INTERNATIONAL MONETARY FUND

Inequality, Household Debt, and the Role of Social Protection in Thailand

WORKING PAPER

Piyaporn Chote, Corinne Deléchat, Seunghwan Kim, Ying Xu, and Tamon Yungvichit

2025
NOV

IMF Working Paper

Asia and Pacific Department

Inequality, Household Debt, and the Role of Social Protection in Thailand
Prepared by Piyaporn Chote, Corinne Deléchat, Seunghwan Kim, Ying Xu, and Tamon Yungvichit *

Authorized for distribution by Rupa Duttagupta
November 2025

ABSTRACT: This study examines the nexus between inequality, household debt, and social protection in Thailand, focusing on their interrelation during the COVID-19 shock. Using data from the Thailand Household Socio-Economic Surveys of 2019, 2021, and 2023, we apply the Recentered Influence Function regression and decomposition method to identify the drivers of inequality in Thailand and demonstrate how the pandemic, despite its severe economic impact, led to a decline in income inequality through these drivers. Our analysis highlights the role of social protection, showing that social assistance helped reduce income inequality, while social insurance exerted the opposite effect in Thailand. Additionally, we investigate how income inequality and disparities in acess to social protection affected household debt dynamics during the pandemic. Our findings show that lower-income households were more likely to be indebted following the pandemic, possbly reflecting increased income shortfalls. Social assistance alleviated the pandemic's effects on household debt by easing income constraints, whereas social insurance exacerbated them.

Inequality, Household Debt, and the Role of Social Protection in Thailand

Prepared by Piyaporn Chote, Corinne Deléchat, Seunghwan Kim, Ying Xu, and Tamon Yungvichit

Contents

I. Introduction

The COVID-19 pandemic had a severe economic impact on Thailand, yet its effect on household income inequality was surprisingly modest. Many households benefitted from the Thai government's unprecedented support, which supplemented their income losses during the pandemic. These support measures were substantial and broad-based, reaching over 80 percent of Thai households (IMF, 2025), and also incurring significant fiscal costs. However, the support fell short for some of the most vulnerable groups. For example, households in the lowest income quintile saw their monthly average work and remittance income decline by approximately 210 baht (3.2 percent of total income) between 2019 and 2021, which was only partially offset by a 180 baht (2.7 percent of total income) increase in social assistance during the same period. Despite receiving government assistance, these households struggled to cover basic needs with their income and resorted to additional borrowing, often on unsecured terms and from informal lenders. This led to a surge in household debt, which increased debt service burdens and constrained spending among low-income households, contributing to a slow and uneven recovery after the pandemic.

This paper explores the nexus between inequality, household debt, and social protection in Thailand, focusing on their interrelation during the COVID-19 shock. Drawing on granular household-level data from the Thailand Household Socio-Economic Surveys of 2019, 2021, and 2023, we address two central research questions. First, what explains the limited impact of the pandemic on inequality in Thailand, and how did social protection contribute to this outcome? Second, how did income inequality and disparities in access to social protection affect household debt dynamics during the pandemic? To answer these questions, we employ multiple empirical approaches. We first use the Recentered Influence Function (RIF) regressions (Firpo et al., 2009) to identify the drivers of inequality in Thailand and estimate their impact.[1] Building on this, we apply the RIF decomposition method (Firpo et al., 2018) to measure how the pandemic has changed the distribution of these drivers, leading to changes in overall inequality. For the analysis of household debt dynamics, we use cross-quintile analysis to measure the distributional effects of the pandemic and the role of social protection, distinguishing between (non-contributory) social assistance and social insurance.

Our empirical analysis identifies several drivers of inequality in Thailand. In line with literature, we find that household heads being employed and getting married, and more households living in an urban rather than rural location are associated with lower inequality. Additionally, increased internet access also contributes to reducing inequality. Conversely, higher proportions of male and older household heads are associated with higher inequality. Education is also a key driver of inequality, but it contributes in a non-linear way. An increase in household heads with lower-level education (from primary up to post-secondary) helps reduce inequality. However, an increase in household heads with higher education (college and above) is associated with larger inequality, possibly reflecting regressive returns to higher education in Thailand. On social protection, we find mixed results: additional social assistance is associated with lower inequality, whereas additional social insurance has the opposite effect.

We then examine how the COVID-19 pandemic contributed to the evolution of inequality in Thailand through the identified drivers. Comparing the 2019 and 2023 data, which represent pre- and post-pandemic periods, we find that changes in the distribution of these drivers during the period—including increased access to internet and social assistance, decreased access to social insurance, and changes in household characteristics, such

---

[1] Inequality is quantified by distributional statistics such as Gini coefficient and various income percentile shares.

as a higher share of household heads with secondary and above education, and a lower share of male household heads—overall contributed to a decline in inequality.

Finally, we study the impact of the pandemic on household debt, and examine how income inequality and disparities in access to social protection contributed to different debt dynamics. Our findings show that, compared to richer households, lower-income households were more likely to be indebted after the pandemic, although the rise in the average indebtedness—measured by the changes in debt-to-income (DTI) ratio—did not significantly differ across income groups. Additionally, we find that greater access to social assistance played a mitigating role, reducing the pandemic's impact on household debt, while greater access to social insurance had the opposite impact, exacerbating the pandemic's impact on household debt.

This paper is related to the broad literature on the drivers of inequality, and the impact of pandemics on inequality. Cross-country macro-level studies and micro-level household survey analyses show that technology, finance, institutional and legal framework, tax and benefit system, distribution policies, demography (age structure of the population), household composition, and education are important drivers of inequality (Aslan et al., 2017; Nolan et al., 2018). In the case of Thailand specifically, diverse aspects of poverty and inequality have been documented,[2] and several studies find that educational gaps, employment, financial development, agricultural factors, and geographic location are the most relevant drivers of inequality (Motonishi, 2006; Paweenawat and McNown, 2014; World Bank, 2023). Furthermore, research has explored the impact of pandemics on inequality with mixed conclusions. Some researchers find that pandemics in the history led to a decline in inequality, such as the 14th-century Black Death (Sayed and Peng, 2021), while others find the opposite or limited impact from pandemics to inequality (Furceri et al., 2021; Alfani, 2022). In terms of the COVID-19 pandemic, empirical evidence shows that government interventions account for the significantly smaller fall in income for low-income groups and thus lead to a decline or limited impact on income inequality (Hacıoğlu-Hoke et al.,2021; Stantcheva, 2022; Darvas, 2024). However, studies also indicate that the regressive impacts of the COVID-19 pandemic may lead to a more persistent increase in inequality, resulting from scarring due to unemployment, technological change, or uneven opportunities for remote work (Angelopoulos et al., 2021; Tyson and Lund, 2021). Our study builds on the existing inequality literature and contributes by providing an in-depth empirical analysis of inequality in Thailand before, during, and after the COVID-19 pandemic using the RIF regression and decomposition analyses, demonstrating the role of internet access and heterogenous contributions of social assistance and social insurance.

This paper also relates to the literature on the pandemic's impact on household debt and its scarring effects. Several studies on the U.S. and other advanced economies show that the pandemic shock exacerbated the racial and income disparities in financial distress and access to credit (An et al., 2021; Agarwal et al., 2021), including higher debt burdens for low-income individuals relative to high-income individuals (Davydiuk and Gupta, 2021) and a drop in credit card loans driven by the most creditworthy, while the recovery in credit card borrowing was driven by the least creditworthy borrowers (Horvath et al., 2021). However, government policies such as debt relief and fiscal support significantly dampened household debt distress and inequality in access to credit (Yannelis and Amato, 2023; An et al., 2021; Cherry et al. 2021; Cooper et al., 2021). Studies have shown that the COVID-19 pandemic could lead to persistent output loss through impacts on productivity, labor market, human capital accumulation (Barrett, et al., 2022, Suphaphiphat and Shi, 2022), and high leverage and suboptimal policies (IMF, 2022). Our study contributes to the literature by presenting the distributional effect of the pandemic on Thailand's household debt, filling the gap of the rather limited studies on emerging market

---

[2] For example, an upcoming paper by the ILO takes an in-depth examination of the poverty and inequality in Thailand and proposes policy recommendations for the social protection system.

economies. We also contribute to the literature by highlighting interlinkages between inequality, social protection, and household debt.

Our study offers several policy implications. It underscores the critical role of social assistance in mitigating the adverse distributional impacts of the pandemic, while also highlighting the regressive nature of Thailand's social insurance system and the need for reforms to enhance its equity. The different debt dynamics across households during the pandemic show that low-income households in Thailand are more prone to accumulate debt during economic shocks, which could worsen financial stability risks and prolong recovery due to their increased debt service burdens. Moreover, the positive role of social assistance in alleviating the pandemic's effect on household debt suggests that providing adequate income support to the poorer households during economic shocks can be an effective policy intervention to curb household debt accumulation and the associated financial stability risks.

