THE IMPACT OF TRADE LIBERALISATION ON HEALTH CAPITAL: A REVIEW

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ABSTRACT. This paper explores the relationship between trade liberalisation and health capital within the context of economic globalisation. Acknowledging the limited integration of trade theory and health economics, the author reviews existing research on trade's impact on health capital. The article develops a model based on Grossman's health production function to analyse indirect effects, considering factors like labour market dynamics, income distribution, environmental pollution, and public services. Finally, the author critiques current literature, highlighting contributions and gaps, and suggests future research directions, particularly with a focus on evidence from China.

KEYWORDS: trade liberalisation, health capital, health production functions, determinants of health capital.

JEL-code: F18, I15.

DOI: 10.46782/1818-4510-2024-4-129-143

Introduction

Health, as one of the important human capitals, is the most basic and viable ability of an individual, which is crucial for promoting sustainable economic prosperity and is an important factor in the sustainable development of a country and social harmony. With the rapid development of science and technology brought about by globalisation, the market has unleashed tremendous energy, and trade exchanges between countries have become more and more intensive. While economic globalisation promotes socio-economic prosperity, increases national income, and improves the quality of life (Fischer, 1993), it may also further aggravate a series of problems such as regional conflicts, environmental pollution, diseases, and distributional inequity (Benzeval, Judge, 2001; Chokshi, 2018; Dix-Carneiro, Kovak, 2017). Therefore, to further improve the national health level and realise the sustainable and harmonious development of the society, it is of great practical significance to clarify the relationship between trade and health.

China is an excellent example for understanding this research direction. Since the reform and opening up, China's average annual economic growth rate has been three times that of the world in the same period, and there is no doubt that trade liberalisation has played an important role in «China's miracle of economic growth», especially since its accession to the World Trade Organization (WTO) in 2001, when the total volume of trade has expanded dramatically (Fig. 1).

Almost simultaneously, hypertension and obesity have risen to varying degrees in China. Data show that in 2012, compared with 2002, China's adult obesity rate rose by 67,6%[1]. The per capita daily salt, oil, and sugar intake of adults was higher than the World Health Organisation standards (Table 1)[2]. Furthermore, from 1991 to 2015,

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[1] Body mass index (BMI) is Weight(kg)/Height(m)2, and according to Chinese weight determination standards, BMI ≥ 28 kg/m² is considered obese. Adult obesity growth rate refers to the average annual growth rate of obesity rate of residents aged 18 and above.

[2] Healthy China Initiative (2019–2030). URL: https://www.gov.cn/xinwen/2019-07/15/content_5409694.htm

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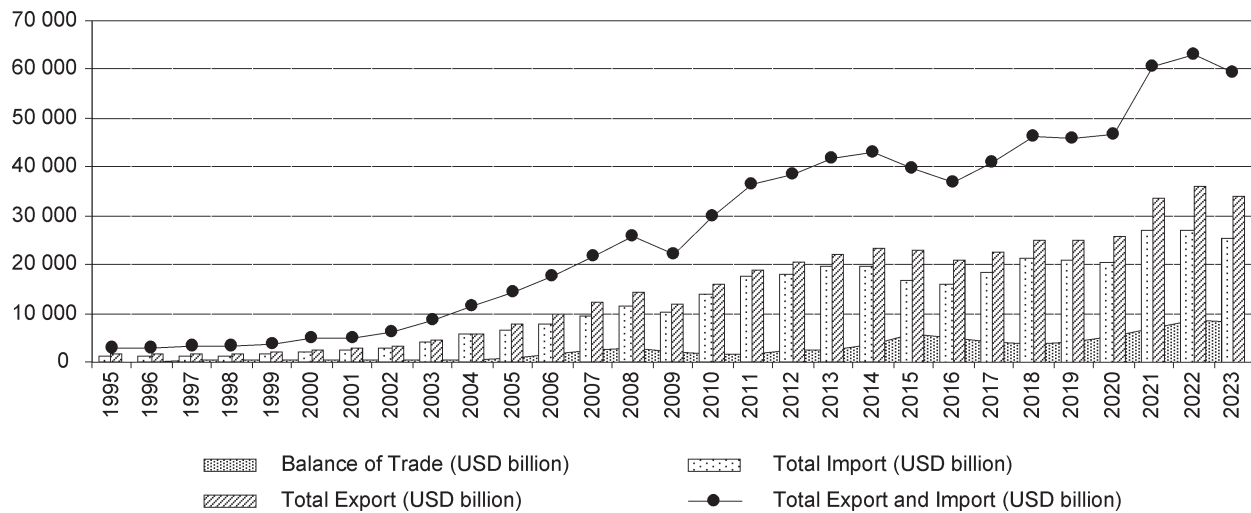[*] **Zhang Yuting** (zytingoing@gmail.com), Belarusian State University (Minsk, Belarus).

Fig. 1. Development of China's import and export trade, 1995–2022

Source. National Annual Statistical Bulletin, URL: http://www.stats.gov.cn

Table 1

Daily intake of oil, salt, and sugar by Chinese adults, 2012

Category, g	Standards of World Health Organization	Adults in China
Per capita intake of daily salt	< = 5	10,5
Per capita daily intake of edible oil	25–30	42,1
Per capita daily intake of added sugar	< = 25	30

Note − Calculation. Total daily consumption of added sugars in the monitored population / total number of people in the monitored population, the same as belo.

