FORECASTING THE STRATEGIC ECONOMIC POTENTIAL OF THE WORLD'S LEADING ECONOMIES UNTIL THE END OF THE 21st CENTURY

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ABSTRACT

A study of long-term economic growth using the educational model of human capital has been conducted. The work aims to forecast the economic growth of the world's leading economies until the end of the 21st century to identify potential candidates for world leadership and create conditions for increasing the terms of strategic planning. Mathematical research methods include the development of models for the growth of the number of researchers and the calculation of the contribution coefficients to GDP of specialists with various educations, as well as the formation of a global ViC model for predicting GDP growth. A comparison of GDP calculations using the ViC model and the forecast of PricewaterhouseCoopers in 2050 showed their good agreement. The average value of the difference in GDP values for the two forecasts is 3%, and the standard deviation is 12%. Calculations of the development of the 12 largest economies until 2100 showed that their total GDP at PPP will amount to 350 trillion international dollars in 2017, and the countries that are currently developing will have a dominant share among them (78%). China will be the leader in terms of GDP for about 47 years, and then its growth rate will decrease, as a result of a decrease in the population. India will surpass China in terms of GDP by about 2067 and India will have GDP = 96.5 trillion international dollars by 2100. There are no countries that can potentially surpass India in terms of GDP. The share of employees with tertiary education and the number of research and development specialists per billion GDP has a dominant influence on economic growth. The results of the work can be used for strategic planning.

Keywords: Forecasting, Strategic Planning, Human Capital, GDP, Research and Development, Economic Leadership, Education, Demographic Transition.

INTRODUCTION

An important feature of the current state of the world community is that it is undergoing several fundamental changes. One of the most important among them is the possibility of changing the leading countries (Hawksworth et al., 2017; Franklin & Andrews, 2012). Research on the development of major economies by Goldman Sachs (Wilson & Parashothaman, 2003), PricewaterhouseCoopers (Hawksworth et al., 2017), OECD (Organisation for Economic Co-operation and Development) (Guillemette & Turner, 2018), and others (Franklin & Andrews, 2012) show that the GDPs (Gross Domestic Product) of China and India will grow rapidly and

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they may become a new dominant of world development. However, these forecasts are made for 30-40 years, which does not allow drawing confident conclusions about the prospects for changing the world leader.

The assessment of the economic potential of the 12 largest GDP at PPP (Purchasing Power Parity) of the world's economies by the end of the 21st century (China, USA, EU-23, India, Japan, Indonesia, Russia, Brazil, Mexico, Turkey, Pakistan, Nigeria) is an important basis for the elaboration of long-term development strategies of countries, corporations, and interstate associations. Therefore, it is quite natural to set the task of increasing the timing of forecasting, at least for the life expectancy of one generation, that is, until the end of the 21st century. Presumably, this will increase the predictability of interstate relations and the stability of global development.

The studies conducted in the works of Pricewaterhouse Coopers (Hawksworth et al., 2017) and others (Franklin & Andrews, 2012; Guillemette & Turner, 2018) on this topic were carried out, as a rule, using an exogenous model, in which the USA is taken as a reference economy. Such an approach may give insufficiently accurate estimates of the weight ratio of various economies in the future since the postulate of the USA's world leadership in the predicted time range is accepted in advance.

The authors use a methodology based on a human capital model based on differentiated accounting of the level of education of employees and the number of research and development specialists to predict GDP growth. The use of such an index of human capital, the growth of which occurs endogenously, allows predicting the growth of GDP of countries relatively accurately for the period up to 2100. Random factors such as the Covid-19 pandemic are not considered in the model.

The purpose of the work was to form a forecast of economic growth of the world's largest economies until the end of the 21st century to identify potential leaders of world development and increase the timing of strategic planning.

LITERATURE REVIEW

Among the first theorists of models of long-term economic growth was a representative of neo-Keynesianism Harrod (1939). He formulated the fundamental equation of economic growth and established a link between the investment growth rate and the GDP growth rate. In the framework of the neoclassical direction, important results were obtained by Solow (1956). According to the model, the sustainability of long-term growth arises from technological progress. The disadvantage of the model is that this progress is determined exogenously.