The rest of the paper is structured as follows. Section II provides an overview of inequality, household debt, and social protection system in Thailand. Section III discusses the impact of the COVID-19 pandemic and presents stylized facts on household income and debt developments. Section IV introduces the data for the empirical analysis. Section V presents the empirical analysis to identify the drivers of inequality in Thailand and examine how the pandemic contributed to its evolution. Section VI discusses how income inequality and social protection affected household debt dynamics during the pandemic. Section VII concludes with policy implications.

II. Overview of Inequality, Household Debt, and Social Protection in Thailand

A. Inequality in Thailand

Thailand has made significant progress in reducing poverty and inequality. Over the past decades, robust economic growth and a gradual structural transformation of the economy have increased household incomes. As a result, poverty rates have declined drastically, with the proportion of the population living below the national poverty line dropping from 27 percent in 2004 to 6 percent in 2021.[3] This increase in earnings at the lower end of the distribution has been the main driver of inequality reduction in Thailand (Wasi et al, 2019). During the same period, the income and consumption Gini coefficients decreased from 49 percent to 43 percent and from 43 percent to 35 percent, respectively (**Figure 1, panel a**).

However, the progress has slowed since the mid-2010s, as Thailand's economic growth decelerated and structural transformation nearly stalled (Klyuev, 2015). Reducing poverty has become more challenging, as it has been concentrated within marginalized groups, such as ethnic minorities, persons with disabilities, vulnerable children and the elderly. Similarly, the pace of the decline in inequality has slowed considerably. Currently, Thailand's inequality remains relatively high compared to countries with similar income levels (**Figure 1, panel b**). The extent of inequality in Thailand is particularly evident in the concentration of income and wealth among the richest groups. According to the World Inequality Database, the top decile earned 52 percent of the total pre-tax income, and held 76 percent of total net personal wealth in 2022, making the country one of the most unequal by these metrics (World Bank, 2023).

---

[3] National poverty line is THB 2,803 per person per month as of 2021.

Inequality in Thailand can be observed in diverse dimensions of the economy, including regions, sectors, formal vs informal employment, and genders (**Annex I**). For example, the average household income in Bangkok is nearly double that of the poorest Northeast region—the gap is even more pronounced in terms of regional GDP per capita, with Bangkok's GDP per capita being more than 6.5 times that of the Northeast region. Wage gaps are large across sectors, particularly between agriculture and non-agriculture sectors. Even within the same sectors, informal workers in Thailand earn much lower wages and experience poorer employment outcomes, often with adverse knock-on effects such as lower education, poorer health status, and social exclusion. Gender inequality in Thailand has improved significantly over time, but among employees with similar education and/or skill levels, wages for female workers are still lower than those for male workers, particularly for jobs requiring higher education and advanced skills.

Figure 1. Thailand's Poverty and Inequality

a. Poverty and inequality trends in Thailand
    (in percent)

b. Cross-country comparison of Gini coefficients
    (in percent)
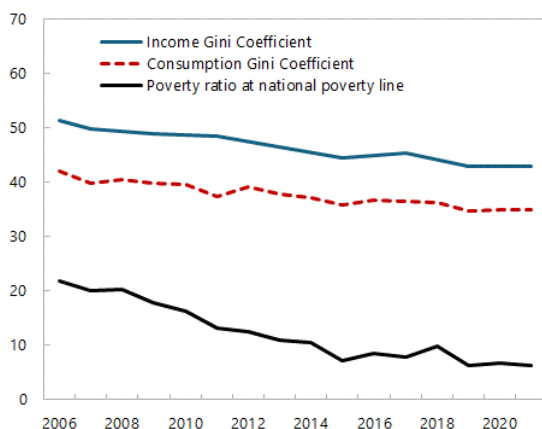
Sources: World Bank World Development Indicators, Thailand National Statistical Office (NSO).
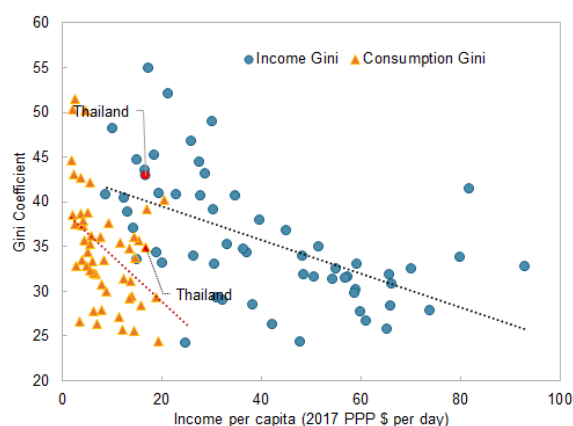
Sources: World Bank Poverty and Inequality Platform, authors' calculation.

B. Household Debt in Thailand

Thailand has a high level of household debt. Even before the COVID-19 pandemic, Thailand's household debt-to-GDP ratio exceeded 80 percent, surpassing that of many regional peers and countries with similar income levels (**Figure 2, panels a and b**). The rise in household debt since the early 2000s can be attributed to several macroeconomic and structural factors. The economic recovery following the Asian Financial Crisis, combined with an accommodative monetary policy stance, encouraged borrowing. At the same time, the expansion of financial services—particularly the growth of non-bank financial institutions—enhanced households' access to credit, as financial institutions increasingly shifted their focus toward personal lending amid subdued corporate performance. Government policies aimed at stimulating household consumption further fueled credit growth (BOT, 2003). Consumer behavior has also played a significant role in the accumulation of household debt in Thailand. Many individuals tend to start borrowing at a young age and often overextend themselves financially, sometimes without fully understanding loan terms and conditions. The widespread practice of making only minimum monthly payments has further contributed to debt accumulation.

Moreover, many Thai households do not have adequate emergency savings for adverse income shocks (Xu, 2025), increasing their reliance on borrowing during periods of financial stress.

Household debt in Thailand is regressively distributed, with low-income households bearing a disproportionately large burden relative to their income. DTI ratios for the lowest-income quintile are higher than those of most other income groups—likely reflecting their limited income base and a greater reliance on credit to meet basic consumption needs (**Figure 2, panel c**). This disparity is even more pronounced in the case of informal loans, where DTI ratios are generally higher among the lower-income groups (**Figure 2, panel d**). These informal loans often carry higher interest rates, further exacerbating the debt burden for the low-income households.

Figure 2. Thailand's Household Debt

a. Historical evolution of Thailand's household debt-to-GDP ratio (in percent)
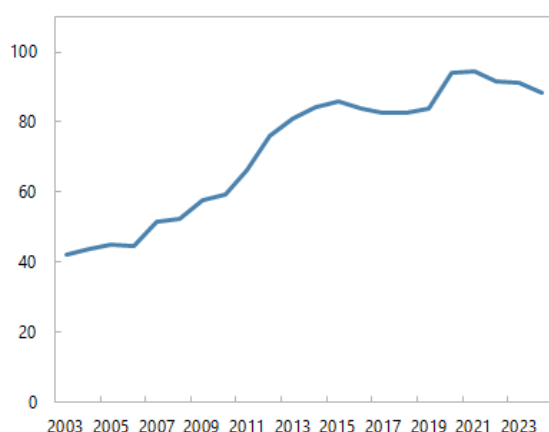
Source: CEIC.

b. Household debt-to-GDP ratio comparison with selected countries (in percent, as of 2022)
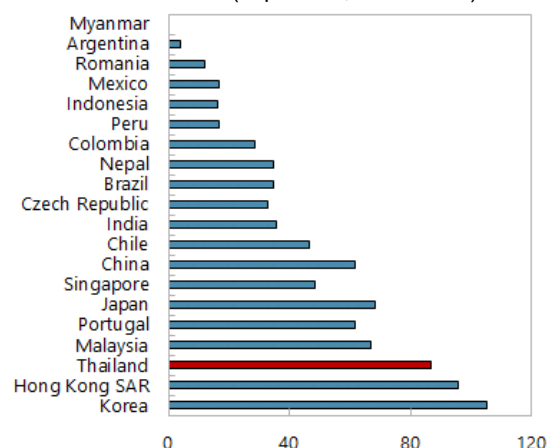
Source: Xu (2025).

c. Total loan DTI ratio and income balance by household income quintiles (as of 2019)
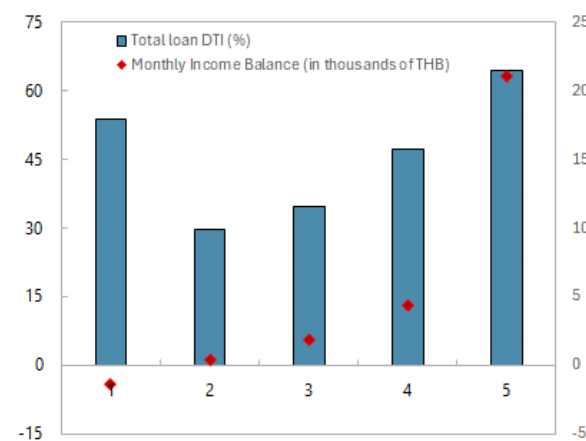
Sources: Thailand National Statistical Office (NSO), authors' calculation.

d. Informal loan DTI ratios by household income quintiles (in percent, as of 2019)

Sources: Thailand National Statistical Office (NSO), authors' calculation.

