Uncovering Gender Pay Disparities: An Examination of Chinese Gig Workers' Earnings and Asset

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A thesis submitted to the Department of Economics and Social Sciences in partial
fulfillment of the requirements for the degree of
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Declaration

It is hereby declared that

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2. The thesis does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.

3. The thesis does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.

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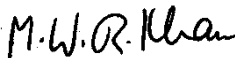
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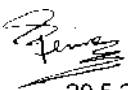
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Abstract

The analysis utilized gender pay disparities among Chinese gig workers' earnings and asset ownership in Chinese households. To analyse the determinants of gig workers' earnings and asset ownership disparities, we avail data from China Household Finance Survey (CHFS) 2017 sample. Possible presence of endogeneity is accounted in the model specification as well as by using the Lewbel heteroscedasticity identified endogenous variables estimator and Oster's (2019) technique to test for potential omitted variable bias and the coefficient stability of our conflict variable. In addition, we are the first to scrutinise disparity and discrimination by conducting the Blinder–Oaxaca decomposition of asset ownership model by gender, Gig worker, region (Eastern vs. non-Eastern provinces), and urbanisation status (rural vs. urban residents). Our analysis shows: (i) Gig workers who are women typically make less money; (ii) asset ownership determinants including durable goods and precious metals discrimination are found. Female gig workers found discrimination in durable goods; and (iii) the Blinder–Oaxaca decomposition analyses show statistically significant gender and gig workers discrimination in asset ownership in terms of precious metals. However, there is statistically significant discrimination between Eastern and non-Eastern provinces and between rural and urban households in asset ownership.

Keywords: China, disparity, Gig economy, Asset ownership, Lewbel, Blinder–Oaxaca

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In the name of the Most Gracious and Merciful Allah. I want to thank him, for providing me with the strength, wisdom, and perseverance I've needed to complete my academic journey. To my loving late father, even though you are no longer with us, your unwavering faith in my skills inspires me every day. This thesis is dedicated to your memory, as a tribute to your unfailing love and encouragement. May Allah bless your soul with eternal peace.

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Introduction

The gig economy is relatively new and has impacted aspects of people's working and earning a living; it also has generated controversies about employment laws, wage guarantees and fairness. Gig work is suggested an employment status where instead of having a permanent full-time job, a person works on short-term projects or gigs which are often temporary (Ahmad, 2021). This method also fosters employee voice because one can run many gigs or jobs at the same time (Singh, 2023). This segment consists mainly of the individual workers and temporary workers who are hired under low-waged or part-time jobs or have no labour contract. Gig employment is promising and a valuable concept that supports the economy (Ahmad, 2021).

Freelancing and entrepreneurship are intertwined and gig economy provides opportunities for establishing new ventures as well as financial cushion during the unstable moments. Several studies show that in credit-constrained markets, gig work finances the entrepreneurial activity, which increases business creditworthiness. The gig workers are classified into two categories, independent contractors and contingent workers, web-based and location-based platforms, emotional literacy and online reputation becoming an essential marketing tool for knowledge-based gig workers (Mukhopadhyay, 2021). Not only that, but the gig economy has allowed the bottom workers such as students, retired persons, or workers who look for additional income streams. Labour force participation of women has increased over the years making the diversity of workforce even more enhanced (Xu, 2022).

While the gig economy provides an opportunity for the cancellation of gender discrimination, work opportunities for women, and freedom, it contributes to the increase in income differentiation, women's insecurity, and their lack of a place in high-paying positions (Chibanda et al. 2022). Globally, gender pay discrimination is predominant with female

employees being paid less than their male counterparts for the same work done. This imbalance can be attributed to various factors such as girls and women having limited control over money, health, and education as compared to their counterparts- boys and men. Income difference has been widely researched by scholars from academic organizations and has been widely discussed (Baloch et al. 2018). Kasliwal (2020) noted that women abandon gig economy more than males, mainly because their primary income is "distressed." The unequal access to digital technology also deters women's engagement in gigs.

Gig economy, a labour market that is fundamentally based on freelance employment and short-term contractual basis is one of the most expanding sectors in China. They operate through online platforms or directly with clients and they have the option to do short term and flexible jobs to fit their schedules. The sectors of gig economy in China include online teaching, food delivery, e-commerce, ride-sharing, and many others. Some examples of the applications which contributed to the popularity of these types of occupation arrangements include Meituan Dianping, Alibaba Taobao, and Didi Chuxing. The expansion of the gig economy in China may be attributed to two factors: The fast development of digital devices and the increasing amount of mobile internet usage. Technology has therefore expanded the need for on-demand and flexible businesses for the consumer and the convenience of employments.

Towards the end of the 1980s, the gig economy grew quickly. In addition to creating new markets and commercial prospects for private companies generally, the pervasive corruption also provided some political security for the gig economy and private firms. The situation was comparable in the countryside, where the government was again instrumental in fostering the growth of small enterprises. After the former people's commune and collectives were demolished, millions of little family plots and companies were created. Many labours from rural areas moved to cities and found employment in the urban gig economy. Strong

governmental backing played a major role in the gig economy's explosive growth in China in the late 1980s.

During fluctuating market opportunities, government officials and elites actively engaged in the private sector to employ the resources and connections in this sector of communism. Despite its issues, an expanded corruption process also supported legitimization of private business and the gig economy throughout the country and the development of new sectors. The gig economy at this time was on the rise in China and this was attributed to structural factors and government support in the urban as well as the rural areas. People who were engaged in individual employment or gig economy increased during the 1980s or more than 21 million. One million in different areas including the urban and the rural areas by the end of the decade from the current population of 0. 15 million in 1978. A large number of urban workers are employed in state-, collective- or otherwise state-owned companies so although this sector has expanded, it is still much smaller than the formal economy.

However, China adopted major structural changes in the 1990s as a result of neoliberalism economic measurement including policies and practice of privatization and shifting towards the market economy. Due to these changes, approximately 45 million officials and employees of the state and cooperative-owned businesses lost their jobs between 1995 and 2002. As an example, in 1995, there were 144 million jobs while in 2018 there were only 61 million implying that there were distinctly fewer job opportunities generally within those companies. Before this change of gears in this part of the year, the gig economy in China was a niche though rapidly expanding economy in the country.

Thus, one of the remaining critical concerns in the Chinese gig economy is the gender pay gap that has slightly decreased over the years but remains a problem for men and women alike. Scholars have noted gendered precarious labour relations as the characteristic features of the

on-demand economy in China. All of these relationships affect women gig drivers because they experience multiple oppressions and restricted access to opportunities. Female earners in this region earn far less than male earners for the gig economy, even with flexible scenarios that should optimize on labour markets. As it is with many countries, the gig economy of the China has its problems of wage disparity, discrimination and marginalization of women. Therefore, there is a need to close these gaps and make the gig work in China more equitable by covering the following critical areas with concrete implementation.

While gig work has brought significant improvements in income generation, there are still gender disparities in earnings among virtual workers for males than those for females, causing controversies over economic equity and gender justice. It, therefore, becomes important that the subject of gender wage gap among gig workers in China is addressed as we seek to unravel the problems that women face in attaining equitable incomes. This paper presents issues like gender discrimination at the workplace, segregation of occupation, and imbalance in the ability to acquire necessary skills which are valuable for the policymakers who would want to pursue the enhancement of gender equity in the workplace. In addition, it is essential also to establish how gender contributes to asset ownership targets amongst the gig workers that is instrumental in shaping the wealth and economic power.

The fact that the gender wage gap, which has persisted as evidence for the uneven salaries of male and female workers, remains a crucial issue in this rapidly changing environment cannot be treated with carelessness. There is regrettably a true scarceness of thorough research in this regard highlighted by the Gig Economy focusing on freelancers and those going in for temporary work in the context of China displaying unique character on the relationship between earnings and ownership of assets. Such investigations shall be aimed at revealing the underlying gender income gap reasons within the gig economy development and the importance of asset ownership. The main Questions sought to be addressed here are-

i. How significant is the level of wage discrimination by gender within the gig workers in China? Practical gender wage disparities in the gig economy are significant economic concerns because they reflect greater paradigms of labour market dynamics and prejudices. Comparing the level of differences found helps to understand the nature of efficiency and equity in the labour market. They can be linked to such factors as gender discrimination, gendered opportunities for choosing a job, gendered routes that separate individuals from work activities, and gendered development of a set of skills and career mobility. Analysing the extent of gender wage gaps among gig employees in China provides information on wage discrimination against women and contributes to debates on how to establish policy reforms that will fashion out ways to achieve comparable wages between men and women in the marketplace.

ii. The ownership of assets and gender differences are related in the following ways depending on gig working engagements. The concept of wealth is important in economic growth, financial position, and social class because of asset ownership. Patterns of differences in asset ownership by gender may arise from disparities in income levels and access to capital, culture, and tradition or enactment of laws. The following discussion shows how the gender factor influences the ownership and management of such resources among gig workers and that, consequently, more policies should be developed to improve the gig workers' access to assets and eradicate the inequalities in the distribution of wealth that are common among marginalized groups.