Beginning in the 1980s, it became clear that neoclassical models did not meet the requirements for research on long-term growth (Barro & Martin, 2004). To solve this problem, attempts were made to expand the concept of capital by including human capital, as well as using the assumption that the return for such capital does not decrease. This type of exogenous economic growth model was developed in 1990 by Mankiw et al. (1992). This model is more consistent with differences between countries but also retains the disadvantages of the exogenous model. To approximate it to the endogenous type, various assumptions were introduced into the model about the impact of knowledge, technology, and innovation on economic growth. However, attempts to combine models of the neoclassical and semi-structured types (Saaty, 2008) have not brought significant success. Currently, a unified theory of economic growth has not been developed (Guillemette & Turner, 2018).

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Since the beginning of the third millennium, several financial and consulting organizations have started forecasting economic dynamics for 30-40 years. In 2003, a forecast by Goldman Sachs (Wilson & Parashothaman, 2003) appeared, which showed that a group of the largest developing countries - BRICs - can change the world order. PricewaterhouseCoopers (PwC) has been the most consistent in making such forecasts. The presence of several forecasts made in similar formats (Hawksworth & Tiwari, 2011; Hawksworth & Chan, 2013; Hawksworth, 2015; Hawksworth et al., 2017) makes it possible to compare them and evaluate the resulting errors.

The estimates of the growth of the largest economies show that China's GDP will surpass the US by 1.5 times by 2050; even India will be ahead of the US. This is a good reason to analyze in more detail the possibility of change in the world leader.

METHODS

The fact that the share of human capital in the national wealth of the largest economies reached 75-78% and tended to further increase by the end of the second millennium, allows it to make human capital the core of the predictive model of economic growth (Schultz, 1971; Barro & Lee, 2015; Prichina et al., 2019). According to the adopted model, the entire increase in GDP per capita at PPP (hereinafter GDP/C or G/N) will be proportional to the specific index of human capital (IHC)-IHC following the dependence (1)

$$G/N \approx 0.5 \cdot IHC \cdot M0 \cdot MC \quad (1)$$

Here M0=200,000 international dollars in 2017 - the coefficient that determines the order of magnitude of G/N. The coefficient of 0.5 was introduced to reflect, as a first approximation, that the able-bodied (25-64 years old) and employed population is about half of the country's citizens. Here MC is a coefficient that characterizes the efficiency of the use of human capital in specific countries, including taking into account the real share of the working population. The specific index of human capital is determined with the differentiation of the contribution to GDP (1) according to the dependence (2) (Orekhov et al., 2019).

$$IHC = \Sigma Ki \cdot Di. \quad (2)$$

Here Di is the share of specialists with the level of education - i among the population aged 25-64 years, and Ki is the weighting coefficients of the contribution to IHC of the level of education - i. For all the countries under consideration, the set Ki is the same, and K4=1. We will take into account five levels of education, according to the ISCED 2011 classification (UIS UNESCO, 2013; OECD, 2020). We will consider not the formal level of education, but workers in the field of research and development as the E5 level (The World Bank, 2018).

The values of Ki are determined from the condition of the minimum coefficient of variation of the values of MC, determined using equation (1), as well as statistical data on the largest economies (European Union 23, United States, China, Japan, Brazil, Turkey, Mexico, Indonesia), applied to 2017 in 2017 dollars (The World Bank, 2020a, 2020b; United Nations, 2015, 2019).

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RESULTS

According to preparatory studies, the share of the population with tertiary education - Dtr is growing rapidly and for people aged 25-34 years is Ireland - 70%, South Korea - 70%, Japan - 62%, Russia - 62%. This figure reaches 76% for women (OECD, 2020). Next, we will assume that the Dtr level is ≤ 75%.

To predict the dynamics of Dtr, we will proceed from the achieved level of education and take into account the annual increase in the share of the population with tertiary education - ΔDtr. It is equal to 0.8±0.2% for most of the economies under consideration. It is still higher than 1.0% for China (Donetskaya & Qiannan, 2018), South Korea, and Ireland.