Note: DTI ratios are calculated as household's total debt divided by 12-month income. Income balance is the difference between monthly household income and expenditure.

C. The Social Protection System in Thailand

Thailand has a comprehensive social protection system, comprising nearly 50 schemes that offer a wide array of benefits and services. The ILO estimates that 70 percent of the population is covered by at least one social protection benefit.[4] These programs can be broadly categorized into two types: (1) *social assistance* schemes, which are non-contributory, publicly financed programs aimed at supporting the poor and/or vulnerable; and (2) *social insurance* schemes, which are contributory programs designed to supplement income in times of economic stress due to economic shocks or life cycle risks (Table 1).[5]

1. Social Assistance

Thailand's social assistance schemes comprise various categorical and poverty-targeted support programs. The main schemes include Universal Health Coverage, Child Support Grant, Disability Grant, State Welfare Card (SWC), and the Old Age Allowance (OAA). These schemes are budget-financed and provide benefits to a broad population, although eligibility criteria vary. For example, the OAA provides nearly universal benefits for those 60 and older (excluding those with other pensions), while Child Support Grant and SWC offer means-tested benefits, and the Disability Grant targets those with qualifying conditions.

Thailand's social assistance has extensive coverage. For instance, the SWC is estimated to benefit more than 13 million people, and the OAA covers more than 9 million people. Collectively, about 95 percent of the poorest quintile is estimated to receive some form of social assistance benefits in Thailand, which is relatively high compared to countries with similar income levels (World Bank, 2023). As these schemes are generally targeted for the poor and vulnerable, Thailand's social assistance system is progressive in nature and has helped reducing poverty. According to the ILO estimates, social assistance in Thailand has contribute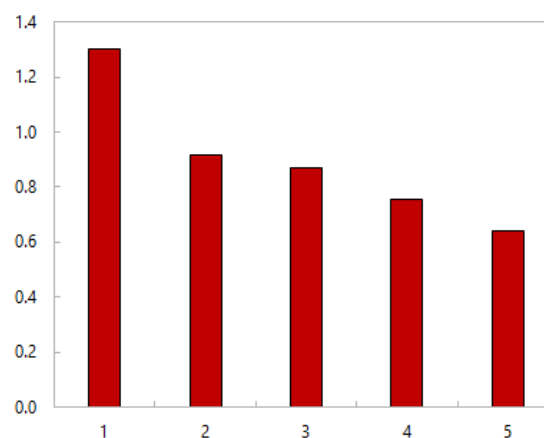d to reducing national poverty rate by 5.2 percentage points compared to what it would have been without such support (UN SDG, 2022).

However, Thailand's social assistance is often characterized as being "spread thin", due to its low and insufficient benefits (World Bank, 2021). For example, social pension benefits, including the OAA, amount to only 7 percent of the average household income, or 14 percent for the poorest quintile, which is among the lowest in the region (World Bank 2021). Most benefits provide transfers that are well below the national poverty line, covering only around 11-20 percent of the average per-capita consumption expenditure of the target population (UN SDG, 2022). Overall, Thailand's fiscal costs associated with social assistance are estimated at around 0.8 percent of GDP, significantly lower than the average for lower-middle-income countries (1.4 percent) as well as for upper-middle-income countries (1.6 percent). Additionally, inefficient targeting and the lack of coordination across different schemes make the system susceptible to leakages, with significant resources potentially benefiting wealthier households that are not in acute need of assistance. For example, in 2019, nearly half of the social assistance benefits were estimated to have accrued to households above the bottom two quintiles, with more than 11 percent benefitting the richest quintile (World Bank, 2023).

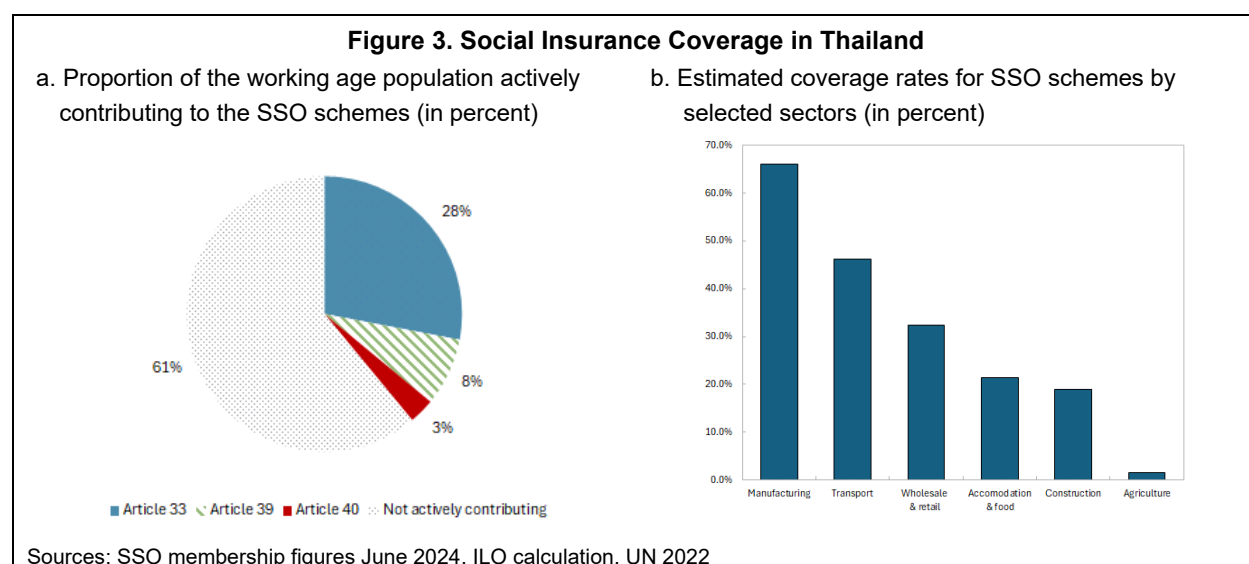[4] SDG indicator 1.3.1 (excludes medical benefits and services where coverage is close to universal).

[5] Besides, current and former civil servants receive benefits managed by the civil service scheme. This includes a budget-financed defined-benefit pension, and a contributory defined-contribution scheme (the Government Pension Fund).

2. Social Insurance

Social insurance schemes in Thailand comprise programs administered by the Thailand Social Security Office (SSO). The SSO schemes cover all nine branches of social security, including old age, unemployment, sickness, disability, maternity, and death. Employment injury benefits are provided through the Workers' Compensation Fund also managed by the SSO. There are three schemes within the SSO: mandatory *Section 33* for all private sector employees; *Section 39* for former members of Section 33; and *Section 40* for those not covered elsewhere, including informal workers.

Thailand's social insurance benefits are generally considered to meet the international standard. For example, Social Security Fund members who contribute for 30 years are entitled to a pension equivalent to 42.5 percent of the insured salary, which exceeds the 40 percent minimum requirement under the ILO's Social Security Minimum Standards Convention, 1952 (No. 102).[6] However, in practice, many individuals receive less than this due to the salary cap used to calculate contributions and benefits.[7]

Social insurance schemes in Thailand have limited coverage, with only about 35-40 percent of the working age population actively contributing to the SSO schemes (**Figure 3, panel a**). Coverage is primarily concentrated among formal sector workers, who represent the wealthier and less vulnerable segments of the population. Although voluntary schemes exist to allow informal workers to participate (SSO Section 40), uptake is very low, and most informal workers—accounting for more than half of the workforce—are not covered. Even among formal employees, only about 30 percent of non-government formal workers are estimated to be covered (UN SDG, 2022), indicating compliance challenges. Across sectors, coverage is lowest in the agriculture sector and higher in the service and the manufacturing sectors (**Figure 3, panel b**). Coverage also differs depending on whether enterprises are formally registered or their sizes, with unregistered and smaller enterprises having lower coverage. As a result, social insurance in Thailand is regressively distributed, with coverage more prevalent among higher earners (UN 2022).

