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The Impact of Financial Inclusion on Household Incomes in China: An Empirical Study

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ABSTRACT

Financial inclusion is considered one of the important determinants for improving the incomes of households. This research analysis is to estimate the impact of financial inclusion on household incomes in China. The data was obtained from China Household Financial Survey (CHFS) for the year 2017. This paper measures financial inclusion through its four dimensions, namely formal account, formal saving, formal credit, and formal insurance, based on the definition of financial inclusion by the World Bank, 2017. Three different econometric techniques, namely Ordinary Least Squares, Quantile Regressions, and Instrumental variable methods, are used to empirically test the influence of inclusive finance on income in China. The instrumental-variable method was used to cope with the problem of endogeneity. The results of this research showed a significant relationship between households' incomes and formal accounts, formal savings, formal credit, and formal insurance in China. This study found that the main driver of household income is financial inclusion, as these two are positively correlated. The main determinants of financial inclusion are significant variables for households' incomes in China. Thus, this study concluded that financial inclusion helps to reduce income inequality. Hence, this research work recommended that policymakers in China should devise such policies to further improve the status of financial inclusion, ensuring a reduction in income inequalities.

Keywords: *Financial Inclusion; Household Incomes; Ordinary Least Square; Quantile Regression; Endogeneity.*

1. Introduction

Low access to financial services is still a major concern to policymakers in both developed and developing countries of the world. According to the latest report of the Global Findex for the year 2017, 31% of adults are still unbanked in the world. This implies a growing need for inclusive finance in recent times. Financial inclusions are considered one of the most important factors for bringing economic well-being and dwindling poverty and economic backwardness (According to Bravo, 2018). Basically, the concept of financial inclusion got immense attention from researchers and decision-makers when financial exclusion was regarded as the main

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reason for poverty in a research study (Babajide et al., 2015). In simple words, we can define financial inclusion as bringing more and more people to the chain of financial institutions at reasonable and modest costs. In the words of Gomathy M, financial inclusion means access to finance and financial services for all in a fair, transparent and equitable manner at an affordable cost.

China has experienced significant development and accumulated rich experience in inclusive financial systems as the second-largest economy. With the rapid growth of the economy, reform, and transformation of the financial sector, more financial services are now provided for individuals and enterprises in China, especially MSEs and low-income groups. Zhang and Posso (2019) constructed an indicator of financial inclusion using the information on transactions and payments, savings, credit, and insurance. They found a strong positive effect on household income in China. In addition, its large share of the world population justified investigation in the context of China. Since the outline of the Promoting Financial Inclusion Plan 2016-2020 in November 2015, various programs, such as establishing village banks and microcredit units, have been implemented to promote financial inclusion throughout the country. By the end of 2017, five state-owned commercial banks, six joint-stock commercial banks, over 1600 rural and county banks, and 17 private banks in China had established financial inclusion divisions (Li et al., 2018; Mallick & Zhang, 2019).

China has recently emerged as one of the leaders in global digital finance and financial technology (FinTech). With the integration of digital technology and financial services, traditional financial institutions and emerging Internet financial service providers have further expanded their ability to tap into traditionally unmet and neglected financial demands of consumers such as MSEs. Digital finance development lowers the financial services threshold and promotes operational efficiency with new models, delivery channels, and products (Lai et al., 2020). This signifies the importance of financial inclusion to the Chinese government. The banking industry is the leading force in China's financial system, with bank lending as the most frequent financial channel for the real economy.

According to CBIRC, by the end of 2019, there were 4607 banking financial institutions in China, with total assets of RMB 290 trillion (USD 41.5 trillion). Under significant policy guidance, Chinese banking financial institutions have notably expanded the scale of their service networks, product uptake, and innovation. They are committed to promoting the development of financial inclusion. Outstanding loans to MSEs and agricultural areas in China reached RMB 40.7 trillion and RMB 37.8 trillion, accounting for 24% and 22% of the total outstanding loan of financial institutions, respectively (Chen et al., 2021).

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The main purpose of this study is to answer the question that how inclusive finance can be made better. Moreover, this study w also analyzes that whether there is any association between financial inclusion and household income in China. The worldwide tendency depicts that financial inclusion is sometimes a win-win opportunity for all the people and institutions involved in financial services. However, financial inclusion requires special and immediate attention as still there is a need to extend financial services to the unbanked population. Findex data also shows that the percentage of rural people who used digital payments in the previous year (64%) has almost caught up. These figures suggest that there is still a gap which needs attention from the policy makers and decision makers in China so that the unbanked population of the country can be brought to the chain of financial system.

2. Literature Review and Hypothesis

The phenomenon of financial inclusion has spread around the globe in recent times. The term financial inclusion, defined as the use of formal financial services, crucially measures economic progress. The financially included individuals may invest in education, business, and entrepreneurship, leading to poverty reduction and economic growth in a country (Bruhn & Love, 2014). Financial inclusion is conforming access to efficient and reliable financial products and services. It includes bank accounts, formal savings, insurance, and cheaper credit facility needed by un-served and underprivileged segments such as low-income groups and weaker sections at an affordable cost transparently and fairly by mainstream formal institutional entities (Raza et al. 2,015). The United Nations first proposed financial inclusion in the International Year of Microcredit 2005, and the inclusive financial systems have prospered. The emergence of financial inclusion promotes social inclusion through convenient access, availability, and usage of rules-based formal financial services by the “newly banked.” These are generally underprivileged population segments; vulnerable groups such as rural dwellers, women, and low-income families benefit enormously from basic financial services like savings, borrowings, payments, and insurance (World Bank,2014).

According to Bravo (2018), financial inclusion includes financial education and the availability and provision of financial services. Financial inclusion was measured by Rehman et al. (2016) using its determinants, formal accounts, formal saving, and formal credit. According to the World Bank (2017), people should access relevant and reasonably priced financial services and products that address their needs for monetary transactions, investments, and credit. Boot et al., 2020 argues that new technologies can help match the supply and demand of funds over long distances and improve the efficiency of capital use. The development of information technology also helps overcome the information asymmetry problem in traditional financial markets. It enables financial institutions to improve the accuracy of enterprise risk assessment while

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reducing assessment costs and helping small businesses obtain financing with greater efficiency (Prystav Fabian, 2016).

Donald M et al. (1998) suggested that the technology could alleviate the information asymmetry problem in traditional financial markets, reduce transaction costs and thus facilitate the rapid development of financial markets. Ozturk (2017) conducted an empirical study using data from banking supervisors and found that an inclusive financial system is essential for stable social development. Financial inclusion can effectively tackle poverty and reduce income inequality by analyzing data from developed and developing countries. Similarly, Loconto (2012) conducted a survey and found that inclusive digital finance can help individuals' access financial services by improving ease of payment, providing access to subsidies, and providing new channels and ways to tackle national poverty.

