How Does the Minimum Wage Affect Inequality in Family Income?*

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Abstract

We study the distributional consequences of regional minimum wage policies in Japan using household microdata from the Comprehensive Survey of Living Conditions (1986–2022). Estimating specifications with prefecture and year fixed effects, prefecture-specific trends, and instrumental-variable approaches, we find little evidence of reductions in poverty rates. Instead, minimum wage increases raise employment income near the bottom of the distribution and lead to higher equivalized disposable income for households just above the poverty threshold. For the poorest households, the transmission is weaker because non-employment income—particularly self-employment and pensions—accounts for a larger share of total resources, leaving employee earnings as only a limited fraction of household income. Overall, the effects of minimum wage policy on household living standards are concentrated above the poverty line.

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1 Introduction

Minimum wage policies are often promoted as a tool to improve the living standards of low-income workers and reduce poverty. While the effects of minimum wage increases on employment have been extensively studied (Manning, 2021; Neumark and Wascher, 2008), less is known about whether these policies actually enhance household welfare—particularly among the most economically vulnerable. Understanding the link between minimum wages and outcomes such as poverty and income inequality is therefore critical for evaluating their effectiveness as a social policy (Giupponi et al., 2024; Dube, 2019).

One reason for this research gap is the lack of detailed individual and household-level data needed to thoroughly analyze the distributional effects of minimum wage policies. Moreover, the mechanisms through which minimum wages affect income inequality at the household level are not straightforward, as minimum wage earners are often secondary workers, such as students or housewives, whose income may not substantially alter their household's overall financial situation.

Nevertheless, a more nuanced understanding can be gained by examining how different components of household income respond to minimum wage changes, including disposable income, employment earnings, and the distribution of minimum wage workers across the income spectrum. This study contributes to this effort by using detailed household-level data to explore the channels through which minimum wages may influence income inequality and poverty.

Japan offers a particularly relevant context for this analysis. Unlike many Western countries where inequality is driven by rising top incomes, inequality in Japan is largely characterized by stagnating or declining incomes among low-income groups (Moriguchi, 2017). This pattern suggests that minimum wage policies may play a distinctive role in addressing inequality in Japan.

By examining detailed individual and household income data derived from the Comprehensive Survey of Living Conditions, this study aims to provide a to offer an in-depth analysis of the effects of minimum wages on income inequality. The findings are expected to offer valuable insights into the role of minimum wage policies in addressing income inequality and contribute to the ongoing global discussions on their effectiveness.

We analyzed the impact of minimum wages on the poverty rate (defined as an income of 1.27 million yen or less in 2020 real terms) using data from the Comprehensive Survey of Living Conditions, conducted every three years from 1986 to 2022. The analysis excluded households composed solely of individuals aged 60 and older. To address the endogeneity of minimum wages, which tend to increase during favorable economic conditions, we incorporated prefecture fixed effects and linear time trends. Following the methodology of Kawaguchi and Mori (2021) and Okudaira et al. (2019), we also conducted robustness checks using an instrumental variable approach. This approach leveraged the gap between social assistance benefits and minimum wages, which influenced minimum wage changes between 2008 and

2013.

This study yields five main findings. First, descriptive analysis using the Comprehensive Survey of Living Conditions reveals that income growth at the bottom 10th percentile has been substantially weaker than at the median or 90th percentile since 1986. The poverty rate has shown an upward trend over time, and although elderly households exhibit the higher poverty incidence, the rise in poverty is also evident among non-elderly households, which are more likely to be affected by minimum wage policies.

Second, we examine the effects of minimum wage increases on poverty using equivalized disposable income per capita. We find evidence that minimum wage increases raise household disposable income for households located just above the poverty line. In contrast, we do not find statistically significant effects for households below the poverty threshold, and the estimated impacts for this group are small in magnitude. These patterns are robust across alternative specifications and remain qualitatively similar when using instrumental variable estimation to address endogeneity.

Third, to shed light on why minimum wage increases do not translate into sizable poverty reductions, we examine the income composition of low-income households. We first document that minimum wage workers are disproportionately concentrated among households below the poverty line, suggesting that increases in employment income have the potential to contribute to poverty reduction. However, an analysis of income sources across the distribution reveals that households in poverty derive a smaller share of their total income from employment compared to higher-income households, while relying more heavily on self-employment and other non-employment income sources. This income composition limits the extent to which gains in employment income alone can raise total household income above the poverty threshold.

Fourth, focusing on equivalized employment income per capita, we find that minimum wage increases are associated with larger income gains among households with lower levels of employment income. In particular, minimum wage increases reduce the share of households earning very low levels of employment income, consistent with positive effects at the lower end of the employment income distribution documented in the UQPE estimates. These gains imply some potential for minimum wage increases to improve the incomes of poor households. Nevertheless, because household income among the poor is drawn from diverse sources, the resulting increase in employment income is generally insufficient to generate a statistically significant reduction in poverty rates.

Finally, when we compare the UQPE of minimum wages across different income definitions (employment income, total income, and disposable income), aligned by disposable income percentiles, we observe that the employment income effect peaks near the poverty threshold. However, the effect is smaller for total income—likely due to greater income heterogeneity—and further attenuated for disposable income, reflecting the offsetting influence of taxes and social security contributions.

This study makes three primary contributions. First, this study contributes to the international literature on the relationship between minimum wages and poverty. While the effects of minimum wage increases on employment have been extensively studied, a growing body of work has examined their potential to reduce poverty, particularly in the United States and Europe (e.g., Dube, 2019; Giupponi et al., 2024; Engbom and Moser, 2022). However, these studies often face data limitations. For example, Dube (2019) uses the Current Population Survey (CPS), which focuses on individual workers and lacks comprehensive household-level income data. Similarly, the study by Giupponi et al. (2024) employs household data in the UK, but the sample size is limited, and the minimum wage policy is uniform across the country, reducing variation for identification.

In contrast, our study utilizes the Comprehensive Survey of Living Conditions (CSLC), a nationally representative household survey with a large sample size, conducted triennially in Japan since 1986. The CSLC provides detailed information on income, taxation, and social security contributions for all household members, enabling us to assess the distributional effects of minimum wage policies at the household level. This allows for a more comprehensive evaluation of how minimum wages affect poverty and income inequality, taking into account the complexities of household composition and non-labor income sources.

Second, this study contributes to the broader literature on income inequality, particularly in the context of Japan (Kitao and Yamada, 2025, 2024; Tachibanaki and Urakawa, 2008; Ohtake, 2008). Unlike many Western countries where inequality is driven by rising top incomes, Japan's inequality is largely characterized by stagnating or declining incomes at the bottom (Moriguchi, 2017; Moriguchi and Saez, 2008). This pattern makes Japan a unique case for studying whether minimum wage policies can mitigate disparities in household income. By examining not only disposable income but also the distribution of employment and total income, this study provides a more nuanced understanding of inequality dynamics in Japan.

Third, this study adds to the extensive empirical literature on minimum wage policies in Japan. While numerous studies have focused on employment effects—particularly among youth and low-skilled workers (e.g., Kawaguchi and Yamada, 2007; Higuchi, 2013; Kawaguchi and Mori, 2021; Okudaira et al., 2019; Mori and Okudaira, 2025)—there is limited research examining their implications for poverty and household income distribution. For instance, Ito et al. (2017) analyzed data from 1992 to 2012 and concluded that minimum wages do not reduce poverty. More recent research by Kawaguchi and Mori (2021) and Okudaira et al. (2019) identified negative employment effects among low-educated young men and workers in the manufacturing sector, respectively. Conversely, Kambayashi et al. (2013) found that minimum wages increase income at the lower end of the distribution, while Kawaguchi and Mori (2009) noted that, as of 2002, half of minimum wage earners belonged to households with incomes of 5 million yen, indicating that many are not in poverty. Building on this literature, our study shifts the focus from employment outcomes to the distributional consequences of minimum wage policies.

The remainder of this study is organized as follows. Section 2 outlines the institutional background of minimum wage policy in Japan and describes the identification strategy based on

instrumental variable (IV) estimation. Section 3 presents the data and empirical methodology. Section 4 reports the main results using disposable income, including summary statistics and regression analyses. Section 5 examines the effects of minimum wages on employment income. Finally, Section 6 concludes the study.

