of all mandatory deductions from the income base) to total assets; the indicator (index) of market concentration of the deposit base; the number of banks per the current population of the country/market/region/territory.

foundation for a synergetic effect of banking sector activities, which may be termed the "regulatory-competitive" synergy. The ability of banks to withstand stress and recover from the consequences of potential future crises will serve as the primary indicator for assessing their competitiveness.

In the context of a weak competitive environment, characterized by volatility in financial markets and imperfect institutional infrastructure, the quality of banking assets would deteriorate, thereby limiting the potential for the free redistribution of resources. This kind of "operational constraints" represents a source of risk for banks and impedes the pursuit of new market opportunities, providing economic immunity of the banking sector to both exogenous and endogenous risks. Indeed, the extent of stress resilience will be one of key indicators of competitiveness in the banking sector.

Conclusion

The specifics of banking sector competition and the competitiveness of banks in the post-crisis era indicate that competition and financial stability are interrelated elements within the framework of the post-crisis regulatory paradigm. The advent of new aspects of competition as a result of international banking regulation and supervision reform urges a more focused attention by macrofinancial authorities, including financial regulators. However, the mechanism that would integrate competition into regulation to ensure sustainable growth of financial institutions and their stress resilience, is yet to be developed. The variety of expert opinions regarding the quantitative banking sector indicators for competition once again shows sophistication of this area and its significance for ensuring stress resilience of banks and the banking sector. This, in turn, serves as the foundation for a crisis-free perspectives of financial sector towards financial stability.

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Prospects for Import Substitution in the Russian IT Sector under Sanctions Pressure

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Abstract

Since March 2022, the Russian information technology (IT) industry has been operating under unprecedented sanctions pressure, resulting in a profound transformation. The government and private sector entities must address the challenge of facilitating a rapid transition from products sourced from foreign vendors and foreign software to domestically developed alternatives. The objective of this study is twofold: first, to evaluate the potential for import substitution in specific sectors of the Russian IT market, based on an analysis of the progress made in the transition to domestic products and developments; and second, to identify strategies for overcoming the challenges associated with this transition.

The process of import substitution in the Russian IT sector is gaining pace driven by two key factors: the government's stated objective of achieving technological sovereignty as well as private business's development needs. However, the timing of the transition will vary significantly depending on the market segment in question. The highest rates of penetration of Russian products are observed in information security segment, reaching up to 80%. The lowest rates of penetration are observed in the segment of mobile operating systems, as well as in process management tools, reaching only 25–35%. In order to achieve the stated goals, it is necessary to maintain the state support measures and, in some segments, to expand them and develop new ones. This should be done with the consideration of the initial experience of market participants in import substitution. It is possible that the government may extend the timeframe

for the complete transition to domestic products for the public sector and large state-owned companies, contingent on the progress in overcoming the existing barriers to import substitution. At the same time, the longer-term goals, set to achieve the required level of utilization of Russian IT products, will not be revised in a more conservative direction.

Introduction

In response to the unprecedented sanctions pressure it has faced since March 2022, the Russian information technology (IT) industry has been compelled to expeditiously transit from reliance on foreign vendors' products and foreign software to a reliance on domestic products.

The scale and complexity of this task can be attributed to three key factors: (1) the considerable size of the Russian IT market, (2) the historically high penetration rate of foreign products, and (3) the sudden and dramatic negative change in the situation due to the withdrawal of many foreign players from the market. By the time the geopolitical situation escalated, the annual turnover of the Russian IT market was estimated at RUB 3 trillion, with foreign suppliers accounting for over 50% of IT budgets in both the corporate and public sectors. The unfeasibility of continuing business processes in the usual mode under the conditions of foreign players ceasing their activities in the market, as well as in connection with the introduction of sanctions against Russian companies and government agencies, necessitated the implementation of emergency measures by all participants of the Russian IT market. These measures were designed to minimize damage, adapt to the new conditions, and ensure conditions for long-term development.

Over the past two years, the Russian IT sector has undergone a significant transformation with the objective of achieving technological sovereignty and strengthening its position in the global IT market.

The objective of this study is to evaluate the potential for import substitution in specific sectors of the Russian IT market, based on an analysis of initial results of the transition to domestic products and developments. Additionally, it seeks to identify strategies for addressing the challenges associated with this transition, at the level of regulators, IT product developers, and customers.

The article is comprised of six sections. The first section outlines the prevailing circumstances of discrete segments of the Russian IT market up to 2022, with a particular focus on the preponderance of foreign or domestic suppliers. The second section provides an overview of the sanctions pressure measures on the Russian IT sector and identifies the primary challenges faced by the Russian IT sector. The third section is dedicated to an examination of the adaptation strategies employed by various types of market players in response to the evolving landscape of the Russian IT market. The fourth section presents a comprehensive examination of the government's initiatives to foster the growth of the IT industry. These initiatives include measures to speed up and scale up the transition of the local IT infrastructure from imported

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to domestically developed solutions, and the implementation of support measures for Russian companies, specialists and customers in the IT sector. The fifth section is dedicated to an examination of the opportunities and constraints faced by Russian IT developers. The sixth and concluding section of the study analyzes the export potential of the Russian IT sector in the markets of friendly countries.

1. Russian IT market prior to 2022: positions of foreign and domestic suppliers

In 2021, the Russian IT market[1] surpassed a volume of RUB 3 trillion (equivalent to approximately USD 41 billion), representing a 19% CAGR in dollar terms between 2019 and 2021. This is markedly higher than the growth rate of the global IT market, which increased by an average of 5% over the same period [Strategy Partners 2023 (1)]. One of the factors contributing to the accelerated growth of the Russian IT market during the 2020–2021 period was the increased demand from corporate and government entities for IT solutions (including software and hardware) and services related to the organization of remote work formats, the accelerated digitization of critical business functions, and the protection of information systems in the context of the pandemic.

Since the early 1990s, the Russian IT market has been developing in close conjunction with the global IT market, exhibiting a notable prevalence of foreign vendors' penetration into the software and hardware sectors. Prior to 2022, the Russian IT market was dominated by solutions provided by foreign vendors. In 2021, foreign vendors' solutions accounted for 55% of the total IT budgets of corporate customers and the public sector, while in the consumer segment, their share exceeded 95%. This is hardly surprising, given that the retail consumer demand for information technologies is 96% represented by the cost of PCs and laptops, while only 4% of spending is attributed to software and information security solutions [Softline 2023 (1)].

In the B2B and B2G segments, the shares of domestic and imported software and hardware varied depending on the product category. The lowest penetration of domestic solutions (less than 10%) was observed in the segment of personal computing machines (PCs, tablets, laptops). This is due to the historically high focus of this market on supplies from the leading global vendors (Lenovo, HP, Dell, Apple, Acer, ASUS, and others) and its limited domestic production base. In the IT infrastructure equipment segment (information security equipment, corporate communication network equipment, data storage systems, servers, etc.), foreign suppliers accounted for up to 70% of the market. In early October 2022, the Deputy Head of the Ministry of Industry and Trade of the Russian Federation, V. Shpak, provided an estimate indicating that the average share of domestic radio electronic products in Russia, including the public sector and the open market, was 19% by the end of the first half of 2022 [INTERFAX-PROZAKUPKI 2023].

In the infrastructure software segment (which includes operating systems for PCs and servers, backup solutions, database management systems, virtualization solutions,

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[1] Main segments of the information technology market: software; hardware and microelectronics (user and infrastructure); IT services.

and so forth), the proportion of domestic developers in 2021 was a mere 8% [Strategy Partners 2023 (1)]. Historically, Microsoft, IBM, Citrix, Dell, Broadcom, and Red Hat have held a dominant position in this field. Additionally, domestic companies were underrepresented in the segment of software development tools, which encompasses artificial intelligence platforms, testing and software lifecycle management tools, data management software, and application development platforms. In 2021, international vendors held a market share exceeding 55% in the Russian office software market, which encompasses office suites, video conferencing, email, and other software. This segment was dominated by solutions from global majors such as Microsoft, Adobe, Zoom, and others. In the corporate software segment (ERM systems, CRM, SCM, BI analytics, manufacturing software), more than 40% of Russian customers' budgets were allocated to foreign solutions, primarily SAP, Oracle, Adobe, and Salesforce.