Literature review

Maurer-Fazio & Hughes (2002) established that the extent of the gender wage differential differs with the Chinese women's marital status, level of education, and occupation in urban China. Married women receive lower wages than unmarried women, and married women's wage penalty is statistically greater than that of unmarried women, with a larger portion of the gap that cannot be explained by differences in productivity. One of the conditions that have been found to reduce the size of the gender wage gap is enrollment and participation in higher education. There is a scope of work to investigate whether being married made any difference in asset ownership. Therefore, the paper finds that in the context of Chinese urban labor markets, the concept of industrial segregation is more relevant than occupational segregation, for determining the gender wage gap. Li and Ma (2015) attempted to find out the impact of minimum wages on the gender pay gap among workers in urban China. A significantly higher proportion of the female employees than the male ones in the selected industries paid less than the minimum wage (MW) between 1995 and 2007 the difference-in-differences results confirm the hypothesis suggesting that (MW) over time helps decrease the gender pay gaps, particularly for the lowest-paid candidates.

In contrast to urban areas and the public sector, Iwasaki et al. (2020) study indicates that the gender pay disparity is more noticeable in rural areas and the private sector (Li Shi, 2011). While this study focuses on urbanization contexts, it is crucial to investigate whether similar disparity exists in regional contexts. Income disparity was discovered in Xie and Zhou's (2014) investigation. Firstly, income inequality in China has been abnormally high, surpassing historical averages and comparable nations by a Gini coefficient of 0.50 in the year 2010. Comparatively speaking, China's income disparity is mostly determined by regional and rural-urban differences, reflecting historical trends, in contrast to the United States where personal and family characteristics have a greater effect.

Gender wage discrimination and Women earning less than men, a longstanding issue highlighting unequal wages for male and female employees, remains a major issue in this shifting context (Vyas, 2021; Liang, Hong, Gu, and Peng, 2018). First, while there have been studies analysing gender wage gaps focusing mostly on hourly workers and temporary jobs in more general terms as sectors of the Gig Economy, there is admittedly a striking dearth of comprehensive and systematic works devoted to freelancers and workers performing temporary assignments in particular referring to China.

Female UBER drivers earned 6.9% less per hour compared to their male counterparts Hall & Krueger (2018) study on the driving UBER in the US. Challenges in synchronising driving velocity, expertise, and choices on work schedule and location bear the blame for this divergence. Likewise, differences in the distribution of platform usage and employment sectors are among the causes of income differences between women and men as pointed in a study done by Berger et al. (2020). Although this research had been conducted with the focus on the western environment, in order to find out if similar gender wage gaps are present among the gig workers in China is crucial.

Women drivers suffer a variety of legal protection barriers, including work insecurity, a double burden, gender stereotypes, and sexual harassment (Zulfiyan, 2020). Women experience systemic disadvantages in the job market as a result of issues such as slower professional progress, under-representation in management, and uneven caregiving obligations. Single women's wage income has remained comparable to men's in recent years, but mothers have experienced significant disadvantages in their earnings (Zhang and Hannum, 2015). This study will also investigate whether being married create any difference in income. The gig economy, which is characterized by flexible employment arrangements, has sparked debate over gender parity (Dokuka, 2022).

As noted by Chen et al. (2013), the overseas and exporting companies and local non-explorers prefer female employment. As it is observed from the study, more employment opportunities and female employees are offered when there is higher international involvement and export orientation, the gender pay gap is closed drastically especially if the employer and employee are in the same sector and place. Remarkably, gender productivity discrepancies rather than discriminatory behaviors are the reason behind the female salary disparity reported in exporting and overseas companies.

Hughes et al. (2002) conducted research on the gender wage differential in the urban China with special emphasis on pay disparities by occupation, educational attainment, and marital status. Hence, there is a research gap to confirm whether such difference can be found within the Chinese gig economy. The study shows that as compared to single women, married Chinese women have far greater absolute gender pay inequalities. The general challenges that are often faced by female gig workers are not clearly articulated here. Moreover, married women are more represented than single women in the gender pay gap that is unexplained by differences in productive characteristics. More educated women also seem to have less gender income inequalities, according to the study. Most notably, the results imply that industrial segregation—rather than occupational segregation—is a more significant factor in explaining the gender wage disparity in China's urban labor markets (Li Shi, 2011; Iwasaki, 2020).

Zulfiyan (2020) investigates the vulnerability of women in the gig economy within a patriarchal framework, concentrating on female Grab drivers. According to the report, there is no work tie between Grab and its drivers, denying women drivers rights specified under labor regulations. This report highlights that the female employees within the gig economy ought to be given additional legal protection and legal assistance. Similarly, following the data collected from the gig workers, Wei (2021) states that the four determinants influencing quality of work and

work relations within the gig economy include income, legal protections, voice, and clients' treatment.

In a study of over a million rideshare drivers, Cook et al. (2018) found that males tend to drive at more profitable times and places, including during surge pricing. Platform incentives and algorithms may unintentionally favor male workers, pushing them to take on more trips or work longer hours, according to Scheiber (2017). These findings suggest that the gender wage inequalities among the gig workers could be explained by the platform characteristics, working patterns, and work-related choices. This paper aims at determining the extent of gender wage disparity by analyzing these dynamics within the Chinese gig economy.

These gender imbalances in asset ownership can therefore be attributed to income rankings of genders in the structure of gig economy. In a scenario where income is unpredictable, as can be the case with some modern jobs such as in the gig economy, where one maybe Freelancer, cash flow may not always be guaranteed, possessing assets is an indication of financial stability. To improve employment flexibility and access to possibilities, durable goods—like cars and cutting-edge electronics—are necessary for many gig economy occupations. Owning durable things improves economic prospects since they are useful and may be used as collateral to secure financing (Mian & Sufi, 2014). As per Sundararajan (2016), men are more likely to possess high-value assets in the gig economy, which is essential for obtaining gig labor that pays more. Thus, there is a work to be done to examine whether the same difference holds for the Chinese gig economy.

Gender inequalities in assets ownership in the gig economy are thoroughly associated with gender inequalities in the earnings received. For the people relying on their income from the gig economy whereby the income could be irregular, owning one is a sign of economic security as well as economic liberty. To enhance work flexibility and availability, several gig economy

jobs involve owning sturdy assets like cars and technology for work. Consuming durable assets is advantageous in the economic sense because durable assets are functional, and many can be pledged to obtain credit (Mian & Sufi, 2014). Sundararajan (2016) noted that it would be wise for the gig economy to source gig labor that earns more, and the author opined that men are more likely to own such high value assets in the gig economy. In general, studies do not report the specific challenges that bother female gig workers.

Besides, purchasing durable consumer goods, gold and silver are considered as the insurance and hedge against the shift in the economic conditions. According to Baur and McDermott (2010), it was established that precious metals are stores of value. Inequality in ownership of assets on the other hand shows larger overall economic differences between genders. Men also tend to spend more in precious metals than women because they have a higher discretional income as well as higher financial literacy level. There is an area of research that would need to be explored as to whether or not being female had the effect of changing the amount of asset that one owned. According to the OECD (2013), women can have access only to limited quality financial assets because they get lower salaries and face financial difficulties, so they have poorer financial prospects. This paper will explore how these trends are present among Chinese gig workers and how asset ownership by gender is altered. Thus, there is a research gap pertaining to gender inequalities in the context of the emerging gig economy specifically in China. This clearly calls for more research to demystify and reduce this gender disparity in this growing field.