The concept of financial inclusion has been explained in diverse ways in the existing literature, but all seem to have analogous information regarding conclusions. The World Bank (2019) has defined financial inclusion as the share of households and firms that use financial services. Amidzic et al. (2016)[38] defined financial inclusion as an economic state where nobody is denied access to primarily financial services based on motivations other than efficiency criteria. Demirguç-Kuntet al. (2013) conceptualized financial inclusion as the use of formal financial services among different groups that benefit the welfare of many individuals. Sahay et al. (2015) said that financial inclusion is the access, usage, and delivery of financial services at affordable costs to vulnerable segments of society, while Sarma (2012) gave a comprehensive definition of financial inclusion based on several dimensions including accessibility, availability, and usage of the formal financial system for all members of an economy.

Over the past two decades, much of the inclusive finance literature has clustered around how to measure and promote it (Prabhakar, 2019). Likewise, Sarma (2008) developed a multidimensional financial inclusion index by applying an approach similar to the one adopted in UNDP's human development index (HDI) calculation. The author employed three dimensions that are banking penetration (accessibility) measured by the number of bank accounts per 1,000 populations, usage measured by the volume of credit and deposit as a proportion of the country's GDP, and availability of banking services measured by the number of bank outlets per 1,000 populations. Similarly, following the dimensions presented by Sarma (2008) constructed a financial inclusion index for 18 developing Asian economies using different dimensions of the inclusive financial system, for example, availability, accessibility, and usage. The result confirmed that financial inclusion alleviates poverty and income inequality.

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In addition, in recent years, the explosion of mobile phone users globally, especially in developing countries, has increased the application of these mobile devices to services. Moreover, the penetration of mobile phones is considered a proxy for mobile banking, gaining consensus to use it in FI measurement (Chauvet and Jacolin, 2017). Accordingly, mobile money accounts have become an important means of conducting financial transactions for many households in developing countries (Mehrotra and Nadhanael, 2016). However, this factor has not yet been considered in calculating the FI index due to the scarcity of available data. Therefore, constructing a new FI index that includes mobile money indicators is necessary to fill the research gap. On the other hand, in previous studies, the FI index was developed only by accounting for banking-related financial services. The recent focus on FI has also included other financial services such as insurance, pension, or services from microfinance, financial institutions, and Fintech (Sarma et al., 2016). Few studies have surveyed individuals' and families' perceptions of barriers to accessing credit. Constrained access to formal credit creates a need for informal alternatives such as those obtained in subprime financial markets (e.g., from pawnshops and payday lenders) or through informal networks (family and friends; Campero & Kaiser, 2013). Unlike formal credit, informal credit involves higher costs and greater financial risk from unregulated operations. Research has shown that everyday credit is widely used by those who are poor, have low levels of education, reside in rural areas, and live in female-headed households (Park and Mercado, 2015).

China has recently emerged as one of the leaders in global digital finance and financial technology (Fintech). With the integration of digital technology and financial services, traditional financial institutions and emerging Internet financial service providers have further expanded their ability to tap into traditionally unmet and neglected financial demands of consumers such as MSEs. The development of digital finance lowers the threshold of financial services and promotes operational efficiency with new models, delivery channels, and products (Lai et al., 2020). This signifies the importance of financial inclusion to the Chinese government. The banking industry is the leading force in China's financial system, with bank lending as the most frequent financial channel for the real economy. With the largest number of institutions and the smallest average customer, VTBs were designed to support MSEs and farmers. Since the pilot program of VTBs was initiated in 2006, the number of VTBs has increased rapidly and reached 1633 as of June of 2019, with 65.7% located in the central and western regions, covering appropriately 1300 counties of 31 provinces (municipalities, autonomous regions) (Li et al. 2018).

According to the PBC, the number of digital payments in rural areas, including online and mobile payments, increased from 160 billion to 309 billion during 2017–2018, near the amount

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in urban areas. The Internet and technology facilitate financial service providers to launch more appropriate and targeted financial products for MSEs and individuals. Based on different service providers, Internet microfinance in China can divide into three categories: bank-based, e-commerce-based, and supply-chain-based (Li et al., 2020). Moreover, some domestic enterprises explore the advantages of the supply-chain relationship and industrial reputation, launching e-finance platforms in cooperation with banks, and providing financial services to SMEs. Financial awareness and knowledge, along with a robust consumer protection framework, are vital for individuals or enterprises to use a wide range of regulated financial products and services adequately, timely, and effectively (Adomako et al., 2015). Among all G20 countries, China has a high score of financial literacy at 14.1%, as only three of the G20 countries achieved an average score above 14% (the other two countries are France (14.9) and Canada (14.6), indicating that Chinese consumers and enterprises have a relatively high level of financial awareness worldwide (Grohmann et al. 2018).

Focusing on rural China, Zhang and Posso (2019 find that poor households benefit more from financial inclusion than rich ones. Using household data from the 2011 China Household Finance Survey, they construct a multidimensional index of financial inclusion, which includes measures of account ownership, savings, credit, and insurance, and investigate its impact on household income. Their findings show that financial inclusion positively affects revenue (Huang and Zhang, 2020). Wen et al. (2016) conducted a two-stage least squares regression and instrumental variable Quantile regression to study households in 10 provinces and found that formal credit significantly increases households' income in the top 10% income bracket,

i.e., the elite class. Some scholars analysed the mechanism through which formal credit affects rural household income. Park and Mercado (2015) tested the factors influencing financial inclusion and the significance of financial inclusion in reducing poverty and lowering income inequality, focusing on developing Asian economies, including Pakistan. Moreover, financial inclusion significantly reduces poverty; there is also evidence that it lowers income inequality when more regressors are considered. Financial exclusion is a problem not faced by a single country; rather, it is a challenge for the world (Atkinson et al., 2019).

In the empirical literature, several studies investigated the influence of financial inclusion on income, poverty alleviation, and reducing income disparities in Pakistan (Shahbaz and Islam; 2011; Rahman et al., 2018; Kashif & Khalil, 2012). However, none of these studies has focused on the determinants of financial inclusion, perceived barriers to financial inclusion, and their implications for inclusive growth in Pakistan. A study measured the FI index using PCA procedures from an array of variables and used the ARDL bounds test approach to find co integration and show that FI is positively related to economic growth in the long run and in the

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short run but also income in Pakistan. FI does not affect economic growth contemporaneously. Rather it impacts growth with a lag of one year, which is not surprising. The speed of modification towards equilibrium is exceptionally high, as shown by the coefficient of ECM.

In our study, the opportunity effect through inclusive finance significantly and positively affects the relationship between financial inclusion and income. Based on these results, it can be concluded that an increase in opportunity leads to an improvement in Pakistan's income level. This empirically confirms the causality of the hypothesized relationship. The results are in line with Brune et al. (2011), who argued that increasing opportunities to access various financial services facilitated poor households' lives because they could use their savings for agricultural inputs. Ardic et al. (2011) also supported this view and asserted that access to a range of financial services by low-income households could empower them economically and socially and assist them in escaping poverty.

