Topical Issues Surrounding Supply Chain Management in Developing Food Industry: Kazakhstan Case Study

Sholpan I. Karkinbayeva[*1], Kasiya A. Kirdasinova[2], Elmira M. Adiyetova[3], Ainur Zh. Kanatova[4], Bibinur B. Korgan[5]

[1,2]*Department of Management, Eurasian National University named after L.N. Gumilyov, Astana, Kazakhstan*

[3,4] *Department of Finance and Accounting, Kh. Dosmukhamedov Atyrau State University, Atyrau, Kazakhstan*

[5]*Department of Economic, Pavlodar State University named after S. Toraigyrov, Pavlodar, Kazakhstan*

[1]karkinbayeva@bk.ru

[2]marso310@mail.ru

[3]Adiet_Elm79@mail.ru

[4]a.kanatova@asu.edu

[5]b.korgan@asu.edu.kz

Abstract **- In modern conditions of socioeconomic development of the Republic of Kazakhstan, one of the priority areas associated with food industry development is the development of methods for managing supply chains. The food industry development itself is crucial in current setting because the level of competitiveness of domestic food products depends on food production in the global economy. Considering the fact that traditional food logistics is no longer able to meet market requirements, it becomes increasingly important to create an innovation-driven system for tracking the supply of agri-food products. This article provides a literature review of domestic and foreign authors who conducted research on the practice of supply chain management aimed at the development of the food industry. The economic assessment of the current state of the food industry of the Republic of Kazakhstan for the implementation of the tasks of the national economy. As a result of the research, the theoretical and practical aspects of the food industry research are systematized, on the basis of which the relevant conclusions are drawn. This article puts forward various hypotheses and uses theoretical approaches, within which we can expect to stimulate sustainability of supply chain management. These approaches are presented within the framework of the following theories: institutional theory, dynamic capability theory, and the theory of stakeholders. Additionally, a conceptual framework was built on the stakeholder theory to identify indicators, drivers and barriers and achieve sustainability in the food supply chain.**

Key words **-** *economy, food industry, agro-industrial complex, production, sector of economy, products, supply chain management*

1. Introduction

Modern world development is characterized by the transition to a new stage in the formation of society - the construction of the economy, the basis of which is the generation, dissemination and use of knowledge. Knowledge and intellectual resources in recent years have become particularly important in the socioeconomic development of society. One of the focus areas in the SCM definition cited above is cooperation between supply chain members and it is also a major challenge to achieving SCP. In order to make food supply chains sustainable and, in particular, the consumption and production areas, the interests of the different supply chain parties have to be coordinated The formation of the national economy, which indicated the need for the development of innovative approaches to management, identified unresolved problems in relation to the most important factor of economic growth – human capital has exacerbated the relevance of the study of human resource as an important link in a single priority sector – the education system, the study of the process of modern management of the formation and use of human capital. Education is a key factor in improving the country's competitiveness. In any developed country, the gross domestic product per capita and the productivity of workers by economic sector are closely related to the level of knowledge.

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In the modern world, the importance of higher education and the role of universities has changed. The no less important part is to choose a proper strategy of supply chain management, which will enable savings and reduce time costs.