Methodology

Model specification

Based on the past literature such as Chen et al. (2013), we have adopted an income and asset ownership models. First, income was considered separately for each year to get an idea of the overall magnitude of the gender differences in income earnings. The results are based on the OLS regressions of logged income where Gig Workers, Female, Primary Education, Junior High Education, Vocational Education, Higher Education, Married, Good Health, Age, Smart Phone Users, Region (Eastern), Energy Expense, And GIG Female works as independent variables (predictor variables).

$$
\begin{aligned}
(\ln \text{Total income})_i \\
= \beta_0 + \beta_1(\text{Gig})_i + \beta_2(\text{Female})_i + \beta_3(\text{Primary Education})_i \\
+ \beta_4(\text{Junior High Education})_i + \beta_5(\text{Vocational Education})_i \\
+ \beta_6(\text{Higher Education})_i + \beta_7(\text{Married})_i + \beta_8(\text{Good Health})_i \\
+ \beta_9(\text{Age})_i + \beta_{10}(\text{Phones})_i + \beta_{11}(\text{Eastern})_i + \beta_{12}(\ln \text{Energy Expence})_i \\
+ \beta_{13}(\text{GIG Female})_i + \mathcal{E}_i
\end{aligned}
$$

$$(1)$$

For the purpose of this study, temporary employees and freelancers were considered as gig works (Aristi et al., 2021; Malik et al., 2021; Mitchell et al., 2021). Gender is one of them and it is measured by the variable called "Female." Using this variable, the model is able to find out whether female status has any influence on income or not. Education is an important element in this narrative. Educational background is divided into several groups: primary, secondary, and tertiary education. Previous studies provide knowledge on the correlation between income and education level including (Arshad et al., 2022; Setyadharma et al., 2021; Rotimi-Ojo, 2024; Chang, 2024).

The model looks at the relationship between income levels and factors like marriage and health. The variable "Eastern" is utilized to consider geographic location as well. The use of an Eastern dummy to represent the respondent's location is driven by existing research on income

inequality in China, such as (Lian et al., 2024; Liu et al., 2023; Sang et al., 2023) This is an example of a geographical issue that might have varying effects on income. Incorporating age as a possible factor affecting income, the model also includes age as a variable. The total spending on fuel, water, electricity, heating, property management, and others for the last year also shows that the energy expenses can decide the income too. Whether there are some specific challenges affecting women in the gig economy that influence their income in a way that is not explained by the traits.

Thus, to understand the specifics of this group's ownership, we need to find out more about the factors that influence gig earners' incomes. In order to explain the highly complex relationships that characterise the asset ownership, we analyse the more detailed aspects such as asset purchase going beyond the basic income measures, but rather focusing on acquiring valuable assets such as durable consumer goods and metals. In an economically vibrant city where the gig economy thrives, researchers set out to unravel the complicated fabric of asset ownership among temporary employees and freelancers. Researchers attention shifted away from traditional income metrics and toward the acquisition of valued assets such as precious metals and durable commodities. Here asset ownership is measured by two distinct dummy variables: (a) Precious metal, and (b) Durable goods. The story begins with a model that is used to determine the elements that influence asset ownership (Hu et al. 1989).

$$
\begin{aligned}
(\text{Asset Ownership})_i &= \beta_0 + \beta_1 (\text{Gig})_i + \beta_2 (\text{Female})_i + \beta_3 (\text{Primary Education})_i \\
&\quad + \beta_4 (\text{Junior High Education})_i + \beta_5 (\text{Vocational Education})_i \\
&\quad + \beta_6 (\text{Higher Education})_i + \beta_7 (\text{Married})_i + \beta_8 (\text{Good Health})_i \\
&\quad + \beta_9 (\text{Age})_i + \beta_{10} (\text{Phones})_i + \beta_{11} (\text{Eastern})_i + \beta_{12} (\ln \text{Energy Expence})_i \\
&\quad + \beta_{13} (\text{GIG Female})_i + \mathcal{E}_i
\end{aligned}
$$

$$(2)$$

Unfortunately, using the specified model, specified by the variable 'Precious Metal," the model attempted to determine the relationship between gig employment and owning these valuable

assets. Household requirements such as BW/Colour TVs, air conditioners, refrigerators, washing machines etc are also stakeholders but had the less important role in this drama. As for the control variable, "Durable Goods" was added as a monetary expression for the possibility of purchasing capital goods by gig workers. The intention of the study was to determine if the gig economy provided people with an opportunity to accumulation of those costly items. Over time, model offered the evolving markers and contours of the gig work environment that define who within the gig economy owns precious metals and durable goods: gender, education, marital status, health, geography, age, and finances.

The findings of this research in aggregate offer an extensive look at the financial situation of Chinese households participating in gig economy-related jobs. Besides providing the insights on how gender and other employment characteristics influence income changes over time, the data presented in the paper also explain the interdependency between gig labour and valued assets. These lessons are useful to recall as the economy of the People's Republic of China is progressing for the purposes of better understanding of the modern nature of the enterprises and people's occupations as well as maximizing the effectiveness of international cooperation for the target governments.

Empirical methodology

Logistic regression

The relationship between the asset ownership proxies and OLS estimates will be tested using the binary variable representation. Binary variables are widely employed in regression analysis and can be also called dummy or indicator variables. Here, the dependent variable is a dichotomous variable 0 or 1 and the probability of occurrence of the event is modelled with dichotomous independent variables. Logistic regression is used for modelling of the binary outcomes.

A log of odds, or logit, is used to transform the dependent variable in Equation (2) of logistic regression. In more detail, the probability that a given household would own a characteristic can be calculated by taking the natural logarithm of the odds ratio. The log-odds of a family having a feature compared to not having it is captured by the logit, that is $\log\left(\frac{P(\text{Asset Ownership})}{1-P(\text{Asset Ownership})}\right)_i$, which is represented by the letter log and P stands for the probability of the occurrence.

$$
\begin{aligned}
\log&\left(\frac{P(\text{Asset Ownership})}{1 - P(\text{Asset Ownership})}\right)_i \\
&= \beta_0 + \beta_1(\text{Gig})_i + \beta_2(\text{ Female})_i + \beta_3(\text{ Primary Education})_i \\
&+ \beta_4(\text{ Junior High Education})_i + \beta_5(\text{ Vocational Education})_i \\
&+ \beta_5(\text{ Higher Education})_i + \beta_6(\text{ Married})_i + \beta_6(\text{ Married})_i \\
&+ \beta_7(\text{ Good Health})_i + \beta_8(\text{ Age})_i + \beta_9(\text{ Phones})_i + \beta_{10}(\text{ Eastern})_i \\
&+ \beta_{11}(\text{ ln Energy Expence})_i + \beta_{11}(\text{GIG Female})_i + \mathcal{E}_i
\end{aligned}
$$

(3)

Specifically, with the asset ownership converted as a binary variable, the logistic regression model allows for testing interaction between the specific event's odds and the possession or lack of specific assets. That is, it is possible to estimate the log-odds of existence or nonexistence of each asset using the transformation $\log\left(\frac{P(\text{Asset Ownership})}{1-P(\text{Asset Ownership})}\right)_i$. It can be useful in cases when analyzing the impact of the asset ownership on the likelihood of the studied event since these markers indicate whether a household has a particular asset (1) or doesn't (0). Logistic regression analysis of these binary factors and their relationship with the log-odds of the event is, in fact, quite an effective approach.

Lewbel

The presence of endogeneity due to the omitted variable bias is a possible source of concern when evaluating Equations (1). We use two techniques to dealing with endogeneity problems. First, we follow the existing research on income inequality models and estimate Equation (1)

with the Lewbel (2012) estimator, which takes use of heteroskedasticity in the data to tackle the identification problem caused by endogeneity. Second, we estimate the treatment impact of conflict on log total income using Oster's (2019) technique to test for potential omitted variable bias and the coefficient stability of our conflict variable.

The influence of asset possession on the likelihood of an event may be efficiently evaluated by applying the logistic regression framework to investigate the link between asset ownership and the log-odds of specific events. Lewbel (2012) proposed an endogenous regressor estimator employing heteroscedasticity to solve endogeneity problems and provide a reliable method for modeling endogeneity in regression equations, which we use to re-estimate Equations (1) and (2) for robust modeling of endogeneity. The method uses heteroscedasticity to determine the structural parameters of the endogenous model. Lewbel (2012) incorporated the desirable aspects of both the systems and made use of both the external and internal instruments of the GMM as well as 2SLS/3SLS. It can handle a number of endogenous and/or mis measured regressors by the effective estimator that is produced. This estimator is as accurate as the typical endogenous variable modeling with acknowledged external tools.