It can be stated with a reasonable degree of confidence that domestic companies have historically dominated the Russian IT market in the following segments: IT services, information security, cloud infrastructure, and infrastructure hosting. By the end of 2021, the share of Russian information security vendors is 61% [CSR 2023 (1)]. At the conclusion of 2021, the proportion of international suppliers in the Russian IT services market was 18% [Softline 2023 (2)].

2. Unprecedented sanctions pressure

The year 2022 was a period of significant disruption and transformation in the Russian IT sector. It was a challenging time for all market participants, characterized by intense challenges and profound changes. As early as the end of February, Russian users of foreign IT solutions, domestic software developers, and equipment manufacturers began to experience profound negative changes in the external environment. These manifested themselves in a sudden disruption of established supply chains and customary business processes.

Direct measures of sanctions pressure on the Russian IT sector included the following:

1. A ban on exports of high-tech products to Russia as well as on the provision of information technology services.

In February 2022, the US Department of Commerce implemented export restrictions on goods deemed essential for the advancement of Russian defense, aerospace, and maritime industries. The sanctions had a significant impact on a range of sectors, including the export of semiconductors, computers, telecommunications equipment, information security equipment, lasers, and sensors. Additionally, South Korea enacted sanctions, prohibiting the export of strategic materials to Russia. Seoul implemented restrictions on the sale of electronics, semiconductors, computers, information and communication technologies, sensors, lasers, and other types of equipment.

In April 2022, as part of the fifth package of anti-Russian sanctions, the European Union banned the export of high-tech products to Russia. These included quantum computers and advanced semiconductors, high-tech electronics, sensitive equipment, and software.

In October 2022, the European Union member states approved the eighth package of anti-Russian sanctions. Furthermore, a prohibition was enacted on the provision of IT consulting services to Russian individuals and legal entities.

In February 2023, the US Department of Commerce's Bureau of Industry and Security (BIS) expanded the list of "luxury goods" that are prohibited from being shipped or re-exported to Russia and Belarus (the list was originally enacted in March 2022). In addition, the export of computer peripherals, including keyboards, laser and inkjet printers, and hard disks priced above USD 300, has been prohibited. The restrictions apply to goods manufactured in the United States. However, any product containing at least 25% of its components or technologies manufactured or developed in the United States is considered to fall within this category. In addition, as part of the same restrictive package, one of the largest Russian suppliers of facial recognition systems, VisionLabs (which is owned by PJSC MTS), was subjected to US export sanctions. The company was included on the list of entities subject to export restrictions on a range of technologies and dual-use goods.

2. Inclusion of Russian IT companies on sanctions lists of unfriendly countries.

Since the end of February 2022, the United States has been consistently imposing and tightening sanctions against Russian microelectronics designers and manufacturers. In March, domestic design centers and major computer manufacturers, including Baikal Electronics JSC, MCST JSC, Modul, and Elvis Research and Development Center JSC, were subjected to export restrictions. The sanctions obliged foreign contractors were obliged to coordinate with the Bureau of Industry and Security of the US Department of Commerce all their deliveries of products to these companies. However, in September 2022, these companies, along with several others, were designated as SDNs (Specially Designated Nationals and Blocked Persons) by the United States. Inclusion on the SDN list entails the most comprehensive set of restrictions, including the blocking of assets in the United States and correspondent bank accounts, the termination of financial and economic legal relations, the freezing of assets, and a prohibition on transactions except those permitted by a license, typically a license to cease business operations. Additionally, the sanctions impacted other entities within the IT sector. In September 2022, approximately 30 Russian companies and research institutes in the electronics sector were put on the US sanctions list.

In March 2022, Japan imposed sanctions on Baikal Electronics, and the US Federal Communications Commission placed Kaspersky Lab on a blacklist of communications equipment and services. The list comprises entities whose equipment or services are deemed to pose an "unacceptable risk" to national security or the security of US citizens, and are therefore considered a threat to the US.

In June 2023, the European Union introduced the eleventh package of sanctions against Russia. The most significant aspect of the package was not the inclusion of new entities on the sanctions list, but rather a shift in the methodology employed in its compilation and expansion. From that point forward, it was sufficient for sanctions to be imposed on IT companies from Russia if they possessed an FSB license to work with state secrets or specific licenses from the Ministry of Industry and Trade. These

grounds constituted the basis for sanctions against the parent company of Positive Technologies (Positive Group PJSC), the developer of Defense Ministry-certified routers Scientific and Production Association (SPA) Eshelon, and the integrators Iteranet, Poisk-IT, and Akuta [Kommersant 2023 (1)].

In July 2023, the United States Department of the Treasury imposed sanctions on Russian companies involved in the development and import of electronics, components, and equipment, putting on the SDN list Rosatom's SPA Critical Information Systems (SPA KIS), as well as a number of companies engaged in the importation of electronic components or the provision of contract manufacturing services. Simultaneously, Canada introduced restrictions against electronics manufacturer CMT-AiLogic and component supplier Device Consulting.

In November 2023, the United States sanctioned JSC CSoft Development, a developer of specialized software used for computer-aided design in mechanical engineering, industrial and civil construction, architectural design, and land management.

In December 2023, the EU approved the 12th sanctions package against Russia, expanding the sanctions list to include several information security firms, such as Informzaschita, Infotex, and Bizon.

3. Personal sanctions against Russian entrepreneurs engaged in the information technology sector.

In April 2022, A. Karachinsky, the founder and co-owner of IBS, one of the most prominent Russian IT enterprises, was designated as a Specially Designated National (SDN) by the United States. Subsequently, in May, he relinquished his position on the company's board of directors. Poland has added two individuals to its sanctions list: Eugene Kaspersky, the founder of the Kaspersky Lab, and Boris Nuraliev, the founder of the 1C enterprise software company.

In light of the aforementioned factors, the primary challenges confronting the Russian IT sector in 2022 can be delineated as follows:

- The most significant challenge for Russian customers of IT products was the abrupt and extensive withdrawal of foreign suppliers of telecommunications equipment, software, consumer electronics, and IT services (including cloud services) from the market. A multitude of prominent vendors from the US, Western Europe, Australia, Canada, Israel, and other countries ceased the sale of new software licenses and equipment supplies, terminated the provision of technical support and maintenance services for previously installed software and equipment, terminated software upgrades, and disconnected Russian clients from cloud services. It is noteworthy that the reduction in business activities in Russia by foreign IT suppliers was more extensive than the sanctions imposed by unfriendly countries directly implied. While the sanctions mandated the cessation of collaboration with specified legal entities and individuals who had been blacklisted, numerous prominent foreign enterprises (e.g., SAP and Oracle) independently elected to entirely withdraw from the Russian market, effectively terminating all ties with local customers, irrespective of their status with regard to sanctions.