Figure 3. Social Insurance Coverage in Thailand

a. Proportion of the working age population actively contributing to the SSO schemes (in percent)

b. Estimated coverage rates for SSO schemes by selected sectors (in percent)

Sources: SSO membership figures June 2024, ILO calculation, UN 2022

---

[6] ILO Convention No. 102 sets out contingencies that should be covered, maximum eligibility periods, minimum benefit levels and duration and minimum coverage requirements for nine social security branches. Thailand has not yet ratified the convention.

[7] Civil service schemes provide considerably more generous benefits. For example, a civil servant working 35 years and earning THB 30,000 a month receives over 2½ times the retirement benefit of an SSO retiree with the same earnings and service record.

Table 1. Major Social Assistance and Social Insurance Schemes in Thailand

Program	Description	Target Beneficiaries	Estimated Coverage
Social Assistance			
Universal Health Coverage	Comprehensive healthcare including general medical care, rehabilitation services, high-cost medical treatment, and emergency care.	Thai citizens not covered by other health protection schemes, such as (a) the Social Security Scheme for private sector employees, and (b) the Civil Servant Medical Benefit Scheme.	47.5 million (2019).
State Welfare Card	Cash transfer program for poor working age households (THB 200-300 consumer goods allowance and additional allowances for transportation and utilities).	Thai citizens with an annual income below THB 100,000, with no financial assets worth more than THB 100,000 or real estate.	13.5 million (2024).
Old Age Allowance	Basic pension that provides a monthly benefit of THB 600-1,000 per month (depending on age).	All Thai citizens aged 60 and above, except recipients of civil service pensions.	9.1 million (2019).
Child Support Grant	Cash transfer program for poor families with children with a flat rate benefit of THB 600 per month.	Thai children aged 0-6 years old with annual household income less than THB 100,000 per head.	1.8 million (2020).
Disability Grant	Cash allowance for people with disabilities with a benefit of THB 800 per month (THB 1000 per month for children and those eligible for the SWC).	All Thai disabled persons with qualifying disability.	1.8 million (2020).
Social Insurance			
Social Security Fund (Sections 33 and 39)	Contributory social insurance scheme for private employees.	Section 33 covers those employed in non-agricultural establishments (with at least one employee). Section 39 covers those previously insured under Section 33 who contributed for not less than 12 months or wish to remain insured.	Section 33: 11.7 million; Section 39: 1.6 million (2019)
Social Security Fund (Section 40)	Contributory social insurance scheme for informal economy workers.	Informal economy workers (i.e., self-employed or family workers not covered by any social security system) aged between 15-65.	3.2 million (2019)

Sources: World Bank (2021), United Nations (2022), IMF (2025).

III. Impact of the COVID-19 Pandemic

A. Economic Shock and the Authorities' Responses

The COVID-19 pandemic had a severe impact on Thailand's economy. As a country heavily reliant on tourism, the halt in international tourist arrivals due to travel restrictions and lockdowns induced a sharp slowdown in multiple sectors, notably tourism-related industries such as hospitality, retail, and transportation. The manufacturing sector also faced difficulties due to supply chain disruptions, further exacerbating the economic slowdown. As a result, Thailand's GDP contracted by 12.2 percent y/y in the second quarter of 2020, while unemployment more than doubled from around 1 percent pre-pandemic to 2.3 percent in the third quarter of 2021 (**Figure 4, panel a**).

In response, the Thai government deployed a large fiscal support package totaling THB 1.56 trillion (9.3 percent of GDP), of which THB 886 billion (5.3 percent of GDP) was used to provide relief including through transfers. Existing social assistance schemes were scaled up, and emergency programs for those not previously covered (e.g., informal workers and farmers) were introduced, expanding the number of beneficiaries to around 81.5 percent of the population (World Bank, 2023). While these measures provided vital support, the nearly universal benefits came at a substantial fiscal cost, widening Thailand's fiscal deficit rapidly and increasing Thailand's public debt to historically high levels, which continue to constrain fiscal space in the post-pandemic era (**Figure 4, panel b**).

Figure 4. Impact of the Pandemic and Fiscal Response

a. Real GDP growth and unemployment rate (in percent)

b. General government overall balance and public debt (in percent of GDP)

Sources: CEIC, IMF World Economic Outlook Database.
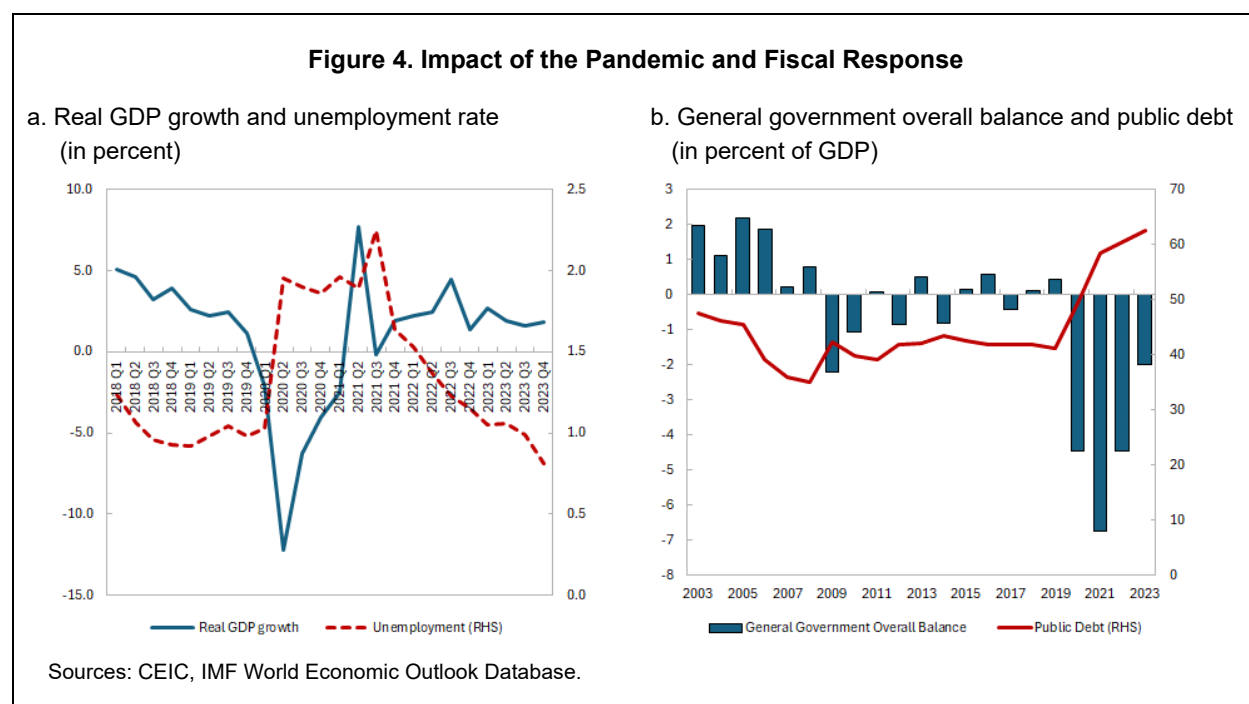
B. Impact on Inequality and Household Debt

Despite the severe economic shock from the pandemic, Thai households' average income continued to grow modestly during the pandemic. While work income (i.e., income from wage, business, and farm) contracted in 2021, it was more than offset by other income sources, particularly social protection payments and in-kind income—which likely included various forms of government support (**Figure 5, panel a**).

On a more granular level, the composition of income sources varied significantly across income groups. Lower-income households experienced a relatively large decline in the share of work income, which was supplemented by increases in in-kind income, social assistance, and remittances. In contrast, wealthier households experienced smaller declines in the share of work income and benefited from social insurance which was not the case in the lower-income groups (**Figure 5, panel b**). Overall, these shifts in income sources helped contain a spike in poverty and inequality during the COVID-19 pandemic. The poverty rate increased by only half a percentage point to 6.8 percent in 2020, before returning to 6.3 percent the following year. The impact on inequality was more muted, with little changes in the Gini indices in 2021, and a further decline compared to 2019 thereafter.