Blinder-Oaxaca decomposition

Using another approach that can also help to understand the reasons behind the differences in asset ownership rates the Blinder-Oaxaca decomposition method has been employed. Fairlie (2005) The Blinder-Oaxaca decomposition method is a popular tool for determining and measuring the individual contributions of group variations in observable traits, such as location, marital status, education, and experience, to disparities in race and gender outcomes. Nevertheless, if the result is binary and the coefficients originate from a logit or probit model, the method cannot be applied directly. The Blinder (1973) – Oaxaca (1973) decomposition procedure is applied in order to study the systematic divergence of asset holding rates by the

primary categories of social exclusion. It is a common counterfactual decomposition technique that is often employed in order to understand how the outcomes of different groups vary, with reference to discrimination and/or labor economics. In this study, the Blinder (1973)–Oaxaca (1973) technique is employed to estimate and account for systematic differences in own-rates of capital assets while, at the same time, detecting discrimination or meditating against such systematic differences. The decomposition assesses the "explained" and "unexplained" predictors of every systemic difference and calculates systemic differences in outcome across groups.

The Blinder–Oaxaca decomposition studies consider the following social exclusion groups: gender, gig worker, area (non-Eastern vs. Eastern provinces), and urbanization status (rural vs. urban inhabitants). Apart from the customary social exclusion categories found in previous research, we further partition the dataset based on the respondents' 'Eastern' and 'non-Eastern' status, as there are significant distinctions between these two regions of China. The twelve provinces and autonomous municipalities located in the eastern area of China are Beijing, Tianjin, Hei Bei, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, Guang Xi, and Hainan. These provinces and municipalities are the regional structures and are fully controlled by the central government. Thus, although this region constitutes only 13% of the total size, it comprises only 5% of China's land area while it is consistently populated by close to 40% of the entire population of China.

Empirical estimation results

Preliminary data analysis

The summary statistics describe the aspects of the sampled population by providing an overview of several economic, demographic, and socio-economic variables. Panel A examines the data of income, expenditure, and assets, Panel B provides the information on demographic and socio-economic characteristics, and Panel C provides the details of social exclusion indicators for 40,011 persons.

Statistics shown in the panel A, which present the income, spending and asset shares show that the mean total income in the sample equals 39,216. Hence, an amount of 35 Renminbi (RMB) Yuan was estimated with a relatively high standard error of RMB 96,600. 68. This means that there is a possibility of the income levels of the participants to be these different or homogeneous. The highest income in the data set in each category is: The highest income earner in terms of income in the RMB is 6. 3 million highlights the extent of the inequalities; 6,000 RMB minimum income is suggestive of negative values or at least debts or loss most probably. Analyzing the results of the energy costs calculation, it is possible to establish that its mean value is 330.25 while its subject is revenue ranging from 0 to 25000, and it will contain less fluctuations as compared to the conventional ones. Purchases of durable goods have become evident with an average of 97.6%, but the ownership of precious metals is quite low at 25.2%.

The demographic and socio-economic characteristics identified in Panel B show that 13.5% people claim to be gig workers, which underlines the specificity of non-regular employment patterns. With 46.2% Gender distribution can be considered quite balanced since only of the participants are female. Educational achievement varies, with large percentage having finished junior high education (45%) and holding higher education degrees (8.6%). Eighty-two percent

of people are married, and about thirty-three percent say they are in excellent health. With an average age of 47.2 years, there is a wide range of ages present. 62.9% of people use smartphones, indicating widespread usage. 5.2% of the workforce consists of female gig workers. Panel C, which focuses on social exclusion factors, shows that 31.8% of people live in rural regions and 14.1% live in the Eastern region.

Table 1 Summary statistics

	Count	Mean	SD	Minimum	Maximum
Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Panel A: Income, expenditure, and asset shares					
Total Income	40,011	39216.350	96600.684	-6000.000	6.30e+06
Energy expense	40,011	330.247	591.117	0.000	25000.000
Durable Good	40,011	0.976	0.154	0.000	1.000
Precious Metal	40,011	0.252	0.434	0.000	1.000
Panel B: Demographic and socio-economic indicators					
Gig Worker	40,011	0.135	0.342	0.000	1.000
Female	40,011	0.462	0.499	0.000	1.000
Primary Education	40,011	0.243	0.429	0.000	1.000
Junior High Education	40,011	0.450	0.498	0.000	1.000
Vocational Education	40,011	0.075	0.264	0.000	1.000
Higher Education	40,011	0.086	0.280	0.000	1.000
Married	40,011	0.822	0.383	0.000	1.000
Good health condition	40,011	0.329	0.470	0.000	1.000
Age	40,011	47.185	16.677	0.000	117.000
Smart Phone Users	40,011	0.629	0.483	0.000	1.000
GIGF (Female Gig worker)	40,011	0.052	0.222	0.000	1.000
Panel C: Social exclusion					
Eastern Region	40,011	0.141	0.348	0.000	1.000
Rural	40,011	0.318	0.466	0.000	1.000

Income disparities and Asset ownership estimations

Analyzing the results of regression gives more understanding to the variables affecting the studied population's log of the total income as illustrated on the Table 2 above. The signs of the coefficients suggest the estimated partial relationships of each variable with income The standard errors in parenthesis imply the accuracy of these estimates. Therefore, the existing increase in gig working is inversely related to income among all demographic and socioeconomic features at the 10% level (Aristi et al., 2021). Nevertheless, it can also be observed that the vocational and higher education enhance the income in concordance with

Macas-Acosta et al. (2024); Contreras Cueva et al. (2023); and Ordemann (2023) at 1% level of significant concurrently, primary education decreases income significantly. At one percent level of significance, income increases with: marital status, self-reported health status, and smartphone ownership. The pay-off data suggest that as income is low and age is high, the pay-off is low. Earlier literature by Lui et al. (2023) established that living in the Eastern area has a bearing in determining the income levels, and while testing the type of relationship between the log energy expenditure and the log income, there was a high level of positive correlation at 1% level of significance.

Table 2 Income inequality model, OLS and Lewbel estimates

| | **Regressand:** Log of Total Income | |
| | **OLS** | **Lewbel** |
Regressor	(1)	(2)
Gig Worker	-0.0402*	-0.0415*
	(0.0234)	(0.0233)
Female	0.0298	0.0294
	(0.0183)	(0.0180)
Primary Education	-0.151***	-0.147***
	(0.0323)	(0.0309)
Junior High Education	-0.00633	-0.000234
	(0.0282)	(0.0265)
Vocational Education	0.424***	0.433***
	(0.0345)	(0.0329)
Higher Education	0.799***	0.807***
	(0.0327)	(0.0305)
Married	0.326***	0.340***
	(0.0245)	(0.0238)
Good health condition	0.112***	0.107***
	(0.0160)	(0.0159)
Age	-0.0180***	-0.0181***
	(0.000904)	(0.000891)
Smart Phone Users	0.215***	0.216***
	(0.0213)	(0.0211)
Eastern Region	0.204***	0.200***
	(0.0241)	(0.0236)
Log of Energy expense	0.190***	0.186***
	(0.00943)	(0.00907)
GIGF (Female Gig worker)	-0.0353	-0.0321
	(0.0345)	(0.0343)
Constant	9.676***	9.687***
	(0.0677)	(0.0668)
No. of observation	21189	21189
R^2	0.195	0.195

Note: Heteroscedasticity robust SEs in parentheses.
*, ** and *** denote statistical significance at the 10%, 5% and 1% levels of significance.

In detail, Log Total Income was subjected to OLS Lewbel regression, and the results show the

following variables as relevant to the income level. The author has supported the conclusion making process by providing evidence that gig workers are generally paid less than other workers (Aristi et al., 2021). The Gig female worker is also paid less that male workers (Gomez-Herrera et al. 2019; Zulfiyan, 2020). That is in tune with economic theory since gig laborers are not protected by their employment contracts in the same way that they are in traditional labor market situations; they are not provided with full employment, remunerations, insurance or opportunities for promotion. However, there could always be some issues that are unique to women and these are, restricted access to jobs, discrimination, and limited likelihood of landing better paying jobs that are likely to translate to better incomes. One can assume that health, vocational & higher education, marital status, energy cost, geographical region (eastern) and owning a smartphone directly affects one's income.