Source. Healthy China Initiative (2019−2030). URL: https://www.gov.cn/xinwen/2019-07/15/content_5409694.htm

adult morbidity rates showed an increasing trend of varying degrees in different provinces of China (Fig. 2)[3]. The serious health situation of the population has attracted great attention from the society and the government. Therefore, to further enhance national health and promote sustainable socio-economic development, it is of great practical significance to clarify the relationship between trade and health capital.

It should be noted that the concept of «trade» in this study mainly refers to the exchange of goods and services between countries (Abu-Akeel, 1999). The meaning of «health» mainly refers to the concept of the World Health Organisation (WHO) expenditures since 1948, and health not only refers to the absence of disease and infirmity, but also refers to a good state of health such as mental and social adjustment[4]. With the development of micro-databases and questionnaires in recent years, self-assessed health has become one of the most important indicators of health. Health refers not only to the absence of disease and infirmity, but also to a good state of mental, psychological and social adjustment. Therefore, the definition of health in this paper includes two aspects: physical health and mental health. The paper is structured as follows: the second part is about the direct impact of trade on health; the third part discusses the determinants of health based on the health production function, such as labor market related factors, income distribution, environmental quality, healthcare accessibility, education accessibility and other public services, and on this basis discusses the indirect impacts of trade on health; finally, it summarises and further provides a brief outlook on future

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[3] Morbidity refers to illness or injury, as well as chronic or acute illness. Calculated from the China Health and Nutrition Survey (CHNS) database.

[4] Basic documents: forty-ninth edition (including amendments adopted up to 31 May 2019). Geneva: World Health Organization.
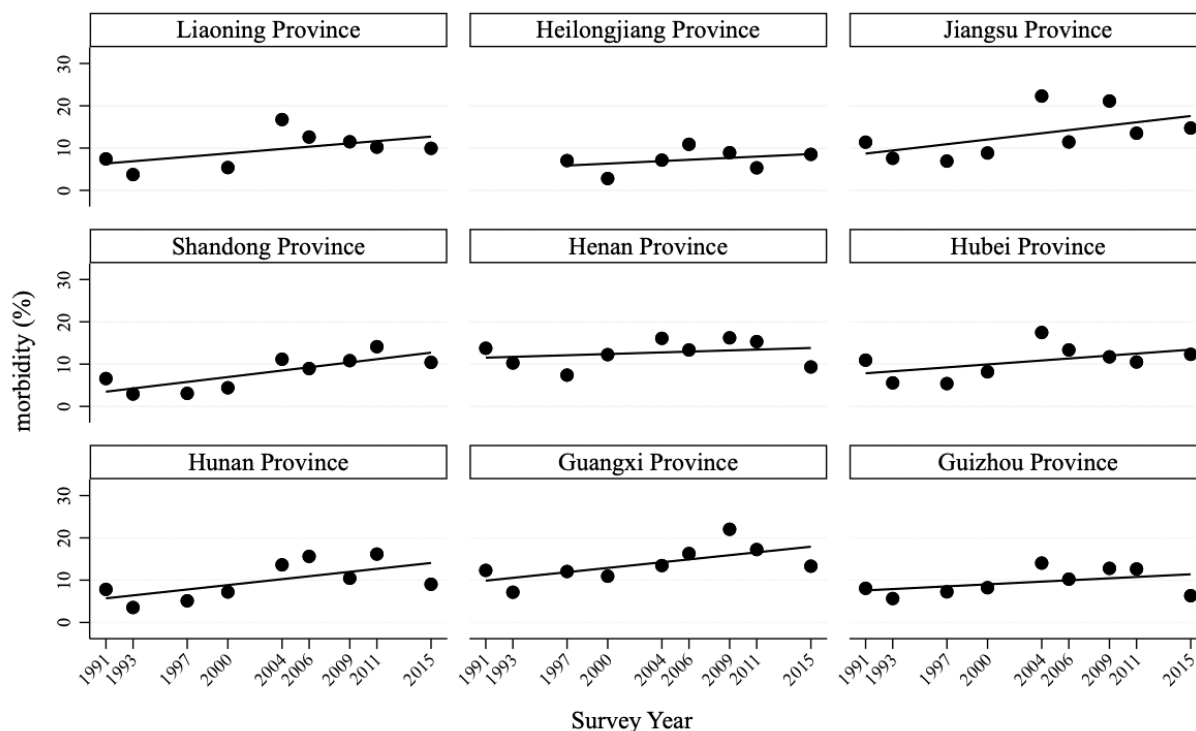
Fig. 2. Trends in morbidity by province in China, 1991−2015

Source. Calculated from the China Health and Nutrition Survey (CHNS) database. The data originated from a follow-up survey conducted in 1989 by the University of North Carolina at Chapel Hill in collaboration with the Institute of Nutrition and Health of the Chinese Center for Disease Control and Prevention (CDC), with multiple rounds of surveys conducted in 1991, 1993, 1997, 2000, 2004, 2006, 2009, 2011, and 2015, and the data covered 15 Chinese The data covered 15 provinces/autonomous regions/municipalities with different levels of economic and social development in China, and included individual characteristic variables, labor market information, and personal health information such as the morbidity rate of the respondents.

research directions in the trade and health nexus based on current research gaps.

Direct impact of trade on health capital

Considering that there are currently few studies on the direct impact of trade on health, we have reviewed the limited literature to analyse this impact in terms of disease, food safety quality, and nutritional intake.