2. Literature Review

Supply chain managers regard the integration of environmental, economic, and social issues into their daily tasks in order to achieve sustainable performance [1]. The findings show that institutional pressure has a significant positive impact on supply chain management and sustainable supply chain design [2]. Sustainable practices are essential for improving the ability of companies to perform, while coercive, mimetic and normative pressures have a negative restraining effect [3]. The integration of sustainability principles into supply chain management and dynamic capability theory is a fairly young and promising topic that has been recently brought to light. The findings show the necessity of additional studies on dynamic capabilities to ensure sustainability, especially in emerging economies [4, 5]. Innovative advances play an important role in efficient supply chain management. Scholars acknowledge the importance of big data and predictive analytics (BDPA) in achieving business value and firm performance [6]. Stakeholder theory conceptualizes assimilation as a three stage process (acceptance, routinization, and assimilation) and identifies the influence of resources (connectivity and information sharing) under the mediation effect of top management commitment on big data assimilation (capability) and supply chain management [7, 8]. In the modern scientific literature of foreign authors, attention is paid to the issues of modern management in the management of the food industry from various positions of socioeconomic development, such as: Kamariah Ismail, Jawad Hussain, Fayaz Ali Shah [9] using regression analysis, investigated causal relationships that influence the image of soft drink brands in shaping consumer behavior; [10] considered government food risk management policies and marketing strategies for genetically modified food products; ref. [11] examined the impact of relations between suppliers and consumers in the value chain on innovation in the food industry using the example of a region - the western part of Poland. Ref. [12] identified the problems and prospects of development of foreign trade of Belarus in agricultural products in the context of Eurasian integration. Ref. [13] considered the competitive advantages and disadvantages of the international trade in agro-industrial products in Moldova in the context of neighborhood with the EU countries. Ref. [14] conducted research on the effects of food on human health. Russian scientists have contributed to the research work in the food industry: [15] developed their own methodology based on the results of the study on the market capacity of sausages. [16] considered in their studies the environmental problems in the food industry and ways of their solutions. [17] investigated the main consequences of the introduction of problematic innovations on the quality of food products and domestic consumption of the population. [18] studied the effect of dairy and meat products in the human diet. [19] studied the identification and detection of falsification of food products and others, conducted research in the food industry in various aspects. The development of the food industry in modern development has been studied in the publications of Kazakhstani economists, such as: [20], [21], [22], [23], [24] and others. Nevertheless, the analysis of publications shows that this area of scientific direction is not sufficiently studied, in this regard, the author's research is aimed at further studying the patterns, characteristics and the current state of the food industry.

3. Methods

The most effective methods of development of the food industry are food industry support programs in the Republic of Kazakhstan. Currently, the food industry in Kazakhstan is in a relatively stable state, but it requires further development, competitiveness and export potential. Together with the World Bank, the Ministry of Investment and Development of the Republic of Kazakhstan has identified priority sectors in which it is most beneficial to attract new investments aimed at improving efficiency. These industries are divided into two groups:

-1st group - “industries with existing potential”, such as food industry, deep processing of oil, gas and minerals, as well as mechanical engineering;

- 2nd group - ICT, tourism and finance. To improve the investment climate in August 2017, the Ministry of Investment and Development of the Republic of Kazakhstan approved the National

Investment Strategy for 2018-2022. In accordance with the instructions of the President of the Republic of Kazakhstan, the strategy focused on the need to attract foreign investment in the non-primary sectors of the economy of Kazakhstan, as well as to increase their export potential. In accordance with the Strategy, by 2022 it is planned to increase the volume of investments in the fixed capital of the non-primary sector of the economy (excluding the state budget) by 1.46 times, and the volume of foreign investments in the fixed capital of the non-primary sector of the economy will increase 1.5 times. Within the framework of the State Program "Digital Kazakhstan" for 2017-2020. The goal is to introduce digital technologies to control food safety products entering Kazakhstan from third countries, as well as being exported from the country to other EAEU states. In 2016, through JSC "EDF"Damu" in the food industry financed new projects in the amount of 122.9 billion tenge. During the period of 2014-2016, the share of financing of the Fund "Damu" in the total volume of loans issued in the manufacturing industry ranged from 16% to 25% or in monetary terms from 234 billion tenge to 374 billion tenge. In 2016, STB issued loans to producers of food, beverages and tobacco products in the total amount of 375 billion tenge (+ 22.4%). As of November 2017, the volume of loans issued to the food industry amounted to 328 billion tenge. The predominant source of financing for the food industry is investors own funds (over 70%), and then - STB loans (up to 30%). Within the framework of the State program of development of the agro-industrial complex of the Republic of Kazakhstan for 2017-2021. Subsidies for investment costs will be continued in the construction and modernization of the food industry with modern equipment, focused on the production of competitive export-oriented products. Criteria will be revised, thresholds will be reduced and standards will be differentiated taking into account actual production volumes, as well as the opportunity to receive subsidies through associations into cooperatives will be provided. As part of the unified program of support and development of business "Business Road Map 2020" in 2016, 521 food industry projects were funded in the amount of 113.6 billion tenge.