Figure 5. Household Income Developments During the Pandemic

a. Average real monthly household income (in THB)   b. Shares of income sources by quintiles (in percent)

Sources: Thailand National Statistical Office, authors' calculation.
Note: Real monthly household income is adjusted for inflation using the average headline CPI, with 2019 as the base year.
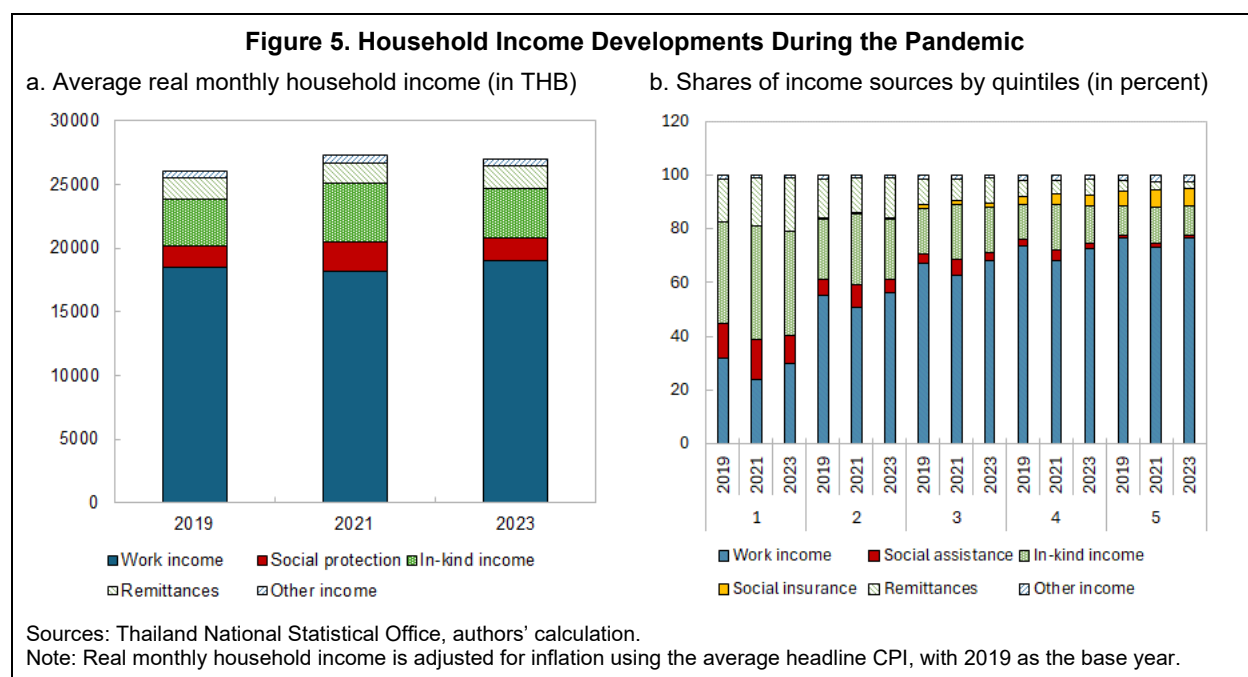
Meanwhile, the pandemic led to an increase in Thailand's household debt. The household debt-to-GDP ratio, already high at 84 percent of GDP in the fourth quarter of 2019 (pre-pandemic), surged to 95.5 percent by the first quarter of 2021—reflecting both a rise in debt levels (4.7 percent) and a contraction in GDP (-7.9 percent). The purpose of borrowing differed across income groups. While consumption loans remained the largest category across all income groups, their share declined among lower-income households (first to third quintiles) in 2021, while increasing among higher-income households (fourth and fifth quintiles). For lower-income groups, this decline was supplemented by a rise in farm loans. Real estate loans, by contrast, remained highly concentrated among the wealthiest households (**Figure 6, panel a**). Loan types also differed by income level with lower-income households relying more heavily on informal loans (**Figure 6, panel b**).

Households' debt burden relative to income also diverged across income groups. During the pandemic, total loan DTI ratios rose for most income groups before declining in the post-pandemic period. However, for the lowest-income households, the DTI ratio continued to decline (**Figure 6, panel c**), likely due to tighter credit constraints limiting their access to borrowing. At the same time, informal loan DTI ratios rose sharply for the first and second income quintiles, suggesting that these groups increasingly relied on informal borrowing sources to cope with income losses and restricted access to formal credit (**Figure 6, panel d**).

Figure 6. Household Debt Developments During the Pandemic

a. Share of household loan purposes by income quintiles (in percent)
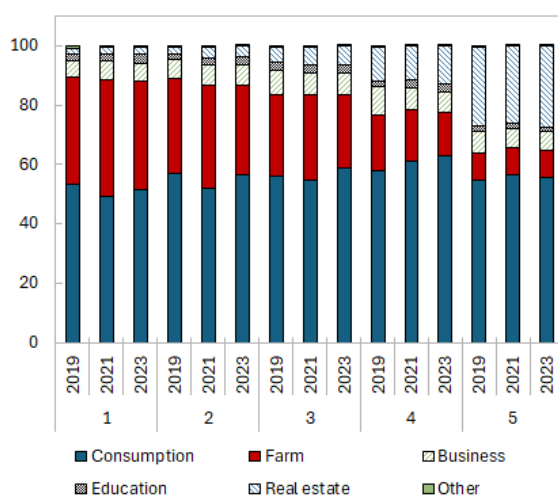
b. Share of formal versus informal loans by income quintiles (in percent)
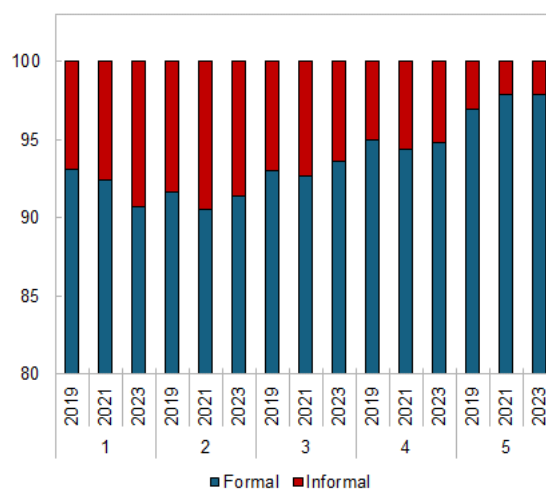
c. Total loan DTI ratios by household income quintiles (in percent)
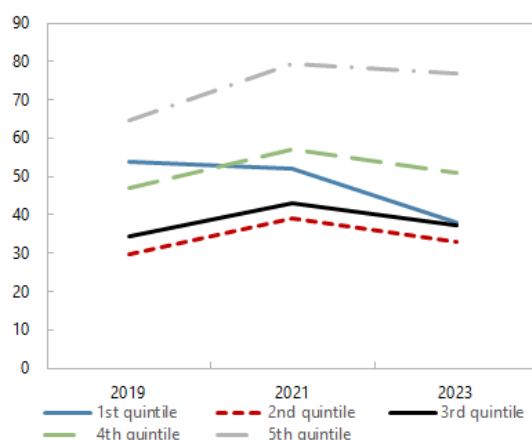
d. Informal loan DTI ratios by household income quintiles (in percent)
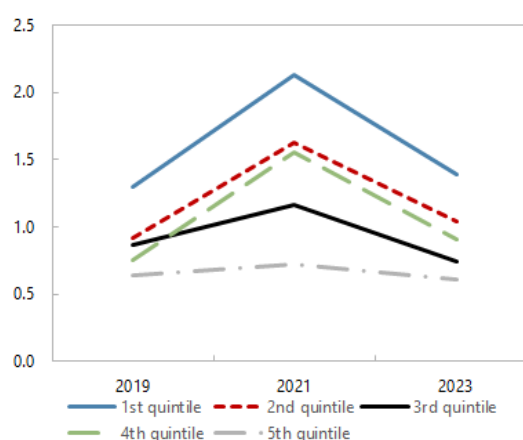
Sources: Thailand National Statistical Office, authors' calculation.
Note: DTI ratios are calculated as household's total debt divided by 12-month income.

IV. Data for the Empirical Analysis

The main data source for our empirical analysis is Thailand Household Socio-Economic Survey, a granular household-level dataset based on a survey conducted by Thailand NSO. While the survey is conducted annually, household income data is collected biennially. It uses a stratified two-stage sampling method, where Bangkok Metropolitan and other provinces are considered as constituted strata. There are 77 strata in total, with each stratum (except Bangkok Metropolitan) divided into two parts according to the type of local administration—municipal areas and non-municipal areas. In our analysis, we use the 2019, 2021, and 2023 survey results, which represent the periods before, during, and after the COVID-19 pandemic. For each year the sample comprises about 50,000 households, but the survey does not provide a panel as the households surveyed each year are different.

For dependent variables, we include household income, which is used for constructing inequality measures, and a set of variables on household debt. The latter comprises dummy variables indicating whether a household has certain types of debt (e.g., formal/informal loans, and loans for different purposes), and DTI ratios for each type of debt. Our explanatory variables include social protection access and household characteristics. For social protection, we use the average number of schemes per each household member to gauge access to social assistance and social insurance. Regarding household characteristics, in line with the literature, we include variables related to household heads (education level, employment status, age, marital status, and gender), as well as other household characteristics (household size, rural or urban location, region), and internet access (Chongvilaivan and Kim, 2016; Nolan et al., 2018; World Bank, 2023). For education variables specifically, we use dummy variables for four education levels to capture the potential non-linear effects on inequality. Additionally, we include dummy variables to identify the income group of each household and a dummy variable that differentiates between the pre- and post-COVID period. **Annex II Table 1** lists the dependent and independent variables used in the empirical analysis, along with their definitions. **Annex II Table 2** presents the summary statistics and data availability for each variable.