An analysis of the dynamics of the ratio of the number of research and development specialists to GDP at PPP (NS/G) (Prichina et al., 2017; Von Foerster et al., 1960) in the period from 1996 to 2018 showed that the average value of NS/G in the world decreased from 97 to 91 people. In the USA, the value of NS/G fluctuated in the range of 68-74 (The World Bank, 2018) and it increased from 61 to 91 in the European Union. As a result of GDP/C growth, the NS/G decreased in three BRIC countries: in China from 168 to 86, in Russia - from 295 to 104, in India - from 69 to 39. Based on the current trends in the dynamics of NS/G, shortly, it is possible to predict a convergence of the values of this parameter with the world average level.

Optimization of the coefficients of the Ki contribution to GDP/C of groups of workers with different education showed that K1 and K2 are less than 0.00025, K3=0.5, K4=1.0, K5=19. With a slight loss of accuracy, we can assume that K1=K2=0, K3=K4=1.0, K5=18. Therewith, the coefficient of variation MC for the economies under consideration is 17%. The approximate formula for the specific index of human capital has the form (3):

$$IHC=Dtr + 36\cdot(NS/G)\cdot(G/N) \quad (3)$$

MC parameter plays the role of an indicator of the favorable external economic conditions, including proximity to the largest markets. In 2017, MC was: USA -0.99, Turkey - 0.93, EU-23 - 0.89, Mexico - 0.83, Indonesia -0.83, Brazil -0.72, China -0.70, Japan -0.57, India - 0.52, Russia - 0.4. Further, when forecasting, it will be assumed that the coefficient MC will eventually tend to an average value of 0.81.

Using equations (1), (3), GDP growth was predicted for the largest economies using Excel spreadsheets. Initially, the forecast of the educational level of employees for the period up to 2100 has been carried out. The level of education grew linearly up to the level of Dtr=50% and then aspired to the level of 75% in 2100. The values of MC changed linearly from the level of 2017 to the final value in 2100 - MCf. The NS/G parameter varied linearly from the level of 2017 to the IS value, which could be either the global average or higher by 2100. At the second stage of the calculation, the G/N value was determined by the iterative method for each time date, at which the IHC value required according to formula (1) does not exceed that provided by the workers' education level.

The calculation of GDP dynamics for the USA with the values MCf=0.81-0.99 and IS=100-130 showed that in 2050 GDP=31.5-35.8 trillion international dollars of 2017. According to PwC's 2017 forecast for the USA, GDP=34.8 US Dollars Trillion, which is best consistent with the forecast variant IS=100, MCf=0.9, for which GDP=34.1 US Dollars Trillion in 2050 (a difference of 2%). This option corresponds to an increase in the number of research and development specialists per billion GDP compared to the global average and a decrease in

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MCF compared to the level of 2017. However, MCf remains larger than the global average. This decrease in MCf is since as global economic activity shifts towards Asia, countries located in another part of the world will become more distant from the main markets, and this will put pressure on their labor productivity (Barro & Lee, 2015).

Figure 1 shows a comparison of GDP dynamics for nine of the largest economies, including the BRIC countries. Here the reference values are IS=0.91, and MCf=0.81. For USA MCf=0.9, and EU-23-0.85. The value of MCf=0.75 for Russia and India, which have low initial MC.