According to the World Bank, 2.5 billion people worldwide cannot access formal financial services, such as savings, credit, insurance, and payment services (Demirguc-Kunt and Klapper, 2012). As most of the population in developing countries remain financially marginalized, this creates an inequitable economic world that impacts an individual's socioeconomic standing and well-being. Regarding financial inclusion, Pakistan is one of the least financially inclusive countries in the world. It is also lagging behind other countries of the same income level in the Asian region and outside (Wang et al., 2022).

Hypothesis (A) Financial inclusion positively impacts household income in China.

3. Research Methodology

3.1 Population and Sample of the Study

The current study focuses on the impact of financial inclusion on household incomes in China. Therefore, the population of our study is comprised of households in China. The representative sample for China is about 6000 households as this study uses the China Household Finance Survey (CHFS) for the year 2017. This survey is the major survey in the field of financial inclusion in China. This household survey is expected to provide a more comprehensive measure of the status of financial inclusion in China.

3.2 Population Collection

The current study seeks to analyze the impact of financial inclusion on household incomes in China. For this purpose, we can use both the secondary and primary data as used by the

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researchers in this field. The secondary data is available at the World Bank Global Findex Database for the year 2017 (the most recent one so far) and some other financial institutions. However, we tried to use the data collected through a comprehensive household survey in Chin. Our purpose is to analyze the impact of financial inclusion on household incomes at the gross root level in China. Therefore, we have decided to use data based on household surveys.

3.3 Research Design

Based on the existing literature, this study has used the four main indicators of financial inclusion for China. In this regard, the first indicator used widely by the researchers is the knowhow of an individual about having a formal account in a bank or a financial institution. This indicator of financial inclusion is a customary one and it is known as a formal account. This is judged through a question in a survey as: Do you currently possess an account in a bank or other financial institution?

The second determinant of financial inclusion is related to the saving patterns of the individuals, and this is known as formal saving. This is measured through asking the following question in a survey: Have you saved some money in a financial institution during the past one year? The response to this question drastically decreased during the survey. The probable reason for this may be the saving behavior of respondents in non-formal institutions. That is why the sample respondents for formal saving is low as compared to the sample respondents for the formal account.

The third indicator of financial inclusion is related to the usage of bank credit, and it is termed formal credit. This is measured through a question in the surveys: Have you borrowed some money during the previous year from a financial institution? The last and final indicator of financial inclusion is formal insurance. This is asked through a question about whether the households have availed any kind of insurance or not in the survey.

3.4 Empirical Model

In this section, we are presenting our model, which can be used for the performance of financial inclusion in China. The independent variable of our study is financial inclusion which is measured through the four indicators of financial inclusion i.e., formal account, formal saving, formal insurance and formal credit. The dependent variable of our study is the household income denoted by the HHI. This is measured through the following question in the survey: How much is your monthly income from all sources?

Besides the measure of financial inclusion and family income, we also use some control variables as well in our analysis that are expected to explain variations in either financial inclusion or family income. The control variables of our analysis include members of the family (family size), age, gender, marital status (married or others/unmarried), and the level of

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education. These control variables are measured through relevant questions in the survey. Moreover, we are also using a dummy variable in our analysis that controls for unobserved time-invariant characteristics, for example, mountainous or seaside. Finally, we add a normally distributed mean-zero error term to our model. Incorporating all these variables to the analysis, our empirical model is given by:

$$Y_i = \beta F_i + yX_i + a_i + \varepsilon_i \quad \text{----------} \quad (3.1)$$

In the above model, the left-hand side of the equation represents the dependent variable, while the right-hand side of the equation indicates the independent variable, control variables, a dummy variableandanormallydistributedmean-zerodisturbance/errorterm.Thecapital$Y\ i$ on the left-hand side of the equation represents the income of the household i.The variable $F\ i$on the right-hand side of the equation denotes the measure of financial inclusion. The variable $ai$is a dummy that controls for the unobserved time invariants characteristics, while the last one $\varepsilon_i$is a random disturbance term of our analysis.

As the financial inclusion has four main determinants namely formal account, formal saving, formal credit, and formal insurance and we take these comprehensive determinants to measure financial inclusion in China. These four pillars of financial inclusion are consistent with the existing literature. Therefore, financial inclusion can be measured using the following equation.

$$F_i = \frac{a+s+c+i}{4} \quad \text{----------} \quad (3.2)$$

Where the capital F_i on the left-hand side of the above equation represents a measure of the financial inclusion. The small letters$a$, s, c and i denote the four pillars of the financial inclusion namely formal account, formal saving, formal credit, and formal insurance respectively. Following Ibrahim & Aliero (2020), we assign equal weightage of 25% (¼) to each pillar of financial inclusion.

The total weightage for the overall level of financial inclusion is therefore 100% as we assign an equal weightage of 25% to each indicator. So, the maximum limit for the level of inclusion in 100%. Furthermore, we set a cut-off score of 50% meaning that the value of F_i equal to 50% or above is considered to be financially included and a score of less than 50% is considered otherwise. In order to get the aggregate value of the variable of our interest i.e.,F_i which denote the financial inclusion, we use the methodology of computational strategy often used for the computation of multidimensional poverty index (MPI). We prefer to use the MPI for the computation of a household's financial inclusion index because MPI is considered a superior

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methodology compared to other methods such as principal components analysis by (e.g., Ibrahim et al., 2019; Zhang & Posso, 2019).

The method of measuring financial inclusion depends on how we can conceptually define financial inclusion. In this regard, we are following the definition of financial inclusion by the World Bank as access to affordable and useful financial services and products that meet the needs of individuals for transactions and payments, savings, credit, and insurance (World Bank, 2017). In this study, we use proxies of each part by finding the microeconomic analogs to estimates used in an aggregate financial inclusion literature.

For instance, one major counterpart of financial inclusion is the ability of the individuals to use and access financial services in order to meet their routine expenses and also to save money. The macroeconomic literature generally proxies for this measure as the number of people having a bank account to avail of various services provided by financial institutions (Park and Mercado, 2015). Microeconomic analogue to this measure is traditionally measured as an individual having a formal account in a bank or other financial institution.

The second main determinant of financial inclusion is the saving behavior of the individuals. Usually, rational consumers give up their present consumption in order to save money for future consumption or investments. The empirical literature shows that the saving behavior of individuals can be included in the determinants of financial inclusion by various estimates such as the number or number of deposits per 1000 adult population (Massara & Mialou, 2014). The microeconomic measure for this can be obtained similarly to the approach for measuring the formal account as above. We can estimate this determinant of financial inclusion through variables that depict whether households have access to the term deposits, bonds, funds and stocks of the banks or not.

Conversely to the saving behavior, as explained above, the credit behavior of the households enables them to give up their future consumption in order to have money for present consumption or investment. The empirical macroeconomic studies show that the credit behavior of individuals is included into the indicators of financial inclusion through similar measures such as the percentage of credit-receiving individual (Sarma, 2008). A microeconomic estimate of formal credit can be estimated in the same way as above, like knowing whether an individual has availed the credit or have credit card or not.