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- Microelectronics manufacturers have experienced a significant disruption in the supply of advanced technology equipment and components, as well as the cessation of collaboration with foreign assembly facilities. For example, following the commencement of Russia's military operation in Ukraine, Taiwan Semiconductor Manufacturing Company (TSMC), a prominent global semiconductor manufacturer, ceased collaboration with Russian entities due to US sanctions. Furthermore, the inclusion of domestic design centers in the US SDN list also resulted in the loss of access to foreign intellectual property, including processor architectures such as ARM and IP blocks utilized in chip design. The implementation of extensive restrictive measures has rendered the establishment of new facilities for the manufacture of computer hardware and electronics a more challenging undertaking for Yadro and Aquarius [Kommersant 2022 (1)].
- Russian software developers were subject to a prohibition on the export of their solutions to a number of countries, lost the opportunity to utilize the development tools of foreign vendors, and found themselves partially isolated from foreign open-source platforms.
- A considerable number of large, medium, and small Russian manufacturing companies, financial institutions, and research organizations have been included on the sanctions lists of unfriendly countries. This has resulted in their exclusion from the supply of products and services from foreign suppliers, including IT solution providers.
- A significant exodus of IT professionals from Russia. In a statement released at the end of 2022, the head of the Ministry of Digital Development, Communications and Mass Media, M. Shadayev, indicated that approximately 100,000 IT professionals had departed from the country over the course of the year. According to the aforementioned data, approximately 80% of IT specialists who relocated abroad continued to be employed by Russian companies [Interfax 2023 (2)].
- A notable increase in the cost of foreign and Russian software has been observed. In November 2023, market participants observed a price increase since the beginning of the year for specific types of corporate software and equipment, reaching up to 40%. The increase in the price of foreign products can be attributed primarily to their importation into the country through parallel importation and purchase through intermediaries. The primary factors contributing to the escalation in the cost of Russian software are the rise in labor expenses and the decline in competition resulting from the withdrawal of cost-effective foreign alternatives from the Russian market [Vedomosti 2023 (1)].

In general, since 2022, over 200 technology companies have either left the Russian IT market entirely or significantly restricted their activities within it [Strategy Partners 2023 (1)]. It is also noteworthy that a number of Chinese technology companies have ceased operations in Russia. This is due to the combination of US sanctions and the demands of their US suppliers of electronic components, which have led to a reduction in their activities in the country without any official statements being made.

Foreign entities withdrew from the Russian market without considering the financial implications of their actions. As estimated by M. Shadayev, the head of

the Ministry of Digital Development, Communications and Mass Media, the losses incurred by international IT companies that ceased operations in the country in 2022 are estimated to have reached RUB 650–700 billion [TASS 2022]. Furthermore, 2022 was a period of unparalleled activity on the part of cyber groups targeting the IT infrastructure of Russian authorities, private companies, organizations, and media. While the attacks were not particularly sophisticated, their primary strength was their sheer scale [Anti-Malware.ru 2022].

In conclusion, the radical changes that took place in the Russian IT sector in 2022 can be summarized as follows: the market did not escape contraction, but the negative dynamics did not become catastrophic. In fact, the market decline in 2022 amounted to no more than 10% year-on-year (YoY) to RUB 2.74 trillion. It is notable that there is a considerable discrepancy in the growth patterns observed in the IT equipment and software and IT services segments. In contrast, the equipment market contracted significantly, by 24% YoY, due to the inability to rapidly establish alternative supply channels in sufficient quantities. Conversely, the software and IT services segment exhibited accelerated growth, reaching 24% YoY, driven by the surge in demand for solutions from Russian IT companies. Additionally, in 2022, there was an increase in prices of select Russian-made software products, with a growth rate of 10–20%. In accordance with the projections of industry experts, the aggregate revenue of Russian software developers and integrators (comprising the Top 100 companies in the field) exhibited an increase of 28.5% in 2022. Conversely, the revenue of foreign companies experienced a decline of 62% during the same period [Strategy Partners 2023 (1)].

3. Adaptation of Russian players to new market realities

As estimated by experts, approximately 50% of Russian companies encountered difficulties in renewing foreign software licenses during the 2022 period. A significant proportion of entrepreneurs (32%) reported difficulties with technical support, while 31% encountered issues with payment for maintenance. Additionally, 10% expressed concerns regarding the reliability of foreign software. These findings are based on a survey conducted by Vedomosti in 2023 [Vedomosti 2023 (2)]. As evidenced by the survey conducted by K2Tech in December 2023, the share of direct vendor support for foreign products declined from 52% in 2022 to 14% in 2023. The majority of companies that continue to utilize foreign solutions (over 50% of respondents) either rely on in-house support or engage with local service partners. Additionally, 17.5% of these companies engage in parallel importation. Additionally, the implementation of currency control measures and sanctions has rendered it unfeasible for numerous Russian customers to recuperate cash paid for software, equipment, and services under existing contracts that ultimately were not supplied [K2Tech 2023 (1)].

The issues primarily impacted government entities and large commercial enterprises. A considerable number of Russian companies were compelled to promptly identify alternative solutions for foreign software, cloud services, and IT services, and to allocate additional budgets for emergency migration to new solutions, which resulted in an increased financial burden. Two additional behavioral patterns among Russian

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corporate customers of IT products can be identified. The first of these strategies, "wait-and-see," implied that in the sharply changed market conditions, a number of companies did not make prompt decisions regarding the migration to substitute products. Instead, they preferred to observe the results of the transition undertaken by other companies as part of developing a strategy for further actions. The second model, "denial," assumes that some customers do not believe in the final and complete withdrawal of foreign IT vendors from the Russian market and anticipate their return in the future. These customers primarily utilize parallel imports or gray schemes for importing foreign software and support services and do not contemplate import substitution alternatives in the near future.

In general, it can be observed that Russian large businesses have reacted in both proactive and passive ways to the significant changes in the IT landscape resulting from the withdrawal of foreign vendors from the Russian market and the increased government requirements regarding the timing and scale of the transition to domestic software and equipment.

One example of a proactive response to the aforementioned changes is the formation of a consortium by major oil & gas companies with the objective of developing domestic IT solutions for the oil and gas industry. In June 2023, it was announced that the leading Russian companies in the fuel and energy sector are planning to create an industrial consortium with the objective of providing 100% coverage of the domestic IT landscape of the oil and gas and petrochemical industries, as well as subsoil use, by 2028. The pertinent agreement was executed at the St. Petersburg International Economic Forum [Vedomosti 2023 (3)].

Conversely, major Russian banking institutions adopted a cautious approach, advocating for an extension of the import substitution deadline. In August 2023, representatives of major Russian banks (Russian Agricultural Bank, Gazprombank, Promsvyazbank, VTB, Dom.RF) proposed at a meeting of the Central Bank to postpone by two years from 1 January 2025 the effective date of the requirement that subjects of critical information infrastructure (CII) must cease using foreign software. Credit organizations hypothesize that domestic suppliers will be unable to ensure compatibility of automated banking with domestic database management systems by the specified deadline.

4. Strengthening the role of the state in the development of the IT industry

In the context of the announcement of anti-Russian sanctions, the withdrawal of foreign vendors from the market, and the departure of a significant number of IT specialists from the country in the initial months following the intensification of geopolitical tensions, the Russian government has delineated the principal avenues for the advancement and support of the IT industry and market over the forthcoming years. The government's initiatives can be divided into two main categories: (1) acceleration and expansion of IT infrastructure migration from foreign to domestic solutions and (2) broad support measures for Russian IT companies, IT specialists and customers of domestic IT solutions.

4.1 Stimulating the transition to domestic software and IT equipment in the Russian Federation

The formal commencement of the transition from foreign to domestic software in Russia was initiated in late 2015 (a unified register of Russian software was created, and a ban on the purchase of foreign software for state needs was established). Thereafter, the regulatory framework for import substitution in IT was expanded and clarified with consideration of the practice of law implementation and the actualization of tasks. In 2017, concepts pertaining to critical information infrastructure (CII) were incorporated into the regulatory and legal discourse. In 2019, the Unified Register of Russian Radioelectronic Products was established with the objective of stimulating the production of radioelectronic products within the Russian Federation. The Presidential Decree No. 166 of 30 March 2022, "On Measures to Ensure Technological Independence and Security of the Critical Information Infrastructure of the Russian Federation," served as the pivotal document that delineated the conditions for the obligatory transition to the utilization of domestic software and hardware by specific categories of Russian customers. The decree prohibited from 31 March 2022 certain categories of customers from making purchases of foreign software and services necessary for the use of this software without coordination with the authorized federal authority. As of 1 January 2025, public authorities and certain categories of customers are prohibited from utilizing foreign software at significant CII facilities under their ownership. Consequently, the extant regulations mandate that proprietors of significant CII facilities from diverse industries must transition from foreign to domestic software within a limited timeframe, by the end of 2024. The Presidential Instruction of 12 June 2023, stipulates that state-owned enterprises must transition to domestically produced operating systems and office software by 1 January 2025.

