



Impact of Digitalization on Informal Economy in China

Siyi Li*

Department of Commerce, University College Dublin, Dublin, Ireland

*siyi.li@ucdconnect.ie

Abstract. The informal sector in China plays a significant role towards both the country's employment and economy. The progress of urbanization to some extent increases Chinese self-employment phenomenon. Digitalization is a current trend to exchange information through electronic devices, which boosts the working efficiency for people. This paper examines the impact of digitalization on informal economy in China, especially for those who are self-employed. The study makes the utilization of secondary data from database such as Statista to check the condition of Chinese informality and digitalization condition. Mathematical tools (e.g., Excel and JASP) are implemented for the data visualization. According to the analysis, the development of digitalization has great impact on informal economy in China. The application of digital tools can promote the informal employment into formal one, which brings the pathways to the formalization. Digital solutions help the country to increase its economic productivity, application of regulations as well as improve enforcement systems and measures. However, without proper understanding and use of the advanced technology, it will have adverse impact towards the current informal economy condition.

Keywords: digitalization, informal economy, China

1 Introduction

As a part of economy, informal economy is a worth studying part though it is hard to be measured. Nowadays, informal employment plays a vital position of economy and labour markets in many countries, and it has significant impact on the income, production, life standards of the people living in these areas. For the term 'informal economy', it was used to describe the economic survival strategies which applies by people in poor countries [1]. Their working and earning tactics are not under the restriction of the government, which completely reverses from formal economy. By the definition of certain experts, informal economy is deemed as the incomplete evolution of the society [2]. It puts high risks of vulnerability and precariousness on the workers. According to International Labour Organization (ILO for short), informal economy is linked with self-employment and small-scale family enterprises correlated with poverty and unemployment [3]. Currently, with the fast development of the world's urbanization and diverse economic sociology, informal economy attracts people's attention for its flexibility and

a kind of practical exercise for their future ventures instead of the livelihood and income-generating strategies. Informal economy is recognized as an important phenomenon which poses a wide range of potentially serious challenges for the government and the whole society [2].

Informal economy is not defined as completely illegal economy, instead it is a kind of monetary activities which is not regulated or under the legislation of government such as the street vendors and shoes repairmen [4]. This form of economy mostly appears in the developing countries. Among these developing countries, China is the one which draws attention. China's informal economy particularly refers to the economic activities of units or individuals which are not registered by government regulatory authorities [5]. By the informal economy database, the size of China's informal economy is estimated to be 12.7% which represents approximately \$3.160 billion at the GDP level [6]. It can be seen that the informal economy size is considerable in Chinese whole economic environment. By certain estimates, nearly half of employment in urban China is still in informal economy and nearly 120 million people are not registered to work in cities. Causes such as weak legal, social safety nets and urbanization can be accounted for informal sector of Chinese economy under the fast development of gross domestic population [7].

With the development of technology, electronic devices are used much more often in people's life. Digitalization transformation makes people's life more convenient and effective. The process of converting information into a digital format is defined as digitalization. It is the use of digital technologies to change a business model and provide new revenue and value-producing opportunities [8]. Trace back to 1945, John von Neumann documents the key decisions made in the design of EDVAC, which is one of the earliest computers. This computer and its explanation became the technological basis for all modern computers as well as lay the solid foundation for today's digitalization [9], [10]. From 1950s with a bounce in 1990s, digitalization changed the way we work, study, shop, travel because of the advent of Web. It simplifies our traditional ways of communicating and living and has already penetrated every aspect of our life. As the data presented in Fortune Business Insight, the digital transformation market share was 737.88 billion in 2020 and is projected to reach 3,546.8 billion by 2028, with a CAGR of 22.1% [11]. The future expansion and growth of digitalization is no doubt considerable. Greater access towards digital technology enables people to find useful information and makes it available to increase the productivity and connection between people. With the benefits of advanced technology, more job opportunities will be available on the market, which may foster formal work and influence the condition of informal economy. Digitalization affects the informal work and informal economy greatly. According to ILO, e-formalization is defined as using digital tools to accelerate the transformation of workers into formality and make the informal economy gradually turn into the formal one [13]. Digitalization will contribute to the informal economy and forms a sustainable and inclusive environment for the Chinese working market.