The last and final dimension of financial inclusion as per its definition put forwarded by the World Bank is the insurance facility availed by the households. According to Bodie et al. 2009, households use financial services for insurance in order to construct strength in case of individualistic and covariate shocks. Individuals need different types of insurance policies and products like health, life, and property. Generally, researchers do not include controls for

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insurance. However, the current study uses a microeconomic approach to measure whether households are availing of the facility of insurance provided by the various financial institutions. In order to measure F_i , these four dimensions of financial inclusion, as proposed by the World Bank (2017), can be grouped into the following Table 1.

In order to calculate F_i of our empirical model, we allocate every individual a financially excluded score as per his or her financial exclusion in each of the above six mentioned indicators in Table 1. The highest exclusion score is 100% as an equal weightage to all the four determinants of financial inclusion. The first indicator, namely formal account, has been assigned 25% weightage as it can be measured by having a formal account in a financial institution. The next two determinants, namely formal saving and credit, has been assigned 12.5% Weightage as both have two dimensions such as debt, equity, and Loan, and credit card, respectively.

Table 1 Dimensions, indicators, and status of financial inclusion Fi

Dimension(weight)	Indicator	Status of Financial inclusion/exclusion
Transaction ¼	Formal account	Household doesn't have a formal bank account
Saving ¼	Formal Saving	Household doesn't have a formal savings
Credit ¼	Formal Credit	Household doesn't have a formal credit
Insurance ¼	Formal Insurance	Household doesn't have a formal insurance

Finally, we assigned 25 percent weightage to the last determinant of financial inclusion, insurance. In our analysis, we are using 50 as our cut-off score. This means that an individual having less than 50 percent exclusion score is considered financially included, while an exclusion score of more than 50 percent is financially excluded in our analysis. In the current study, we have tried to present a more comprehensive measure of financial inclusion in order to facilitate the policymakers and decision-takers. This study will help them to formulate and design the policies in order improve the status of financial inclusion and to reduce the income inequality.

Hence, we use four comprehensive dimensions of financial inclusion as suggested by the World Bank 2017, namely formal account, formal saving, formal credit, and formal insurance. The empirical models for the estimation of each of these dimensions are given below respectively.

$$Y_i = \beta A_i + yX_i + a_i + \varepsilon_i \quad (3.3)$$

$$Y_i = \beta s_i + yX_i + a_i + \varepsilon_i \quad (3.4)$$

$$Y_i = \beta C_i + yX_i + a_i + \varepsilon_i \quad (3.5)$$

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$Y_i = \beta I_i + yX_i + a_i + \varepsilon_i$ ………………………………………………………………… (3.6)

Where A_i, si, C_i, and I_i represents the formal account, formal saving, formal credit, and formal insurance respectively. The other notations represent the same as in equation (3.1).

3.5 Robustness Test

The above empirical models may suffer from the problem of endogeneity. We suppose that finances may lead to greater opportunities for earning of higher incomes. It is, however, crystal clear that higher income would make the households more financially included and would enjoy more financial services provided by the financial institutions. To tackle the problem of endogeneity, we use the 2SLS technique of instrumental variable. Our empirical model, in this case, consists of household income as dependent variable, formal account, formal saving, formal credit, and formal insurance as endogenous variables, age, education, and marital status as exogenous variables, and finally, distance as an instrumental variable. The four respective empirical models are given below.

$Y_i = \beta A_i + yX_i + d_i + \varepsilon_i$ ………………………………………………………………. (3.7)

$Y_i = \beta s_i + yX_i + d_i + \varepsilon_i$ ………………………... (3.8)

$Y_i = \beta C_i + yX_i + d_i + \varepsilon_i$ ………………………………………………………………. (3.9)

$Y_i = \beta I_i + yX_i + d_i + \varepsilon_i$ …………………………………………………… ………. (3.10)

Where d_i denote distance, and we use it as an instrumental variable in our analysis. The other notations are the same as in equation (3.1). The empirical results for these models are presented in part 4 of this article.

4. Research Results and Findings

4.1 Status of the Overall Financial Inclusion in China

In this section, we summarize the overall level of the status of financial inclusion in China. Following Ibrahim & Aliero (2020), we assign an equal weightage of 25% (¼) to each pillar of financial inclusion in China. Therefore, the total weightage for the overall level of financial inclusion is 100%, as we assign an equal weightage of 25% to each indicator. So, the maximum limit for the level of inclusion is 100%. This is given in Table 4-11.

Table 2 summarizes the four determinants of the status of financial inclusion in China. Column1 shows the four determinants of financial inclusion, total and average value, column-2 shows the percentages and column three depicts the cumulative frequencies. This table gives us the aggregate value of the status of financial inclusion in China.

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Hence, if we take the most comprehensive measure of financial inclusion, the result is far better than considering only partial dimensions of the status of financial inclusion in China. For example, if we consider only the first indicator of the status of financial inclusion, i.e., formal account, as many researchers had taken it as a measure of financial inclusion, then financially included households are 90.12%. Similarly, if we only take the second indicator, i.e., formal saving, as a measure of financial inclusion, then then the percentage is a bit lower than the first

Table 2: Status of overall financial inclusion in China

Variable	Percentage	Cumulative %age	25% weightage
Formal Account	90.12	90.12	22.53
Formal Saving	69.88	160	17.47
Formal Credit	31.58	191.58	7.895
Formal Insurance	93.32	284.9	23.33
Total	---	---	71.225

Source: Author's own calculations through Stata

indicator of financial inclusion, which is 69.88%. Therefore, it is better to take these four dimensions of financial inclusion, as suggested by the World Bank, as a measure of the status of financial inclusion in countries.

The last column of Table 2 shows the 25% weight of each dimension of financial inclusion in Pakistan. By adding all this weightage, we get the percentage of the status of overall financial inclusion in China, which is 71.225%. This percentage is well above than the status of financial inclusion in Pakistan, which is only 9.584% which needs the proper attention of the policymakers in Pakistan. This low level of financial inclusion is alarming in Pakistan and the policy makers need to divert their attention to the area of financial inclusion. As financial inclusion is considered as a key determinant in removing income disparities, therefore, it must be kept among the top priorities of the policy makers and decision takers. Although the status of financial inclusion in China is far better than Pakistan, but still it needs to be improved because about 31% people are still not financially included, according to the results of our analysis. As China is the most populous country of the world, therefore, this lot of financially excluded people still represents a huge number of individuals. So, this requires the attention of policy makers and decision takers to improve the present status of financial inclusion in China.

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4.2 Impact of Financial Inclusion on Household Income in China

This part of our analysis focuses on the estimate of the impact of financial inclusion on household incomes in China. In this section, we estimate the impact of financial inclusion on household incomes in China. As we did before, we will estimate the status of financial inclusion through its four pillars as defined by the World Bank (2017) entitled formal account, formal savings, formal credit, and formal insurance. We analyze the impact of each of these indicators separately on household incomes in China but let us first present a description of our variables in Table 4.