This is probably as a result of households splitting or where good jobs are relevant, they are well associated with family stability and good health. It could be due to the membership of digital economy or the chance to get a job in a better organization. Common gig workers are less paid than the general population, and this is truer still for women in particular (Dong et al., 2024). Surprisingly, income levels are not as significantly threatened with living in the Eastern area. The appropriateness of these parameters in understanding income changes in the study population is evident from the model cumulative accuracy of 97. 5%. of the income variance.

The regression results presented in Table 3 include coefficients and marginal effects of each predictor variable, which indicates pertinent and useful data about the factors affecting the possession of durable goods and invaluable metals. The coefficients for the ownership of durable items (Column 1 and 2) establish substantial coefficients that represent the correlations. From Table 3, it can be observed that gig workers own comparatively fewer durable items than regular employees; this result is significant at the 10% level. Interestingly, overall product

possession has negative relation with education level; positive association is observed for the primary and junior high school education level while negative association is noticeable with higher education level. Marriage in most cases goes hand in hand with the chance of owning durable items, it is also related positively with the use of smartphones and good health.

Table 3 Asset Ownership model, logit estimates

	Regressand			
	Durable goods		Precious Metal	
	Coefficient	Marginal effect	Coefficient	Marginal effect
Regressor	(1)	(2)	(3)	(4)
Gig Worker	-0.269*	-0.00490*	-0.311***	-0.0575***
	(0.145)	(0.00265)	(0.0484)	(0.00894)
Female	0.0499	0.000909	0.188***	0.0347***
	(0.0827)	(0.00151)	(0.0255)	(0.00471)
Primary Education	0.325***	0.00591***	-0.664***	-0.123***
	(0.100)	(0.00182)	(0.0386)	(0.00707)
Junior High Education	0.717***	0.0131***	-0.243***	-0.0449***
	(0.108)	(0.00200)	(0.0341)	(0.00631)
Vocational Education	0.327*	0.00594*	0.108**	0.0200**
	(0.195)	(0.00356)	(0.0515)	(0.00952)
Higher Education	-0.303**	-0.00552**	-0.00257	-0.000476
	(0.151)	(0.00275)	(0.0505)	(0.00934)
Married	1.272***	0.0232***	-0.0125	-0.00231
	(0.0790)	(0.00158)	(0.0299)	(0.00552)
Good health condition	0.173*	0.00315*	0.0655**	0.0121**
	(0.0893)	(0.00163)	(0.0257)	(0.00475)
Age	-0.00316	-0.0000575	-0.0178***	-0.00330***
	(0.00200)	(0.0000365)	(0.000683)	(0.000123)
Smart Phone Users	0.286***	0.00521***	0.488***	0.0902***
	(0.0879)	(0.00161)	(0.0306)	(0.00561)
Eastern Region	-0.160	-0.00291	0.333***	0.0616***
	(0.120)	(0.00218)	(0.0338)	(0.00622)
Log of Energy expense	0.544***	0.00990***	-0.0757***	-0.0140***
	(0.0315)	(0.000606)	(0.00940)	(0.00173)
GIGF (Female Gig worker)	-0.220	-0.00401	0.143**	0.0264**
	(0.219)	(0.00399)	(0.0724)	(0.0134)
No. of observation	38,051	38,051	38,051	38,051
Wald (F) test	9175.9		7833.1	
	0		0	

Note: Heteroscedasticity robust SEs in parentheses; except for marginal effects. p-values in square brackets.
*, ** and *** denote statistical significance at the 10%, 5% and 1% levels of significance (α).

Gig workers also have a negative correlation with owning precious metals (Columns 3 and 4), which is statistically significant at the 1% level. Once more, education is vital; a decline in the ownership of precious metals is linked to elementary and junior high school education, whereas

vocational education has a beneficial effect. As illustrated above, having precious metals does not require being married, having a spouse, having a specific house type, home phone, access to internet connection, own computer, clothes, clothing accessories, and stationeries in order to possess Smartphone and being in excellent health condition. Although they target two different types of audiences, it is useful to point out that there is another correlation in the survey data, now at the 1% level: on having precious metals it is seen to correlate with living in the Eastern region of the country. As the energy cost is increased, the likelihood of owning metal diminishes in the same manner as the coefficients of the log of energy cost are negatively correlated with the possession of metal.

To sum it all, the fact as understood from the regression analysis also reinforces and validates the fact how complex the factors defining possession of precious metals and durable commodities are. The estimates of coefficients and marginal effects of the regression results will give an insight on several socio-economic factors that are influential in the acquisition of these assets necessary for wealth accumulation, which is useful for the policymakers and scholars, who are concerned with several issues, including distribution of wealth and economic welfare of the sampled residents. This shows the reality that owning such precious metals and durable goods reduces employment of gig workers and regular employees for hire because gig jobs would expose them to less security and less money which intrinsically, would limit the ability to invest in these types of assets. This is in line with economic theory especially because the gig platforms are volatile and unpredictable and the workers have an unsteady income which denies them the ability to save.

Once again, human capital is discovered as one of the essential elements towards wealth creation since observed in the relations between ownership of assets as well as education. The negative association with higher education and the positive correlation with ownership of durable things between elementary and junior high schools may be due to varying income

levels and consumption patterns associated with different educational degrees. Of course, with the help of modern dynamic generations, which are associated with education, consumption and investment in non-recurrent products will reduce costs, while the use of gems or other durable articles will partly compensate for the investments. It also provides credence to the fact that there are consumption economies and consumer coordination in activities that entail acquisition of assets within families because marriage does hold significant correlation to the prevalence of durable goods in society. There is no discernible pattern to the data that could be easily attributed to the ownership of precious metals only weakens in cases of marriage and therefore it may be wise to assume hypothetically that there must be other factors that influence apart from family bonds.

An advantage of the accumulation of assets is the technology utilization and life satisfaction, as revealed in the positive significant coefficients underlying the use of smartphones and the positive association both with good health and asset holding in the form of durable household items and precious metals. Technology consumers may also acquire the desired financial service as well as employment investment opportunities whereas physically fit people may be able to acquire gainful employment and long-term investments. It does indicate, however, that the residence in the Eastern region is positively associated with the ownership of these precious metals, meaning that there may be regional economic factors related to changes in income levels, ethnocultural factors, or investment behaviours. Last but not least; the negative sign between energy expenditures and precious metals suggests the trade-offs that one could be willing to make when investing in scarce resources in different kinds of assets.

Hence, from the estimates of Lewbel, Table 4 provides him with the estimates of the asset ownership model with stress on durable goods as depicted in Column 1 and precious metals in Column 2. There are certain characteristics that are associated with ownership of sturdier items and these are features that must be taken into consideration from an analyst's viewpoint given

their distribution in the population. A coefficient of 0.0481, highlighting the probability at 1 %
illustrates the positive link between owning durable items and engagement in gig working
employment. Other positive significant predictors include gender, grasping primary and junior
high school education, being married, having excellent health, using smartphones, and being
from the eastern region.

Table 4 Asset Ownership model, Lewbel estimates

Regressor	Regressand	
	Durable goods (1)	Precious Metal (2)
Gig Worker	0.0481***	-0.0251***
	(0.00336)	(0.00777)
Female	0.0342***	0.0574***
	(0.00200)	(0.00472)
Primary Education	0.113***	-0.0314***
	(0.00324)	(0.00635)
Junior High Education	0.0711***	0.0132**
	(0.00293)	(0.00650)
Vocational Education	0.0359***	0.0867***
	(0.00396)	(0.0110)
Higher Education	-0.0357***	0.0820***
	(0.00386)	(0.0109)
Married	0.124***	0.0412***
	(0.00300)	(0.00534)
Good health condition	0.0151***	0.0171***
	(0.00191)	(0.00481)
Age	0.00405***	-0.000853***
	(0.0000600)	(0.000114)
Smart Phone Users	0.0551***	0.0997***
	(0.00222)	(0.00509)
Eastern Region	-0.0329***	0.0469***
	(0.00260)	(0.00683)
Log of Energy expense	0.104***	0.0288***
	(0.000825)	(0.00168)
GIGF (Female Gig worker)	-0.0431***	0.00286
	(0.00533)	(0.0131)
No. of observation	38051	38051
R^2	0.967	0.305
Wald (F) test	114683.5	1093.7
Kleibergen–Paap rk LM Test (χ2)	6689.6	6689.6
Hansen test (J)	753.3	83.15

Note: Heteroscedasticity robust SEs in parentheses. p-values in square brackets.
*, ** and *** denote statistical significance at the 10%, 5% and 1% levels of significance.