2 Minimum Wage Institutions and Identification Strategy

2.1 Minimum Wage in Japan

Japan's minimum wage system is classified into regional minimum wages and specific minimum wages (industry-specific minimum wages). Since specific minimum wages apply only to certain industries and have limited coverage, this study focuses on analyzing regional minimum wages.

Regional minimum wages are set for each prefecture, and the revised minimum wages take effect sequentially from October 1st each year. The determination of minimum wages is carried out by the Central Minimum Wage Council, which is composed of representatives of workers, employers, and the public. The council provides guideline amounts (*Meyasu* in Japanese) for wage increases based on four regional classifications to the Local Minimum Wage Councils.[1] These amounts of guideline reflect economic conditions and wage trends, and therefore tend to increase more significantly during periods of economic growth. Tamada (2009) pointed out that regional minimum wages were effectively tied to local average wages before 2007, as increases in local minimum wages were closely linked to the annual wage growth of workers in establishments with fewer than 30 employees.

On the other hand, criticisms have been raised regarding the reverse phenomenon, where wages at the minimum wage level fall below the levels of public assistance. In response to this issue, the Minimum Wage Act was revised in 2007. Under the revised law, the Central Minimum Wage Council is required not only to present guideline amounts but also to indicate the discrepancy between minimum wages and public assistance levels. Furthermore, the law explicitly demands the elimination of this gap.

We address the endogeneity of minimum wages and perform robustness checks by using this gap as an instrumental variable. The gap represents the difference between welfare benefits and the earnings from minimum wage work, which we consider to be exogenous, as it is distinct from economic conditions and labor market influences. The prefecture-level welfare benefits are calculated as the population-weighted average of welfare benefits across municipalities. Welfare benefits are determined by factors such as family composition, earning capacity, and living costs. However, the regional differences are primarily influenced by living

[1] The regional classification was revised from four groups to three in 2023.

costs, particularly housing and utility expenses. In urban areas like Tokyo and Kanagawa, housing costs tend to be higher, while in northern regions such as Hokkaido and Aomori, utility costs are elevated due to colder climates, resulting in higher welfare benefits. In these prefectures, the reverse phenomenon has been observed, and minimum wages increased significantly between 2008 and 2013.

Figure 1 shows the trends in minimum wages for selected prefectures from 1986 to 2023. Tokyo and Kanagawa, representing urban areas, have the highest minimum wage levels. In contrast, local areas such as Okinawa have lower minimum wage levels. After the 2007 revision of the minimum wage law, the minimum wages in some prefectures, such as Tokyo, Kanagawa, and Aomori, increased significantly. Furthermore, after 2013, the growth rate of minimum wages accelerated in many prefectures compared to the period before 2007.

2.2 Instrumental Variable Estimation

Minimum wages tend to increase during periods of economic growth, raising concerns about endogeneity issues. To address these challenges, some studies, such as Card and Krueger (2000) and Dube et al. (2010), exploited differences in minimum wages across state borders, while others, such as , controlled for regional fixed effects and trends. Similarly, we identify the causal effects of minimum wages by controlling for covariates, regional dummies, and fixed effects for trends.

Another approach is to use exogenous variations in minimum wages to perform instrumental variable (IV) estimations. Several studies have previously employed IV estimations (Clemens and Wither, 2019; Baskaya and Rubinstein, 2012). In this study, we aim to conduct robustness checks by utilizing the IV approach introduced in the study by Kawaguchi and Mori (2021).

We focus on the revision of the minimum wage law and use the gap between welfare benefits and the minimum wage as instrumental variables. As discussed in Section 2.1, the revision of the minimum wage law requires prefectures to address the gap to resolve the reversal phenomenon between earnings from minimum wage and welfare benefits.

The Ministry of Health, Labour and Welfare publicly reported the gap in 12 prefectures. Therefore, we use this gap in our analysis. The first-stage regression used in this analysis is as follows:

$$\ln(\mathrm{MW}_{pt}) = \sum_{\tau=1986}^{2022} \left(\alpha_\tau \times \min \left\{ \ln \left(\frac{\mathrm{WB}_{p2006}}{\mathrm{MW}_{p2006}} \right), 0 \right\} \right) + X_{ipt}\Gamma_c + Z_{pt}\zeta_c + \omega_{pt} + (t \cdot \theta)_p + \nu_{ipt} \quad (1)$$

, where MW_{pt} is minimum wage of prefecture p in year t. WB is the monthly welfare benefit amount of a single household headed household. MWE is the monthly earnings of minimum wage workers. We consider the coefficients are different across the year. If the montyly earnings of minimum wage workdrs is larger than welfare benefits, a first term of right hand side takes zero. ν_{ipt} is prefecture fixed effects. ξ_j is prefecture-specific linear time trends.[2]

The results of the first-stage regression are shown in Figure 2. The coefficient of α_t is positive after 2009 and stable after 2012, which is consistent with the policy requirement that the government recommended raising the minimum wage to close the gap within five years after 2008. F statistics is 832.24, which is sufficiently large.

3 Data and Empirical Strategy

3.1 Data

The Comprehensive Survey of Living Conditions (CSLC) is an administrative data set used to assess the living conditions of the population, covering areas such as health, medical care, social security, and income. The survey has been conducted since 1986, with a large-scale survey carried out every three years and a simplified version conducted in the intervening years. In this study, we use data only from the large-scale survey years, which are available every three years from 1986 to 2022. The CSLC provides information on both households and all individual household members.

This survey consists of several components: the Household Questionnaire, which collects basic household information; the Income Questionnaire, which provides detailed data on household income; and additional questionnaires on savings, caregiving, and health. For our analysis, we use data from the Household Questionnaire and the Income Questionnaire.

For income, taxes, and social insurance payments, respondents are instructed to provide information based on their withholding tax statements. For employed individuals, this ensures that the reported figures are, in most cases, accurate. This is one of the strengths of the Comprehensive Survey of Living Conditions. However, since the withholding tax statements are only available for the previous year, the income data reflects the annual income of the year prior to the survey.

The survey subjects are selected through stratified random sampling based on regional divisions used in the Population Census. A complete enumeration survey is conducted in the selected regions. The number of survey participants has been declining over the years as shown in Table 1, leading to a gradual decrease in sample size. According to Nitta (2003), the proportion of refusals to participate in the survey is particularly high among single-person

[2] As for X_{ipt} and Z_{pt}, we explain in the Section 3

households.

Total income consists of various components, including earned income (employment income, business income, agricultural and livestock income, and domestic labor income), property income, social security benefits (such as public pensions, military pensions, unemployment insurance, child allowances, and welfare benefits), remittances, corporate and personal pensions, and other income sources. Among these, employment income, as part of earned income, is considered to be the component most directly influenced by minimum wage increases.

Payments for social welfare and taxes include several categories, such as resident tax, income tax, social insurance premiums, fixed asset tax, city planning tax, automobile tax, contributions to corporate and personal pensions, and remittances. Summary statistics are shown in Table 2. While an increase in income due to a rise in the minimum wage may improve an individual's financial situation, the progressive structure of income tax may offset these gains. Furthermore, resident tax, although similarly progressive, differs from income tax in that it is based on the previous year's income rather than the current year's earnings.

When analyzing poverty, we use disposable income as reported in the CSLS. Disposable income is defined as total income minus social security contributions and taxes. The values are adjusted to real terms on the basis of the 2000 price level. To convert household-level disposable income into individual-level income, we divide it by the square root of the number of household members, following the OECD equivalence scale.

Disposable income reported in the CSLS contains a non-negligible share of missing values, amounting to approximately 20 percent on average. Importantly, these missing values do not stem from missing income components themselves, but rather from missing information on payments and contributions. In particular, most of the missingness is attributable to income tax, resident tax, and social insurance contributions.

To address this issue, we impute the three major contributions using detailed information on income sources and household characteristics, and reconstruct disposable income by filling in the missing components. To assess the validity of the imputation, we compare the imputed values with observed contributions for households with reported amounts. The comparison shows a close correspondence between the imputed and observed values, particularly among low-income households.

While some components, such as fixed asset taxes, remain unobserved, we consider their omission unlikely to affect our analysis of low-income households or the estimated impacts of minimum wage increases. Since missing contributions are more prevalent among higher-income households, accounting for them leads to a modest reduction in the measured poverty rate.