4.2.1 Impact of Formal Accounts on Household Income in China

The F (4, 37545) of 27758.48 shows the joint significance of the formal account on household incomes in China. As this value of the F statistic is high enough to conclude that the formal account is a significant variable to explain the variations in household incomes in China. The Prob *F*>0.0000 shows the significance of the F statistic. As this F-value is well below 5%, we can easily conclude that this is a good model, and the formal account jointly influences the household's incomes in China.

The description of the data, variables explanation, observation, R squares value and standard error values are present in Table 3. Here, the value of R-squared shows the total variations in the household's incomes that are explained by the formal accounts in China as the value of Rsquared is 0.106, which is a positive value showing the total variations in the household's incomes, which are explained by the formal accounts in China. The value of the adjusted Rsquared is also the same as R- squared, which is 0.106 because here, we take only one independent variable, which is a formal account. The value of Root MSE in the above table simply means the standard error of the entire regression.

The top left side of the Stata table shows the Sum of Squared (SS) residuals, degrees of freedom (df), and the mean sum of squares (MS). The SS has two parts, one for the inside model and the other for the residuals. The one for the model is those obtained within the model. The ones on the residuals are those obtained outside the model. These are caused due to randomness. Degrees of freedom (df) for our model are computed by k-1, where k stands for the number of restrictions on our model. The total number of restrictions is made up of intercept (_cons) and the total number of independent variables. So, the degree of freedom for our model is 4. The degree of freedom for the residuals is computed by n-k where "n" is the total number of observations and "k" represents the number of restrictions our model, i.e., intercept (_cons), and the total number of independent variables.

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Table 3: Description of Data and Variables

Variable	Explanation	Obs.	R2	Std. Err.
Formal Account	As having a formal account is the most important & fundamental indicator of financial inclusion according to its definition by the World Bank 2017. That formal account is selected as our first variable.	37549	0.106	93.16
Formal Saving	The 2nd foremost indicator of FI is the saving behavior of the households as per the definition of FI by the world bank in 20That that is why it is selected as a variable.	39514	0.1434	93.16
Formal Credit	According to the definition of FI by the world bank 2017, formal credit is selected as a variable in order to know the status of financial inclusion.	39910	0.121	43.32
Formal Insurance	Formal insurance is the final indicator of FI, according to World Bank 2017. That is why it is selected as a variable.	39596	0.0679	76.4
Education	Education is taken as a control variable as it does affect the status of financial inclusion. However, it's not our variable of interest	37549	0.1787	41.34
Age	Age is also taken as a control variable as it also plays a vital role in the status of financial inclusion.	39514	0.1992	34.56

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Hence, the degrees of freedom for the residuals are 37549. The last part is the MS which stands for the Mean sum of squares. It is obtained by simply dividing the SS by the respective degree of freedom (df).

Table 4: Results from OLS and Quantile Regression for the estimation of the impact of Formal Accounts on household income in China

	Dependent Variable: Household income									
	(1) OLS	(2) Q_10	(3) Q_20	(4) Q_30	(5) Q_40	(6) Q_50	(7) Q_60	(8) Q_70	(9) Q_80	(10) Q_90
Formal Account	0.00* [40.7]	0.00* [25.4]	0.000* [50.18]	0.000* [57.42]	0.000* [66.20]	0.000* [74.95]	0.000* [74.96]	0.000* [73.44]	0.000* [67.05]	0.000* [49.27]
Education	0.00* [32.3]	0.00* [31.33]	0.000* [61.36]	0.000* [62.28]	0.000* [64.87]	0.000* [69.00]	0.000* [65.70]	0.000* [61.03]	0.000* [49.15]	0.000* [32.14]
Age	0.00* [-3.6]	0.000* [3.53]	0.000* [5.00]	0.000* [5.39]	0.000* [5.53]	0.000* [5.09]	0.003* [2.97]	0.698* [0.390]	0.002* [-3.13]	0.000* [-5.28]
Marital status	0.07* [-1.8]	0.884* [-0.15]	0.031* [-2.16]	0.000* [-4.26]	0.000* [-6.56]	0.000* [-7.47]	0.000* [-6.74]	0.000* [-5.85]	0.000* [-4.01]	0.127* [-1.53]
Constant	0.438* [-0.8]	0.000* [-10.9]	0.0000* [-13.83]	0.000* [-4.91]	0.000* [-11.07]	0.000* [-9.12]	0.000* [-5.19]	0.134* [-5.50]	0.012* [2.51]	0.000* [4.87]
Observations	37549	37549	37549	37549	37549	37549	37549	37549	37549	37549
R^2	0.106	0.0370	0.1170	0.134	0.1338	0.1449	0.1532	0.1615	0.1699	0.1787

Note: This table represents the OLS and QR. Q_10 to Q_90 represents quantile from 10 to 90. The figures in brackets are robust t-values. The values outside the brackets are the corresponding p-values at 5%* level of significance.

In the last part of the Stata table, total income is the dependent variable, while formal account is the independent variable. _cons mean constants or intercepts of regression line. The coefficient of the model is interpreted already in the above lines. The standard error which shows the deviations of the coefficient of our model. The t value measures the number of standard errors that the coefficient is from zero. The t value for our model is 55.48 which also indicate that this distribution is normally distributed and is a good model.

The most important in the above table 4 is the p-value. The p-value of the t statistic has many interpretations. It is the smallest evidence available required to reject the null hypothesis. It also tells us how significant the coefficient is as the p-value is 0.0000, which is well below than 5%

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significance level. Thus, we can conclude that there is a significant relationship between formal accounts and household incomes in China.

The first column of Table 4 also shows the p-values and their corresponding t-values inside the parenthesis of our model's control variables, namely education, age, and marital status. Out of these control variables, the p-value for our control variable, that is, education, is 0.000, which shows that there is also a significant relationship between education and household income in China.

In Table 4, column 2 through column 10 shows the results of the Quantile regression of Q_10 to Q_90, respectively, for estimating the impact of formal account on household income in China. The results of the Quantile regressions are consistent with the Ordinary Least Square (OLS) results as all the p-values from Q_10 to Q_90 for formal accounts household income in China is 0.000. These results of Quantile regressions also confirm that there is a significant relationship between formal accounts and household income in China. The same holds true for the control variable, that is, education as well. All the p-values of Q_10 to Q_90 for education is 0.00, 0, which shows that education is also a significant variable for household income in China. Similarly, the control variable Age is also a significant variable for household income in China.

4.2.2 Impact of Formal Savings on Household Income in China

According to the definition of financial inclusion given by the World Bank (2017), the second dimension of financial inclusion is formal savings. Following this, we regress formal saving on household incomes in China and the corresponding results of OLS and Quantile regressions are shown in Table 5.

The below table shows the impact of the second dimension of financial inclusion, that is, formal saving, on household income in China. The first column of Table 5 shows the results of the ordinary least squares (OLS) for the estimation of the impact of formal saving on household income in China. The table reveals that there exists a significant relationship between formal savings and household income in China as the p-value for formal saving on household income is 0.000, which is well below than 5% level of significance. The value of the coefficient is 0.38, which is a positive value indicating that there is a positive relationship between formal savings and household income in China.