Trade and disease

Explorations on the relationship between trade and disease are basically in agreement that trade to some extent triggers diseases and thus is detrimental to the health of the nation. Using the global wildlife trade as an example, it has been argued that trade liberalisation threatens not only livestock, rural livelihoods and indigenous wildlife, but also population health and ecosystems, and that disease outbreaks triggered by the animal trade have led to hundreds of billions of dollars in economic losses worldwide (Karesh, Cook, Bennett, Newcomb, 2005). A study based on a questionnaire analysis of livestock trade networks in West and Central Cameroon has analysed the impact of animal trade activities on the spread of infectious diseases at the micro level, validating to some extent the conclusion that trade triggers the spread of diseases (Motta, Porphyre, Handel, Hamman, 2017). Based on the British Household Panel Survey (BHPS) found that import competition increases people's mental stress mainly by increasing work stress and lowering people's expectations of the future (Colantone, Crinт, Ogliari, 2015). A study based on data on Mexican food imports from the U.S. along with anthropometric data showed that up to 20% of the increase in the prevalence of obesity in Mexican women between 1988 and 2012 was attributed to exposure to food imported from the U.S., and that the importation of unhealthy food significantly increased obesity rates in Mexico (Giuntella, Rieger, Rotunno, 2020). Studies in China have come to similar

conclusions, with trade liberalisation also leading to an increased risk of obesity in the population (Tian, Lin, 2023).

Trade and food safety and quality

The study of trade and food safety was initially centred on the income levels of countries. High-income nations typically develop stringent trade safety regulations, and the expansion of trade can enhance food safety quality by increasing government regulatory awareness. In contrast, in low-income countries, the growth of trade and the development of trade safety regulations do not progress in tandem, making it challenging to ensure food safety quality in the short term (Labontй, 2019).

Subsequently, many scholars have conducted research around the positive or negative impact of trade on the existence of food safety. Based on data from 15 importing countries, some studies have identified a positive relationship between food safety standards and the scale of trade. On one hand, improvements in food safety levels can enhance trade gains; on the other hand, the expansion of trade can further elevate food safety standards (Wilson, Otsuki, 2001). Expansion of the scale of food trade will further increase the importance attached to food safety by relevant government departments and safety agencies, thus effectively improving the quality of food safety (Khan, 2012).

However, there are also studies that concluded that the expansion of trade scale brings harm to food safety. Trade liberalisation has led to challenges on the cultivation of maize diversity in Southeast Asian countries, and the large-scale planting of genetically modified (GM) crops undermines the cultivation of the original crops, posing a hazard to local food security (McMichael, 2001). It has also been argued that food standards can act as a barrier to trade; however, the challenges posed by these safety standards can simultaneously serve as a catalyst for enhancing food safety management capacity. For developing countries, whether standards are seen as barriers or catalysts, it is essential to adopt a strategic perspective. They must actively respond to the opportunities and challenges presented by international markets for high-value agricultural and food products (Henson, Jaffe, 2006).

Trade and nutritional intake

Early studies on trade and nutritional intake concluded that trade liberalisation improves food supply to a certain extent and lifts poor countries out of poverty, but at the same time it also leads to over-nutrition through the spread of unhealthy diets, which adversely affects the health of the population (Rayner, Hawkes, 2006). Subsequently, some studies have launched a systematic analysis of the relationship between trade and nutritional intake of residents, and concluded that trade liberalisation mainly affects the nutritional intake of residents of low-income countries through three channels: trade in goods, trade investment and trade in services (Thow, 2009). Some scholars have attempted to incorporate «habit formation» into general equilibrium models and conduct empirical tests. They found that, due to differences in agro-climatic endowments, local foods that are well-suited to the climate are abundant and relatively inexpensive. Over generations, these foods have become the preferred dietary choices of local residents. However, the liberalisation of trade in agricultural products has resulted in an increase in the relative price of these local foods, which in turn has diminished the gains from trade, thereby negatively impacting the nutritional intake of the local poor (Atkin, 2010). Above, we analysed the direct impact of trade on health by reviewing the literature from three perspectives: disease transmission, food safety quality, and the nutritional intake of the population (Fig. 3).