Chinese informal economy is a significant part in the whole country's economy, and it has its special characters over other countries in the world. This is not only resulted from the process of urbanization for such massive population, but also for the increasing economy and technology development in China [7]. For those who unemployed

and have the burden from family, they have no choice but to do the informal jobs. Digitalization is the trend of current world with ones and zeroes surrounding us. The convenience and efficiency it provided is something cannot be ignored. The way of working, managing and paying have completely changed by year [11], [13]. There is no doubt that digitalization has great impact towards the informal economy in China with the benefits of speeding the process of formalization. However, it also needs the government to take proper measures towards new technologies. Balancing the technology and social problems is quite vital.

This paper will collect and deliver data to analyze the impact of digitalization on formal economy in China. Then, the paper will illustrate the fundamental characteristics of Chinese informal economy, the general concept of digitalization as well as the effects of digitalization on the Chinese informal working market. At last, certain suggestions will be given for both policy makers and workers to achieve ideal consequences for progress of the society.

2 Data and Method

The data of this study such as the share of global informal employment in 2021, the number of employed people in China from 2011 to 2021 mainly sourced from International Labour Organization (ILO) and National Bureau of Statistics of China. ILO is an authority which concerns and reports the working condition around the world. For National Bureau of Statistics of China, it is an official database for statistics concerned China's economy, employment, and other aspects. It can tell the accurate data and show real situation of China. The condition of informal employment and economy in China and the current condition of digitalization will be illustrated. Data sourcing and analyzing between the digitalization and informal working and informal economy is made by JASP and Excel. Both frequency and correlation analysis will be applied in the study.

For the research and data analysis, the characteristics and current condition of the world informal economy and China's one will be illustrated. The informal sector in China will be discussed as well as the digitalization market trend from both the world and Chinese sides. The data for the connection between digitalization and informal economy will be correlated.

3 Empirical Analysis

3.1 Chinese Informal Economy Condition Analysis

As reported by International Labour Organization, about 61% of world's employed people make their living in the informal economy. In Africa, 85.8% of employment is informal. As in Asia and Pacific, the data is 68.2% and 68.6%. For Americas, Europe and Central Asia, the proportion of informal economy is 40%, 25.1% respectively. According to Fig. 1, the share of informal employment is illustrated visually. Nearly 93% of total informal employment appears in emerging and developing countries, which to some extent indicates that poverty may be a cause and consequence of the informality

in these countries. For China, the proportion of its informal economy is estimated to be 12.7% of its total economy [1]. It is worth studying for a country with fast-growing GDP and high progress of urbanization still accounts for a considerable rate of informality.

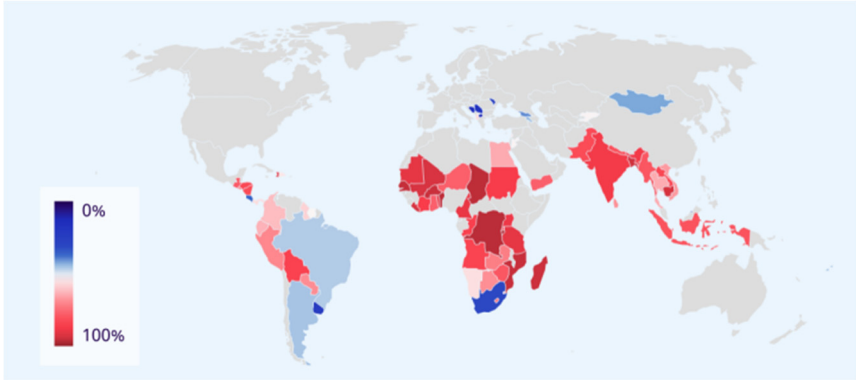


Fig. 1. Share of informal employment by country (in percent) (2021). Source from: ILOSTAT [12].