We primarily restrict our sample to individuals under the age of 60, as those aged 60 and older are less likely to be directly affected by minimum wage policies due to lower labor force participation. In Japan, however, the poverty rate among the elderly is notably higher than

that among the non-elderly population. As a robustness check, we extend the sample to include individuals aged 60 to 64.

3.2 Empirical Strategies

To examine the effects of the minimum wage on the poverty rate, we estimate the following equation across various poverty thresholds c. Specifically, we consider thresholds set at 50%, 75%, 100%, 125%, and 150% of the standard poverty line of 1.27 million yen, which is commonly used in Japan. All values are adjusted to real 2020 yen.

$$I[y_{it} < c] = \alpha_c \ln MW_{pt} + X_{it}\Gamma_c + Z_{pt}\zeta_c + \mu_{cp} \cdot t + \theta_{cp} + \tau_{ct} + u_{it} \tag{2}$$

i indexes individuals, p prefectures, and t years. The dependent variable takes the value 1 if an individual's income is below the threshold c, and 0 otherwise. The explanatory variables include the logarithm of the minimum wage in prefecture p and year t; household-level controls (X_{it}) including household size; the share of children under age 6 and under age 18; the share of elderly members (aged 60 and over); a dummy for single-mother or single-father households; and the household head's age (included as a fourth-order polynomial) and gender; and prefecture-level controls (Z_{pt}) such as the job openings-to-applicants ratio and age group shares in the population. We estimate this equation using weighted least squares with sampling weights, clustering standard errors at the prefecture level.

As mentioned in Section 2, we also estimate this model using an instrumental variable approach to address the potential endogeneity of minimum wages, where the instrument is based on the gap between minimum wages and welfare benefits.

To assess the broader impact of minimum wages on the income distribution, we use the Unconditional Quantile Partial Effect (UQPE) framework proposed by Firpo et al. (2009) and applied by Dube (2019). This approach allows us to estimate the marginal effect of minimum wage changes at various points of the unconditional income distribution.

Operationally, we estimate Equation 2 repeatedly using a sequence of income thresholds corresponding to percentiles of the outcome variable (e.g., 5th, 10th, ..., 95th). Each estimate captures the effect of the minimum wage on the probability of falling below that threshold. These effects approximate the marginal changes in the cumulative distribution function (CDF) of income. By applying numerical differentiation and inversion techniques, we recover the effect of minimum wage changes at each quantile—i.e., the UQPE.

This method enables us to explore how the impact of minimum wage policy varies across the entire income distribution, rather than focusing solely on average effects.

4 The Effects of Minimum Wage on Disposable Income

4.1 Trend of Income Inequality and Poverty

Figure 3 shows the trends in absolute income levels for each quartile of per capita disposable income from 1986 to 2022. All values are adjusted to 2020 prices, and households composed solely of individuals aged 60 and over are excluded from the analysis.

Across all quartiles, income levels peaked around 1990 and declined thereafter, with relative stability observed since the 2010s. The bottom 25 percent experienced the weakest growth, with their real income level in 2020 remaining almost unchanged from that in 1986. While the top 25 percent did not experience dramatic increases, their income level in 2020 was still noticeably higher than in the late 1980s, in contrast to the lower quartiles. These patterns suggest that income stagnation has been most pronounced among low-income households, contributing to a widening gap between the bottom and upper parts of the distribution.

Figure 3 illustrates the changes in disparities between the 90th, 50th, and 10th percentiles of per-capita disposable income. Compared to the levels in 1986, the gaps between the 50th and 10th percentiles, as well as between the 90th and 10th percentiles, have increased more substantially than the gap between the 90th and 50th percentiles. This suggests that income growth at the bottom of the distribution has been particularly weak, indicating a relative deterioration in the economic position of low-income households.

Table 3 summarizes poverty rates by category for the years 1986, 2001, and 2022. The poverty line for 2020 is set at 1.27 million yen; thus, an individual is considered to be in poverty if their real per capita income, adjusted to 2020 values, falls below this threshold.

The poverty rate in 2022, when all samples are included in the analysis, is 15.3 percentage, a figure close to the government's official report. The poverty rate among elderly households consisting only of members aged 65 and above is higher than that of non-elderly households. However, it has improved compared to 1986. On the other hand, poverty rate among non-elderly household has been raised compared to 1986. Households with a head of household who has a university degree exhibit lower poverty rates compared to those where the head of household has only a high school education.

Additionally, the poverty rate among single-person households exceeds 30 percentage, indicating a high level. The poverty rate for single-mother households remains high in all urban areas, but it has declined significantly, from nearly 60% in 1986 to 38% in 2022.

4.2 The Effects of Minimum Wage on Poverty and the Income Distribution

This section examines the effects of minimum wage increases on poverty and the income distribution, based on Equation 2. We define the poverty line using the 2020 benchmark of 1.27 million yen in equivalized disposable income per capita, and apply this real threshold uniformly across all years after deflating income to 2020 prices. To assess the sensitivity of the results to the definition of poverty, we construct a set of poverty indicators corresponding to five thresholds: 50%, 75%, 100%, 125%, and 150% of the standard poverty line.

Table 4 reports the estimated effects of minimum wage increases on the poverty rate using both OLS and IV specifications for each threshold. Across most definitions of poverty, the estimated coefficients are negative, suggesting that higher minimum wages are associated with modest reductions in poverty. However, these effects are generally small in magnitude and statistically insignificant. At the lowest threshold (50% of the poverty line), the estimated coefficient is close to zero and slightly positive, indicating that minimum wage increases do not benefit households in deep poverty. The only statistically significant estimate appears at 150% of the poverty line under the OLS specification, implying that minimum wage increases may modestly reduce near-poverty rather than poverty at the bottom of the distribution. Overall, the results provide little evidence that minimum wage increases lead to a robust reduction in the poverty headcount.

Table 5 further explores heterogeneity in the effects of minimum wage increases across time periods and population subgroups, using the standard poverty line of 1.27 million yen. Columns (1) to (3) compare estimates for the pre-2000 and post-2000 periods, but no statistically significant effects are detected in either period. Columns (4) and (5) focus on single mothers, a group with relatively high poverty rates, yet the estimated effects remain imprecise and statistically insignificant. Columns (6) and (7) extend the sample to include households whose head are above 60, and the estimated coefficients are further attenuated. Taken together, these results suggest that minimum wage increases have limited effects on poverty reduction across population subgroups.

To complement the poverty rate analysis, Figure 5 presents the unconditional quantile partial effects (UQPE) of minimum wage increases on equivalized disposable income per capita across the income distribution. The figure reports both OLS and IV estimates, with shaded areas indicating confidence intervals. While the estimates are imprecise and not statistically significant at conventional levels, the point estimates are systematically negative in the lower tail of the disposable income distribution. Notably, the magnitude of the estimated elasticity becomes larger around the poverty threshold, suggesting that the effects of minimum wage increases may be concentrated near the poverty line rather than among the poorest households.

Taken together, the poverty rate and UQPE results point to a consistent pattern: minimum wage increases tend to shift the lower tail of the disposable income distribution upward, but

these distributional gains are not sufficiently large to translate into statistically significant reductions in the poverty headcount. This finding highlights the limited role of minimum wages as a direct anti-poverty tool in a context where household income aggregation and tax-and-transfer systems substantially mediate the impact of wage policies.

5 The Effects of Minimum Wage on Employment Income

5.1 Income Composition and Minimum Wage Worker Distribution by Income Quantile

In Section 4, we show that the effect of the minimum wage on disposable income is limited. Since disposable income reflects the impact of taxes and social security contributions, and the effects of the minimum wage may vary depending on the source of income, its overall impact on disposable income may be diluted. Therefore, this section focuses on employment income, which is directly affected by the minimum wage. First, we examine the composition of income sources by disposable income percentile.

Figure 6 plots the average share of each income source by disposable income percentile. While employment income constitutes a major source of income across all income groups, its share declines as income decreases. Even after excluding households composed solely of individuals aged 60 and over, a substantial portion of low-income households still rely on pension income.

Therefore, the limited effect of the minimum wage on disposable income may be partly explained by the relatively low share of employment income among low-income households. Since the minimum wage primarily affects employment income, its impact on overall household income becomes smaller when other income sources such as pensions account for a larger proportion of total income.