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Table 5: Results from OLS and Quantile Regression for the estimation of the impact of Formal saving on household income in China

	Dependent Variable: Household income									
	(1) OLS	(2) Q_10	(3) Q_20	(4) Q_30	(5) Q_40	(6) Q_50	(7) Q_60	(8) Q_70	(9) Q_80	(10) Q_90
Formal Saving	0.00* [40.7]	0.00* [25.4]	0.000* [50.18]	0.000* [57.42]	0.000* [66.20]	0.000* [74.95]	0.000* [74.96]	0.000* [73.44]	0.000* [67.05]	0.000* [49.27]
Education	0.00* [32.3]	0.000* [31.3]	0.00* [61.36]	0.000* [62.28]	0.000* [64.87]	0.000* [69.00]	0.000* [65.70]	0.000* [61.03]	0.000* [49.15]	0.000* [32.14]
Age	0.00* [-3.6]	0.000* [3.53]	0.000* [5.00]	0.000* [5.39]	0.000* [5.53]	0.000* [5.09]	0.003* [2.97]	0.698* [0.390]	0.002* [-3.13]	0.000* [-5.28]
Marital status	0.07* [-1.8]	0.884* [-0.15]	0.031* [-2.16]	0.000* [-4.26]	0.000* [-6.56]	0.000* [-7.47]	0.000* [-6.74]	0.000* [-5.85]	0.000* [-4.01]	0.127* [-1.53]
Constant	0.43* [-0.8]	0.00* [-10.9]	0.0000* [-13.83]	0.000* [-4.91]	0.000* [-11.07]	0.000* [-9.12]	0.000* [-5.19]	0.134* [-5.50]	0.012* [2.51]	0.000* [4.87]
Observations	37549	37549	37549	37549	37549	37549	37549	37549	37549	37549
R^2	0.106	0.0370	0.1170	0.134	0.1338	0.1449	0.1532	0.1615	0.1699	0.1787

Note: This table represents the OLS and QR. Q_10 to Q_90 represents quantile from 10 to 90. The figures in brackets are robust t-values. The values outside the brackets are the corresponding p-values at 5%* level of significance.

The value of R-squared shows the total variations in the household's incomes that are explained by the formal savings in China as the value of R-squared is 0.16, which is a positive value showing the total variations in the household's incomes, which are explained by the formal savings in China. The value of adjusted R-squared is also the same as R- squared, which is 0.16 because here we take only one independent variable, which is formal saving in China. The value of Root MSE in the above table simply means the standard error of the entire regression. In the last part of the Stata table, total income is the dependent variable, while formal saving is the independent variable.

The most important in the above table 5 is the p-value. The p-value of the t statistic has many interpretations. It is the smallest evidence available required to reject the null hypothesis. It also tells us how significant the coefficient is as the p-value is 0.0000, which is well below than 5% level of significance. Thus, we can conclude that there is a significant relationship between formal savings and household incomes in China.

The first column of Table 5 also shows the p-values along with their corresponding t-values, inside the parenthesis, of the control variables, namely education, age, and marital status, of our

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model. Out of these control variables, the p-value for our control variable, that is, education, is 0.000, which shows that there is also a significant relationship between education and household income in China.

Table 5, column 2 through column 10 shows the results of the Quantile regression of Q_10 to Q_90, respectively, for the estimation of the impact of formal saving on household income in China. The results of the Quantile regressions are consistent with the results of the Ordinary Least Square (OLS) as all the p-values from Q_10 to Q_90 for formal accounts on household income in China are 0.000. These results of Quantile regressions also confirm that there is a significant relationship between formal savings and household income. The same holds for the control variable, that is, education as well. All the p-values of Q_10 to Q_90 for education is 0.000, which shows that education is also a significant variable for household income.

4.2.3 Impact of Formal Credit on Household Income in China

The third indicator of the status of financial inclusion is formal credit as per the definition of financial inclusion put forward by the World Bank (2017). Following this, we regress debt, i.e., formal credit, on household's incomes in China and the respective results are displayed in table 6.

Table 6 shows the impact of the third dimension of the status of financial inclusion, that is, formal credit, on household income in China the p-value for formal saving on household income is 0.000, which is well below than 5% level of significance. The coefficient value is 0.33, which is a positive value indicating a positive relationship between formal credit and household income in China.

Table 6, column 2 through column 10 shows the results of the Quantile regression of Q_10 to Q_90, respectively, for estimating the impact of formal credit on household income in China. The results of the Quantile regressions are consistent with the results of the Ordinary Least Square (OLS) as all the p-values from Q_10 to Q_90 for formal accounts on household income in China are 0.000. These results of Quantile regressions also confirm a significant relationship between formal credit and household income in China. The same holds for the control variable, that is, education as well. All the p-values of Q_10 to Q_90 for education are 0.000, which shows that education is also a significant variable for household income in China.

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Table 6: Results from OLS and Quantile Regression for the estimation of the impact of Formal credit on household income in China

	Dependent Variable: Household income									
	(1) OLS	(2) Q_10	(3) Q_20	(4) Q_30	(5) Q_40	(6) Q_50	(7) Q_60	(8) Q_70	(9) Q_80	(10) Q_90
Formal Credit	0.00* [51.6]	0.000* [4.57]	0.000* [32.02]	0.000* [58.68]	0.000* [76.63]	0.000* [83.52]	0.000* [92.92]	0.000* [99.43]	0.000* [98.66]	0.000* [76.78]
Education	0.00* [40.0]	0.000* [40.1]	0.000* [68.20]	0.000* [77.02]	0.000* [82.44]	0.000* [82.03]	0.000* [80.63]	0.000* [68.26]	0.000* [55.46]	0.000* [39.07]
Age	0.01* [2.41]	0.005* [2.82]	0.036* [2.10]	0.002* [3.09]	0.003* [2.96]	0.006* [2.73]	0.026* [-2.23]	0.264* [1.12]	0.602* [-0.52]	0.013* [-2.47]
Marital status	0.00* [3.96]	0.248* [-1.15]	0.000* [-3.77]	0.000* [-5.06]	0.000* [-6.94]	0.283* [-10.34]	0.000* [-12.51]	0.000* [-10.67]	0.000* [-8.18]	0.000* [-4.02]
Constant	0.00* [3.08]	0.000* [-9.26]	0.000* [-10.29]	0.000* [-8.60]	0.000* [-5.80]	0.197* [-1.29]	0.003* [2.95]	0.000* [5.89]	0.000* [7.62]	0.000* [7.69]
Observations	3990	39910	39910	39910	39910	39910	39910	39910	39910	39910
R^2	0.121	0.022	0.0709	0.0958	0.1107	0.1215	0.1317	0.1428	0.1582	0.1810

Note: This table represents the OLS and QR. Q_10 to Q_90 represents quantile from 10 to 90. The figures in brackets are robust t-values. The values outside the brackets are the corresponding p-values at 5%* level of significance.

4.2.4 Impact of Formal Insurance on Household Income in China

The last and final pillar of the status of financial inclusion is formal insurance. The impact of the status of formal insurance on household's incomes in China is analyzed in Table 7.