The work being done by the government and market players to ensure the transition to domestic IT solutions is systemic in nature and can be divided into key areas.

- An analysis of the current landscape of IT solutions in different sectors of the economy must be conducted. This analysis should identify areas in which (1) there are already ready-made substitute products for foreign solutions, (2) domestic solutions that are partially available but require significant improvement, and (3) areas in which there are no domestic solutions and where development or production from scratch is necessary.
- Russian companies that will carry out finalization / development of the aforementioned missing IT solutions must be identified. The necessary financial and other resources for these purposes must also be provided.
- A series of measures is to be developed with the objective of stimulating and providing support to customers of IT solutions in the public and private sectors when switching from foreign to domestic solutions.

It is also worth noting the role of ICCs and DCCs in this process. In the second half of 2022, on the initiative of Prime Minister M. Mishustin, 35 Industrial Competence Centers (ICCs) were established under the Ministry of Digital Economy. These centers were formed with the objective of uniting representatives from various industries that were

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tasked with replacing foreign software within the timeframe set by the government. The ICCs encompassed a multitude of pivotal sectors, including machine building, metallurgy, the chemical industry, electronics and microelectronics, the pharmaceutical industry, transportation, agriculture, construction and housing and public utilities, the electric power industry, oil and gas and coal, ecology, trade and services, finance, education, healthcare, communications, and media. Furthermore, development competence centers (DCCs), which include Russian software developers, have been established. The mechanism postulates that, within the framework of ICCs, major Russian software consumers should analyze their requirements for software that cannot be supported or purchased. They should then solicit explanations from developers regarding the existing solutions on the market and the potential for developing new solutions. Consequently, the ICC and DCC expert groups are to collaborate in the selection of promising projects that are capable to supplant foreign software. By mid-2023, Russian customers had identified 670 needs in industry software solutions for which they had a critical dependence on foreign solutions. These are not products per se, but operations that customers had previously carried out with the assistance of foreign solutions. In response, IT companies provided a list of 2,180 domestic products that should facilitate the realization of these operations. Of these, only 196 solutions exhibit a level of similarity to Western analogs that exceeds 70%, 1,423 solutions demonstrate a similarity of 40–70%, and 561 solutions exhibit a similarity of less than 40%. Forty-one foreign solutions that are required by businesses in Russia do not have any local equivalent. Such solutions include those for indexing and markup of audio and video streams, as well as platforms for the creation of metauniverses [Vedomosti 2023 (4)].

In June 2023, M. Mishustin instructed the Ministry of Industry and Trade of the Russian Federation and the Ministry of Digital Development, Communications and Mass Media of the Russian Federation to develop and present to the government proposals for the establishment of competence centers in the field of electronic element base, modeled on the ICC in the software development sphere, with the participation of friendly countries.

In December 2022, the government approved two roadmaps, "New Industrial Software" (NIS) and "New System Software" (NSS), which outlined over 300 domestic solutions necessary for import substitution in IT [Russian Government 2022]. The implementation of the aforementioned projects is scheduled to conclude in 2025, with the exception of a select few, which are expected to be completed by 2027. It is estimated that the total budget required for all NSS projects until 2030 will be RUB 71.5 billion, while the estimated budget for NIS projects is RUB 189 billion. As indicated by the government, the majority of the roadmap projects, amounting to over RUB 200 billion, are to be financed through the companies' own resources. This includes agreements with the government to create conditions that guarantee demand for products. The remaining projects entail the utilization of credit facilities (approximately RUB 20 billion) and grant funds (in excess of RUB 23 billion). By the end of June 2023, Prime Minister M. Mishustin had directed that an additional sum of over RUB 11 billion be made available for the implementation of the NIS and NSS roadmaps. As evidenced in the documentation, the objective is to achieve the aforementioned by 2030. It is anticipated that 71% of the Russian market for system

and application software will be domestic, with projected revenue from projects reaching RUB 211 billion [Kommersant 2022 (2)].

4.2 Support for domestic software developers and microelectronics manufacturers

In 2022, the Russian IT industry received a level of government support that was without precedent. In addition to the tax incentives that were first applied to domestic IT companies in 2021, in 2022 the Russian government introduced further robust support measures. These included a nullified income tax rate until the end of 2024, a program of subsidized loans for companies to accelerate the development, time-to-market and implementation of new domestic software, as well as significant benefits for IT specialists.

The question of whether to extend the zero rate of income tax for accredited IT companies is currently under active debate. As stated by M. Shadayev, the head of the Ministry of Digital Development, Communications and Mass Media [INTERFAX 2023 (1)], the ultimate decision will be contingent upon the prevailing economic circumstances in the regions and the status of regional budgets. This is due to the fact that a considerable proportion of income tax inflows is allocated to the budgets of the constituent entities of the Russian Federation. The zero income tax rate is applicable to IT companies and manufacturers of hardware and software complexes (HSC) included in the register of Russian software until the end of 2024. In the event that the zero rate is not extended beyond 1 January 2025, it will be set at 3%. The Minister evaluated the likelihood of maintaining other benefits for IT companies as high, with some of the benefits being open-ended.

Simultaneously, the Russian authorities are developing a plan to provide tax benefits to radioelectronics manufacturers on an ongoing basis. The current legislative framework provides for tax benefits until 31 December 2024 for enterprises operating in the radioelectronic industry. A reduced income tax rate is established for companies included in the register of organizations operating in the radioelectronic industry. The extension of the tax incentive will permit companies to obtain supplementary investment resources, thereby contributing to the modernization of the domestic electronic component base and radioelectronics production. Table 1 (p. 113) enumerates the principal current measures of state support for accredited Russian IT companies.

It is also noteworthy that customers of Russian software and IT equipment receive support, which encompasses the following measures, among others:
- Possibility of accelerated amortization of equipment included in the unified register of Russian radioelectronic products and software included in the unified register of Russian software;
- Small and medium-sized enterprises and individual entrepreneurs have the opportunity to purchase licenses for Russian software at a 50% discount. The state compensates half the cost of the license to its vendors [Gosuslugi 2023];
- Digital transformation programs developed by government authorities;
- Subsidies for the implementation of Russian software, services, and platform solutions;

● Zero import duties on technological equipment and components, as well as raw materials and supplies to be used in the implementation of major investment projects in priority sectors of the Russian economy, including information technologies.

Table 1. Current measures of state support for the IT industry

Taxation	Preferential income **tax rate** 3% from 1 January 2021 to 31 December 2021 for companies under the general taxation system 0% from 1 January 2022 to 31 December 2024 for companies under the general taxation system Up to 1% for the simplified taxation system (STS) "Income," up to 5% for the STS "Income minus expenses." The rate varies by region
	VAT exemption on sales of software products included in the register of Russian software
	0% tax on dividends
Insurance contributions to the payroll	14% from 1 January 2021 through 31 December 2021. 7.6% from 1 January 2021 (of which pension insurance is up to 6%; social insurance for maternity or sickness, including foreign citizens is up to 1.5%; health insurance is up to 0.1%) for accredited IT organizations (companies with IT-related revenue constituting no less than 70% of total revenue). Once the single base for calculating contributions is exceeded (if payments in favor of an employee in 2023 exceed RUB 1.917 million), contributions are charged at a zero rate
Preferential lending and grants	Digital Transformation Preferential Loan Program: From 2020 to 31 December 2024, the preferential rate is 1-5% (up to 3% for accredited IT companies), the loan amount is from RUB 5 million to RUB 5 billion for one project
	The company must comply with the following conditions: - indexation of employee salaries at least once a year, - refusal to pay dividends for the duration of the loan agreement, - retention of employment: for the period of the loan agreement, the number of employees must be at least 85% of the corresponding figure as of 1 March 2022. Preferential lending program for systemically important IT companies: April–December 2022: Working capital loan for up to 12 months is issued until the end of 2022 at a rate of up to 11%, maximum amount is RUB 30 billion Grant support for the development of certain significant software segments
Moratorium on tax audits	Accredited IT companies are exempt until the end of 2024 from control and supervisory measures, with the exception of preventive measures. Field tax audits of such organizations are suspended until 3 March 2025
Benefits for IT specialists	Preferential rate on mortgage loans Deferment from conscription for compulsory military service and/or exemption from mobilization

Source: compiled by the author.