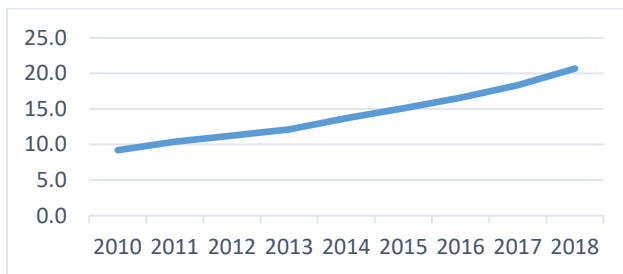


Fig. 2. Share of Self-employment in China of total employment (in percent) (2021) Source: Ref. [2].

Though for Chinese government, it seems never define the kind of being employed without government's legislation as informal economy and this term is not used often. The government in China use another concept which is called 'self-employment' to some extent refer to that kind of employment. Besides this kind of division of labour forces, people in urban and rural areas can be deemed as another way of division. According to Fig. 2, the percentage of self-employment keeps growing from 2010 to 2018 with proportion from 9.2% to 20.7%. The reason of increasing self-employment in China may mainly result from the condition of unemployment and people's pursue of flexible working time [7]. Informalization is also assumed to be a response towards social and economic restructuring that transformed and linked the peripheral economies in the several decades, Globalization, urbanization and the growth of capitalism, socialization increased the competition between businesses and individuals, which results in higher demand of efficient production processes and high profits. These groups try to

escape from state regulation, taxation in order to reduce costs in production and have the desire to get government welfare to achieve profit maximization [4]-[6]. Though the world is developing and living standard is improving, unsolved real problems such as wealth gap between rural and urban areas will still intensify the social conflicts [14]-[16].

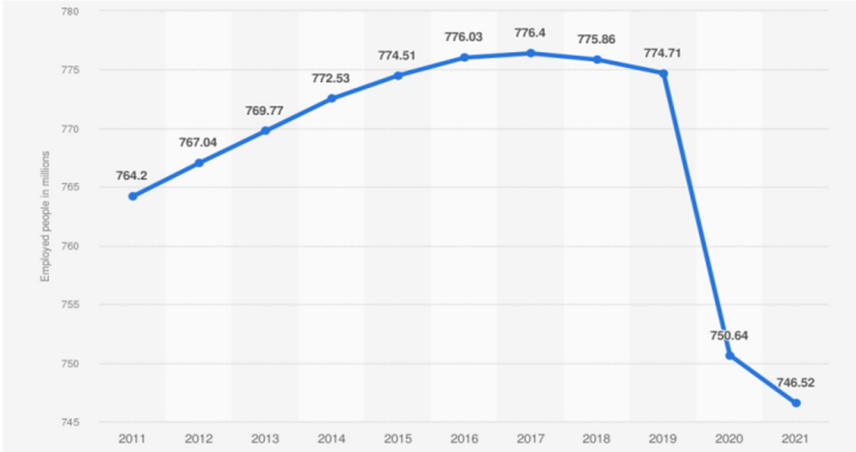


Fig. 3. Number of employed people in China from 2011 to 2021 (in millions) Source: MOHRSS: National Bureau of Statistics of China [14].