Higher education, on the other hand, shows a negative correlation with owning durable items. On the other hand, ownership of precious metals has a distinct set of important determinants. Possessing precious metals is negatively correlated with being a gig worker which is significant at the 1% level. Having precious metals is significantly related to Female gender, Junior High Education completed, Vocational Education received, College Education, currently married, Excellent health status, Smartphone user, and Eastern place of residence.

As a percentage of similar changes in the corresponding regressors, the coefficients reveal the propensity to own precious metals or durable items. From the statistically significant coefficients, one is in a position to estimate that these factors exert a huge influence on the ownership of assets. The model appears to account for a significant amount of the variance in asset ownership, based on the high R-squared values (0.967 for durable goods and 0.305 for precious metals).

An additional proof for the overall significance of the model, F-statistic, and the related p-values can be used. The fact is that F-test results also proved to be significant in both cases and as a result, the overall reliability of the model can be considered quite high. The p- p-values and Hansen J test results are determinant of the validity of the overidentifying constraints while the result estimate tools provide evidence. An influential reliance upon the Socio-Economic characteristics and their correlation values highlight the Lewbel estimates' complexity while also offering policy perspectives and recommendations to the policymakers and scholars interested in the causes behind the durable goods and precious metal ownerships in the investigated community.

Blinder–Oaxaca discrimination analysis

For each of China's four "social exclusion groups," namely female vs male, gig worker versus non-gig worker, Eastern versus non-Eastern, and rural versus urban, Table 5 presents the Blinder–Oaxaca breakdown of Asset Ownership model (2). Table 5 presents an analysis of the Blinder-Oaxaca decomposition, which sheds light on the key elements that contribute to the differences in asset ownership between various demographic groups.

Panel A demonstrates gender specificity of asset formation among the gig economy workers based on the analysis of the difference in the proportion of female gig workers and male gig workers who own precious metals. This difference is statistically significant ($p < .05$). The rest of the variance that has not been accounted for can be attributed to other unknowns which could be in the discrimination or structural factors. The explained portion of the gap defines characteristics that may play a role in forming this divide, including education, marriage, health status, age, use of smartphones, and geographical location.

Looking at panel B, there is a quite significant disparity observed in terms of precious metals and commodities which show that gig workers do not invest much in them. However, such a breakdown lesson shows that the apparent parts of the model contribute a big proportion of this divergence. Significant differences in asset ownership between the Eastern and non-Eastern areas are shown in Panel C, where people of the Eastern region are more likely to possess both durable items and precious metals. The part of this difference that can be explained suggests that observable variables have a significant role in explaining the discrepancy. In Panel D, which compares rural and urban locations, it is evident that there are notable disparities in asset ownership. Specifically, those living in rural areas are less likely to possess precious metals and durable items.

Table 5 Blinder–Oaxaca discrimination of Asset Ownership model

	(1) Durable goods	(2) Precious Metal
Panel A: Gig Female worker versus Gig male worker		
Gig Female worker	0.978***	0.291***
	(0.003)	(0.010)
Gig male worker	0.980***	0.254***
	(0.001)	(0.002)
Difference	-0.003	0.037***
	(0.003)	(0.010)
Explained	0.002	0.040***
	(0.003)	(0.008)
Unexplained	-0.004	-0.003
	(0.004)	(0.013)
No. of observations (Gig Female worker)	1,986	1,986
No. of observations (Gig male worker)	36065	36065
Panel B: Gig worker versus Non-Gig worker		
Gig worker	0.980***	0.241***
	(0.002)	(0.006)
Non-Gig worker	0.980***	0.258***
	(0.001)	(0.002)
Difference	-0.001	-0.017***
	(0.002)	(0.006)
Explained	0.002	-0.001
	(0.002)	(0.006)
Unexplained	-0.002	-0.016**
	(0.003)	(0.008)
No. of observations (Gig worker)	5,139	5,139
No. of observations (Non-Gig worker)	32912	32912
Panel C: Eastern versus Non- Eastern		
Eastern	0.983***	0.336***
	(0.002)	(0.006)
Non- Eastern	0.980***	0.243***
	(0.001)	(0.002)
Difference	0.003*	0.093***
	(0.002)	(0.007)
Explained	0.006***	0.051***
	(0.001)	(0.002)
Unexplained	-0.003	0.042***
	(0.002)	(0.007)
No. of observations (Eastern)	5,309	5,309
No. of observations (Non-Eastern)	32742	32742
Panel D: Rural versus urban		
Rural	0.975***	0.160***
	(0.001)	(0.003)
Urban	0.983***	0.301***
	(0.001)	(0.003)
Difference	-0.009***	-0.140***
	(0.002)	(0.004)
Explained	-0.013***	-0.102***
	(0.001)	(0.003)
Unexplained	0.004**	-0.038***
	(0.002)	(0.005)
No. of observations (Rural)	12199	12199
No. of observations (Urban)	25852	25852

Note: Heteroscedasticity robust SEs in parentheses.

*, ** and *** denote statistical significance at 10%, 5% and 1% levels of significance.

The difference in asset ownership rates between groups that can be explained by the asset ownership variables is shown in Figure 1. The differences in the rates of durable goods between gig workers and gig male workers in china are narrowed by factors such as being female, marital status, smart phone usage, physical fitness, Eastern China, junior and high school education, and energy expenditure in Panel (a). Among them, the demographics of being female, junior and high school education, married, smart phone users, and log energy expenditures all contribute 26, 53, 19, 41, 5.1, and 20% toward closing the gender gap in gig labour for durable products. The other explanatory factors, which include age, primary school, higher education, and vocational education, also play a role in the differences in durable goods between gig female workers and gig male workers.

Gig workers, primary school graduates, and higher education are the most significant sources of decline in the durable goods category accounting for 84, 11, and 3. 9% respectively. Factors like gig workers, high school education, and Eastern China help to reduce the variation between the rate of Precious Metal among the gig female workers and the rates of gig male workers. 39, 8.1, 5.8% gig worker, high school education, and Eastern China respectively all contribute toward closing the gender gap in gig labour for Precious Metal. The other explanatory factors, which include being female, and phone users also play a role in the differences in Precious Metal between gig workers and gig male workers. The largest contributors to the decline in Precious Metal are being female, and phone users — 97, and 52%, respectively.

Panel (b) of Figure 1 depicts the contributions of explanatory variables in explain the systemic differences in rates of durable goods and Precious Metal between Gig workers and non-gig workers of china. Primary school education, junior and high school education, being married, smart phone users, and eastern china reduces the systemic difference in Durable goods between Gig workers and non-gig workers. Of these, junior and high school education, being married, smart phone users explain the most in closing the gig and non-gig disparity which is 348, 196,
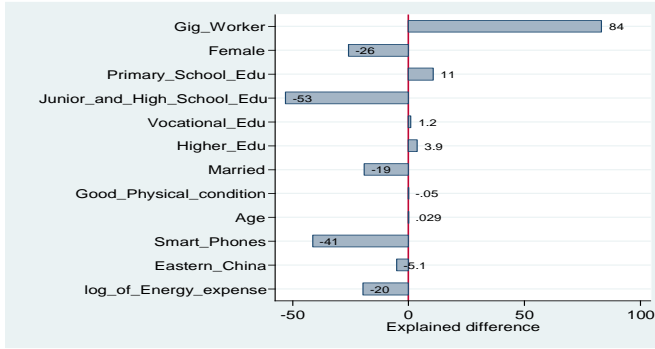
and 102% respectively. By contrast, being female. Vocational education, log of energy expense, and gig female works are found to aggravate the gig and non-gig divide in durable goods.