5. Limits of import substitution: opportunities and barriers on the side of Russian IT developers

5.1. Stated objectives

The course on the utilization of Russian software was initially unveiled in 2016. Subsequently, year after year, adjustments and amendments were made to the regulatory base, with the objective of obligating government customers at all levels to purchase software developed and produced in Russia. However, it was 2022 that fully

demonstrated the viability of the import substitution course and became a catalyst for the transition to domestic solutions among both government customers and private companies. It is anticipated that the transition to Russian alternatives will continue over the next five to seven years, with the pace of change varying considerably across different market segments. Russian alternatives are already available in numerous sectors and their number is expected to increase. In certain sectors, such as oilfield service and geophysical industries, the share of foreign software remains considerable, at 80–90%. Similarly, engineering and graphic software also exhibit a high degree of foreign product penetration. The goal of achieving full substitution of foreign products by Russian systems requires local developers to enhance their functionality, reliability, performance, and fault tolerance.

The nearest time for the transition to domestic products is 1 January 1 2025. This is the date when federal and regional authorities, as well as organizations owning significant CII facilities subject to the law on public procurement (as outlined in Presidential Decree No. 166), must have migrated to domestic products. A longer period of import substitution is permitted for other authorities, budgetary organizations, and state funds, as well as for state corporations and state companies. The transition of private business to domestic software is not subject to any specific timeframes, with the exception of those pertaining to significant CII objects. The timeframes for the complete transition of significant CII objects in federal and regional executive bodies are outlined in the Order of the Ministry of Finance No. 21 of 18 January 2023. Irrespective of the category of software and the status of critical information infrastructure (CII), the penetration of Russian software in government agencies should be brought to 90–100% by 2029–2030. The highest rates of penetration of domestic software are currently observed in the category of information security tools, with some solutions reaching up to 80%. The lowest rates of penetration of domestic solutions are observed in the segments of mobile operating systems and other types of system software, as well as in automated process control systems (PCS) and geological and geophysical data processing and analysis tools, where rates of penetration range from 25% to 35%. The transition to domestic solutions in these software classes will necessitate substantial investments in the coming years.

5.2 Real opportunities

There are regulatory, technological, and market factors affecting the pace of import substitution:

- The *regulatory* environment for import substitution consists of the requirements of the previously listed regulatory acts adopted after February 2022.
- The *market* factor is the withdrawal of major international software vendors from the Russian market and the release of market niches previously occupied by them in favor of local players. This has opened up fundamentally new long-term business prospects for Russian companies and significantly increased the attractiveness of investments in the improvement of existing software and new developments. Meanwhile, the inability to fully leverage foreign software solutions compels Russian customers to hasten their transition to alternative domestic solutions.

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- At the moment, *technological* aspects are rather constraining factors of import substitution. As noted above, in certain niches, domestic analogs of foreign software are not available today, while most Russian operating systems are characterized by poor application software ecosystems.

Over the past year and a half, the geopolitical situation has become increasingly tense, and state regulation has tightened considerably with regard to the use of foreign software. During this period of time, both Russian customers and software developers gained valuable initial experience of doing business in considerable different market environment. Table 2 (p. 115) represents the principal challenges or "pressure points" associated with the import substitution process in the IT sector.

Table 2. Pressure points of import substitution in the IT sector in Russia

On the customers' side	On the side of software companies
• High cost of migration to domestic software, high labor and organizational costs	• Shortage of IT specialists in a number of professional niches, high inflation of salaries
• Problems of compatibility of Russian solutions with existing IT infrastructure	• Increase in the cost of software development tools, increased risks of using open source elements due to the growing number of malware
• Insufficient maturity level of local products and reduced level of functionality when switching to Russian products	• Lack of access to direct government support (in the form of budget subsidies or co-financing of projects without the need for leverage) for a number of promising companies that do not meet the necessary criteria
• Insufficient supply or complete absence of Russian products-analogs of foreign software, lack of information on the availability of analogs	• A number of potential customers leverage in-house developed software
	• Vendors lack of sufficient resources to provide technical support to a large number of new customers who purchased Russian software licenses over the last 1.5–2 years

Source: compiled by the author on the basis of data from the Institute of World Market Studies.

According to analysts, 68% of Russian companies have started import substitution projects, but currently only 10% to 50% of foreign solutions have been replaced, depending on the industry. At the same time, only 13% of companies have import substitution roadmaps with fixed migration deadlines, more than 50% of large Russian companies continue to actively use foreign products, relying on in-house technical support or Russian service partners, as well as through parallel imports, and 64% of companies believe that existing foreign IT solutions cannot be fully replaced by Russian products [K2Tech 2023 (2)].

In general, market participants are sufficiently confident about the prospects for import substitution in the Russian IT sector. The share of Russian vendors in the Russian IT market will reach 72% in 2027, compared to 45% in 2021 [Softline 2023 (1)]. The total substitution potential of foreign products developers (additional demand for domestic products) in 2022–2027 is estimated at RUB 450 billion in 2021 prices. In the infrastructure software segment, the share of Russian developers will increase from 36% in 2022 to 72% in 2025 and further to 90% in 2030 [Strategy Partners 2023 (2)]. Russian vendors of information security products currently hold a dominant position with 70% of the market. The share of foreign vendors in the domestic market is expected to stabilize at 5% in the medium term [CSR 2023 (2)].

6. Export potential of Russian IT products in the markets of friendly countries

In light of the stated objective of attaining technological autonomy through import substitution and the advancement of indigenous solutions across various software and microelectronics domains, Russia exhibits the capacity to emerge as a more prominent and dynamic force within the global IT market. Over the 5–10 years term, the country may well emerge as a pivotal alternative to vendors hailing from Western countries, China, and India. The events that transpired in the Russian IT market following February 2022 have demonstrated to customers of IT products globally that there are considerable risks associated with developing IT infrastructures and systems based on the solutions of global, predominantly Western, vendors. While previously the competition with Western vendors was primarily focused on functionality, the current emphasis is on the assurance of uninterrupted, reliable operation of IT systems and their equivalents in the domain of information security.

As of today, Russia is beyond the top ten countries in terms of global software and services exports. In 2021, the value of Russian software exports exceeded USD 10 billion (equivalent to over RUB 730 billion) [RUSSOFT 2022]. In 2022, the export volume experienced a notable decline (to USD 8.4 billion) due to the implementation of sanctions (primarily by the US and the EU) against Russian developers, as well as the emergence of significant challenges in cross-border settlements [Kommersant 2023 (2)]. In 2022, exports of Russian IT services decreased by 23.1%, while those of Russian IT products decreased by 23.8%. Russian programmers have begun to redirect their export channels to the CIS countries, South and East Asia, and the Middle East. Additionally, there is a growing interest in the markets of Africa and Latin America. As a result, in 2022, Russian IT companies increased software supplies to "friendly" countries by 10% compared to 2021, and the share of those countries in the total revenue of Russian software companies increased to 10%. At the same time, the share of "unfriendly" countries in the aggregate volume of Russian software sales declined from 25% in 2021 to 12.5% in 2022, and projections indicate a continued reduction to 7% by the end of 2023. Nevertheless, Russian companies endeavor to maintain supplies to Western partners through engagement of formally independent third parties [TAdviser 2024].