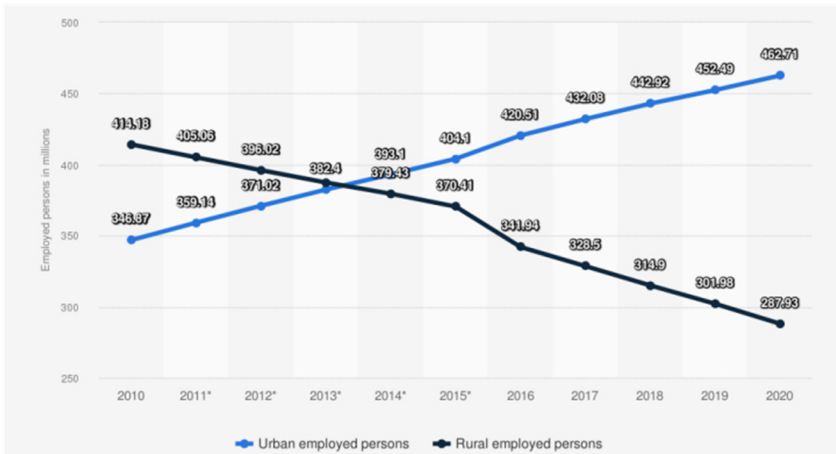


Fig. 4. Number of employed people in urban and rural areas of China from 2010 to 2020 (in millions). Source: National Bureau of Statistics of China. [15].

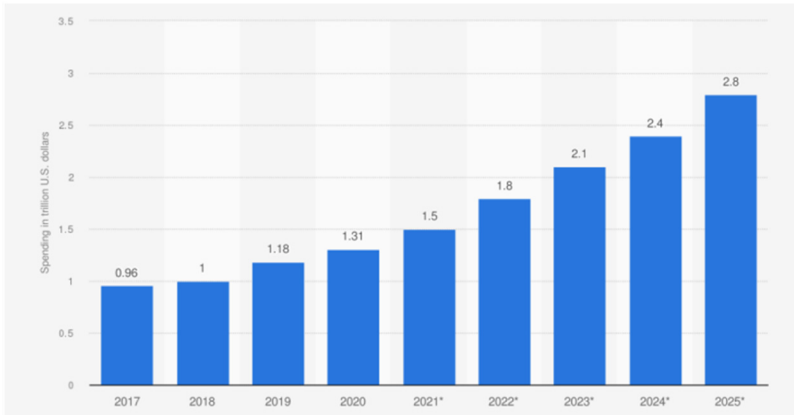


Fig. 5. Spending on digital transformation technologies and services worldwide from 2017 to 2025 (in trillion U.S. dollars) Source from: Statista, IDC [16].

From 2011-2022, the unemployed condition in China worsened with a distinct drop in 2020 and 2021 due to the pandemic. According to Fig. 3, the coronavirus pandemic poses negative effects on the workforce since 2020, reducing the number of employed people by 25% and with the increasing of informal employment during the epidemic time. Besides, the number of people working in rural areas and urban areas has changed greatly since 2013. According to Fig. 4, in 2020, around 463 million people were employed in urban areas of China, while around 288 million were employed in rural areas. The number of people employed in urban areas has increased tremendously in recent years, while the total number of employed people only increased until 2017 and decreased thereafter.

3.2 Digitalization Condition Analysis

With the benefits of convenience and high efficiency, digital tools play more and more important road in the world employment market and economy. Governments, businesses and individuals put more emphasis on the progress of digitalization. From the data in Fig. 5, the global spending on digital transformation technologies and services is gradually rising from 0.96 trillion to 1.8 trillion in 2022 with the estimates toward 2.8 trillion in 2025. The market share of digital tools become more and more important with a dominant role in almost every industry of our current world. Digitalization is changing the past working forms and classic relationships between employees and employers as well as the demand and requirement of employees' personal skills [8].

Digitalization is reshaping the industry and jobs. The products of technology such as robots is assumed to take over the role of human in the future. Automation will put one third of the job in 2030 at a risk according to the report by PwC [11]. New work infrastructure is created under the circumstance of digital worlds. Use of digital tools can be a common thing. In China, the value added on digital economy is increasing greatly according to the Fig. 6. The impact of digitalization on the industry and work-

place can create two-sided effects towards clients and employers. The increase of economic productivity through digital tools will no doubt contributes to the development of businesses, individuals as well as the formalization of current working environment and economy [17].