4. Results

Net world exports of vegetable oil will increase to 25 million tons per year (3 times), and sugar – up to 20 million tons per year. The average annual yield of grain crops in the world will decrease to 0.7%. The growth of the global population could trigger a food crisis. In this regard, it is possible to increase the production of low-nutrition food products, products based on genetically modified ingredients, as well as artificially derived ingredients. The food industry of Kazakhstan in the structure of the processing industry (Fig. 1) ranks second in weight (24.2%) after the metallurgical industry (36.9%). At the same time, in the breakdown of the food industry into types of production 18.7% in the manufacturing industry is food production, 3.9% - beverage production and 1.6% - tobacco production. Since 2014, the share of produced domestic food and beverages increased slightly - by 0.6% and 0.1%, respectively, and the proportion of tobacco products decreased by 0.1%.

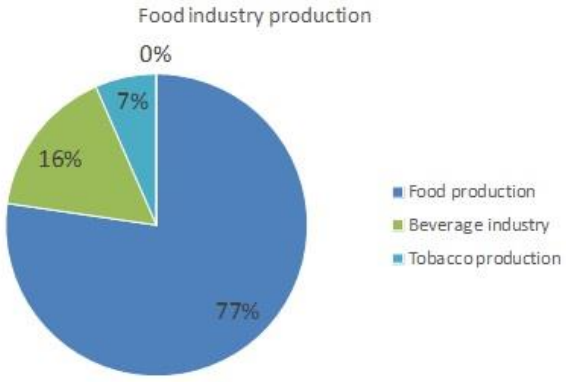

Figure 1. Food industry production in the Republic of Kazakhstan (Source: Committee on Statistics of the Republic of Kazakhstan, Agency of the Regional Financial Center)

Supply chain management in food industry of Kazakhstan includes three major groups of industries: food, meat and dairy, fish. Each of these groups represents a set of industries. Thus, the food industry includes 19 industries. To the meat and dairy industries include meat, gelatin glue, butter and cheese and dairy industry. The industry is distinguished by the production of fish, sea animals and seafood; production engaged in salting, smoking, drying, refrigeration processing of fish, cooking canned food, fish meal, fat, seafood processing (including the production of agar and agaroid). By stages of processing and production food industry are divided into primary and secondary. Primary processing of agricultural raw

materials of plant and animal origin, as well as fishing, harvesting of sea animals, etc. Subsequent processing of raw materials is carried out by baking, confectionery, distillery, sugar refining and other industries (2005). The food industry of the Republic of Kazakhstan includes: fish, meat and milk, bread, milk, sugar, confectionery, pasta, oil and fat, canned fruits and vegetables, wine-making, beer, tea and other industries. The food industry is more than 20% of the total production in the national economy, it accounts for 5.5% of the value of fixed assets, which employs 10.3% of industrial workers. The food industry is important for the sustainable development of the economy of Kazakhstan. During the period 2013-2016 the turnover of food products in the Republic of Kazakhstan (RK) in money terms steadily declined from 133,506 million US dollars to 62,113.6 million US dollars, respectively. In the first quarter of 2017, in the production of food products, beverages and tobacco, all countries of the EAEU experienced an increase in industrial production: in Armenia - by 15.6%, Belarus - by 1%, Kazakhstan - by 2.9%, Kyrgyzstan - by 30.2%, Russia - by 2.1%. The industrial production of the EAEU countries in the first quarter of 2017 amounted to $ 248.2 billion US dollars, including the volume of production of manufactured goods - $ 150.1 billion US dollars. During the 9 months of 2017 Kazakhstan's food enterprises gain by selling in general 2 billion KZT. Deliveries of meat to Afghanistan, the United Arab Emirates and China began. In the structure of industrial production of the EAEU countries, the processing industry takes the largest share (60.5%). Compared to the same period of 2015, its share decreased by 2.5 percentage points. The average industrial production index in the processing industry of the EAEU Member States in the 1st quarter of 2017 was 100.1% compared to the corresponding period of the previous year, including Armenia - 121.4%, Belarus - 105.1%, Kazakhstan - 105,6%, Kyrgyzstan - 137.4%, Russia - 99.2%. In the first quarter of 2017, the industrial production index in the production of food products, including beverages and tobacco in Armenia was 115.6% compared to the corresponding period of the previous year, in Belarus - 101.0%, Kazakhstan - 102.9%, Kyrgyzstan - 130.2%, of Russia - 102.1% In the first quarter of 2017, among the countries of the EAEU, in Kazakhstan the increase in production was marked, compared with the corresponding period of the previous year, fish and seafood (by 43.8%), cereals (by 19.6%), pasta (by 18, 2%), meat (by 15.7%), butter (by 12.2%), flour (by 11.1%), soft drinks (by 7.8%), vodka (by 6%), meat birds (by 3.8%). At the same time, there was a decrease in the production of sugar (by 26.9%), canned fish (by 17.2%), bakery products (by 6.5%), tobacco products (by 6.4%), canned meat (by 5.5%), cheese and cottage cheese (by 3.7%), sausage products (by 2.7%). During the period 2012-2016 the share of the food industry in the GDP structure of the Republic of Kazakhstan did not exceed 4% (Figure 1). For comparison, in 2005 its share was 6.4%. According to preliminary data, in the first 11 months of 2017, the share of the food industry in GDP was 4.9%. According to the Statistics Committee of the Republic of Kazakhstan, for the period 2014-2016, the average annual share of the food industry in the structure of the country's manufacturing industry was 23% - 24%. At the beginning of the 4th quarter of 2017, the distribution of shares of the manufacturing industries is as follows: food production - 16.3%, drinks - 3.3%, tobacco products - 1.2% (Figure 2)