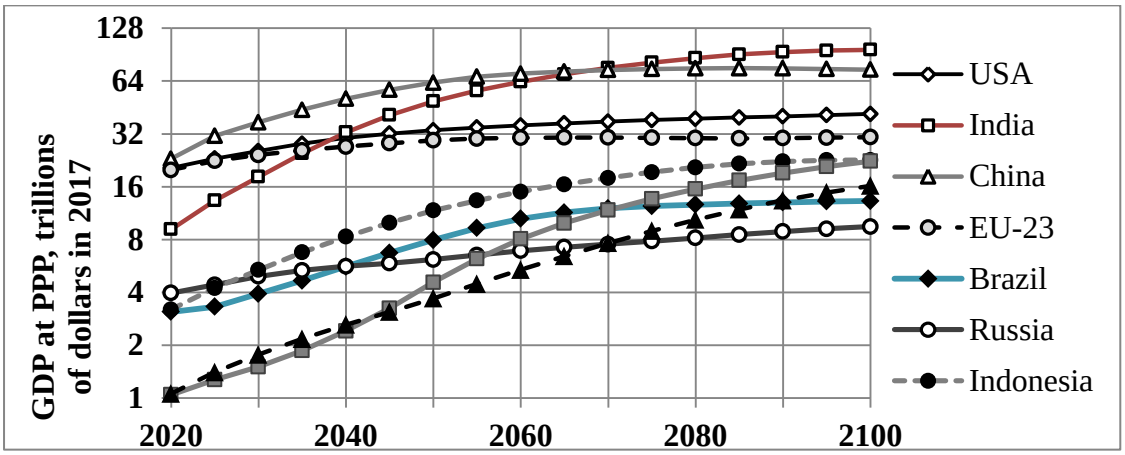

FIGURE 1
COMPARISON OF GDP DYNAMICS FOR THE LARGEST ECONOMIES

It can be seen that China is the world leader in GDP at PPP until 2067, but after this date, the increase in labor productivity is only enough to compensate for the population decline. At the same time, India's GDP is growing throughout the century. It will surpass the GDP of the United States and the European Union (here together with the UK) by 2040. India will be ahead of China in 2067, and it will be ahead by 30% by the end of the century. There are no countries that can surpass India in terms of GDP in the future.

Thus, China will have almost 50 years to realize its opportunities for economic and technological leadership, which is not very much by the standards of global development. The dynamics of China's GDP demonstrates that the demographic transition and population decline have a very significant impact on economic growth.

GDP per capita growth in the presented economies until 2050 is mainly equidistant, and by 2100 there is a convergence of the GDP per capital level for them. Nevertheless, the United States and the European Union will remain the leaders in this indicator. This means that they will have a reserve of GDP to increase the number of research and development specialists to increase the human capital index IHC and, accordingly, GDP.

The dynamics of GDP growth for smaller economies show that Japan, Brazil, Mexico, and Turkey are almost exhausting their GDP growth potential by 2070. Indonesia, Nigeria, Pakistan are moving into a stage of rapid growth and retain the potential for GDP growth for the next century. The main driver of their growth will be the population (300-700 million people), which will grow until the end of the century.

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This forecast shows (Table 1) that the countries that are currently developing will dominate the world economy by 2100. Their share in the total GDP of the studied economies (350 US Dollars Trillion) will be 78%.

Table 1
GDP FORECAST FOR THE LARGEST ECONOMIES IN US DOLLARS TRILLION 2017

	India	China	USA	EU-23	Indonesia	Nigeria	Pakistan	Brazil	Russia	Mexico	Turkey	Japan	Total
GDP 2100	96.5	74.3	41.5	30.7	22.7	22.4	16.2	13.3	9.5	9.5	7.1	6.4	350.1
GDP 2050	49.0	62.7	33.6	29.4	11.7	4.6	3.7	8.0	6.2	5.0	5.7	6.7	226.3

The five largest economies in 2100, as well as in 2050, will continue to rank first, and only India and China are changing places among them. A significant change in the picture of ranks is also that Nigeria and Pakistan are moving from 11-12 to 6-7 places, and Japan is moving from 9 to 12 places due to a reduction in the population.

An important change that will occur with the economic dynamics is the rapid decline in the growth rate of GDP per capita. It will decrease four times to an average value of 0.5% per year from 2050 to 2100. This will happen mainly as a result of reaching the maximum coverage of employees with tertiary education (up to 75%). In the top five economies by 2100, only India will have a GDP per capita growth rate of more than 0.5% per year. This indicator will be at the level of 0.6-0.7% in Brazil, Russia, Mexico, and Nigeria, and 1.7% in Pakistan. This fact requires finding new resources for the growth of human capital, in particular, the relevance of an inclusive approach is increasing, as well as an increase in the share of research and development specialists.

A comparison of the forecast GDP values in 2050, obtained by PwC in 2017, and in this work - ViC, shows that the ranks taken by the six largest and two smallest economies in 2050 are the same according to both calculation methods. The discrepancy in the ranks is observed only among the four economies with similar GDP values, which lie in the range of 5-7 trillion dollars. The arithmetic mean of the difference in GDP values for the two forecasts is 3%, and the standard deviation is 12%. This suggests that these two forecasts give, in general, close values of the GDP of the largest economies in 2050.