Next, we examine the distribution of minimum wage workers across the disposable income distribution. The CSLS provides information on annual working hours, although the reference periods for working hours and income do not fully coincide. Despite this limitation, we approximate hourly wages by dividing annual labor income by annual working hours. Minimum wage workers are defined as individuals earning an hourly wage between 50% and 110% of the statutory minimum wage. Due to data availability on working hours, the analysis is restricted to survey years from 2006 onward.

Figure 7 plots both the share and the number of minimum wage workers by quantiles of equivalized disposable income. The figure shows a clear concentration of minimum wage workers among lower-income households: the share of minimum wage workers is highest in the bottom part of the income distribution and declines monotonically as income increases.

This pattern indicates that minimum wage workers are disproportionately drawn from economically disadvantaged households.

At the same time, minimum wage workers are not confined exclusively to the poorest households. A non-negligible number of minimum wage workers is observed in the middle of the income distribution, reflecting the fact that low-wage earners may reside in households with multiple earners or additional sources of income.

Overall, while minimum wage workers are present across the income distribution, their markedly higher concentration among low-income households suggests that minimum wage policies primarily affect workers located near the bottom of the disposable income distribution.

5.2 The Effects of Minimum Wage on Employment Income

In this section, we examine the effect of the minimum wage on employment income, as the minimum wage directly influences earnings from employment. While it is important to note that we do not account for the impact of the minimum wage on labor market participation, we focus on its effect on the distribution of annual employment income among current workers.

To do so, we estimate Equation 2 using equivalized per-capita employment income as the outcome variable. We define poverty thresholds at 0.75, 1.00, 1.25, 1.50 and 1.75 million yen in real 2020 terms, with 1 million yen serving as the reference point. For each threshold, we construct a dummy variable indicating whether a household's equivalized employment income falls below the specified level. These dummies are then used as dependent variables in the regression framework, allowing us to estimate the marginal effects of minimum wage changes across different segments of the employment income distribution.

The results are shown in Table 6.The estimated coefficients are negative across all thresholds, indicating that minimum wage increases are associated with reductions in the share of households earning below each respective level of employment income. Notably, the effect becomes statistically significant at the 1.25 million yen threshold. The results are consistent across both OLS and IV estimations, suggesting a robust pattern in which minimum wage policies raise employment income, particularly among households near the lower-middle part of the distribution.

We next examine how the effects of minimum wage increases differ across income concepts by focusing on employment income and disposable income.

Figure 8 presents the elasticity of employment income with respect to the minimum wage across quantiles of disposable income. To highlight the role of labor earnings as a source of household income, we report two definitions of employment income: employment income among employed individuals only (excluding zero earnings) and employment income including

zero earnings.

The elasticity of employment income excluding zero earnings is relatively large and concentrated among households in the lower part of the disposable income distribution, with a peak around the poverty threshold. This pattern indicates that minimum wage increases primarily raise labor earnings for low-income workers who are attached to employment. In contrast, once zero employment income is included, the elasticity of employment income drops sharply at the bottom of the disposable income distribution. This sharp decline reflects the fact that, among the poorest households, employment income is often negligible or absent and therefore does not constitute a primary source of household income.

To facilitate a direct comparison across income concepts, Figure 9 aligns the unconditional quantile partial effects (UQPE) of minimum wage increases for disposable income and employment income using quantiles of disposable income as a common reference. For employment income, UQPEs are first estimated based on their respective income distributions and then reassigned to disposable income quantiles by averaging within each disposable income quantile.

The results show that the elasticity of employment income among employed individuals is the largest and is concentrated near the poverty threshold, consistent with the high concentration of minimum wage workers in this segment of the income distribution. However, this strong response in employment income does not translate proportionally into gains in disposable income. In the lowest disposable income quantiles, where employment income including zero earnings collapses, minimum wage increases have only limited effects on household resources, underscoring that labor earnings are not the main income source for the poorest households.

Overall, these findings suggest that while minimum wage increases substantially affect labor earnings among low-income workers, their impact on household well-being is mediated by household composition and non-labor income sources. As a result, minimum wage policies are more effective at raising earnings among the working poor than at improving the economic conditions of households in deep poverty.

6 Conclusion

This study examined the effects of minimum wage policies on poverty and the income distribution in Japan using long-term microdata from the Comprehensive Survey of Living Conditions spanning 1986–2022. By combining poverty headcount measures with unconditional quantile partial effects (UQPE), we provide a comprehensive assessment of how minimum wage increases affect household economic outcomes across the income distribution.

The poverty analysis reveals a clear threshold pattern. At the official poverty line, minimum wage increases are associated with a modest reduction in the poverty headcount that is statis-

tically significant at the 10% level in OLS estimates. When higher poverty thresholds—125% and 150% of the poverty line—are considered, the estimated effects become consistently negative and statistically significant in both OLS and IV specifications. In contrast, at lower thresholds such as 50% of the poverty line, we find no statistically significant effects. These results indicate that minimum wage increases reduce near-poverty but do not alleviate deep poverty.

The UQPE analysis of equivalized disposable income further clarifies this pattern. Minimum wage increases raise disposable income for households located just above the poverty threshold, while the estimated effects below the poverty line are close to zero. Thus, although minimum wage policies shift the lower tail of the income distribution upward, these distributional gains are concentrated above the poverty line and do not translate into substantial income increases for the poorest households.

Consistent with these findings, we show that minimum wage increases substantially raise employment income among low-wage workers who are attached to employment. However, once zero employment income is included, employment income declines sharply at the bottom of the disposable income distribution, indicating that labor earnings are not the primary income source for households in deep poverty. Moreover, part of the increase in labor earnings is offset by taxes and social security contributions, further attenuating the effect on disposable income.

Taken together, our results suggest that minimum wage policies in Japan primarily benefit households near the poverty threshold by increasing labor earnings and disposable income, but have limited effects on households below the poverty line. While minimum wage increases can modestly reduce near-poverty, they are not sufficient on their own to substantially improve living standards among the poorest households. These findings highlight the importance of complementing minimum wage policies with targeted income support and reforms to the tax-and-transfer system in order to more effectively address poverty.