3.3 E-formalization Analysis

The rise of informal employment and economy worldwide and in China in particular has drawn experts’ attention and how to solve this kind of problems is always a hot topic to be discussed. Informal sector has been long considered as a product of incomplete socialization and capitalization development as well as the part appearing most among property regions [2]. For China, it is with the mixed economy in which the informal one plays an important role. However, the Chinese government hardly admit the concept or the existence of informal economy in the country. Instead, it uses the word self-employment to differentiate this kind of employment which is not under the regulations of government from employed and unemployed ones. Recent years, Chinese digital economy grows rapidly. According to the Fletcher digital adoption index, China’s speed of digitalization is faster than other 62 countries. Because of the frequent use of digital tools nowadays, people’s working style has changed to a great degree. People tend to use digital tools for higher efficiency and more convenient communication. The word e-formalization emerges to describe the combination of digitalization and economy formalization [19]. Most scholars believe that digitalization can affect the informal sector can push it towards positive aspects.

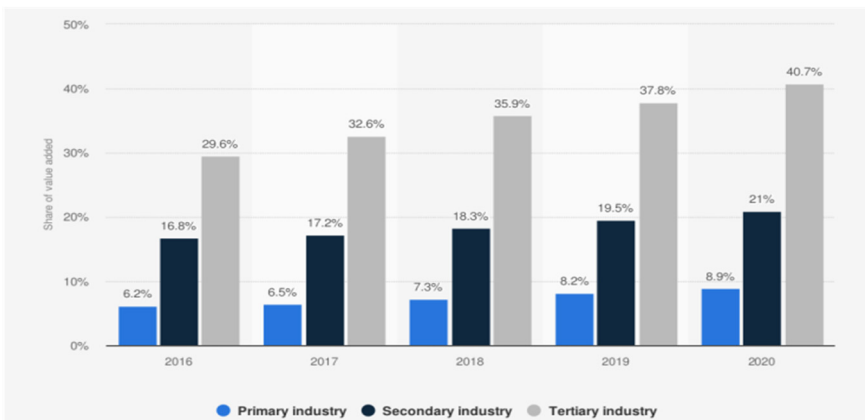


Fig. 6. Value added share of digital economy in China from 2016 to 2020, by industry. Source: CAICT [18].

3.3.1 Productivity

In the digital age, data has become an inevitable element for daily working. By the application of digital tools in daily working process, it benefits the productivity from lowering the transaction cost, contributing better matching of supply and demand as

well as enhancing the production efficiency. First, financial transactions at present can be completed in seconds on digital devices compared to the past with the requirement to visit the bank branches, which saves the time cost. In addition, digitalization tools can help to find the target customers' preference more precisely. It will not only benefit the businesses, but to some extent provide convenience for those who are self-employed. What's more, the automation has resulted in shorter cycle time with the improvement of working quality and reliability. With the digital tools, it enables the businesses have clear sales reports, enables electronic sales and billing as well as facilitating employment formalization by helping SMEs (small and medium-sized enterprises) registering employees [20], [21]. The tablet project of the Confederation of Chambers of Commerce, Service and Tourism of Mexico can be a good example. The first year, the project reached 15,086 beneficiaries of a special tax regime and verified 89% of the beneficiaries mad tax declarations, which promotes the informal working condition into formal ones.