The volume of sales of Russian software developers in the foreign market in 2023 is expected to continue its decline, reaching approximately RUB 413 billion [Finmarket 2023]. Among the factors contributing to the continuation of negative dynamics are:

- The continued rejection of Russian products by customers from unfriendly countries, which is not fully compensated for by increased sales to friendly markets;
- The lack of available resources (including IT specialists) of domestic companies for the development of export directions amid primary focus on meeting the needs of the domestic market;
- The insufficient level of state support measures for IT exports.

Measures of state support for the export of IT products were included into the second package of support for the IT industry adopted in September 2021. They provide

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for partial compensation of Russian developers' expenses for marketing their products abroad, introduction of mechanisms for financial support of software implementation on the infrastructure of foreign customers as well as the creation of a role of "Digital Attachés"—lobbyists promoting domestic products on foreign markets.

To date, the implementation of support mechanisms is largely stalled and requires significant improvement. According to market participants of measures listed above, only the "digital attachés" mechanism has worked in practice, i.e. Russian trade missions abroad are quite effective. Financial measures to support IT exporters have not really been implemented, as the Russian Foundation for Information Technology Development (RFRIT) and the Russian Export Center (REC) failed to receive the necessary funds for this purpose. Representatives of IT companies also point out as a negative factor the lack of necessary coordination of processes between the authorities involved in stimulating IT exports [Kommersant 2023 (3)]. On the government side, about ten authorities and organizations are already engaged in the development of Russian software exports, including the Ministry of Digital Development, Communications and Mass Media, the Ministry of Industry and Trade, the Ministry of Economy, REC, RFRIT, and others. In general, the current level of support for Russian companies is disproportionately low compared to the level of state support received by IT exporters from the largest competing countries in the global market—the United States, India, and China.

As necessary measures to support Russian software exports, it is noted, in particular, the need to apply to them all incentive mechanisms available today to exporters of goods—credit to buyers, insurance of export contracts, issuing guarantees for participation in tenders, reimbursement by the state of expenses for participation in exhibitions. At present, these mechanisms are not applied to software exports, since the sale of software is considered a service. Companies also point out the need to create an international network of partners, as well as the creation of "export integrators"— companies that would have the necessary competencies and resources to deliver and implement complex solutions for foreign customers. This is explained by the fact that entering international IT markets with full product stacks (i.e. complex offers made of products by several vendors) is likely to be more successful rather than export efforts individually made by Russian IT companies. Product stacks allow to replace customers' IT landscapes based on the software of Western vendors.

Growing exports of Russian IT products to friendly countries is an important element of the strategy for the future development of the domestic IT industry. Against the background of the proven high level of safety of Russia's critical IT infrastructure against sanctions and cyber-attacks and taking into account the accelerated development of Russian technologies within the framework of the import substitution program, the best situation for the development of IT exports from Russia to friendly countries has emerged. Market analysts have noted a significant increase in the interest of Russian software developers in entering promising regional markets that were previously not in focus—the Middle East, Asia, Latin America, and Africa [RUSSOFT 2023]. A study has shown that the export of Russian software to Asian countries will grow the strongest and fastest in the near future. 74% of software development companies consider Asian countries as promising for export of Russian

solutions and services. 43% of Russian software development companies are interested in exporting to CIS countries. 35% of companies are interested in exporting their solutions and services to the Persian Gulf countries. The data also show that the export of Russian IT solutions to Latin America and Africa is expected to grow. The actual export experience in these regions is still insignificant and its share is no more than 8%, but the prospects are estimated at 25%. SAR, Algeria, and Egypt are the leading countries on the African continent. Products with the highest export potential include IT services, information security solutions and cloud platforms, operating systems, social networks and messengers, Internet of Things (IoT) device management platforms, retail services, healthcare, and financial services.

Conclusion

The preceding two years have been a period of significant transformation within the Russian IT sector. In 2022, the industry experienced significant turbulence, prompting IT companies and customers of IT products to prioritize minimizing potential damages in the context of dramatically altered conditions. In 2023, however, the focus shifted towards achieving long-term development goals. In a number of market segments (cloud services, infrastructure hosting, cybersecurity), the initial positive outcomes of import substitution were observed. Conversely, in other segments, obstacles and the most significant impediments to the expeditious transition to domestic products were identified. The process of import substitution in the IT sector is irreversible and is developing at a considerable pace. This is due to two factors: the goals set by the state to achieve technological sovereignty and the development needs of the private business.

Although the objective of complete rejection of foreign products at critical facilities of the Russian IT infrastructure in an extremely short time may appear ambitious, import substitution in the IT sector will undoubtedly continue in the coming years. To achieve the stated goals, it is necessary to continue the existing measures of state support, and in a number of segments, to expand them and develop new ones. This should be done in consideration of the initial experience of market participants in import substitution. It is further proposed that mechanisms of direct interaction between IT companies and interested private businesses, whether large or medium-sized, be developed (through industry associations, consortiums, and other formats). This would ensure harmonization of mutual interests, identifying most urgent and pressing needs of both parties, and reduction of time required for the development and implementation of necessary IT products.

It is not ruled out that the government may somewhat extend the timeframe for a complete transition to domestic products for the public sector and large state-owned companies, subject to the progress in overcoming the current import substitution barriers. Nevertheless, the long-term objectives for achieving the requisite level of utilization of Russian IT products will not be subject to a more conservative revision.

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Review of the 11th World Economy Annual Conference, Re-Balancing of the World Economy: In Search of New Models for Global Development

On November 29-30, 2023, the School of World Economy of the HSE University held the 11th Annual Conference on the Global Economy, this year entitled "Re-Balancing of the World Economy: In Search of New Models for Global Development." The conference was devoted to discussing key trends in the development of the world economy at the current stage: inflation, restructuring of trade and investment flows, difficulties in the implementation of the Sustainable Development Goals and transformation of economic growth in Asia. The conference was attended by leading Russian researchers in the field of world economy, as well as representatives from Armenia, Brazil, India, Kazakhstan, China, Poland, Thailand, and Turkey. The use of English as the working language at the conference made it possible to ensure the most interactive and fruitful discussion between all speakers and guests, as well as to make the conference materials available to the international academic community.

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The conference was opened by *Alexandra Morozkina*, deputy dean for research at the Faculty of World Economy and International Affairs, HSE University, and *Igor Makarov*, head of the School of World Economy. They noted the fundamental nature of the challenges facing the world economy, the continuity of global problems, and the high probability of negative scenarios of further development of the world economy. The term "re-balancing" in the title of the conference has three meanings: tactical re-balancing due to sanctions and trade restrictions, long-term structural shifts in the world economy, and the need to change approaches to global governance in order to solve global problems.

The conference program was divided into **four sessions**:
- Session 1. Between Inflation, Financial Instability and Debt: The Patterns of Economic Growth in a Post-Crisis World.
- Session 2. The Great Re-configuration: How Is the Geography of Trade and Investment Flows Changing?
- Session 3. Lost Illusions: In Search of New Approaches to Sustainable Development.
- Session 4. Moving through the Stages of Development: How Is the Asian Economy Changing?

The **first session** was opened by *Alexander Kurdin*, deputy dean of the Faculty of Economics, Lomonosov Moscow State University. The moderator recalled the

first annual conference on the world economy held in 2013, noting its positive and cooperative mood, associated with the feeling that the world economy had overcome the consequences of the 2008 financial crisis. The situation is currently reversed and a gloomy mood prevails. Nevertheless, the leading economists of the country and the world still have an opportunity to present their views on key macroeconomic issues—inflation, economic growth, financial instability, and other issues.

