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DATA ELEMENTS AS THE KEY FACTOR TO INFLUENCE THE GROWTH OF DIGITAL ECONOMY

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At the present stage of human economic development, economic growth has become a phenomenal issue. The economy was in a state of relative stagnation for a long time in human production activities until the industrial revolution in the 18th century, when the economy began to grow in a real sense. Now the digital factor brought by the digital economy has become another round of revolution to drive economic growth. By sorting out the classical economic growth theories can help to better understand the role of data as a new factor of production for economic growth.

Keywords: digital economy; economic growth; data; economic theories; growth models.

ЭЛЕМЕНТЫ ДАННЫХ КАК КЛЮЧЕВОЙ ФАКТОР ВЛИЯНИЯ НА РОСТ ЦИФРОВОЙ ЭКОНОМИКИ

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На современном этапе экономического развития человечества экономический рост стал ключевым вопросом. Экономика долгое время находилась в состоянии относительной стагнации вплоть до промышленной революции в 18 веке, когда экономика начала расти в реальном смысле этого слова. Теперь цифровой фактор, привнесенный цифровой экономикой, стал еще одним витком революции, стимулирующим экономический рост. Разбор классических теорий экономического роста может помочь лучше понять роль данных как нового фактора производства для экономического роста. Статья продолжает цикл исследований, начатый в [1–2].

Ключевые слова: цифровая экономика; экономический рост; данные; экономические теории; модели роста.

Classical economic theories

Malthus's Theory of Economic Development

The first model of economic growth was proposed by Malthus in 1798 in his «Principle of Population» and included productivity and land as the two most important factors of production. There are two features in his model: land is a central factor of production in his model, the total amount of land is limited and the supply is fixed, which shows that countries were in «The Theory of Population Trap» for a long time before the Industrial Revolution, and technological progress could not increase GDP.

Population is endogenous, when the per capita output increases, unless the effective demand increases, simply increasing the population itself cannot lead to economic development. Malthus made a valuable contribution to the theory of economic development by emphasizing the importance of effective demand and its relationship with saving and investment.

Malthusian theory of economic development focused primarily on explaining the factors that impede growth rather than those that promote economic development. However, his Principles of Political Economy theory makes a positive contribution to certain elements to the growth process, arguing that production and distribution are the two main elements of economic growth and that the distribution of production is as important as production itself or sustained economic development [3].

Solow growth model

After the Industrial Revolution, Robert Solow proposed the Solow model of growth, which won the Nobel Prize in Economics. In the model, the factors of production changed, a new factor of production (capital) was added, and it was emphasized that capital can be accumulated [4]. In Solow's model the focus is on the dynamics of capital, but the role of human capital accumulation, education, and research on economic growth is ignored. The base growth in Solow's model cannot be explained.

Romer's Endogenous growth theory

Paul Romer introduces two new factors of production (technology, human capital) in his new model. In the model GDP is determined by four factors of production: human capital, technology, labor and capital. The major difference between the endogenous growth model and Solow's growth model is that in this model knowledge and technology growth can continue to accumulate without limits through endogenous decisions such as investment in education and research [5]. The non-competitive nature of the knowledge factor is also an important property of the data factor [6–7].

The economic role of data elements

Data is the «new oil and computing power is the engine» of the digital economy. As a new factor of production, data plays a productive role in two main ways: one is to produce productive value directly. The second is used in the innovation process. After the acceleration of the digital economy, 90 % of the data in human history as of 2023 has been generated in the last decade. According to IDC's Data Age 2025 global data circle statistics, it will grow more than fivefold in the next seven years. The total amount of new data created in 2025 is expected to increase from 33 ZB in 2018 to 175 ZB [8]. The rapid increase in data due to COVID-19 has contributed to the booming digital economy. As a new factor of production, digital has characteristics that other factors do not have, it is non-competitive, exclusive, and private. In the study of CI Jones, C Tonetti

developed the important role of data in the economic system that can be used directly in the production process and can increase the efficiency of production [9]. Lin William Cong, Danxia Xie el study constructed a new model of endogenous growth with data as a new key factor of knowledge accumulation. Data contribute to innovative activities and efficiency gains in the economy [10]. The value of data is that it is used for innovation by «bleaching and condensing» and turning it into knowledge that circulates in the process of economic development. It has been found that through the innovation process, data becomes a valuable, clean and infinitely usable knowledge that can be used not only in the current period but also in future periods without limits, increasing the role of data for economic growth, which is the key mechanism of the endogenous growth theory of data innovation.

The difference between CI Jones, C Tonetti and Lin William Cong, Danxia Xie el study is that the latter focuses on the role of data in the innovation process, while the former emphasizes that data contribute to productivity in the production process and that data can be shared non-competitively.

It is known from the study that the mechanisms elaborated by the endogenous growth theory of data innovation are particularly important for driving economic growth, and that data are very important mechanisms for increasing the growth rate of the digital economy by promoting innovation. Encouraging more sectors to use the innovative power of data and to use «bleached and condensed» knowledge is important for countries and cities around the world with large populations and economies of scale, and the data resources they generate are valuable for the future growth of the digital economy and the comparative advantage of digital nations. It is also the comparative advantage of digital countries.

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