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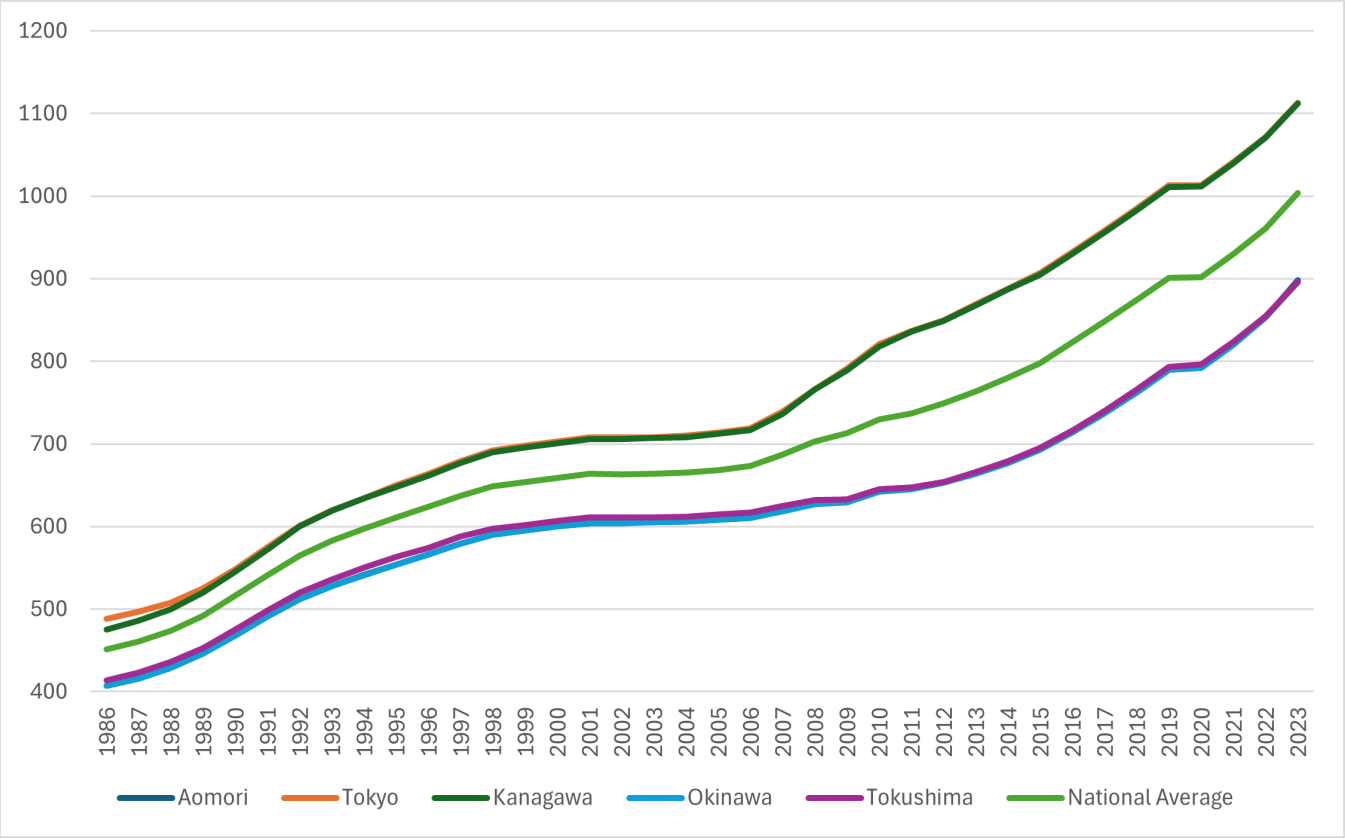
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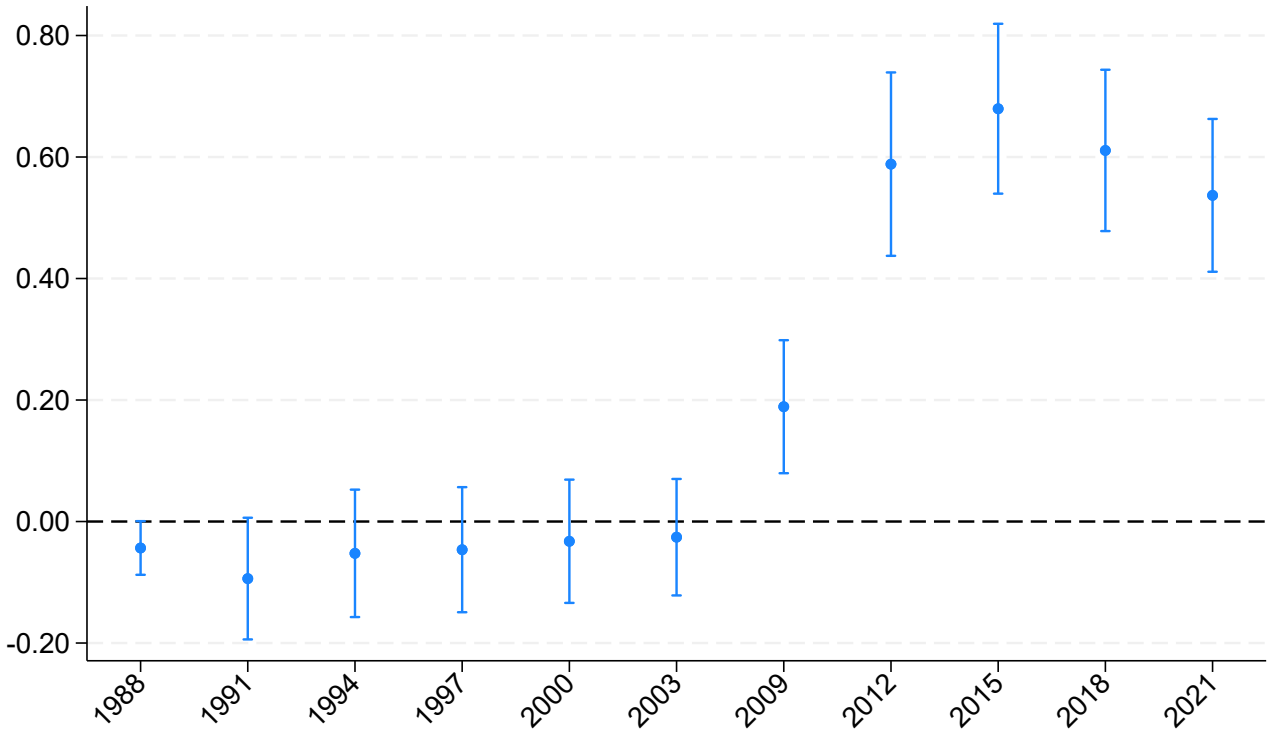
Tables & Graphs

Figure 1: Trend of Minimum Wage, 1986-2023



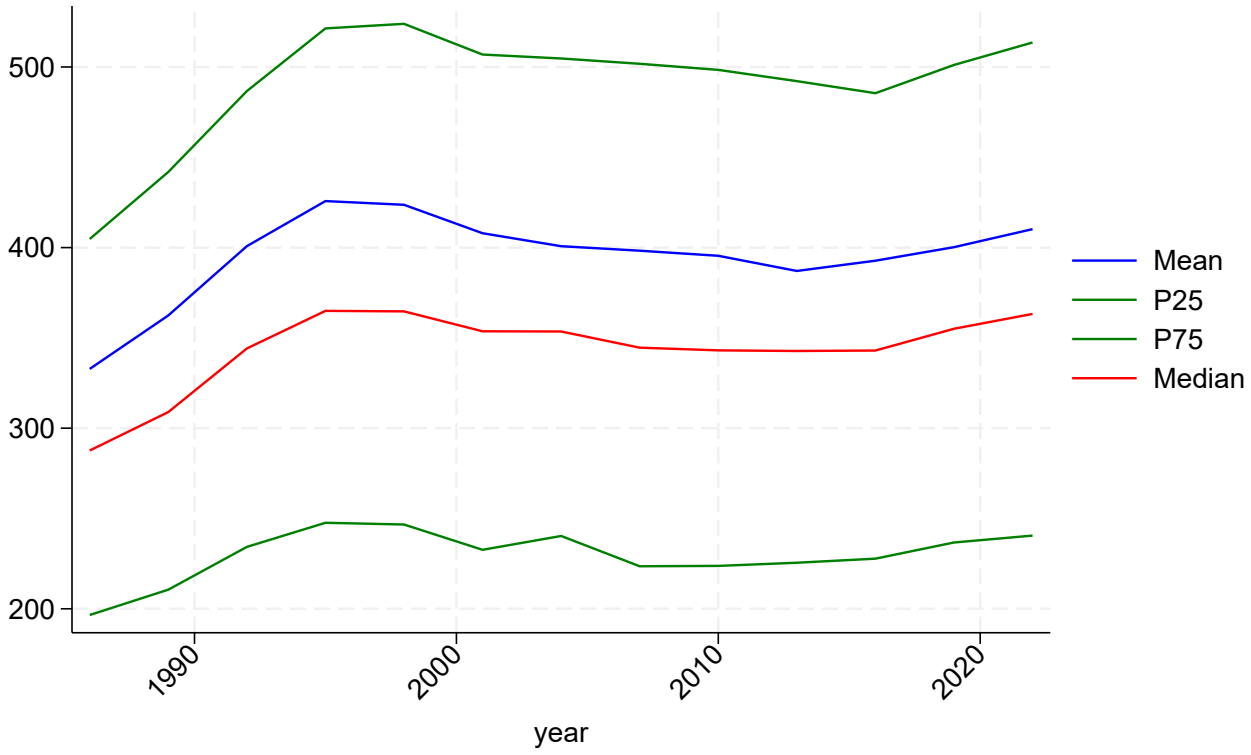
Notes: This figure displays the statutory minimum wages from 1986 to 2023 for five representative prefectures and the national average. The national average is calculated using a population-weighted mean across all prefectures. Tokyo and Kanagawa represent urban areas, while Okinawa and other regions illustrate non-urban trends.