Table 7 shows the impact of the last and final pillar of financial inclusion, that is, formal insurance on household income in China. Column 1 shows the results of the OLS for the estimation of the impact of formal insurance on household income in China. Column 1 depicts the results of the OLS while columns 2 through 10 show the results of the Quantile regressions. The p-values for both the OLS and Quantile regressions are less than 5% which reveals that formal insurance is a significant variable for household income in China. We can clearly conclude that there is a significant relationship between formal insurance and household's incomes in China.

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Table 7. Results from OLS and Quantile Regression for the estimation of the impact of Formal Insurance on household income in China

	Dependent Variable: Household income									
	(1) OLS	(2) Q_10	(3) Q_20	(4) Q_30	(5) Q_40	(6) Q_50	(7) Q_60	(8) Q_70	(9) Q_80	(10) Q_90
Formal Insurance	0.00* [51.6]	0.000* [4.57]	0.000* [32.02]	0.000* [58.68]	0.000* [76.63]	0.000* [83.52]	0.000* [92.92]	0.000* [99.43]	0.000* [98.66]	0.000* [76.78]
Education	0.00* [40.0]	0.000* [40.1]	0.000* [68.20]	0.000* [77.02]	0.000* [82.44]	0.000* [82.03]	0.000* [80.63]	0.000* [68.26]	0.000* [55.46]	0.000* [39.07]
Age	0.01* [2.41]	0.005* [2.82]	0.036* [2.10]	0.002* [3.09]	0.003* [2.96]	0.006* [2.73]	0.026* [-2.23]	0.264* [1.12]	0.602* [-0.52]	0.013* [-2.47]
Marital status	0.00* [3.96]	0.248* [-1.15]	0.000* [-3.77]	0.000* [-5.06]	0.000* [-6.94]	0.283* [-10.34]	0.000* [-12.51]	0.000* [-10.67]	0.000* [-8.18]	0.000* [-4.02]
Constant	0.00* [3.08]	0.000* [-9.26]	0.000* [-10.29]	0.000* [-8.60]	0.000* [-5.80]	0.197* [-1.29]	0.003* [2.95]	0.000* [5.89]	0.000* [7.62]	0.000* [7.69]
Observations	3990	39910	39910	39910	39910	39910	39910	39910	39910	39910
R^2	0.121	0.022	0.0709	0.0958	0.1107	0.1215	0.1317	0.1428	0.1582	0.1810

Note: This table represents the OLS and QR. Q_10 to Q_90 represents quantile from 10 to 90. The figures in brackets are robust t-values. The values outside the brackets are the corresponding p-values at 5%* level of significance.

The value of R-squared shows the total variations in the household's incomes that are explained by the formal insurance in China. As the value of R-squared is 0.0001showing that formal insurance is a significant variable in explaining the variations in the household's incomes in China. The value of adjusted R-squared is also the same as R- squared, which is 0.0001, because here we take only one independent variable, which a formal account in China. The value of Root MSE in the above table simply means the standard error of the entire regression.

4.3 Conclusion Based on Results of OLS and Quantile Regression

Both the OLS and Quantile regressions provide the same results. Both methods revealed that formal accounts, formal savings, formal credit, and formal insurance are significant variables for household incomes in China. Hence, it can be concluded that there is a significant relationship between financial inclusion and household income in China.

4.4 Results of Robustness Tests

This research study also coped with the problem of endogeneity using the method of two-stage least squares (2SLS), and distance was used as an instrumental variable. We also confirmed through post estimation technique that distance is a good instrumental variable for the respective

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models. The robustness was checked through second-stage instrumental-variable regression models 4.4.

4.4.1 Impact of Formal Accounts on Household Income in China

In this section, we use the second-stage instrumental-variable regression for equation 3.7 and estimate the impact of formal accounts on households' income in China. The corresponding results are shown in table 8.

Table 8. Results from single-equation instrumental-variables regression for the estimation of the impact of Formal Accounts on household income in China

	Dependent Variable: Household Income			
	(1) IV regress	(2) Wald chi2	(3) Coeff.	(4) St. Error
Formal Account	0.003* [3.80]	302.54 [0.0000]*	27758.48	9316.142
Education	0.114* [1.58]	302.54 [0.0000]*	4230.61	3614.974
Age	0.242* [1.17]	302.54 [0.0000]*	-485.26	99175.3306
Marital status	0.629* [0.48]	302.54 [0.0000]*	581.0759	1203.748
Constant	0.065* [-1.85]	302.54 [0.0000]*	9518.387	21628.12
Prob. Chi2	0.000	0.0000	0.0000	0.0000
Province Fixed Effects	Yes	Yes	Yes	Yes
Test of Endogeneity do	H_0 : Variables are exogenous do		Durbin (score) chi2(1) = (p = 0.03) Wu-Hausman F(1,39509) = (p = 0.03)	
Test of weak IV	H_0 : Instruments are weak		F(4,39509) = 58.81 (much larger than all critical values)	

*Note: This table represents the single-equation IV regression. The values in column 1 inside the brackets represent the robust z-values, the values in column 2 represent Wald chi2 and the values in brackets are the corresponding values of significance while the figures outside the brackets represent the corresponding z-values at the 5%*level of significance. Distance is used as instrumental variable.*

Table 8 shows the results of the second-stage instrumental-variable regression for the estimation of the impact of formal accounts on households' income in China. Column 1 of the above table shows the results of the IV regression. The p-value is less than 5% showing that formal account is a significant variable for household incomes in China. We also performed tests of endogeneity through Stata to verify whether our instrumental variable i.e., "distance," is actually an endogenous variable or not. Both Durbin and Wu-Hausman have very small critical values, which indicates that we can reject our null hypothesis that variables are exogenous and accept the alternative hypothesis that the variables are actually endogenous. Hence, we can say that distance is an endogenous variable in our model. Similarly, we also performed test for weak

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instruments and the corresponding results is F (1, 39509) = 58.81which is greater than all the critical values.

Therefore, we reject H0, that instruments are weak, and accept that the instruments are not weak. Finally, we observed that the results of IV regression are consistent with the results of the results of OLS and Quantile regressions. Hence, a significant relationship exists between formal accounts and household income in China.

4.4.2 Impact of Formal Savings on Household Income in China

This section deals with the estimation of the impact of formal saving on household income in China for equation 3.8 through second-stage instrumental-variable regression. These results are presented in the following table.