The first paper of the session entitled "From Shocks to 'Soft' Stagflation 2020-2024" was presented by professor *Leonid Grigoryev*, academic supervisor of the School of World Economy. The speaker gave a brief retrospective analysis of the global economic situation, paying special attention to the comparison of current events with the mid-1970s, and touched upon the current situation based on the data of the IMF Annual Report. Noting the lack of convergence between countries, which was expected by economic theories, the researcher proposed a new category of well-developed countries that face a "rich countries trap" consisting of problems such as aging populations and old infrastructure. At the same time, the speaker questioned the effectiveness of global cooperation and expressed skepticism about the possibility of solving global problems, including climate change, under current conditions.

The report on macro-financial issues by *Ali Cufadar*, director of the Macroeconomic Research Program at TEPAV (Turkey), focused on the measures taken by developed and developing countries to overcome the crises of the 1990s and 2008, as well as the consequences of the pandemic in 2020. The speaker expressed concern about the potential difficulties that emerging markets may face due to high budget deficits and debt levels, predicted a general slowdown in global growth, and emphasized that the trend of Asian countries increasing their share in the global economy will continue, but at a slower pace.

DaShu Wang, professor at the Department of Public Finance, School of Economics Peking University (China), focused on inflation, debt, and financial stability in China. Inflation in the country has been effectively controlled for two decades, and digital technology has played a crucial role in improving production efficiency. The speaker paid special attention to China's place in global trade, focusing on exports, which are gradually losing their role as the main driver of the Chinese economy. He also highlighted population decline as an important challenge for the country's further economic development. China still owns a significant amount of US securities, but the volume is significantly decreasing. At the same time, the expert expressed concern about China's public debt, especially at the municipal level, and concluded by emphasizing the stability of the country's financial sector despite this problem.

In his report, "Between Inflation, Financial Instability and Debt: The patterns of Economic Growth in the Post-Crisis World" Marcel Salikhov, director at the Centre for Economic Expert Analysis, noted that the economic activity was robust in 2023, which persisted despite the expectations of experts. The speaker devoted his report to the stabilization of the situation in Europe, which is related to the increase in consumption in key industries and the substitution of Russian gas supplies. According to the speaker, market mechanisms effectively solve most of the issues. The expert noted the importance of a deeper analysis to understand the impact of sanctions on individual

European countries, some of which are experiencing recession and budget deficit problems. In conclusion, the expert expressed concern about excessive government intervention in market processes in Europe and the emergence of additional risks related to this.

Prof. *Marek Dombrowski* (Poland) began his presentation by discussing the short-term economic outlook, noting the improvement in financial stability and inflation in developed economies due to active measures taken by major central banks. Lessons learned from the 2008 crisis have contributed to improved financial supervision. Unemployment remains low in most countries, but economic growth rates have shown volatility since 2019, which poses some risks. Turning to the longer term, the speaker noted challenges related to labor supply, population aging, and total factor productivity, including the impact of the green transition on productivity. Finally, the speaker discussed the global nature of protectionist trends, which can lead to a slowdown in economic growth, an increase in poverty, an intensification of political conflicts, etc.

The last report of the session, presented by *Anastasia Podrugina*, associate professor of the School of World Economy, was devoted to the issues of inflation: its sustainability, consequences, and the efforts of countries to fight inflation, which may lead to the deterioration of financial stability. Inflation remains high globally, despite some improvement in developed countries. The inflation in 2022-2023 was partly driven by rising energy and food prices. However, demand-side factors are now a significant part of high inflation. In this regard, monetary policy instruments can be quite effective, and central banks of leading countries plan to maintain high interest rates for the long term. The speaker concluded by saying that the balance act between combating inflation and ensuring financial stability will continue.

The first session was followed by a welcoming speech by *Anastasia Likhacheva*, dean of the Faculty of World Economy and International Affairs. Likhacheva noted the evolution of the conference themes, emphasizing the transition from optimism to awareness of difficulties and concerns. Among the key challenges, the dean mentioned the sanctions pressure on Russia and the need for the world community to develop a balanced economic policy combining the goals of efficiency and security. The speaker emphasized the difficult task faced by economists in the balance of the boundaries between economics and politics and wished the participants interesting and fruitful discussions during the conference.

The second session was titled "The Great Re-configuration: How Is the Geography of Trade and Investment Flows Changing?". The moderator of the discussion, *Olga Biryukova*, associate professor of the School of World Economy, noted that the large-scale trade and investment restrictions imposed by Western countries on Russia have led to a sharp reconfiguration of world trade, affecting about 10% of global exports. At the same time, trade turnover between many pairs of countries in Eurasia grew by hundreds of percent in 2022-2023. New logistics routes, transportation, payment and insurance schemes have emerged. The long-term implications of this reconfiguration are yet to be understood, including whether they

are robust and sustainable. Equally important is the analysis of changes in the structure and geography of global investment, another result of geopolitical developments.

The main focus of the report by *Alexander Knobel*, head of International Trade Department, Russian Presidential Academy of National Economy and Public Administration, was on the unprecedented sanctions imposed on Russia, which affected various sectors of the country's economy and were accompanied by decisive actions on the part of foreign companies. The speaker highlighted the problems and risks facing the Russian economy, including inflationary pressures, problems with the investment climate, and demographic factors, and emphasized the need for effective adaptation and revision of traditional formats of Russian foreign economic activity. Geographical and structural diversification of Russian exports, as well as the development of Russia's transport and logistics infrastructure, were noted as key factors for successful trade reorientation.

Mariam Voskanyan, head of the Department of Economics and Finance at the Russian-Armenian University, devoted her report to the investment activities of foreign companies in Armenia. Foreign direct investment (FDI) in the country has increased significantly in 2022 and, contrary to popular opinion, not only from Russia. Not all of the FDI is long-term and strategic, and its sectoral structure is still inefficient—it is necessary to attract capital in production, agriculture, and technology. The speaker particularly emphasized the need to invest in human capital, higher education, and science and concluded her presentation with the thesis that it is necessary to achieve a constant and sustainable flow of investments, especially in sectors that will contribute to the long-term development of the Armenian economy.

The report of *Olga Klochko*, associate professor at the School of World Economy was devoted to global trends in the regulation of foreign direct investment. The speaker discussed the main changes in the global FDI policy, which consist in the attempts of the largest countries to control incoming investment flows more strictly and to start regulating outgoing FDI, especially in high-tech industries capable of providing competitive advantages to the recipient countries. The US and European countries are changing their regulatory tools and introducing measures to control FDI for geopolitical and technological reasons. Separately, the report noted the EU's ongoing efforts to coordinate FDI policies among member states. Stressing the importance of FDI for economic development, the speaker noted that Russia lacks a comprehensive FDI policy and called for the inclusion of this issue in the country's economic development and security strategy.

Alexey Kuznetsov, director of the Institute of Scientific Information on Social Sciences of the Russian Academy of Sciences, also began his presentation with the issue of FDI. On the basis of statistical data showing the decline in the volume of FDI in the world, significantly in 2022, the expert drew the audience's attention to the coincidence of this trend with anti-Russian sanctions and suggested that it is associated with the lower activity of developing countries in the EU and US markets. In the geographical structure of Russia's foreign trade, the share of EU countries is decreasing, while interaction with China, India, Brazil, and Arab countries is increasing. In general, the dynamics of world trade is changing, and under these conditions, Russia's main task is

not to wage a sanctions war with the West, but to adapt to the fundamental changes in the world economy in the direction of Asia.

The final presentation of the session and the first day of the conference was given by *Bruno de Conti*, associate professor at the University of Campinas (Brazil), who touched on such topics as obstacles to economic development, historical aspects of colonization, and structural changes in Latin America. The main focus of the presentation was the impact of China on the region's economy: Will China's emergence as the region's most important partner lead to changes in trade, FDI flows, and global value chains? The speaker pointed to the concentration of Chinese investment in sectors such as energy and services, as well as the use of Latin America by Chinese companies to implement their version of nearshoring concept. However, according to the expert, FDI would not lead to significant changes in the regional economy. Highlighting the limitations and opportunities associated with China's growing role, the speaker expressed the hope that the negotiating power of Latin American countries would increase in the geopolitical context, especially when discussing deals in the extractive industries.