Indirect impact of trade on health capital

The production function of health and its determinants

Grossman utilised Becker's concept of human capital to further develop the concept of health capital, which for the first-time distinguished health from other forms of human capital by defining it as a durable capital stock capable of yielding a healthy lifetime and constructing a health production function (Grossman, 1972; Becker, 1962). It is assumed that an individual's investment in health stock consists of self-health investment
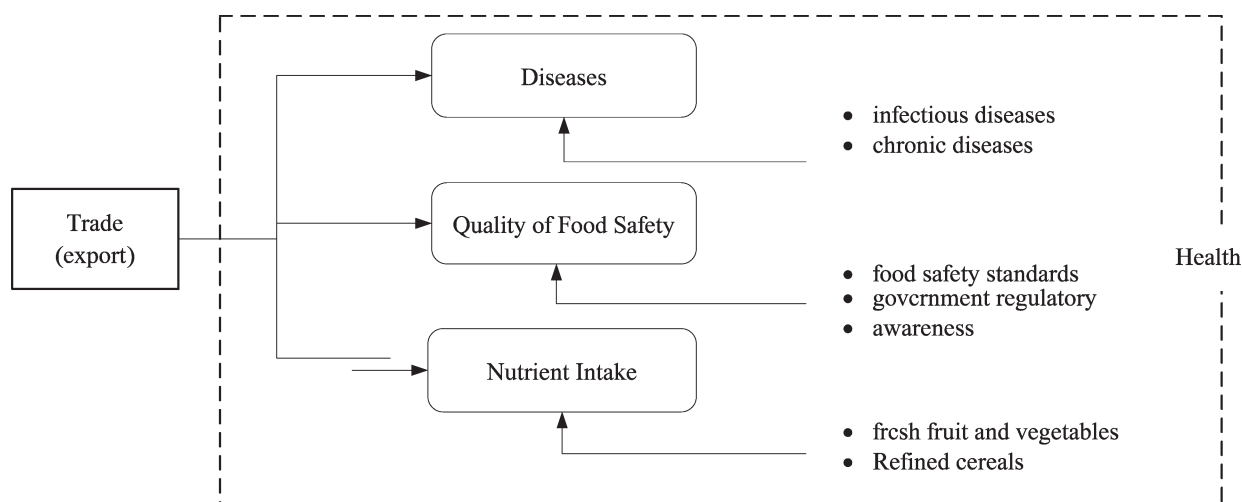
Fig. 3. Direct impact of trade on health

Source. Compiled by the authors.

(*t*) and non-self-health investment (*O*). Among them, self-health investment refers to health investment behaviors in which individuals have autonomy, including daily healthy diet, exercise, and the choice of medical services, etc.; non-self-health investment behaviors refer to those in which individuals do not have the right to manage and make decisions, e. g., the supply of social public services, social medical services, and medical products. Along with the accumulation of self-health investment and non-self-health investment, the stock of health capital (*H*) increases, assuming that the health productivity is *e*, a simple health production function can be obtained:

$$H\,(t,\,O,\,e). \qquad (1)$$

In general, we consider *H* to be an increasing function of *t* and *O* and concave, assuming that *e* improves the elasticity of production of health of *t*, i. e., H_t/H without affecting the elasticity of production of *O*, i. e., H_o/H. At the same time, it is assumed that there is a complementarity between *t* and *O*, i. e., $H_{to} > 0$. That is, the total stock of health capital (H_t) is equal to the initial stock of health capital plus the stock of health capital (H_o) that has changed over the course of the process:

$$H_t = H_o + H\,(t,\,O,\,e). \qquad (2)$$

Subsequently, one after another, scholars have constructed relevant health production functions based on their own research purposes.

Next, we will organise and analyse the literature based on the health production function, and explore the impact of influencing factors such as labor market-related factors (employment rate, personal income level, work intensity, etc.), income distribution, environmental quality, and public services (healthcare accessibility and public education expenditures, etc.) on the health capital. We construct a function of the influential factors on health:

$$H_t = f\,(L,\,I,\,E,\,P,\,N). \qquad (3)$$

In equation (2), *H* is health capital; L refers to labor market-related influencing factors including employment and income; *I* and *E* denote income distribution and environmental quality-related influencing factors, respectively; *P* refers to public service-related influencing factors including medical care, education, etc.; and *N* refers to other factors affecting health capital. Specifically, it can be expressed as:

$$H_t = f\,(L_{1t},\,L_{2t},\,...\,L_{nt};\,E_{1t},\,E_{2t},\,...\,E_{nt};$$

$$L_{1t},\,P_{2t},\,...\,P_{nt};\,N_{nt}). \qquad (4)$$

Then, *Eq.* (4) is further simplified using differentiation:

$$H_t = \prod L_{it}^{\alpha i} \prod I_{jt}^{\beta j} \prod E_{kt}^{\gamma k} \prod P_{mt}^{\lambda m} \prod N_{nt}^{\mu n}. \qquad (5)$$

In *Eq.* (5), where α*i*, β*j*, γ*k*, λ*m* and μ*n* are the elasticity coefficients of the relevant influences. We add the elasticity coefficients of the relevant influencing factors to construct the final model of influencing factors of health capital:

$$\ln H = \sum \alpha_i \left(\ln L_i \right) + \sum \beta_j \left(\ln I_j \right) + \sum \gamma_k \left(\ln E_k \right) +$$
$$+ \sum \lambda_m \left(\ln P_m \right) + \sum \mu_n \left(\ln N_n \right). \qquad (6)$$

Next, we will explore the determinants of health in conjunction with model (6), and discuss the relevant influencing factors of health capital by combing and summarising the literature. Considering the complexity of the determinants of health, this paper will summarise and sort out the existing studies based on Grossman's health production function mentioned above and the four perspectives that are more closely related to China's current economic development needs: the labor market (employment rate, absolute income, intensity of work, etc.), income distribution, environmental quality, and public services (healthcare accessibility and public education services) to explore the determinants of health capital by summarising and sorting out the existing studies separately:

Labor market related elements and health capital. McMichael et al. proposed the *healthy worker effect* (HWE) and found that the total mortality rate of certain types of practitioners is low compared to the general population (Mcmichael, Spirtas, Kupper, 1974). Subsequently, scholars from various countries have explored the relationship between work and health, including research on the connection between employment and health capital in the labour market. This research has found that employment can positively impact employees' health by providing access to fitness facilities, health insurance, and information on healthcare (Seccombe, Amey, 1995; Rogers, Hummer, Nam, 2000). Research from China found that obtaining more social support through work in turn improved the mental health status of urban women (Liang, 2016), but informal employment significantly reduced the health of Chinese residents (Ding, Liu, 2016). Meanwhile, work intensity has been found to negatively affect physical health (including blood pressure, stroke, coronary heart disease,

diabetes, and obesity) (Virkkunen, 2007; Virtanen, 2012; Кivimдki, 2015; Cook, 2018) and mental health (e. g., anxiety) (Kuroda, 2019; Gong, 2023). In addition to this, the positive effect of income on health capital has been demonstrated despite the decreasing effect of income on health capital enhancement (Preston, 1975), after addressing the issues of omitted variable bias and endogeneity (Case, 2002; Adler, 1994; Ecob, 1999).