Figure 2: First Stage Regression



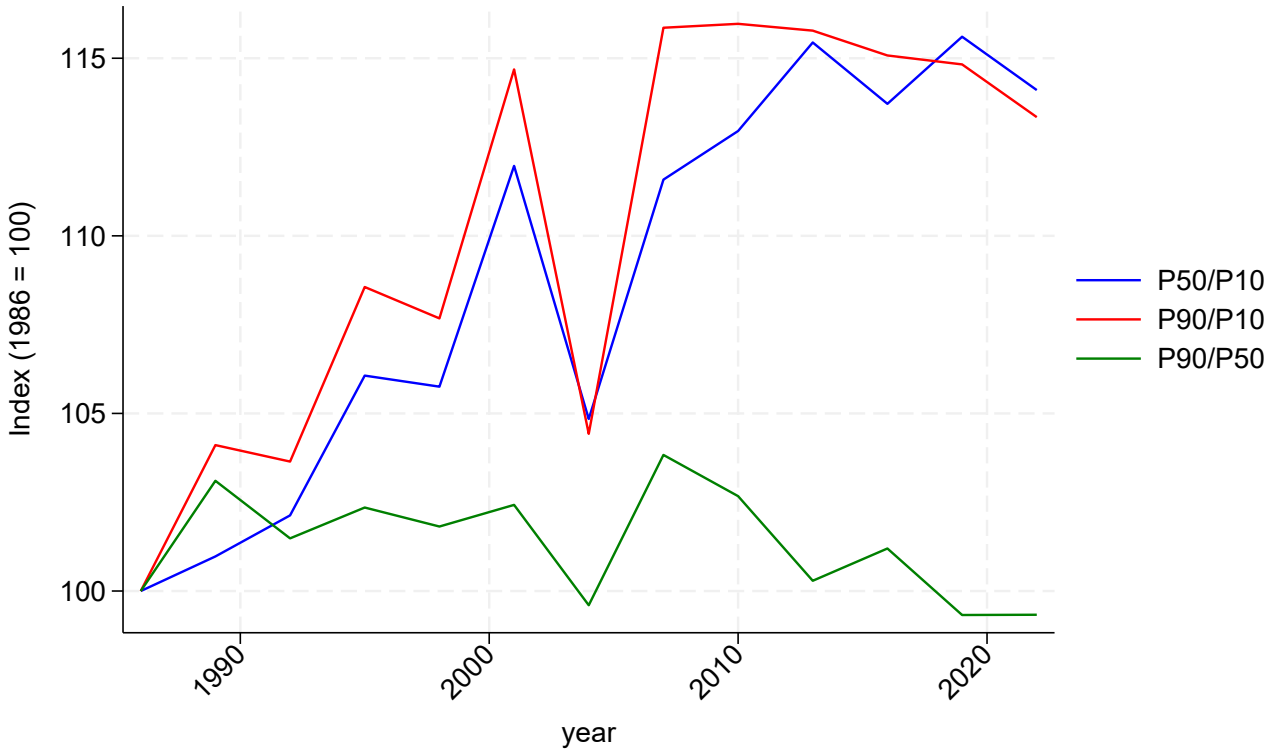
Notes: This figure displays the estimated first-stage coefficients from Equation 1, where the dependent variable is the log of the statutory minimum wage and the instrument is the log gap between welfare benefits and minimum wage earnings in 2006. Each coefficient represents the interaction of the instrument with year-specific dummies, capturing how the effect of the gap varies over time.

Figure 3: Quartile of Equivalent Total Income



Notes: This figure presents quartiles and the mean of equivalent total household income, adjusted to 2020 real prices. Equivalent income is calculated by dividing total household income by the square root of the number of household members. Households consisting solely of individuals aged 60 and older are excluded from the sample.

Figure 4: Changes in Income Disparity Ratios (1986 = 100)



Notes: This figure plots the relative changes in income disparity ratios over time, with each ratio normalized to 100 in 1986. The three series represent the ratios between the 90th and 50th percentiles (90/50), the 50th and 10th percentiles (50/10), and the 90th and 10th percentiles (90/10) of equivalent total household income. Equivalent income is calculated by dividing total household income by the square root of the number of household members. Households composed solely of individuals aged 60 and older are excluded from the sample.

Figure 5: The Effects of Minimum Wage on Disposable Income per capita



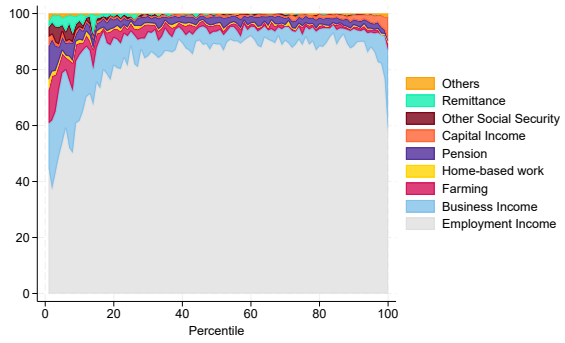
(a) Panel A: OLS



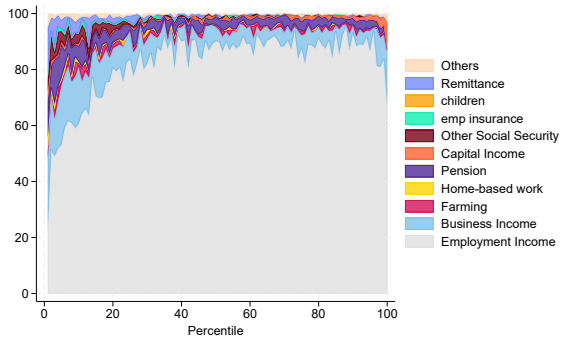
(b) Panel B: IV

Notes: This figure presents the unconditional quantile partial effects (UQPE) of minimum wage increases on per capita disposable income. The UQPEs are obtained from a series of regressions estimating the effect of the log minimum wage on poverty indicators at various income thresholds. Each regression includes controls for household characteristics (such as household size and composition, and the age and gender of the household head), prefecture-level covariates (including the job openings-to-applicants ratio and population shares by age group), as well as prefecture fixed effects, year fixed effects, and prefecture-specific linear time trends. Panel A shows OLS estimates, while Panel B presents IV estimates using the gap between minimum wage earnings and welfare benefits as an instrument. Darker shaded areas represent 95% confidence intervals, and lighter shaded areas represent 90% confidence intervals. Vertical lines indicate income levels of 1 million and 2 million yen. All income values are deflated to 2020 prices, and households composed solely of individuals aged 65 and older are excluded from the sample.

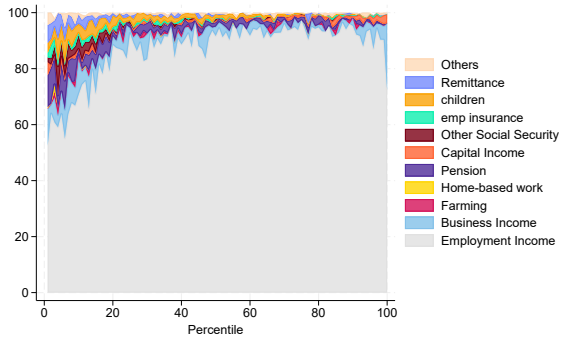
Figure 6: Composition of Income Sources: 1986, 2007, and 2022