The differences in the rates of Precious Metal between gig workers and non-gig workers are narrowed by factors such as gig worker, high school education, and Eastern China. Junior and high school education, being married, smart phone user's in china reduces the systemic difference in Precious Metal between Gig workers and non-gig workers. By contrast, being female. Vocational education, higher education, eastern china, log of energy expense, and gig female works are found to aggravate the gig and non-gig divide in Precious Metal.
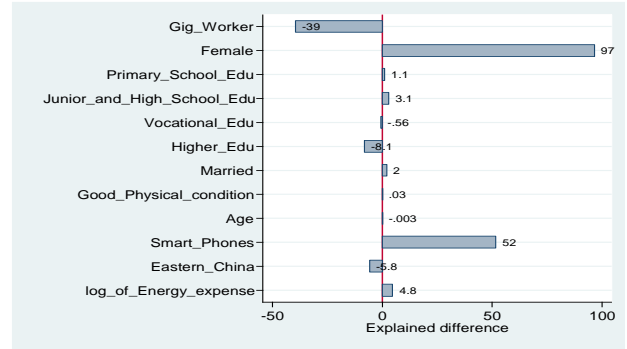
Panel (c) of Figure 1 depicts the contributions of explanatory variables in explain the systemic differences in rates of durable goods and Precious Metal between Eastern and non-eastern provinces of china. Primary school education, and being married contributes 67, and 36% to reduce the systemic difference in Durable goods between Eastern and non-eastern provinces. By contrast, gig workers, being female, junior and high school education, Vocational education, higher education, smart phone users, log of energy expense, and gig female works are found to aggravate the gig and non-gig divide in durable goods.

The differences in the rates of Precious Metal between Eastern and non-eastern provinces are narrowed by only being married in china reduces the systemic difference in Precious Metal by 2%. By contrast, gig workers, being female, Primary education, junior and high school education, Vocational education, higher education, smart phone users, log of energy expense, and gig female works are found to aggravate the Eastern and non-eastern provinces in Precious Metal.
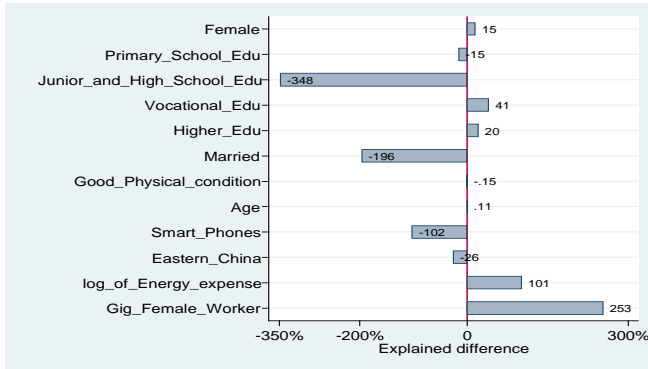
Panel A: Gig Female worker
Regressand: Durable Goods   Regressand: Precious Metal
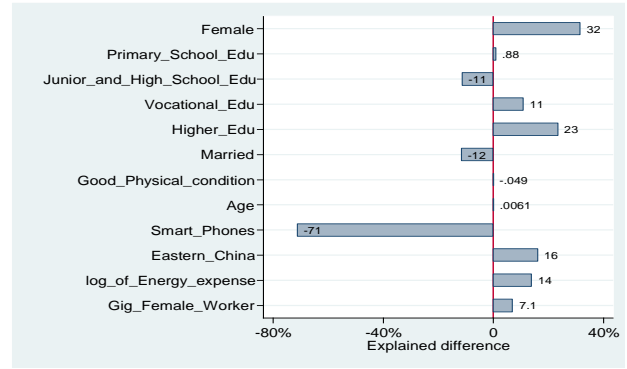

Panel B: Gig Workers
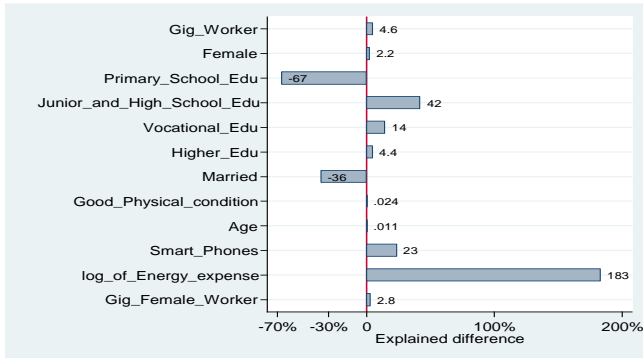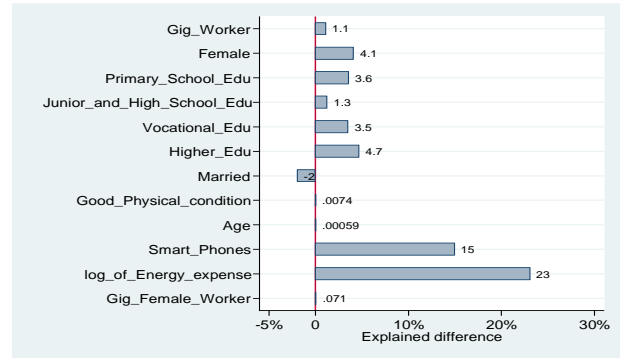Regressand: Durable Goods   Regressand: Precious Metal

Panel C: Eastern
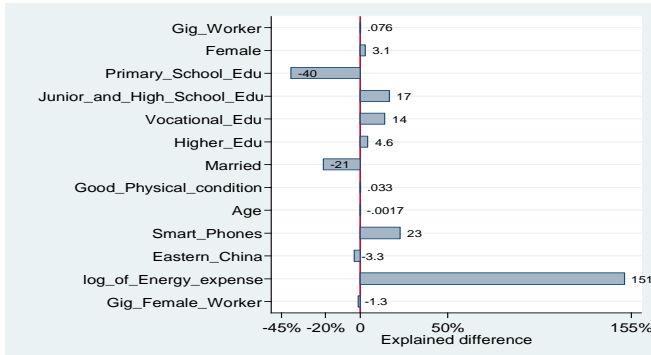Regressand: Durable Goods   Regressand: Precious Metal

Panel D: Rural
Regressand: Durable Goods   Regressand: Precious Metal
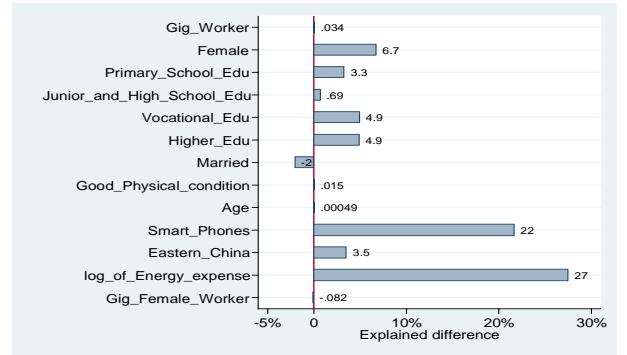

Figure 1Blinder–Oaxaca decomposition of Asset Ownership model. Explained difference reported only for groups and Asset Ownership proxies with statistically significant difference in Table 5. The differences explained by the logarithms of energy expense is semi-elasticities. (a) Gig Female worker; (b) Gig Workers; (c) Eastern; (d) Rural

In Panel (d) of Figure 1 depicts the contributions of explanatory variables in explain the systemic differences in rates of durable goods and Precious Metal between rural and urban of china. The rural and urban schism in durable goods in widened by respondent primary school education, being married, eastern china, and female gig worker. Primary school education, and being married are seen to reduce the systemic difference in durable goods between rural and urban of china by 40 and 21%, respectively.

The differences in the rates of Precious Metal between gig workers and non-gig workers are narrowed by only being married in china reduces the systemic difference in Precious Metal between rural and urban of china by 2%. By contrast, being female, Primary education, junior and high school education, Vocational education, higher education, smart phone users, eastern china, log of energy expense, and gig female works are found to aggravate the rural and urban in Precious Metal by 6.7, 3.3, 0.69, 4.9, 4.9, 22, 3.5 and 27% respectively.

Robustness Checks

We use the Oster (2019) test to check for omitted variable bias and parameter stability to ensure the results are robust. Table 6 shows the Oster (2019) test estimates for the Log of Total Income. As can be observed, the calculated coefficients of internal conflict on Log of Total Income are negative in both the limited and complete models.