Income distribution and health capital. Due to the diminishing health effects of income, one study found that the level of social inequality affects the average health of a society (Preston, 1975; Rodgers, 1979). Consequently, discussions regarding the relationship between income distribution and health capital have become increasingly comprehensive. Using cross-sectional data from 56 countries with significant wealth disparities, one study revealed that income inequality has a significant negative effect on life expectancy (Rodgers, 1979). Additionally, another study examining data from 59 developed and developing countries found that income inequality notably increased the infant mortality rate (Flegg, 1982). With the continuous and rapid growth of China's economy, the health of its residents has significantly improved, leading to a rise in scholarly attention towards the relationship between income, income distribution, and health. Most studies have reached similar conclusions (Rodgers, 1979). From the perspective of the urban-rural dichotomy in China, it was found that the relationship between income and health capital for rural residents was not significant, while for urban residents, income was positively correlated with health. Furthermore, income inequality reduced the health of rural residents, whereas it appeared to have a positive effect on urban residents.

Environment and Healthy Capital. Based on the health production function, the health depreciation rate leads to the decay of health capital stock, and air pollution has a health depreciation effect, which leads to the depletion of health capital. Numerous studies have shown a significant negative correlation between medium-term pollution and respiratory diseases, pneumonia, stroke and cardiovascular

morbidity and mortality (Bedada, 2012; Atkinson, 2013; Baumgartner, 2014). Although there is a relative lack of studies on the relationship between the environment and health capital in China, they have all demonstrated negative correlations between air and water pollution and health (Miao, 2010; Chen, Ebenstein, Greenstone, 2013).

Public services and healthy human capital. Given the findings of Grossman's (1972) health needs model, which suggests that both public education services and public healthcare services contribute to health promotion, Flegg (1982) empirically analysed the relationship between healthcare accessibility and mortality. He found that a 1% increase in the number of physicians per 10,000 people resulted in a 0,134% decrease in the infant mortality rate, while a 1% increase in the number of nurses per 10,000 people led to a 0,087% decrease in the infant mortality rate. This study highlights the importance of addressing income inequality and strengthening social infrastructure to reduce infant mortality in underdeveloped countries (Flegg, 1982). Furthermore, the relationship between the accessibility of health resources and the quality of public medical facilities on child mortality and the nutritional status of the population has been consistently demonstrated (Rosensweig, 1982; Rutstein, 2000; Banerjee, 2004). Most of the Chinese literature on the impact of healthcare services on health has also come to the consistent conclusion that healthcare services have a positive impact on health (Miao, 2008; Liao, 2016). Meanwhile, most of the existing related studies support the conclusion that educational services have a positive impact on health capital (Auster, 1969; Mao, 2016). It is not difficult to find that most of the empirical results support the conclusion of positive correlation between public services and health capital, although the research objectives, data, sample size and methodology are different. Considering the complexity of health determinants, the relationship between health capital and its determinants is detailed in Fig. 3.

How trade indirectly impacts health

Through the analysis of the determinants of trade, it becomes evident that trade may indirectly affect health capital through various socio-economic factors, in addition to its direct impacts via disease transmission, food safety quality, and nutritional intake. Based on the Grossman model, factors such as labor market dynamics, income distribution, environmental quality, and social public services can all influence health capital. This raises the question: does trade affect health capital by influencing these socio-economic and related factors? Furthermore, are there hidden health costs associated with the process of trade liberalisation? In the following sections, we will attempt to provide a theoretical basis for this important topic by reviewing the findings of existing studies.

Impact of trade on the labor market

Trade activities can change the incentives of households or firms to increase personal income and welfare gains, so trade liberalisation can indirectly affect population health through labor force employment (Felbermayr, 2011). Specifically, changes related to labor force employment can be summarised as changes in employment, wages, and work intensity (Egger, Etzel, 2012). In recent years, there is no lack of studies on the impact of trade liberalisation on local labor market (Dix-Carneiro, 2015; Hasan, 2006; Hakobyan, McLaren, 2016). In this paper, we will explore the impact of trade on labor market related factors (employment rate, absolute income, work intensity) by combing the existing literature.

Firstly, trade and employment rate. The conclusions of current research on the relationship between trade and employment can be summarised in three ways. The first conclusion suggests that trade liberalisation increases the employment rate. The expansion of the scale of trade liberalisation can improve the health of the population by providing more security for the food and medical expenses of low-income residents through increased employment (Johansson, Partanen, 2002). The second conclusion suggests that trade has a negative effect on employment. Trade liberalisation leads to changes in the labor structure of the labor market, widening the gap in the employment rate between workers with different skills, thus affecting the distribution of social welfare, and overall

bringing a negative effect on the health of the population (Gindling, Robbins, 2001). The third conclusion mainly focuses on the study of developed countries, that trade liberalisation has little effect on the employment rate in developed countries, and the changes in the employment rate are still mainly affected by macroeconomic fluctuations, changes in industrial structure, changes in the structure of demand, and the increase in labor productivity (Kee, Hoon, 2005).