(a) 1986



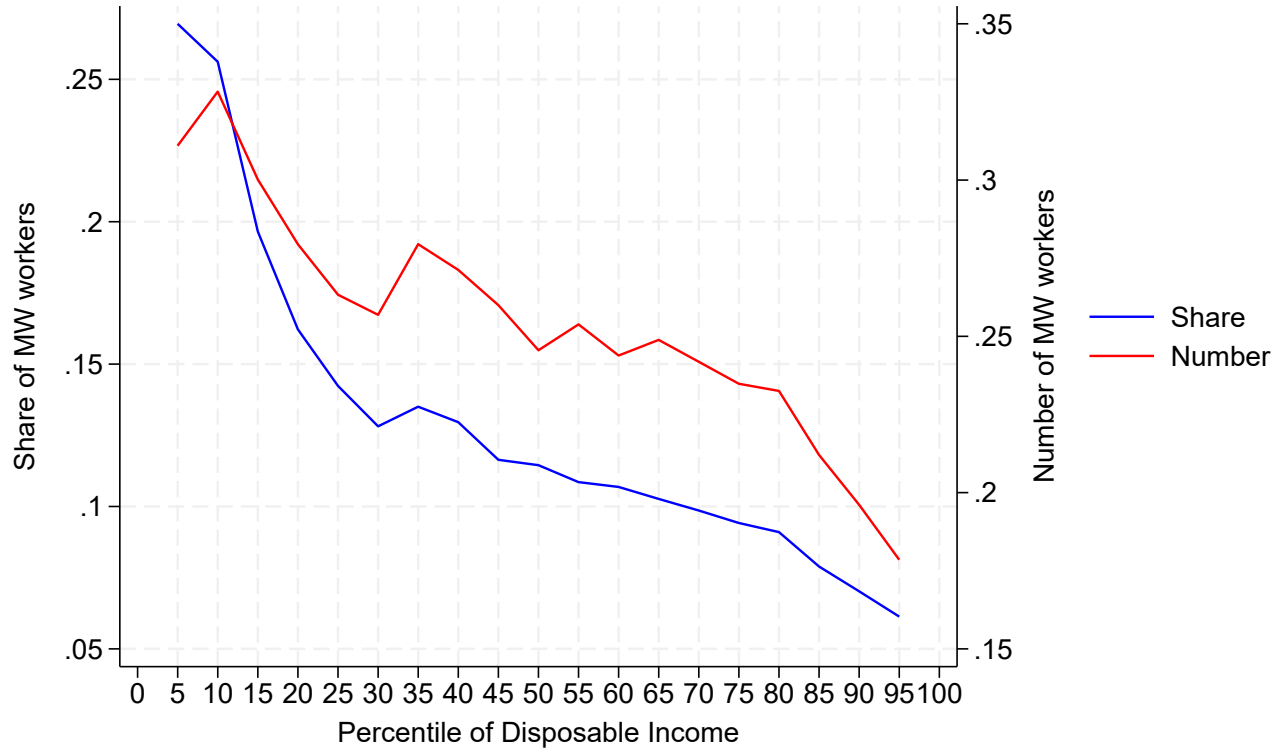
(b) 2007



(c) 2022

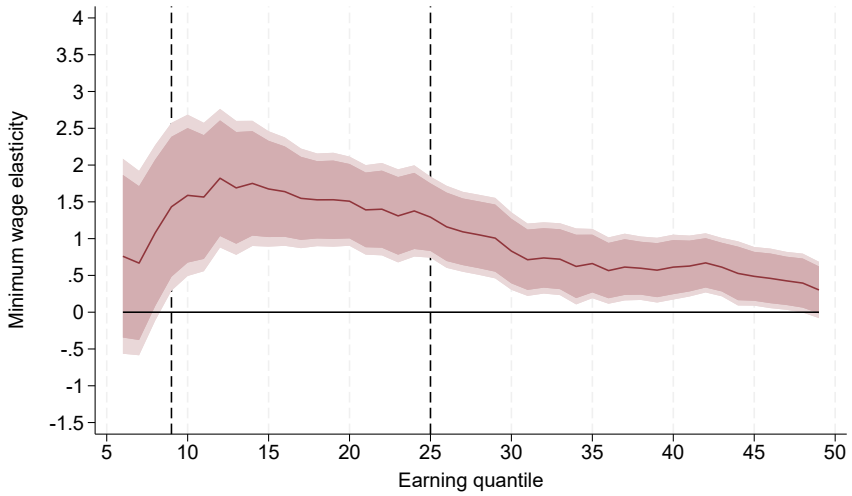
Notes: This figure presents area charts showing the average composition of household income sources by disposable income percentile for the years 1986, 2007, and 2022. For each household, the share of income derived from various sources—such as employment income, business income, pensions, capital income, and public transfers—is calculated relative to total household income. These shares are then averaged within each disposable income percentile.

Figure 7: Share and Number of Minimum Wage Workers by Disposable Income Quantile



Notes: This figure displays the distribution of minimum wage workers across percentiles of per capita disposable income. The left axis shows the share of minimum wage workers within each income percentile, while the right axis represents the absolute number of minimum wage workers. Minimum wage workers are defined as individuals whose estimated hourly wage falls between 50% and 110% of the statutory minimum wage. Hourly wages are approximated by dividing annual earnings by total annual working hours. To smooth fluctuations due to small sample sizes, the calculations are based on 20 income vigintiles (5-percentile groups), and the results are plotted on a 100-percentile scale.

Figure 8: The Effects of Minimum Wage on Equivalent Employment Income per capita



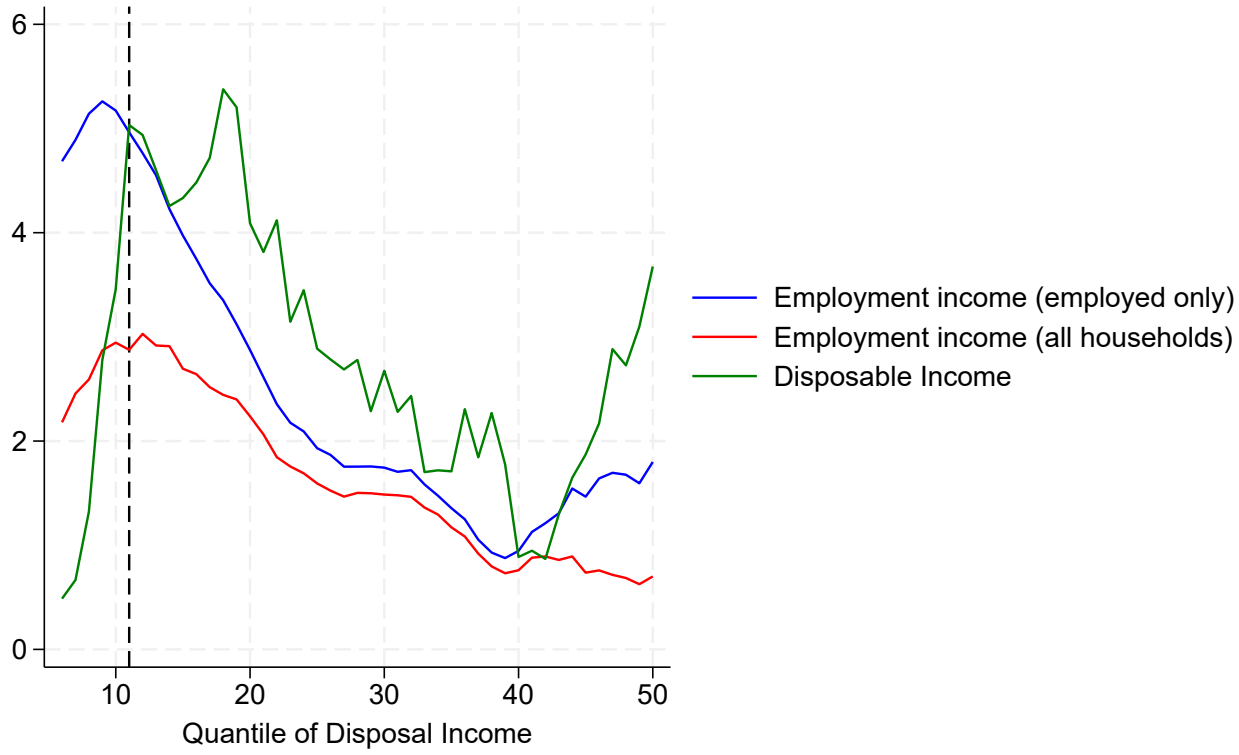
(a) Panel A: OLS



(b) Panel B: IV

Notes: This figure presents the unconditional quantile partial effects (UQPE) of minimum wage increases on per capita employment income. The UQPEs are obtained from a series of regressions estimating the effect of the log minimum wage on poverty indicators at various income thresholds. Each regression includes controls for household characteristics (such as household size and composition, and the age and gender of the household head), prefecture-level covariates (including the job openings-to-applicants ratio and population shares by age group), as well as prefecture fixed effects, year fixed effects, and prefecture-specific linear time trends. Panel A shows OLS estimates, while Panel B presents IV estimates using the gap between minimum wage earnings and welfare benefits as an instrument. Darker shaded areas represent 95% confidence intervals, and lighter shaded areas represent 90% confidence intervals. Vertical lines indicate income levels of 1 million and 2 million yen. All income values are deflated to 2020 prices, and households composed solely of individuals aged 65 and older are excluded from the sample.