Based on the simple t-tests, we find that several explanatory variables (potential drivers of inequality) in our sample changed after the pandemic (**Table 2**). For example, there were fewer male household heads in 2023 compared with the 2019 sample. In terms of social protection, we find access to social insurance declined after the pandemic, whereas access to social assistance increased after the pandemic. As expected, the pandemic also contributed to a significant increase in internet access, which is also one of the potential drivers of inequality we examine in this study. In terms of education, the share of household heads with secondary and above education increased after the pandemic, thus leading to a decrease in the share of household heads with only primary and below education.

Table 2. Changes in Potential Inequality Drivers

	Social Insurance	Social Assistance	Internet Access	Male	Below Primary	Primary	Secondary	Post secondary	College
2019	3.379	1.330	1.411	0.596	0.052	0.574	0.223	0.035	0.115
2023	2.949	2.163	2.020	0.559	0.041	0.512	0.255	0.045	0.147

Note: The table lists the mean of different independent variables in 2019 and 2023. T-tests of these variables suggest their differences among two periods are statistically significant.

V. Drivers of Inequality in Thailand and Contribution of the Pandemic

In this section we analyze the drivers of inequality in Thailand. Our empirical analysis finds heterogenous effect of social protection: increased access to social assistance contributes to reducing inequality, whereas social insurance has the opposite effect. Among various household characteristics, increased internet access, more household heads being employed, getting married, and having primary and secondary education, and more households living in an urban rather than rural location are associated with lower inequality. On the other hand, higher proportions of male and older household heads are associated with higher inequality. In addition, we find that the changes in the distribution of these drivers before and after the pandemic, such as increased access to the internet and social assistance, decreased access to social insurance, and changes in household characteristics, such as increased secondary and above education of the household heads, and a lower share of male household heads, overall contributed to a decline in inequality after the pandemic in Thailand.

A. Empirical Strategy

To examine the drivers of inequality in Thailand, we follow a similar approach to that applied in World Bank (2023) and Xu (2022), using the RIF regression proposed by Firpo et al. (2009). Unlike conventional quantile regressions, where the effect of a covariate is conditional on the values of other covariates, the RIF regression enables the estimation of unconditional effects of a covariate on the distribution of the dependent variable. The estimated coefficients can be interpreted as the usual ordinary least squares coefficients. This approach allows us to measure the general impact of a change in an explanatory variable X (e.g., internet access) on certain distributional statistics (e.g., the top 10 percent share) of a dependent variable Y (e.g., household income), based on its overall distribution. Furthermore, to understand the distributional effect of the pandemic in Thailand, we use the RIF decomposition method proposed by Firpo et al. (2018), which is an extension of the traditional Oaxaca-Blinder decomposition method and allows for estimating the effects of covariates on different inequality measures, not limited to the mean, including the Gini coefficient, quantiles, ratios, and other distributional statistics.

We adopt the following three steps as in Xu (2022). We first estimate the RIF statistics of the dependent variable for a chosen distributional statistic for each observation. The RIF statistics quantify how much the distributional statistic would change if the distribution of the dependent variable were slightly perturbed at the point of observation (Firpo et al., 2009). Next, we estimate a set of regressions in which the dependent variable is the estimated RIF statistics from the first step. The coefficients show how changes in each explanatory variable contribute to inequality in Thailand, measured by the aforementioned distributional statistics. In the last step, we apply the RIF decomposition method to analyze the difference in inequality between the pre- and post-pandemic periods, and measure the contribution of each explanatory variable to the effect of the pandemic on the evolution of inequality. The dependent variable of interest in the first step is household total income. The distributional statistics are inequality measures including the share of income held by the top 10 percent, top 5 percent, top 1 percent, and bottom 20 percent of households, and the Gini coefficient. The explanatory variables include household characteristics including internet access, and social protection. We weight all models by the survey weights and control for year- and region-fixed effects.

B. Empirical Results

1. Drivers of Inequality

Table 3 presents the estimated coefficients from the RIF regression on income inequality measures, using data from all three years of the sample (2019, 2021, and 2023). Positive coefficients in columns (2) to (4) and negative coefficients in column (1) indicate that an increase in the explanatory variable is associated with an increase in inequality. Overall, all models demonstrate consistent directions of the estimated effects, although the magnitude slightly differs based on specific income inequality measures. For example, the coefficients in column (1) on the bottom 20 percent income share are mostly opposite to the coefficients in the other four columns. Robust standard errors using survey weights are reported in parentheses.

Table 3. Drivers of Income Inequality

Income inequality	(1) Bottom 20	(2) Top 10	(3) Top 5	(4) Top 1	(5) Gini
HH head: employed	0.00509***	0.00801	0.0108	0.0101	-0.00451
	(0.00104)	(0.00621)	(0.00677)	(0.00671)	(0.00555)
HH head: Male	-0.00145	0.0134***	0.00993*	0.000710	0.0133***
	(0.000971)	(0.00485)	(0.00528)	(0.00525)	(0.00440)
HH head: Age	-0.000516***	0.000930***	0.000613***	0.0000927	0.00188***
	(0.0000289)	(0.000209)	(0.000228)	(0.000228)	(0.000185)
Household size	-0.00165***	-0.00223	-0.00113	0.00175	0.00108
	(0.000253)	(0.00226)	(0.00250)	(0.00257)	(0.00195)
HH head: married	0.0000743	-0.00568	-0.00289	-0.00147	-0.00667
	(0.000919)	(0.00509)	(0.00556)	(0.00560)	(0.00458)
Internet access	0.0171***	-0.0403***	-0.0261***	-0.00798*	-0.0698***
	(0.000907)	(0.00477)	(0.00504)	(0.00477)	(0.00446)
Social assistance	-0.000189	-0.00661*	-0.00909**	-0.0102**	-0.00247
	(0.000675)	(0.00386)	(0.00423)	(0.00427)	(0.00347)
Social insurance	-0.0249***	0.149***	0.142***	0.106***	0.155***
	(0.00180)	(0.0191)	(0.0215)	(0.0227)	(0.0162)
HH head: primary	0.0130***	-0.0406***	-0.0311***	-0.0148***	-0.0524***
	(0.00130)	(0.00518)	(0.00548)	(0.00516)	(0.00519)
HH head: secondary	0.00350**	-0.0446***	-0.0351***	-0.0153**	-0.0367***
	(0.00152)	(0.00676)	(0.00724)	(0.00705)	(0.00650)
HH head: post-secondary	-0.0122**	-0.0536***	-0.0528***	-0.0363***	-0.00930
	(0.00560)	(0.0131)	(0.0136)	(0.0120)	(0.0141)
HH head: college	-0.0346***	0.0865***	0.0570***	0.00873	0.151***
	(0.00176)	(0.0115)	(0.0123)	(0.0117)	(0.0103)
Urban	0.00245***	-0.00867*	-0.00550	0.00116	-0.0112**
	(0.000815)	(0.00510)	(0.00562)	(0.00580)	(0.00452)
_cons	0.0957***	0.168***	0.0643**	-0.0250	0.224***
	(0.00296)	(0.0245)	(0.0271)	(0.0274)	(0.0213)
N	142065	142065	142065	142065	142065
Year FE	Y	Y	Y	Y	Y
Region FE	Y	Y	Y	Y	Y

Standard errors in parentheses, $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

In line with the literature, several household characteristics contribute to reducing inequality. More household heads being employed, and getting married are associated with lower inequality, with the former particularly relevant for the bottom 20 percent income group. Similarly, more households relocating from rural to urban areas help reduce overall income inequality. Internet access also turns out to be an important driver of income disparities in Thailand. As shown in **Table 3**, increased internet access is associated with lower inequality across various inequality measures, including the income share of the bottom 20 percent, the top 10 percent,

the top 5 percent, and the Gini index. Other household characteristics are associated with higher inequality. On average, a larger proportion of male and older household heads contributes to higher inequality. Similarly, a larger household size decreases the bottom 20 percent income share, making the poor poorer and thereby increases inequality.

Breaking down employment into different sectors (**Table 4**), we can see that an increase in agriculture sector employment contributes to higher inequality. Although it increases the bottom 20 percent income share, it increases the top income shares more, leading to an overall increase in the Gini coefficient. This aligns with Motonishi (2006), which finds that inequality between the agricultural and nonagricultural sectors plays a significant role in determining the income distribution of Thailand. Conversely, employment in the industry and service sectors, including both low- and high-end services, helps decrease inequality.