Secondly, trade and work intensity. Numerous studies have shown that work intensity has an impact on physical health (including blood pressure, stroke, physical pain, etc.) as well as mental health (e.g., anxiety). Generally speaking, the huge market demand and economic benefits brought by trade openness will lead to the development of domestic manufacturing and other industries, and driven by huge benefits, labor-oriented enterprises are bound to increase labor intensity under the condition of meeting their own development needs, so as to obtain higher economic benefits. Hummels et al. (2016) used Danish worker-firm matched data to examine the impact of export growth on workers due to exogenous reasons and showed that exports increase the number of hours worked by workers and reduce the number of days of sick leave (Hummels, Munch, Xiang, 2016). Similarly, expanding trade investment increased the work intensity of workers in the firms, and that working hours above a certain range negatively affects worker health (Robertson, 2000). A study from European international firm data reached the same conclusion that trade activities significantly lengthen firms' standard working hours, which in the long run negatively affects the health of firms' employees (Burgoon, Raess, 2011). It's worth mentioning that in July 2024, the average weekly working hours of employed Chinese enterprises were 48.6 hours, exceeding the legal working hours by 4.6 hours[5,6.] Against the backdrop of the increasing normalisation of overwork, reports of «overworked death» and «overworked fat» have been emerging.

Finally, trade and absolute income. According to the Grossman model, income level is one of the very important factors affecting health capital[7]. The positive effect of income on health capital has been supported by most studies. Most of the studies in the area of trade show that trade liberalisation can improve the health of the population by increasing their wage levels and thus their health. For example, Arnould and Plastina, using trade data from three countries in Latin America, find that fair trade openness is conducive to raising the income of the population and its food expenditures, which in turn improves the health capital of the population (Arnould, Plastina, 2009). On the contrary, a few studies have argued that the effect of trade liberalisation on income growth has gradually weakened, so that the effect of trade-induced increases in income levels on the health of the population is insignificant (Huang, Xu, Lu, 2011), and that the negative effect of longer working hours on the health of workers to a certain extent offsets the positive effect of wage growth (Gafni, Gibson, Johnston, 1983).

Impact of trade on the income distribution

Early studies on the impact of trade liberalisation on income distribution tended to use national or industry data, and it was found that trade may affect the income gap between high-skilled and low-skilled workers (Feenstra, Hanson, 1995; Feenstra, Hanson, 1999). In recent years, scholars have begun to explore based on the regional perspective to analyse the impact of trade liberalisation on local labor market. There are three main categories of studies that have been conducted on the impact of trade on health capital through income distribution. The first category argues that there is no significant effect. For example, Dollar et al. analysis based on data from developed and developing countries shows that trade liberalisation does not have an impact on the health status of the population by affecting income inequality (Dollar, Kleineberg, Kraay, 2016). The second category argues that

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[5] URL: https://www.gov.cn/banshi/2005-05/25/content_905.htm

[6] URL: https://www.stats.gov.cn/sj/zxfb/202407/t20240715_1955618.html

[7] According to the Grossman health capital model, an increase in the level of labor compensation corresponds to a rise in the opportunity cost of a worker's time, i.e., a rise in the price of time. Specifically, higher labor compensation will increase the individual's marginal return to health, which in turn causes the marginal return curve of health investment to shift outward, thus raising the optimal level of demand for health.

trade has a negative effect on health through income distribution. For example, Herzer, Vollmer (2013) found that trade liberalisation exacerbates income inequality in low-income countries and has a negative effect on the health of the population by widening the gap between consumption and healthcare expenditures. The third category argues that trade has a positive effect on health through income distribution. For example, Calderyn argued that greater trade openness reduces income inequality in developing countries, which enhances the distribution of residential well-being as well as health (Calderyn, Chong, 2001). The study by Lee and Cheong (Lee, Cheong, Wu, Wu, 2019) also suggests that trade openness reduces income inequality between social strata, which provides a positive effect on individual well-being index and health with positive impacts. As the world's largest developing country, China has been relatively rich in studies on trade and income disparity, but whether trade has an impact on residents' health through income disparity still needs further empirical research.

Impact of trade on environment

In the context of economic globalisation, the scale of international trade is expanding, while environmental pollution is becoming increasingly severe, alongside a growing public awareness of environmental protection. An analysis from three perspectives – scale effect, structural effect, and technology effect – reveals that trade openness has both positive and negative impacts on a country's environment. The conclusions regarding the impact of trade on the environment can be summarised into two categories.

The first category holds that trade liberalisation exacerbates environmental pollution. According to the «pollution shelter» hypothesis, developed countries generally possess a stronger commitment to environmental protection and enforce stricter environmental regulations, which leads to higher production costs for polluting industries. In contrast, developing countries typically have a weaker environmental consciousness and more lenient regulations, creating cost advantages for manufacturers. As a result, developed countries can relocate pollution-intensive industries to these developing nations with lax regulations through international direct investment, effectively transferring their environmentally harmful enterprises. They can also import pollution-intensive products from developing countries, thereby reducing their own pollution-intensive industries. This dynamic undoubtedly exacerbates environmental pollution in developing countries, turning them into «pollution havens» (Walter, 1979). Empirical analyses have subsequently supported this hypothesis, with evidence from both developing and developed countries confirming its validity (Mukhopadhyay, 2006; Chung, 2012; Bao, Chen, Song, 2010; Yu, Zhang, 2016).