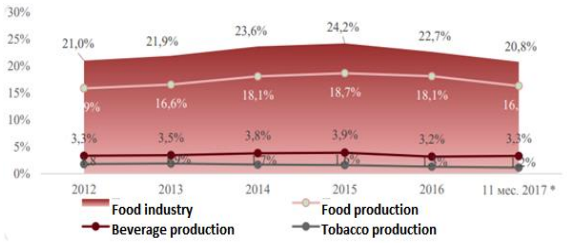

Figure 2. Shares of the food industry in the total volume of manufacturing industry of the Republic of Kazakhstan for the period 2012-2016 and 11 months of 2017,%

Since 2016, the total volume of production of the food industry amounted to 1,808.6 billion KZT (+ 30%). According to preliminary data, for 11 months of 2017 the volume of food industry production amounted to 1,712 billion KZT (Figure 3).

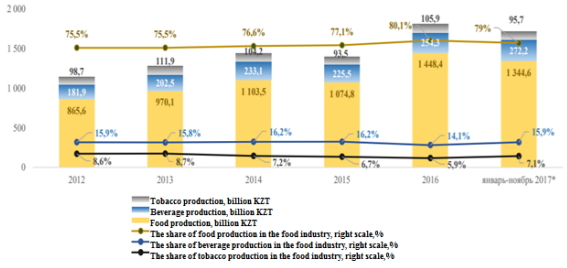

Figure 3. The volume of production of food

industry branches of the Republic of Kazakhstan for the period 2012-2016 and 11 months of 2017. By the end of 2016, there are positive changes in the volume of generated pre-tax profits in the food production and tobacco production sectors. During the entire analyzed period, the production of tobacco products is still the most profitable industry in the food industry of Kazakhstan. In the period 2012-2015, the production of tobacco products showed an increasing trend of generating profits - from 28.6 billion KZT to 52 billion KZT (+ 82% by 2012) (Figure 4).

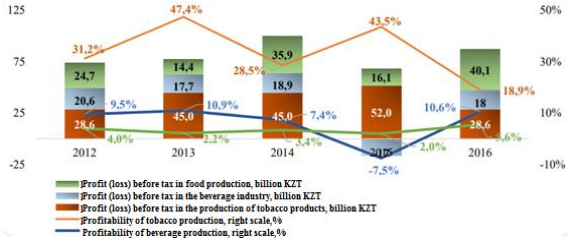

Figure 4. Economic indicators of the production of food, beverages, tobacco for the period 2012-2016.

At the end of 2016, the tobacco industry experienced an almost two-fold decline in the volume of generated profits and, consequently, the profitability of production. As a result, in 2016, the profit before tax decreased to the indicator of 2012 and amounted to 28.6 billion KZT, and the profitability of production amounted to 18.9%. After the "oil crisis" in 2015, there were no significant changes in the total number of food industry enterprises in Kazakhstan. Thus, the total number of food production enterprises was 1,776 units. (+ 0.9%), enterprises for the production of tobacco increased to 3 units, and the number of enterprises for the production of beverages has not changed (Figure 5).