Table 4. Drivers of inequality by different employment sector

| Income inequality	(1) Bottom 20	(2) Top 10	(3) Top 5	(4) Top 1	(5) Gini
Agriculture	0.00297***	0.0297***	0.0280***	0.0177**	0.0182***
	(0.00103)	(0.00660)	(0.00724)	(0.00729)	(0.00589)
Industry	0.00695***	0.00565	0.0103	0.0125	-0.0114
	(0.00139)	(0.0103)	(0.0113)	(0.0116)	(0.00896)
High-end Service	0.00505***	-0.0305***	-0.0284**	-0.0220**	-0.0314***
	(0.00146)	(0.0108)	(0.0116)	(0.0112)	(0.00941)
Low-end Service	0.00729***	-0.00227	0.00611	0.0145	-0.0201***
	(0.00138)	(0.00841)	(0.00924)	(0.00937)	(0.00747)
_cons	0.0949***	0.167***	0.0624**	-0.0281	0.227***
	(0.00298)	(0.0250)	(0.0277)	(0.0280)	(0.0217)
N	142065	142065	142065	142065	142065
Other Inequality Drivers	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
Region FE	Y	Y	Y	Y	Y

Standard errors in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The estimated coefficients on education variables suggest that education has non-linear effects on inequality, in line with the literature (Rehme, 2007). For the primary education variable, the coefficients are negative for columns (2)-(5), and positive for column (1). This indicates that, holding everything else constant, increasing the number of household heads with education up to primary is associated with reduced inequality. Similarly, secondary education also shows this equalizing effect. On the contrary, we find that an increase in the share of household heads with education up to college level leads to higher inequality. Our results echo World Bank (2023), which shows a regressive return to education in Thailand, where wealthier quantiles obtain higher returns to education, and the return becomes even more regressive at higher education levels. Richer households have better access to higher education (**Annex II Figure 1**) and can get higher returns compared with the poorer ones. An increase in the share of household heads with post-secondary education is associated with a decrease in the income share of both the bottom and the top, thus leading to an increase of income share for households in the middle.

Social protection contributes differently according to its type. Social assistance is associated with lower inequality, as an increased access to social assistance leads to lower income shares of the top 5 percent and top 1 percent. Social insurance, however, is associated with higher equality, as it increases the top income

shares and the Gini index, while decreasing the bottom income share. The opposite impact on inequality from social assistance and social insurance is rooted in the structure of Thailand's social protection system, as discussed in Section II. In **Figure 7**, we plot the number of social insurance schemes and the number of social assistance schemes per household member against average monthly household income. The red dots represent access to social assistance schemes, and the blue dots represent access to social insurance schemes. It clearly shows that high- and middle-income groups have more access to social insurance, while the lower-income group has more access to social assistance. Due to this uneven coverage, an increase in access to social insurance disproportionally benefits the relatively richer group compared with the lower-income group, thus increasing inequality. As a robustness check, we also use (1) the amount of social assistance and social insurance benefits and (2) a dummy indicating whether households have social assistance and a dummy indicating whether households have social insurance as the dependent variables, instead of the average number of social assistance and social insurance schemes each household has. The regression results are consistent with our baseline findings that social assistance is associated with lower inequality while social insurance, on the contrary, is associated with higher inequality.

Figure 7. Distribution of social insurance and social assistance
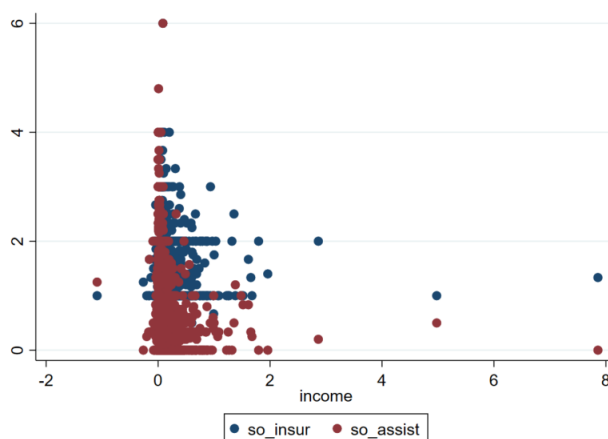
Note: the chart plots the average number (y-axis) of social insurance (blue dots) and social assistance (red dots) schemes per household member has in our sample based on their household total income (x-axis, unit: million THB).

2. Contribution of the Pandemic

We now examine how the COVID-19 pandemic contributed to inequality in Thailand through the identified drivers. The RIF regression in the previous section used the entire 2019-2023 sample. In this decomposition analysis however, we focus on the samples from 2019 and 2023, which represent the pre- and post-pandemic periods, respectively.

Table 5 presents the results of the RIF decomposition, showing how the COVID-19 pandemic affected different inequality drivers and led to changes in inequality in Thailand during the period. This approach allows us to measure the pandemic's impact on previously identified drivers, and how the changes in these drivers led to changes in inequality. We use three distributional statistics to measure inequality: column (1) is the Gini-type coefficient, column (2) is the top 10 percent income share, and column (3) is the top 5 percent income share. We control for region fixed effects and all models are weighted by survey weights.

Overall, we see a decline in income inequality after the pandemic, driven by the changes in inequality drivers. **Panel a of Table 5** shows the overall difference between pre- and post-pandemic inequality measured by different statistics, all of which are negative, suggesting a decline in equality. **Panel b of Table 5** presents the explained part of the decomposition results, showing the change in inequality due to the differences in the levels of explanatory variables. This is the central part of interest for our study, as we aim to measure how much the pandemic contributed to the changes in different drivers (explanatory variables), and how these changes led to the changes in inequality. **Annex II Table 3** is the unexplained part that shows the changes in inequality driven by the differences in the coefficients of explanatory variables in two different periods.

Different drivers have mixed impacts on inequality after the pandemic. Among household characteristics, the coefficients for the male household variable are negative, which means, fewer male household heads in post-pandemic period compared to the pre-pandemic (as we discussed in section IV) contributed to lower inequality. The coefficients for internet access, social assistance, and social insurance are also negative, implying that increased internet access, increased access to social assistance, and decreased access to social insurance, all contributed to a decline in inequality. The impact of changes in education is mixed: an increase in household heads with secondary and post-secondary education leads to a decline in inequality, whereas an increase household heads with college and above education, and a decrease in household heads with primary education both contribute to an increase in inequality post pandemic.

Table 5. Decomposition of Income inequality pre- and post-pandemic

Income inequality measures	(1) Gini	(2) Top 10	(3) Top 5
a. Overall			
Difference (post-pre)	-0.0216***	-0.0153***	-0.00962
	(0.00507)	(0.00576)	(0.00627)
Explained	-0.0656***	-0.0660***	-0.0638***
	(0.00870)	(0.0100)	(0.0112)
Unexplained	0.0440***	0.0507***	0.0541***
	(0.0119)	(0.0138)	(0.0154)
b. Explained			
HH head: employed	-0.0000131	0.0000306	0.0000320
	(0.0000475)	(0.0000597)	(0.0000652)
Internet access	-0.0251***	-0.0174***	-0.0139***
	(0.00173)	(0.00174)	(0.00181)
Social assistance	-0.00433	-0.00891***	-0.0104***
	(0.00282)	(0.00321)	(0.00355)
Social insurance	-0.0387***	-0.0395***	-0.0387***
	(0.00648)	(0.00757)	(0.00848)
HH head: Male	-0.000621**	-0.000527*	-0.000432
	(0.000258)	(0.000286)	(0.000309)
HH head: Age	-0.000413	-0.000282	-0.000244
	(0.000336)	(0.000234)	(0.000207)
Household size	0.000297*	0.000385**	0.000323*
	(0.000157)	(0.000183)	(0.000186)
HH head: married	-0.0000433	-0.0000274	-0.000160
	(0.000170)	(0.000191)	(0.000209)
HH head: primary	0.00297***	0.00169***	0.000930
	(0.000688)	(0.000648)	(0.000688)
HH head: secondary	-0.00173***	-0.00167***	-0.00123***
	(0.000388)	(0.000365)	(0.000353)
HH head: post-secondary	-0.000625***	-0.000881***	-0.000790***
	(0.000214)	(0.000246)	(0.000239)
HH head: college	0.00324***	0.00185***	0.00150***
	(0.000557)	(0.000519)	(0.000533)
Urban	-0.0000435	-0.0000146	0.0000141
	(0.0000703)	(0.0000764)	(0.0000834)
Region FE	Y	Y	Y

Standard errors in parentheses, $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

VI. Pandemic, Income Inequality, Social Protection, and Household Debt

This section examines the impact of the pandemic on household debt, focusing on how income inequality and disparities in access to social protection affected household debt dynamics. We find that, compared to richer households, lower-income households were more likely to be indebted after the pandemic, both for formal and informal loans. This increased likelihood of indebtedness was driven by agriculture, business, and education loans. In contrast, the increase in the extent of indebtedness—measured by the changes in DTI ratio—did not significantly differ across income groups. In addition, we find different roles of social assistance and social insurance in household debt dynamics. Access to social assistance had a mitigating effect, reducing the pandemic's impact on both the likelihood and extent of household debt, whereas access to social insurance had the opposite effect.