The second category believes that trade is conducive to improving the ecological environment. Eliste (Elist, Fredriksson, 1998) suggest that trade liberalisation does not lead to serious environmental pollution problems, and that international trade division of labor based on comparative advantage not only allocates global resources efficiently, but also improves the ecological environment effectively. At the same time, from the perspective of welfare economics, it is pointed out that trade liberalisation is beneficial to the improvement of the environment and to the realisation of the global allocation of environmental resources, thus greatly enhancing social welfare (Cole, Rayner, Bates, 1998; Strutt, Anderson, 1999).

Impact of trade on public services

Education enhances health awareness and encourages healthy lifestyles, thereby helping to mitigate health risks. Simultaneously, healthcare services can directly increase life expectancy by treating and preventing diseases. Given this context, an important question arises: can trade promote improved government provision of public services, such as education and public health? Studies have answered in the affirmative.

Overall, trade exports have led to an increase in central government tax revenues. According to Yan Kun and Chen Changsheng (2003), yxports contribute to an increase in GDP and state revenues by driving export-induced investment or enhancing domestic consumption levels due to rising export volumes. Concurrently, economic development

further stimulates the growth of export trade, creating a positive feedback loop that boosts both the economy and fiscal revenues. As a result, the expansion of exports not only increases government tax revenues but also strengthens the government's fiscal position (Yan, Chen, 2003).

The impact of fiscal revenue and expenditure on public services and public goods has been preliminarily examined in the relevant literature. In China, public services such as education and healthcare are primarily provided by grassroots local governments rather than central or provincial authorities. Consequently, when county-level finances are under strain, the supply of public goods and services also becomes inadequate. Some scholars have investigated the relationship between rural tax and fee reform in China and the fiscal burdens at the county level, using county-level data from 1997 to 2005. Their findings indicate that the fiscal burden is negatively correlated with the government's provision of public services (Lou, Wang, 2008). A similar study concluded that although the tax and fee reform reduced the burden of Chinese rural residents, it exacerbated the financial difficulties of county-level governments, which in turn led to the insufficient supply of public goods and public services by local governments, especially the insufficient supply of education (Zhou, Chen,

2015). To summarise, it is not difficult to find that trade may affect the government's public product supply and public service supply by affecting the government's fiscal revenues such as taxes, and then affecting the government's public product supply and public service supply.

Regarding the indirect effects of trade on health, a substantial body of literature has explored various research pathways. First, trade influences the labor market, with relevant labor market factors being crucial determinants of health. Specifically, trade affects health capital through its impact on income, work intensity, and employment rates. Second, there is currently no consensus on the effect of trade on health concerning income distribution. Third, trade can influence health capital by affecting environmental quality and government revenues. The detailed indirect pathways of trade's impact on health capital are shown in Fig. 4.

Conclusions and prospects

Although the relationship between trade liberalisation and health capital has received increasing attention in academic circles, there has never been a consistent conclusion, and the literature that directly explores the relationship between trade and population health is still rare. Based on this, this paper
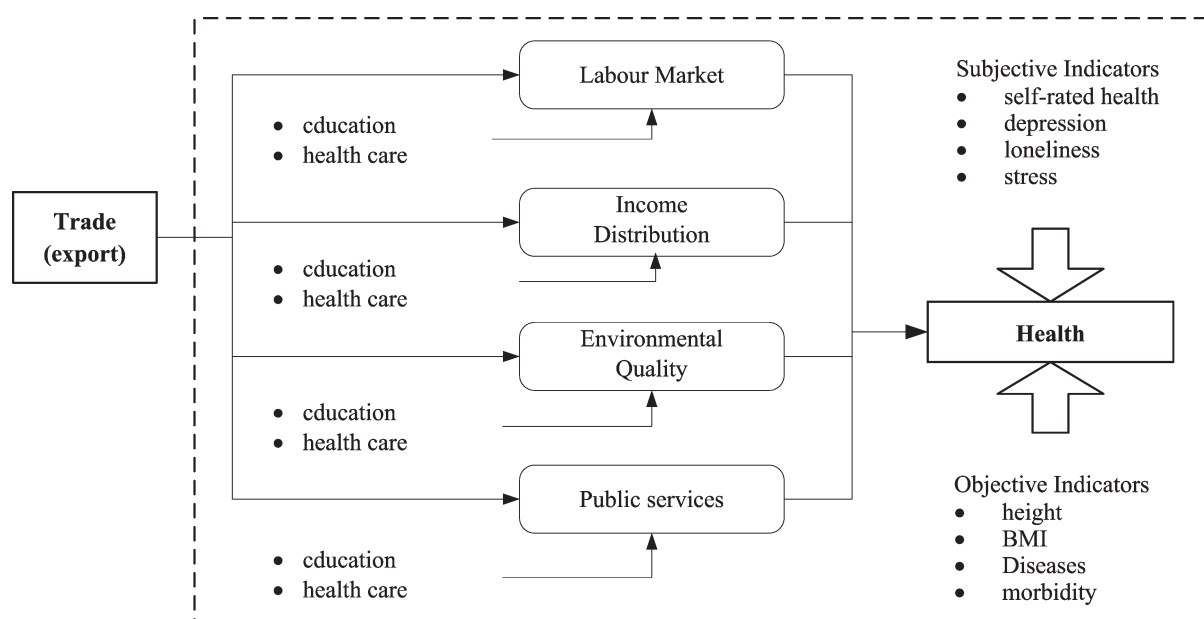

Fig. 4. Indirect impact of trade on health

Source. Compiled by the authors

reviews the existing literature on the relationship between trade and health and analyses the relevant literature in the fields of international trade, health economics, labour economics, environmental economics, and public economics, in an attempt to explore the pathway of trade's impact on health capital.