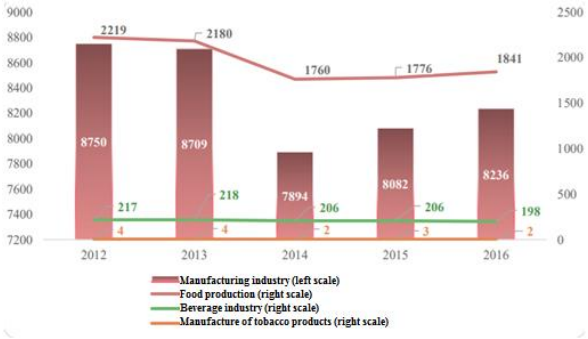

Figure 5. The number of existing enterprises in the food industry for the period 2012-2016, units.

In 2014-2016, the growth in average prices was observed in the food and beverage industry. These changes were due to negative macroeconomic effects on the background of annual devaluation jumps in the national currency against the US dollar. (Figure 6)

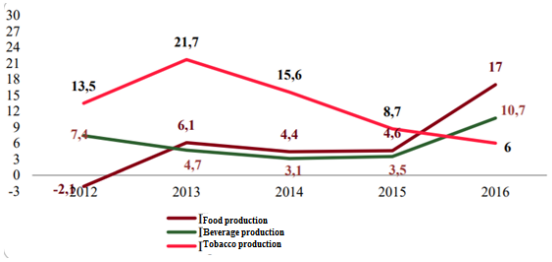

Figure 6. Change in average producer prices in the food industry, %

In 2013-2016, there was a decrease in average prices for tobacco products, which was formed under the influence of conjuncture factors of the industry (annual increase in the excise rate on tobacco, the volume of imported products, illegal turnover of tobacco products, the mood of domestic demand). The development of the food industry in Kazakhstan is currently particularly relevant in the face of changing environmental conditions — when Kazakhstan joins integration associations, as well as the changing internal environment — in the context of a growing population, food consumption and consumer changes are aimed at improving and more diverse products. The leading position in the food industry is occupied by the meat industry - the food industry, processing livestock. Industrial enterprises produce harvesting and slaughter of livestock, poultry, rabbits and produce meat, sausages, canned meat, semi-finished products, meatballs, dumplings, culinary products. This industry gives ¼ of the whole country industry of production and ranks first in its specific weight. Along with the production of food products, dry animal feed, valuable medical products (insulin, heparin, linocaine, etc.), as well as adhesives, gelatin, and down-feather products are produced. On the basis of a developed animal husbandry, an extensive network of enterprises in the meat and dairy industry has been created. Kazakhstan on development of meat yielded only the RSFSR and the Ukraine. The largest enterprises in this industry — now there are more than 40 meat processing plants. Semipalatinsk, Petropavlovsk, Alma-Ata, Ural meat processing plants. Semipalatinsk meat processing plant is particularly distinguished with its size. It produces over 100 items of finished products and semi-finished products. To reduce the radius of delivery of livestock, meat processing plants are located evenly in all regions of the

country. Kazakhstan produced and processed up to 43 kg of meat and by-products per inhabitant in its best-produced production in 1998-2002, producing up to 160 thousand tons of sausage products per year (9 kg per inhabitant). The baking industry ranks second in terms of the number of products produced. Enterprises are existed almost in every village. An example of products that are placed only on the principle of consumption. Basically, in the areas of cattle breeding, numerous dairy and butter-cheese plants are located. Especially a lot of dairy products are produced in Kustanai, North Kazakhstan, East Kazakhstan, and Karaganda regions. The enterprises of the milling industry are located mainly in the cities located in the areas where crops are grown: Kostanay, Astana, Semipalatinsk, Almaty, and others. Sugar industry is developed in the south of Kazakhstan, in the areas of beet-growing - Zhambyl and Almaty regions, from other sectors of the food industry in Kazakhstan are developed fish (in the northern Caspian), confectionery, fruit-preserving, wine-making. A large fish cannery operates in Atyrau. Smaller fisheries and fishing industries are developed on the lakes Balkhash and Zaisan. Analysis of changes in the volume of investments in the food industry for the period 2005-2015 shows that investments in the industry average about 53.7 billion KZT for the analyzed period. It is worth noting that from 2005 to 2007 there is a direct dependence of the volume of the food industry on the volume of investments, while from 2008 to 2015 this dependence is no longer noted. At the same time, for the period 2008-2015, cyclicality becomes a characteristic feature of investments: for example, with a significant increase in production in 2008, there is a rather large reduction in investment in the industry by 15%, and with a maximum increase in investment in the industry by 52% 2006, there is a growth rate in production slightly above average - about 14%. As part of the program "Development of the food industry in Kazakhstan for 2015-2019," investments in the fixed capital of the food and processing industry are planned to increase by 3 times to 97 billion KZT. According to the Food and Agriculture Organization of the United Nations (FAO), as of 4th quarter of 2017, about 37 countries of the world are experiencing food shortages and need external food assistance. According to FAO estimates, in order to feed the 9.1 billion population by 2050, an increase in total food production by almost 70% will be required.