Figure 9: Unconditional Quantile Effects of Minimum Wage across the Disposable Income Distribution



Notes: This figure shows the unconditional quantile partial effects (UQPE) of minimum wage increases on three income measures: (i) equivalized disposable income, (ii) employment income among employed individuals only (excluding zero earnings), and (iii) employment income including zero earnings. All estimates are reported along quantiles of equivalized per capita disposable income to facilitate comparison across income concepts. For employment income, UQPEs are first estimated based on the distribution of employment income and then reassigned to disposable income quantiles by averaging within each disposable income quantile. The vertical dashed line indicates the poverty threshold (1.27 million yen). All income measures are deflated to 2020 prices. Households composed solely of individuals aged 60 and older are excluded from the sample.

Table 1: Number of Respondents in the CSLC

Year	Household Questionnaire	Income Questionnaire
1986	240,208	36,259
1989	250,974	37,634
1992	253,526	36,139
1995	246,892	33,395
1998	247,662	30,506
2001	247,195	30,386
2004	220,836	25,091
2007	229,821	23,513
2010	228,864	26,115
2013	234,383	26,387
2016	224,208	24,604
2019	217,179	22,288
2022	203,819	19,140

Notes: The number of responses to the Household Questionnaire and Income Questionnaire in each survey year is shown.

Table 2: Summary Statistics of Household Income Components

Variable	Obs	Mean	Std. Dev.	Min	Max
Total income	300,935	677.47	556.68	1.00	48,570.27
Employment income	260,576	612.87	469.70	0	48,570.27
Business income	36,873	395.14	633.36	0	12,565.45
Farm income	20,014	131.58	258.14	0	19,386.97
In-home work income	5,918	100.93	136.42	0	2,083.33
Pension income	98,344	173.32	120.67	0	2,370.59
Capital income	26,485	170.31	386.63	0	13,126.49
Public transfers	131,170	11.40	36.35	0	1,193.32
Remittances	8,659	125.82	155.35	0	5,604.17
Other income	26,835	57.17	187.69	0	9,249.74
Disposable income	248,304	557.08	442.34	-2,550	45,927.80

Notes: This table reports summary statistics of income components aggregated at the household level. All values are adjusted to 2020 real prices and expressed in 10,000 yen units. The number of observations varies across variables due to missing entries when a household does not receive a particular income source. Minimum values of zero reflect very small positive amounts. Disposable income is negative due to taxes and social security contributions exceeding gross income.

Table 3: Poverty Rates by Category and Year

Category	100 million yen			127 million yen			150 million yen		
	1986	2001	2022	1986	2001	2022	1986	2001	2022
All	0.070	0.082	0.095	0.117	0.125	0.147	0.168	0.171	0.197
Elderly Household	0.320	0.161	0.135	0.435	0.237	0.217	0.536	0.306	0.289
Non-Elderly Household	0.059	0.074	0.081	0.104	0.113	0.123	0.153	0.156	0.166
CG Household			0.080			0.116			0.156
HG Household			0.106			0.170			0.229
Single Household	0.272	0.211	0.211	0.400	0.321	0.310	0.495	0.391	0.388
Non-Single Household	0.062	0.073	0.075	0.106	0.111	0.119	0.156	0.155	0.165
Single Mother	0.368	0.443	0.276	0.616	0.574	0.392	0.705	0.687	0.536

Notes: The poverty rates are calculated based on CSLS. The figures are presented in three thresholds: 100 million yen, 127 million yen, and 150 million yen, across three years (1986, 2001, and 2022).

Table 4: Minimum Wage Effects on the Poverty Rate

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	0.5	0.5	0.75	0.75	1.0	1.0	1.25	1.25	1.5	1.5
	OLS	IV	OLS	IV	OLS	IV	OLS	IV	OLS	IV
lmw	0.070	0.035	-0.032	0.002	-0.257^{+}	-0.188	-0.456**	-0.318*	-0.429**	-0.304^{+}
	(0.045)	(0.058)	(0.083)	(0.095)	(0.138)	(0.136)	(0.128)	(0.133)	(0.154)	(0.176)
Mean	0.02	0.02	0.05	0.05	0.10	0.10	0.16	0.16	0.24	0.24
N	692400	692400	692400	692400	692400	692400	692400	692400	692400	692400

Standard errors in parentheses

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Notes: This table reports the estimated effects of minimum wage increases on the poverty rate, using various poverty thresholds. Each column corresponds to a poverty line defined as a multiple of the official threshold (1.27 million yen in 2020 prices). For example, 0.5 refers to half the poverty line, while 1.5 refers to 1.5 times the threshold. Columns (1)–(10) present results using both OLS and IV estimation. The dependent variable is a binary indicator equal to one if an individual's per capita disposable income falls below the specified threshold. IV estimates use the gap between minimum wage earnings and welfare benefits as an instrument. Mean represents the average of dependent variables. All regressions include controls for household characteristics, prefecture-level covariates, prefecture and year fixed effects, and prefecture-specific linear time trends. Standard errors are clustered at the prefecture level and reported in parenthesis. *, **, and *** indicate significance at the 5%, 1%, and 0.1% levels, respectively.

Table 5: Minimum Wage Effects on the Poverty Rate: By Period and Population Subgroup Income

	(1) 1986-1998 OLS	(2) 2001-2022 OLS	(3) 2001-2022 IV	(4) SM OLS	(5) SM IV	(6) incl. 60+ OLS	(7) incl. 60+ IV
lmw	-0.168	-0.131	-0.056	0.583	0.703	-0.109	-0.035
	(0.515)	(0.108)	(0.137)	(1.351)	(1.681)	(0.135)	(0.137)
Mean	0.10	0.10	0.10	0.51	0.51	0.12	0.12
N	405983	286417	286417	11906	11906	1089004	1089004

Standard errors in parentheses

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Notes: This table presents heterogeneity in the estimated effects of minimum wage increases on the poverty rate across different time periods and population subgroups. The dependent variable is a binary indicator equal to one if an individual's per capita disposable income falls below 1.27 million yen (2020 prices). Columns (1)–(3) divide the sample by time period: 1986–1998 and 2001–2022. Columns (4)–(5) focus on single mothers (SM), a subgroup with high poverty incidence. Columns (6)–(7) expand the sample to include individuals aged 60 to 64, while Columns (8)–(9) restrict the sample to individuals aged 60–64 only. Mean represents the average of dependent variables. All regressions include household- and prefecture-level controls, as well as prefecture and year fixed effects and prefecture-specific linear time trends. IV estimates use the gap between minimum wage earnings and welfare benefits as an instrument. Standard errors are clustered at the prefecture level. *, **, and *** indicate significance at the 5%, 1%, and 0.1% levels, respectively.

Table 6: Minimum Wage Effects on the Equivalent Employment Income

	(1) 0.75 OLS	(2) 0.75 IV	(3) 1.0 OLS	(4) 1.0 IV	(5) 1.25 OLS	(6) 1.25 IV	(7) 1.5 OLS	(8) 1.5 IV	(9) 1.75 OLS	(10) 1.75 IV
lmw	-0.036	-0.085	-0.124	-0.112	-0.256**	-0.189	-0.334***	-0.227*	-0.375***	-0.194
	(0.051)	(0.101)	(0.067)	(0.115)	(0.074)	(0.104)	(0.080)	(0.104)	(0.094)	(0.108)
Mean	0.05	0.05	0.08	0.08	0.11	0.11	0.15	0.15	0.19	0.19
N	942691	942691	942691	942691	942691	942691	942691	942691	942691	942691

Notes: This table presents the estimated effects of minimum wage increases on the poverty rate using annual employment income as the income measure. The dependent variable is a binary indicator equal to one if an individual's annual employment income falls below a specified poverty threshold. Each column corresponds to a different threshold, expressed as a multiple of 1 million yen (e.g., 0.75 = 750,000 yen). Mean represents the average of dependent variables. Both OLS and IV estimates are reported. IV estimation uses the gap between minimum wage earnings and welfare benefits as an instrument. All regressions include household-level and prefecture-level controls, as well as prefecture and year fixed effects and prefecture-specific linear time trends. Standard errors are clustered at the prefecture level. *, **, and *** indicate significance at the 5%, 1%, and 0.1% levels, respectively.