3.3.2 Employment

Millions of jobs are created due to the digitalization in China. The thriving e-commerce sector and the sharing economy have emerged as a new source of employment creation in China. Alibaba's platform includes about 11 million SMEs in the ecommerce industry, which have produced over 30 million employments over the last decade. The Didi taxi platform (China's Uber) has 13 million drivers. Employment in the ICT industry has also increased, albeit on a smaller scale, with 1.4 million new high-skill jobs added in the last five years, and the average income has more than doubled since 2012. The increasing job position have positive effects for people pursuing formal job opportunities. However, the advanced technology reduced certain kind of jobs. For instance, the job of offline shopping guides has dropped recently due to the digital penetration [9]. Putting the two sides together, it is found that the overall impact is positive towards the employment market. Digitalization contributes nearly one third of the total employment growth in China and indicates the e-formalization can bring benefits towards the market.

3.3.3 Regulations and norms

The digitalization can help improve the informal economy from providing convenience by the electronic employment registration system and national tax system. In China, with the digitalized system, people can easily apply for the abatement of tax on their electronic devices. Compared with past complex process of application and long waiting time for the tax refund, it saves a great amount of time and energy for people to understand and know how many taxes they can refund from their salaries. Tax policies combined with the digitalization, the welfare for individuals can really take effects to relieve people's economic burden and improve their living standard. Thus, with the relieve of life pressure, people will no longer turn to informal jobs which is unstable and without social security.

3.3.4 Equality

Poverty in specific areas can be reduced by digitalization with the connection of suppliers in remote regions to customers in the metropolis. Alibaba's e-commerce platform promoted the development of over 1,300 Taobao villages in China. According to World Bank, digital tools help rural residents to grant easily access towards financial services [21]. With digitalization, the inequality of rural and urban areas can be improved. However, it should be mentioned that most people living in rural areas are usually low-skilled workers who cannot benefit greatly from the digitalization progress compared to those who with high-skilled. The promotion of social equality towards formal employment should be looked at further. It also indicates the call for proactive government policies and education demand for the rural areas.

It is true that the digitalization can expanding opportunities for informal workers and opening a pathway for them to turn to the formal working environment. The higher production efficiency, employment opportunities, more complete policies and systems can relieve informal workers economic burden and to some extent make them aware of the importance of social security and formal working. E-formalization provides a right direction for the government towards the existence of informal economy and advise them to make proper use of digital solutions to achieve sustainable development goals.

4 Conclusion and Suggestions

In summary, this paper investigates the influence of digitalization on informal economy in China based on the secondary data from reliable database. For the informal sector in China, digitalization is a new trend to form a new kind of ways towards the employment and the economy. According to the analysis, digitalization can positively transform the informal economy into formal one, but it will pose risks towards the labor market in certain ways. It will enhance the productivity, increase the job positions in digital areas as well as promote the implementation of regulations and norms. In contrast, digitalization will also result in job losses for those low-skill workers. If the artificial intelligence is applied on a large scale in the future, people who don't have sufficient knowledge in these areas will no longer be needed. What's more, whether the digitalization can eliminate the problems of social inequality is still unsure.

For employees, they need to improve their understanding of the digital era and try to follow the new trend. The digitalization provides abundant opportunities for them to turn informal working into formal ones. For the policy maker, he or she should make full understanding of digital tools and applies it with the popular feelings. Only people-to-people bond can promote the informal economy into a better condition. At country level, the way to design an e-formalization policy and ensure that it is implemented and monitored is to engage the government, businesses and employees in a triple social dialogue. Thus, each party can learn about the heart voices of each other well as well as transforming the informal employment. The government, employers and workers should collaborate with each other to promote the transformation of informal sectors and maintain the social stability.

For scholars, due to the special definition of Chinese informal economy condition, they focus more on western countries' e-formalization problems. This study will help to fill the gap on the digitalization's impact on Chinese informal economy.

Concerned with the data collected from the database, it is not the latest one which may reduce the reliability of this paper. The data applied should be more precise and be updated to the newest one. Besides, due to China's unclear definition about informal economy, it is a bit hard to find more data and more specific one, which makes it hard to do some calculation between the relation among digitalization and informal employment. The problem of hard-to-find Chinese data of informal economy should be solved by other ways and need to be considered in the future.

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