5. Discussion

According to Maslow's “Pyramid of Needs”, the need for food is the primary human physiological need, and the food industry is aimed at meeting the needs of the population in a number of essential food products. Based on this, the food industry (including beverage production, excluding tobacco production) is of strategic importance for the economy of any country. According to [25], future SCP research will have to focus more on the link between consumption and production. Models are required to take into account the heterogeneity of production systems and consumer behavior, as well as the situation on the food market in different countries. Developing a supply chain for a particular commodity is a lot of different from other commodities if not unique at all. Modern tools like ERP Software (Electronic Resource Planning) are increasingly employed in food enterprises throughout Asia instead of cumbersome Excel spreadsheets for inventory updating and managing suppliers and customers data- base [26, 27]. The food industry is a sector of light industry, a set of food production in finished form or in the form of semi-finished products, as well as tobacco products, soap and detergents, perfumes and cosmetics. In the system of the agro-industrial complex, the food industry is closely connected with agriculture as a supplier of raw materials and trade. Part of the food industry tends to raw areas, the other part - to areas of consumption. The main purpose of this industry is the production of food. The development of the food industry makes it possible to compensate for the existing differences in the supply of food to the population of different regions of the country. Food market infrastructure enables the formation of material, financial and informational links between market actors and is a combination of objects and institutional structures. The market infrastructure unites the spheres of production, commerce and consumption into a single chain, accelerates the turnover of material, financial and information flows, contributing to social development [28]. The food industry occupies a special place in food security assurance. In Kazakhstan, despite little victories, there is a lack of a generalized national program for food industry development to make commodities competitive. Improving the regional organization of

agricultural production and processing means the establishment and development of local food complexes, national and regional [29]. In a modern market economy, each sector of economic development occupies a special place. And the state pays special attention to the improvement of the food industry in order to provide the population and satisfy the needs of customers with domestic products. In developing countries, the pace of food production will require a twofold increase. According to forecasts, by 2050 the annual production of grain crops should increase by almost 1 billion tons, meat production – from 200 billion tons to 470 billion tons, of which 72% of production will be in developing economies [30].

6. Conclusions

In the dynamics of indicators of foreign trade turnover of food products of Kazakhstan is still observed the predominant share of imports, due to the lack of development of production of deep processing of agricultural products. There is a positive dynamics of growth of export potential of food products. In the food industry of Kazakhstan, there are still factors of weak provision of domestic products for a wide range of goods and the lack of production capacity that fully satisfy the needs of Kazakhstan for the range of food products. Thus, the world leader of Kazakhstan in the production of wheat and wheat flour, which supplies land resources, the high potential for the production and export of organic products is an important opportunity for the development of the Kazakhstan's food industry. At the same time, the development process is complicated by the following industrial issues: small-scale production, low R&D, reverse technology, low safety and animal safety. High dependence on imports. The potential of the food industry of the Republic of Kazakhstan allows the industry to significantly increase its production, thus providing both domestic market demand and export bids for the main food groups. Kazakhstan has a real opportunity to become not only a major exporter of raw materials, but also agricultural power, developed with a wide export of organic agricultural products [31]. Strengthening the dynamics of the food industry and agro-industrial complexes will help improve the quality of life and ensure food security for Kazakhstan. This study is aimed at helping the food industry to better understand the main barriers and bottlenecks in supply chain management because understanding the problem is half of the solution. The findings show that the lack of proper training and progress control, poor customer awareness and the lack of pressure are the biggest barriers. One can also find valuable insights, limitations, and managerial consequences in this article.

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