Firstly, we sort out the literature on the direct impact of trade on health. The discussion is based on three perspectives: disease transmission, nutritional intake of the population, and food safety quality. We find that while trade liberalisation has led to increasingly closer interregional ties, along with the flow of goods and services, residents of low-income regions may have access to more nutritional supplements. However, it has also led to a certain degree of increase in food safety hazards and the incidence of disease, posing a threat to the health of the population. It is worth noting that the underlying causes of disease transmission, food safety and quality control, and nutritional intake of residents brought about by trade liberalisation among different regions have not yet been systematically and scientifically demonstrated, and research on the direct impact of trade policy on health still needs further empirical exploration.

Secondly, we sort out the determinants of health capital based on Grossman's health production function and further analyse the indirect impact of trade on health. This includes analysing the impact of trade on the labour market, the impact of trade on income distribution, the impact of income on environmental quality, and the impact of income on government revenues and public services. We further argue that trade liberalisation impacts health capital by affecting employment, income, and work intensity in the labour market, as well as income distribution, environmental quality, and public services.

Through a careful analysis of the existing literature, it is clear that there are still gaps in the emerging interdisciplinary area of the relationship between trade and health.

(1) Intersectional studies of trade, health, and various other disciplines. With the intensification of economic globalisation, the impacts of trade liberalisation are complex and intertwined. In exploring the relationship between trade and health, on the one hand, it is necessary to consider the theories and views of various

related disciplines, such as trade theory, health economics, demography, and institutional economics; on the other hand, in exploring the mechanism of the impact of trade or trade policies on health, it is necessary to further consider which subdisciplinary areas are affected by the process of trade or trade policy formulation.

(2) The research framework needs to be improved and empirical research needs to be enriched. On the one hand, although the current theoretical research on trade and health is relatively plentiful, it is mostly based on social and economic factors. There is a lack of a systematic research framework that integrates economic, social, institutional, and cultural aspects. On the other hand, in empirical studies, there is still a lack of further verification of micro and large sample data on the fact that trade has an uncertain impact on the health of the population through its influence on the labour market, the environment, and public services.

(3) The empirical data and empirical methods still need to be supplemented and improved. First, the collection and improvement of databases is essential, including national or regional import and export data, as well as health data. In addition to macro health indicators such as mortality rates and life expectancy per capita at the national level, empirical analysis of micro health indicators such as physical health and mental health at the individual level is also essential. Secondly, how can the trade database, health database, and other cross-disciplinary data involved in the study be matched during empirical research? Finally, resolving the endogeneity issue is crucial in the study of the relationship between trade and health, and many existing studies have lacked consideration of the endogeneity issue in this relationship, which is one of the major reasons for the differences in the conclusions of existing studies.

(4) Research evidence from China is insufficient. In the context of economic globalisation, health has become one of the important issues of common concern around the world. Chinese scholars have analysed the factors affecting health from the perspectives of economic factors, income distribution, environmental pollution, and social security systems, but studies on the relationship between trade and health are still rare. Along with the

development of trade globalisation, China, as the world's second largest country in terms of population and the largest country in global trade, underscores the importance of research on the relationship between trade and health. As a result, is there a hidden health cost in the process of trade liberalisation? This important research direction urgently needs to be supplemented and explored by empirical evidence from China.

It should be noted that this paper, as a literature review, still has deficiencies. Firstly, although the literature collated in the relevant research directions has been relatively adequate, there are still omissions; secondly, the summary of the instrumental value and influence mechanism of trade and health capital in this paper fails to cover all aspects; finally, due to the insufficiency of existing research and the complexity of the influencing factors on the health capital of different groups, we have not discussed the influence mechanism of different groups in detail.

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ВЛИЯНИЕ ЛИБЕРАЛИЗАЦИИ ТОРГОВЛИ НА КАПИТАЛ ЗДОРОВЬЯ: ОБЗОР

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Аннотация. Рассматривается связь между либерализацией торговли и капиталом здоровья в контексте экономической глобализации. Учитывая ограниченную интеграцию теории торговли и экономики здоровья, проанализированы исследования о влиянии торговли на капитал здоровья. Разработана модель, основанная на производственной функции спроса на здоровье Гроссмана, для изучения косвенных эффектов с учетом динамики рынка труда, распределения доходов, загрязнения окружающей среды и государственных услуг. При анализе существующей литературы по данной тематике выделены достижения и недостатки, предложены направления для будущих исследований, в том числе с акцентом на данные из Китая.

Ключевые слова: либерализация торговли, капитал здоровья, производственная функция здоровья, детерминанты капитала здоровья.

JEL-классификация: F18, I15.

DOI: 10.46782/1818-4510-2024-4-129-143

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