A comparison of the relative spread (in%) of the PwC forecast values from ViC with the spread between the PwC values of 2011-2017 shows the following. The relative spread of GDP forecasts made by PwC in different years is, on average, three times greater than the difference between the forecast of PwC 17 and ViC 21. This allows asserting that the forecast for 2050 made in this work using the ViC methodology has fairly high reliability in comparison with the PwC forecast.

Thus, the development of a long-term economic forecasting model of the endogenous type - ViC allowed forming comparative forecasts for the world's largest economies for 80 years, based on the fact that the main GDP growth will occur as a result of an increase in human capital, which occurs due to an increase in the level of tertiary education and research and development activities, as well as the influence of demographic processes.

However, technological revolutions played an important role in the previous cycles of change of the leading countries (Attali, 2011). Currently, the conditions are ripe for another technological revolution (Prichina et al., 2020; Schwab, 2017). Depending on what radical new

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technologies it brings, the process of economic growth may also change. It is especially important to what extent the development of artificial intelligence technology can affect the research and development sphere.

CONCLUSION

The method of ViC forecasting GDP at PPP for the period up to 80 years has been developed. It is formed based on an endogenous approach and an educational model of human capital and allows assessing the potential of economic leadership of the largest economies. This makes it possible to significantly increase the time of long-term strategic planning.

The calculations of GDP at PPP dynamics up to 2100 for the 12 largest world economies at the end of this period have been performed. It has been shown that the dominant share of 78% will be held by countries that are currently developing by the end of the century, in the composition of these economies with a total GDP of 350 trillion international dollars in 2017.

The first place in terms of GDP by 2100 will be taken by India with GDP=96.5 trillion international dollars in 2017, and the second by China with GDP=74.3 trillion dollars. No countries have been identified that can potentially surpass India in terms of GDP even after 2100 unless new factors arise that will dramatically and massively increase labor productivity or affect demographic processes.

China will be the leader in terms of GDP for about 47 years, and then its GDP will grow very slowly, as a result of a decrease in the population. Around 2067, India will outstrip China in terms of GDP at PPP and will break away, surpassing China by 30% of GDP by the end of the century.

The obtained GDP forecast was compared using the endogenous calculation method with the results of the PricewaterhouseCoopers forecasting performed using the exogenous method. It has been shown that there is a good agreement between these two forecasts in 2050. The arithmetic mean of the difference in GDP values for the two forecasts is 3%, and the standard deviation is 12%. The relative difference between the forecasts of PwC 21 and PwC 17 for the studied countries is, on average, three times less than the relative spread between the four forecasts made using the PwC methodology in 2011-2017.

A good agreement of the forecasts according to the models ViC 21 and PwC 17 confirms the reliability of the result obtained, according to which the share of workers with tertiary education and the number of research and development specialists per billion GDP has a dominant influence on economic growth. Therewith, the contribution of a research and development specialist to GDP exceeds the contribution of an employee with tertiary education by about 36 times, which makes it relevant to develop various scenarios for activating scientific activity.

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REFERENCES

Attali, J. (2011). *A brief history of the future: A brave and controversial look at the twenty-first century*. Skyhorse Publishing Inc.

Barro, R.J., & Lee, J.W. (2015). *Education matters. Global schooling gains from the 19th to the 21st century*. Oxford University Press.

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Barro, R.J., & Martin, S.I.X.(2004). Economic growth. *Journal of Macroeconomics*, *18*, 552.

Donetskaya, S.S., & Qiannan, J. (2018). Reforming the higher education system in China: Current results. *Higher Education in Russia*, *27*(12), 79-92.

Franklin, D., & Andrews, J. (Eds.). (2012). *Megachange: The world in 2050*. John Wiley & Sons, 105.

Guillemette, Y., & Turner, D. (2018). The long view: scenarios for the world economy to 2060. OECD Economic Policy Paper No. 22. OECD Publishing, Paris.

Harrod, R. (1972). An essay in dynamic theory. In *Economic Essays*. Palgrave Macmillan, London, 254-277.

Hawksworth, J., & Chan, D. (2013). *World in 2050. The BRICs and beyond: Prospects, challenges and opportunities*. PwC Economics.