The third session of the conference "Lost Illusions: In Search of New Approaches to Sustainable Development" was opened by *Alexandra Morozkina*. The moderator thanked the participants for the intensive discussions of the previous day of the conference and expressed her hope for a comprehensive coverage of the Sustainable Development Goals (SDGs) during the session.

The introductory report on "Gaps of Climate Governance" was presented by *Igor Makarov*. The speaker highlighted three key gaps in international climate governance: the mitigation gap, the climate finance gap, and the coordination gap. Current global emissions trajectories, as well as those planned under the Nationally Determined Contributions, are insufficient to keep temperature increases in line with the goals of the Paris Agreement. The global community has not yet been able to mobilize private capital to reduce emissions and, in particular, to finance adaptation, and the funds provided through official channels will in any case be insufficient to cover all needs. The speaker emphasized the need for greater coordination between countries, especially exporters and importers of hydrocarbons and carbon-intensive products. The speaker noted that despite the continuous acceleration of the green transformation of the global economy, the gap between real and necessary efforts to achieve climate goals is widening every year.

Vatcharin Sirimaneetham, chief for macroeconomic policy, UN Economic and Social Commission for Asia and the Pacific (ESCAP UN), focused his presentation on two key issues: rethinking the role of public debt in financing the SDGs and proposing more proactive central bank policies to build a more equitable society. On the first issue, the expert highlighted the challenging situation in Asia and the Pacific in terms of progress towards the SDGs, particularly the regression in the fight against climate change, and encouraged countries to prioritize long-term sustainability over short-term fiscal targets. On the second issue, the presenter discussed the impact of income inequality on the effectiveness of monetary policy, suggesting that central banks should consider social factors in addition to their traditional mandate. The example

of Mongolia showed how a "greener" economy and diversified development policies could have a positive impact on poverty reduction, carbon emissions, and the overall sustainability of public debt.

Kazi Sohag, senior research fellow at the Ural Federal University, focused on the management of macroeconomic indicators in the context of energy dynamics and geopolitical turmoil, using Russia as an example. Above all, the growth of the Russian economy under the pressure of sanctions was noted. The speaker praised both the policy of the Central Bank of Russia and how quickly the Russian financial market recovered from stressful events. Special attention was paid to the efficacy of Russia's trade integration, especially with the BRICS countries. The speaker pointed to the problems of income distribution and the need to introduce a progressive tax policy in the country.

In her presentation, *Anastasia Sycheva*, head of the Department for International Development Assistance at Rossotrudnichestvo, shared the experience of many years of work in the field of financing the SDGs. Recognizing the relevance of the SDGs, she noted that the achievement of half of them is not progressing and a third is even regressing. For Russia to ensure effective implementation of the SDGs, it is necessary to adopt a federal law on development assistance, create a specialized agency for the SDGs, and modernize the legal and regulatory framework. Turning to the issue of bilateral and multilateral aid, the speaker recognized the need to expand bilateral aid, but stressed the importance of cooperation with multilateral partners, including UN agencies. Special attention was paid to the problems of mobilizing the private sector in this direction. She identified three groups of companies: those that openly support development projects, those that are reluctant due to potential regulation, and those that avoid public attention due to sanctions. In summary, the expert emphasized the need for strategic prioritization of development assistance, the importance of adapting to global change, and the challenges and opportunities of engaging both the private and public sectors in achieving the SDGs.

The main topic of the presentation by *Sedat Alatas*, a research fellow at Aydin Adnan Menderes University (Turkey), was the role of materials in sustainable development, especially in relation to energy efficiency. The expert drew the audience's attention to the fact that climate change mitigation policies focus mainly on energy and overlook the importance of efficiency in the use of materials, the production of which also entails environmental costs. The presenter's research showed that while most countries have made progress in energy efficiency each year, material efficiency has deteriorated significantly in recent years. As a result, the presenter calls for a shift in focus towards material efficiency policies, as they have significant potential to reduce emissions.

The fourth session of the conference, dedicated to the transformation of the economic growth model of Asian countries, was opened with a welcoming speech by the academician of the Russian Academy of Sciences *Natalya Ivanova*, head of Research, Science and Innovation Department of IMEMO RAS. After a period of intensive growth, Asian countries are now facing problems that require new approaches. Possible ways

of adaptation of individual countries and subregions of Asia to the new reality and their future role in the world economy were the key topics of the final session of the conference.

Evgeniy Vinokurov, chief economist of the Eurasian Development Bank, began his report by discussing the outstanding economic growth rates of Asian countries over the past decades and the strengthening of trade integration in the region, as a result of which Asia's self-sufficiency will continue to grow. The high pace of economic growth in the region was largely determined by globalization factors—export growth and foreign investment, but in the current conditions of fragmentation of the world economy their contribution is falling. The speaker paid special attention to demographic changes in Asia and raised the question of whether the growth of the labor force in South and Southeast Asia could compensate for the deficit resulting from the aging of the population in China, Japan, and South Korea. He concluded by emphasizing to the audience that Asian countries should consider the need for economic policy changes to support intra-regional trade and the mobilization of domestic savings to ensure sustainable growth in the coming decades.

The presentation by *Devesh Birwal*, associate professor at the Department of Economics, University of Delhi (India), was devoted to discussing the transformation of the Indian economy. After briefly reviewing the country's historical problems, including the colonial period, the expert noted the stable economic growth rate of about 5% per year since independence until 2020. Foreign direct investment, India's information technology sector, the exploitation of the demographic dividend, and the development of industrial production and services have played an important role in this growth. Strategic alliances with a number of foreign countries, such as Vietnam, were cited as additional strengths. The speaker emphasized that India's modern economy has not only survived the global crises, but has shown resilience and potential for further growth, playing an important role in the economic landscape of Asia and the world at large.

Devin Lin, a consultant and attorney with the Guangdong Zhongxi Law Firm (China), devoted his presentation to China's current economic strategy, in particular the Dual Circulation Strategy introduced in 2021. Its internal aim is achieving self-sufficiency by promoting innovation, diversifying supply chains and investing in specific industries, while its external aim is to position China as a global manufacturing power, strengthen the yuan and support the Belt and Road Initiative. Special attention is given to the challenges limiting the country's economic growth—the aging population, the low birth rate, the high unemployment rates among college graduates, the deepening Sino-US confrontation, regional security issues, and the need for globally recognized brands and standards. The presentation also touches on the role of Hong Kong and recent political changes, such as the introduction of the National Security Law and electoral changes in Hong Kong.

The final report was presented by *Leonid Grigoryev* and his assistant, *Daria Zharonkina*. Based on official Chinese statistics, the researchers comprehensively analyzed the factors of the country's economic growth. They emphasized the uniqueness of China's investment model, including a high share of savings and investment in GDP

and a low consumption rate. Special attention is paid to the formation of a developed infrastructure, primarily the network of high-speed railways. Great importance is attached to the role of exports and the need for China to shift from export-oriented growth to growth based on domestic consumption. The experts also analyzed the investment behavior in various sectors of the country's economy and identified the need to restructure investments in some of them.

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Summing up the results of the conference, the organizers stated that they appreciated the two days of intensive work and noted the importance and value of the opinions expressed during the reports and discussions. Special appreciation and gratitude for the contribution to the conference were expressed to the foreign participants who came to Russia. The organizers hope that the 11th Annual Conference on the Global Economy "Re-Balancing of the World Economy: In Search of New Models for Global Development" will contribute to further research, development of cooperation, exchange of knowledge and opinions in the field of world economy between representatives of different countries.

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