Controlling for omitted variable bias when estimating the treatment effects is represented by bias-adjusted effects. The cogency of the full and restricted models yields these values derived from the difference in the R-squared coefficients. The above measures of bias from missing variables are concluded to be minimal if the difference between the controlled effect and the estimated unbiased treatment effect does not include the zero value if the sign is the same for the two estimates. In Table 6, by comparing it with the estimated control and bias–adjusted

effects we can see that the effects of GIG female workers and GIG workers on income inequality are almost similar in size and sign.

Table 6 Oster (2019) test for omitted variable bias and coefficient stability

	Dependent variable: Log of Total Income			
Independent variable	Restricted (1)	Full model (2)	Restricted (1)	Full model (2)
GIG Female worker	-0.0353	-0.1665		
GIG worker			-0.0402	-0.2778
Controls	YES	YES	YES	YES
Constant	YES	YES	YES	YES
No. of observations	21,998	21,189	21,998	21,189
R^2 (WITHIN)	0.195	0.001	0.195	0.009
Bias-adjusted treatment effect (β^*) $(R_{Max} = R_{Full} + (R_{Full} - R_{Restricted}))$				
GIG Female worker		-0.0221		
GIG worker				-0.0153

Note: ***, **, & * indicate statistical significance at 1%, 5%, & 10% levels of significance (α).
R_{Max} denotes the R^2 from hypothetical regression estimate of the treatment effect incorporating both observed and unobserved factors. R_{Full} denotes the R^2 from regression estimate of the treatment effect using a full set of observed control variables. $R_{Restricted}$ denotes R^2 from regression estimate of the treatment effects using the outcome and treatment variables only.

Summary of findings and economic discussion

Overall, the above empirical analysis points to gender pay differentials as the primary driver of the income inequality model and asset ownership model for Chinese households in 2017. Gig workers who are women, however, earn significantly less than their male counterparts (Dong et al. 2024). The findings of the Blinder–Oaxaca decomposition further indicate that there are gender-related gaps in the precious metal ownerships in the gig economy and possible factors such as discrimination, education status, marital status, health status, age, smartphone usage, and geographical location as influencing the observed disparities in the 2017 China.

The research focuses on gig workers, gender discrepancies, and regional divisions to examine the variables causing variances in asset ownership rates among different demographic and geographical groups in China. Factors including education level, marital status, smartphone usage, physical fitness, geography, and energy expenditure help to close the ownership gap

between gig female workers and gig male workers when it comes to durable items and precious metals.

Notably, factors such as gender, marital status, smartphone use, junior and high school education, and greater energy costs all contribute significantly to closing the gender gap in gig labor for durable products. On the other hand, gig labor, elementary education, and vocational training increase these differences. Based on the asset ownership rate of the gig workers and the non-gig workers, similar scenarios can be observed. In other words, the ownership of durable goods is affected by the use of smartphones, marital status, and education whereby the above negatives factors reduce the difference in the ownership of the durable goods significantly as highlighted below.

While having a vocational education further extends the gap, being a woman also extends this gap. I also find it significant to point out the effect of the region as well; there are variables that affect the variations between Eastern and non-Eastern provinces and between rural and urban areas: education, marital status, and geographic location. In conclusion, based on the findings, it is demonstrated how factors endow sociology and region interdependently affect the variations in asset holding, which are paramount for understanding and addressing issues of wealth and economic disparity in China 2017.

Conclusion and policy implications

The analysis employed an income model within Chinese households. To measure gender disparities, yearly income variations were further explored on an individual level annually by Chen et al. (2013). OLS regressions find significant drivers of log total income: The precariousness of gig employment lowers income (Aristi et al., 2021), while vocational and higher education raise it. Residents of the Eastern region earn higher incomes than their

counterparts in other regions of the country (Lui et al., 2023). There is no impressive relationship between the income level and female gig workers.

The provisional government could afford priority to regional development projects in a view of economic expansion, which can be perceived in places such as the Eastern region, where higher wages correlate with growth. Policies on the federal level regulating the labor market have to ensure the proper treatment of gig workers. The national government should make curriculum revisions a high priority so that the curriculum can address the needs of businesses, increase funding for preparing teachers, and emphasize STEM courses so that students can have sufficient preparation for highly demanded occupations. Also, it is necessary for both levels of government to address programs aimed at increasing gender equity in the labor market.

Based on the results of the OLS Lewbel regression analysis, several characteristics are strongly correlated with different levels of income. Gig workers and female gig workers, on average, receive lower pay (Dong et al., 2024). Among these, the central government focuses on increasing healthcare and education expenditures to become a priority to enhance the development of human capital. To increase the income of gig workers especially women, the provisional government should focus on providing them with financial assistance, contact lists, and additional training.

Gig workers were found to have different levels of asset ownership as shown Table 4. It is a positive association for durable goods but a negative for precious metals for gig workers. Another important factor is education: it stands for a positive association between owning precious metals and positively associated with having a higher level of education and owning durable goods is negatively associated with it. Additionally, while females are more likely than males to work in gig economy to own chainsaws but more fragile materials.

The Blinder-Oaxaca decomposition illustrates that region and age and gender gaps in asset ownership dominates in China. Specifically, gig workers, especially women, indicated they have higher proportions of the durable items and metals than the non-gig sector counterparts. The provisional government should focus on ensuring that gig workers can build up an inventory of such durable goods by supporting them especially in the aspects of training on how to manage their financials as well as access credit. Education reform should be considered one of the priorities of central government actions to provide gig workers with the opportunities for education that will lead to the opportunity to buy precious metals and other valuable goods.

Limitations and future research directions

While this study is extensive, there are numerous limitations that should be addressed. First, due to the flexibility of jobs in the gig economy, data collection could be either restricted or not very accurate. Another weakness of bias is self-earned income and possession of fixed assets. Also, the cross-sectional design raises the issue of a lack of causality in the data collected. To overcome this limitation, it would be necessary to carry out the research in the form of longitudinal studies that will allow observing shifts in time and improve the credibility of the conclusions. Quantitative strategies like surveys may provide faster results but can provide broader and often limited insights, while using focus groups or interviews – more detailed information about gig workers' experience might contribute to the improvement of the research and might offer more specific recommendations for action. Future researches in Bangladesh should look into the specific industries that gig economy operates in, understand the influence of culture on gig workers, evaluate how the existing labor laws that are in place affect the gig workers, as well as evaluate how digital literacy and technological infrastructure affect opportunities and wages of gig workers differ between male and female workers.

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APPENDIX

Variable	Type (1)	Definition (2)
Panel A: Income, expenditure, and asset shares		
Total Income	Continuous	Total income of a household includes wage income, agricultural operating income, industrial and commercial operating income, transfer income, and investment income.
Energy expense	Continuous	Ratio of total expenditure on water, electricity, fuel, property management, heating and other expenses on average last year
Durable Good	Dummy	1 if household has BW/Colour TVs, air conditioners, refrigerators, and washing machines; 0 otherwise.
Precious Metal	Dummy	1 if household has gold, silver, and jewellery; 0 otherwise.
Panel B: Demographic and socio-economic indicators		
Gig Worker	Dummy	1 if respondent is doing temporary work (he/she has not signed a legal labour contract, like doing part-time jobs), or freelancing; 0 otherwise
Female	Dummy	1 if respondent is Female; 0 otherwise
Primary Education	Dummy	1 if highest level of respondent education is Primary; 0 otherwise
Junior High Education	Dummy	1 if highest level of respondent education is Junior; 0 otherwise
Higher Education	Dummy	1 if highest level of respondent education is General High School; 0 otherwise
Vocational Education	Dummy	1 if highest level of respondent education is College/Vocational; 0 otherwise
Married	Dummy	1 if respondent is Married; 0 otherwise
Good health condition	Dummy	1 if respondent is in a good health condition; 0 otherwise
Age	Continuous	No. of years
Smart Phone Users	Dummy	1 if respondent use Smart Phone; 0 otherwise
GIGF (Female Gig worker)	Dummy	1 if respondent is Female and doing temporary work (he/she has not signed a legal labor contract, like doing part-time jobs), or freelancing; 0 otherwise
Panel C: Social exclusion		
Eastern Region	Dummy	1 if respondent is residing in Eastern provinces; 0 otherwise
Rural	Dummy	1 if respondent is a rural resident; 0 otherwise