Hawksworth, J., & Chan, D. (2015). (2015). The World in 2050. Will the shift in global economic power continue? PwC Economics.

Hawksworth, J., & Tiwari, A. (2011). The World in 2050: The accelerating shift of global economic power: challenges and opportunities. PWC.

Hawksworth, J., Audino, H., & Clarry, R. (2017). *The world in 2050. The long view how will the global economic order change by 2050?* PwC.

Mankiw, N.G., Romer, D., & Weil, D.N. (1992). A contribution to the empirics of economic growth. *The quarterly Journal of Economics*, *107*(2), 407-437.

OECD. (2020). *Education at a Glance 2020: OECD Indicators*. Paris: OECD Publishing. Retrieved from https://www.oecd-ilibrary.org/education/education-at-a-glance-2020_69096873-en

Orekhov, V.D., Prichina, O.S., Blinnikova, A.V., Panfilova, E.A., & Shchennikova, E.S. (2019). Indicative diagnostics of the educational component of human capital based on mathematical modeling. *Opción*, *35*(20), 2337-2365.

Prichina, O., Orekhov, V., & Shchennikova, E. (2017). World number of scientists in dynamic simulation for the past and the future. *Economic and Social Development: Book of Proceedings*, 69-81.

Prichina, O.S., Orekhov, V.D., Egorova, E.N., Kukharenko, O.G., & Blinnikova, A.V. (2020). Developing and testing the forecasting algorithm for the technological revolution theme through the analysis of the scimago JR scientific journal database. *Journal of Advanced Research in Dynamical and Control Systems*, *12*(Special Issue), 712.

Prichina, O.S., Orekhov, V.D., Evdokimova, Y.V., Kukharenko, O.G., & Kovshova, M.V. (2019). Evolution of key factors and growth potential of human capital. *International Journal of Innovative Technology and Exploring Engineering*, *8*(7), 2226-2234.

Saaty, T.L. (2008). Relative measurement and its generalization in decision making why pairwise comparisons are central in mathematics for the measurement of intangible factors the analytic hierarchy/network process. *RACSAM-Revista de la Real Academia de Ciencias Exactas, Fisicas y Naturales. Serie A. Matematicas*, *102*(2), 251-318.

Schultz, T.W. (1971). Investment in human capital. The role of education and of research.

Schwab, K. (2017). The Fourth Industrial Revolution. Crown Business, New York. *The smart-up ecosystem: Turning Open Innovation into smart business*.

Solow, R. M. (1956). A contribution to the theory of economic growth. *The quarterly journal of economics*, *70*(1), 65-94.

The World Bank. (2018). *Researchers in R&D (per million people).* Retrieved from https://data.worldbank.org/indicator/SP.POP.SCIE.RD.P6?end=2018&start=1996

The World Bank. (2020a). *GDP per capita, PPP (current international dollar)*. Retrieved from https://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD?view=chart

The World Bank. (2020b). *Inflation, GDP deflator (annual %) - United States*. Retrieved from https://data.worldbank.org/indicator/NY.GDP.DEFL.KD.ZG?locations=US&view=chart

UIS UNESCO (2013). *International Standard Classification of Education 2011*. Montreal, UIS UNESCO, Canada. Retrieved from http://uis.unesco.org/sites/default/files/documents/isced-2011-ru.pdf

United Nations. Department of Economic and Social Affairs, Population Division. (2015). *World population prospects: The 2015 revision, key findings and advance tables.* New York. Retrieved from https://www.un.org/en/development/desa/publications/world-population-prospects-2015-revision.html

United Nations. Department of Economic and Social Affairs, Population Division. (2019). *World Population Prospects 2019: Highlights*. Retrieved from https://www.un.org/development/desa/publications/world-population-prospects-2019-highlights.html

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Von Foerster, H., Mora, P.M., & Amiot, L.W. (1960). Doomsday: Friday, 13 November, ad 2026. *Science*, *132*(3436), 1291-1295.

Wilson, D., & Parashothaman, R. (2003). *Dreaming with BRICs: The Path to 2050*. Global Paper No. 99. Goldman Sachs, 19-20.

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