Table 9 Results from single-equation instrumental-variables regression for the estimation of the impact of Formal Saving on household income in China

	Dependent Variable: Household Income			
	(1) IV regress	(2) Wald chi2	(3) Coeff.	(4) St. Error
Formal Saving	0.004* [2.88]	161.86 [0.0000]*	27758.48	9316.142
Education	0.370* [0.90]	161.86 [0.0000]*	4230.61	3614.974
Age	0.000* [-4.57]	161.86 [0.0000]*	-485.26	99175.3306
Marital status	0.840* [0.20]	161.86 [0.0000]*	581.0759	1203.748
Constant	0.000* [3.53]	161.86 [0.0000] *	9518.387	21628.12
Observation	9009	9009	9009	9009
Prob. Chi2	0.0000	0.0000	0.0000	0.0000
Province Fixed Effects	Yes	Yes	Yes	Yes
Test of Endogeneity do	H_0 : Variables are exogenous do		Durbin (score) chi2(1) = (p = 0.001) Wu-Hausman F (1,11503) = (p = 0.001)	
Test of weak IV	H_0: Instruments are weak		F(4,11503) = 22.4 (much larger than all critical values)	

Note: This table represents the single-equation IV regression. The values in column 1 inside the brackets represent the robust z-values, the values in column 2 represent Wald chi2 and the values in brackets are the corresponding values of significance while the figures outside the brackets represent the corresponding z-values at the 5%* level of significance. Distance is used as instrumental variable.

Table 9 shows the results of the second-stage instrumental-variable regression for the estimation of the impact of formal savings on households' income in China. Column 1 of the above table

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shows the results of the IV regression. The p-value is less than 5% showing that formal savings is a significant variable for household incomes in China. We also performed tests of endogeneity through Stata to verify whether our instrumental variable, i.e,. "Distance, "is actually an endogenous variable or not. Both Durbin and Wu-Hausman have very small critical values, which indicate that we can reject our null hypothesis that variables are exogenous and accept the alternative hypothesis that the variables are actually endogenous. Hence, we can say that distance is an endogenous variable in our model. Similarly, we also performed test for weak instruments and the corresponding results is F (1, 39509) = 22.45 which is larger than any of the critical values in Stata table. Therefore, we reject H0 that instruments are weak and accept that the instruments are not weak. Finally, we observed that the results of IV regression are consistent with the results of the results of the OLS and Quantile regressions. Hence, there is a significant relationship between formal account and household income in China.

4.4.3 Impact of Formal Credit on Household Income in China

In this section, we use the second-stage instrumental-variable regression for equation 3.9 and estimate the impact of formal credit on households' income in China. The corresponding results are shown in table 10.

Table 10 shows the results of the second-stage instrumental-variable regression for the estimation of the impact of formal credit on households' income in China. Column 1 of the above table shows the results of the IV regression. The p-value is less than 5% showing that formal savings are a significant variable for household incomes in China. Both Durbin and WuHausman have very small critical values, which indicates that the variables are actually endogenous. Hence, we can say that distance is an endogenous variable in our model. However, for equation 3.9, the value of the test is smaller than the values of the other critical values. Hence, in this case, we accept the null hypothesis and conclude that the instruments are weak. Finally, we observed that the results of IV regression are consistent with the results of the results of the OLS and Quantile regressions. Hence, there is a significant relationship between formal account and household income in China.

4.4.4 Impact of Formal Insurance on Household Income in China

This section deals with the estimation of the impact of formal insurance on household income in China for equation 3.8 through second-stage instrumental-variable regression. These results are presented in table 11.

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Table 10 Results from single-equation instrumental-variables regression for the estimation of the impact of Formal Credit on household income in China

	Dependent Variable: Household Income			
	(1) IV regress	(2) Wald chi2	(3) Coeff.	(4) St. Error
Formal Credit	0.006* [0.25]	121.45 [0.0000]*	10.87825	43.32273
Education	0.838* [-0.20]	121.45 [0.0000]*	-61086.21	299053.2
Age	0.815* [0.23]	121.45 [0.0000]*	11721.52	50112
Marital status	0.877* [0.16]	121.45 [0.0000]*	3692.494	23814.14
Constant	0.816* [-0.23]	121.45 [0.0000]*	-875597.4	3763453
Observation	12108	12108	12108	12108
Prob. Chi2	0.0000	0.0000	0.0000	0.0000
Province Fixed Effects	Yes	Yes	Yes	Yes
Test of Endogeneity	H0: Variables are exogenous do	Durbin (score) chi2(1) = (p = 0.0019) do Wu-Hausman F(4,39509) = (p =0.0019)		
Test of weak IV	H0: Instruments are weak	F (4,39509) = 0.17 (much smaller than all critical values)		

Table 11 shows the results of the second-stage instrumental-variable regression for the estimation of the impact of formal insurance on households' income in China. Column 1 of the above table shows the results of the IV regression. The p-value is more than 5% showing that formal insurance is not a significant variable for household incomes in China. Both Durbin and Wu-Hausman have very small critical values, which indicate that the variables are actually endogenous. Hence, we can say that distance is an endogenous variable in our model. However, for equation 3.10, the value of the test is smaller than the values of the other critical values.
Hence, in this case, we accept the null hypothesis and conclude that the instruments are weak. Here surprisingly, the results of the IV regression do not coincide with the results of the OLS and Quantile regression as the p-value for equation 3.10 is greater than 5%. Thus, according to the IV regression result, we conclude that formal insurance is not a significant variable for household income in China. Based on the findings, this study suggests the following policy suggestions.

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Table 11. Results from single-equation instrumental-variables regression for the estimation of the impact of Formal Insurance on household income in China

	Dependent Variable: Household Income			
	(1) IV regress	(2) Wald chi2	(3) Coeff.	(4) St. Error
Formal Insurance	0.220* [1.23]	51.38 [0.0000] *	93.78021	76.39462
Education	0.050* [1.96]	51.38 [0.0000] *	36764.2	18742.29
Age	0.299* [1.04]	51.38 [0.0000] *	4774.938	4594.169
Marital status	0.173* [-1.36]	51.38 [0.0000] *	-6599.501	4837.978
Constant	0.286* [-1.07]	51.38 [0.0000] *	-456992.3	428754.7
Observation	12025	12025	12025	12025
Prob. Chi2	0.0000*	0.0000*	0.0000*	0.0000*
Province Fixed Effects	Yes	Yes	Yes	Yes
Test of Endogeneity do	H_0 : Variables are exogenous do		Durbin (score) chi2(1) = (p = 0.002) Wu-Hausman F(1,11503) = (p =0.002)	
Test of weak IV	H_0 : Instruments are weak		F(4,39509) = 1.82 (much smaller than all critical values)	

Note: This table represents the single-equation IV regression. The values in column 1 inside the brackets represent the robust z-values, the values in column 2 represent Wald chi2 and the values in brackets are the corresponding values of significance while the figures outside the brackets represent the corresponding z-values at the5%*level of significance. Distance is used as instrumental variable.

Although the status of financial inclusion in China is better than in other developing countries, there still exists room for further enhancement. As this study found that 71.225% of households are financially included in China, there is still a huge mass of financially excluded people.

Hence, we recommend that the government of the people's republic of China should divert its attention to the field of financial inclusion. The government should provide easy and affordable financial services so that the common citizens should avail these financial services. In this way, the status of financial inclusion will further improve, and the income gaps can be reduced up to a certain desirable level. As financial inclusion is regarded as a key enabler for removing income inequality, this study recommends that financial inclusion should be included among the top priorities of the government. This will ensure rapid economic growth, and the standard of living of the people will improve.

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