A. Empirical Strategy

To examine the distributional effect of the pandemic on household debt, we conduct a cross-quintile analysis, by interacting the COVID-19 dummy with income quintiles to examine the impact of the pandemic on each income group. In addition, to measure how social protection affected pandemic's impact on household debt, we include an interaction between the COVID-19 dummy and social protection. Model (1) is the main model we use in our analysis,

$$credit_{it} = \sum_{q=1}^{4} \beta_{1,q} Covid_t \times q.Quintile_{it} + \sum_{q=1}^{4} \beta_{2,q} q.Quintile_{it} + \beta_3 Covid_t \times SP_{it} + \beta_4 HC_{it} + \gamma_t + \epsilon_{it}$$

$$(1)$$

where $credit_{it}$ represents two sets of credit-related dependent variables for household i in year t. The first set consists of dummy variables indicating whether a household holds specific types of debt: formal loans, informal loans, and loans for agricultural operation, business operation, consumption, education, real estate purchases, or any type of loans. Each variable equals 1 if the household holds the specified type of debt and 0 otherwise. These indicators capture the *extensive margin*—the likelihood of household indebtedness. The second set of dependent variables includes DTI ratios of all the above mentioned types of loans and total DTI ratio. These variables capture the *intensive margin*—the extent of households' indebtedness relative to their income. On independent variables, the $Covid_t$ variable is a dummy that equals 1 if $t = 2023$, 0 if $t = 2019$. Variables $q.Quintile_{it}$ identify the quintile q of household i. For example, $1.Quintile_{it} = 1$ means the household income is in the bottom 20 percent group. When dividing household into quintiles, we use the survey weights to correct for the representativeness of the sample. Since there are five groups of households, we use the top quintile as the base for the regressions to present the differences between the top quintile and other quintiles. Thus, the key coefficients for our analysis are $\beta_{1,q}$, which represent the relative change in credit in each quintile q after the pandemic, compared with the top quintile.

SP_{it} include two variables on household access to social assistance and social insurance, the same as the ones used in section V. β_3, the coefficients of the interactions between the COVID-19 dummy and social protection variables, are another two key coefficients that measure how social protection contributes to household debt dynamics with the pandemic shock. In addition, we control for all different household

characteristics HC_{it} that are used in section V which include SP_{it} as well as internet access and household region. We also control for year fixed effects γ_t that makes $Covid_t$ itself dropped from the regression.

B. Empirical Results

### 1. Effect of Income Inequality

At the extensive margin, compared to the top income group, more households are likely to be indebted after the pandemic across all income groups, primarily driven by agriculture, business, and education loans. **Figure 8** presents selected results from Model (1), with full regression results available in **Annex II Tables 4 and 5**. The **panel a of Figure 8** plots estimated coefficients for the interaction between income quintiles and the COVID-19 dummy, with blue dots representing changes in formal loans and red dots representing changes in informal loans between pre- and post-pandemic, both relative to the top 20 percent income group. Coefficients for all groups are positive, suggesting that compared with the top 20 percent income group, more households have debt after the pandemic in all income groups. This result holds for both formal and informal loans. The estimated coefficients for the bottom 20 and 20-40 percent income groups are larger compared to the middle and 60-80 percent income groups, especially for informal loans, indicating that the impact of the pandemic makes lower-income households more likely to be indebted. The **panel b of Figure 8** shows the relative increase in the number of indebted households compared to the top income group after the pandemic by loan purposes. For lower-income groups, more households have debt for agriculture, business, and education purposes, while for the 60-80 percent income group, the increase in households with debt is driven by consumption purposes (including auto loans). The broad increase in the number of households with debt for agricultural purposes among the lower-income groups may be driven by employees previously working in the tourism sector returning to agriculture during the pandemic, thereby increasing demand for such financing. In addition, the increase in business loans may reflect worsened profitability of small and medium-sized enterprises, which lower-income households are more likely to be involved in.

At the intensive margin, **panel c of Figure 8** shows that the coefficients for DTI ratios are largely statistically insignificant, indicating that the changes in DTI ratios before and after the pandemic were not significantly different from those of the top income group. Taken together with the previous findings, the results indicate that, compared to pre-pandemic period, while the number of indebted households increased more among lower-income groups than the top income group, their average debt burden (measured by the DTI ratios) did not rise more than the top income group. However, a more nuanced picture emerges when examining the changes in DTI ratios by loan purposes. As shown in **panel d of Figure 8**, households in the 20-40 percent income group increased the amount of their borrowing for consumption, agriculture, and education purposes. Although the previous analysis did not find a statistically significant increase in the number of households with consumption loans in the 20-40 and the 40-60 percent income groups, their DTI ratios for consumption loans did increase more than those in the top income group.
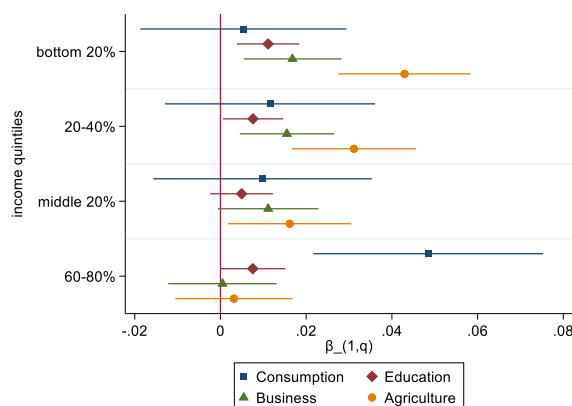
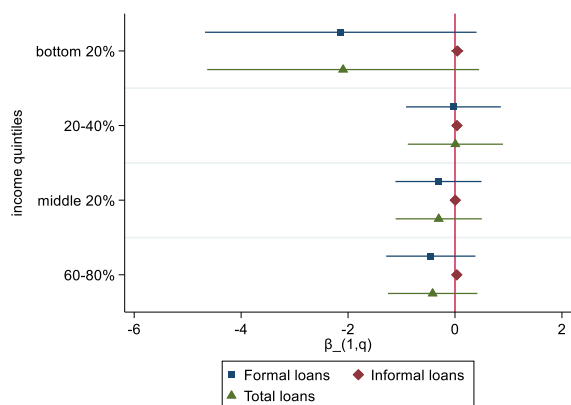**Figure 8. Distributional effects of the pandemic on household debt**

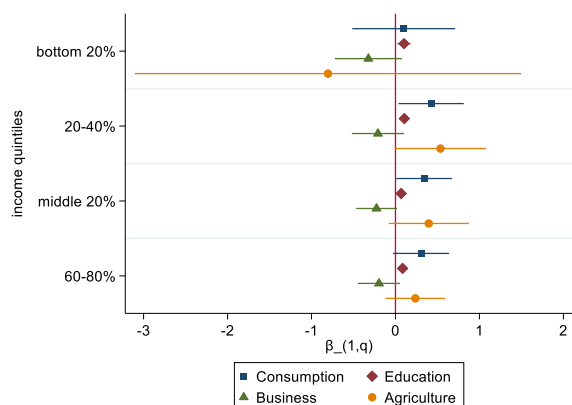a. Extensive Margin: by loan formality
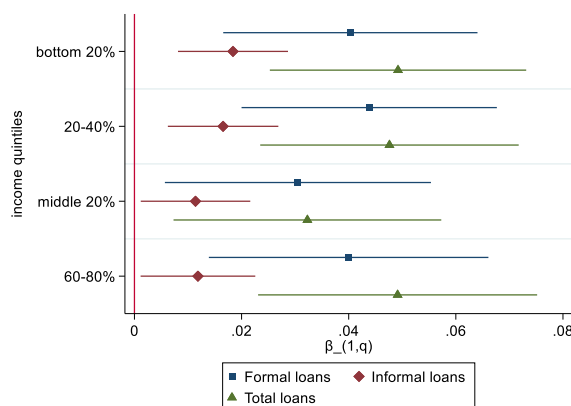
b. Extensive Margin: by loan purposes

c. Intensive Margin: by loan formality
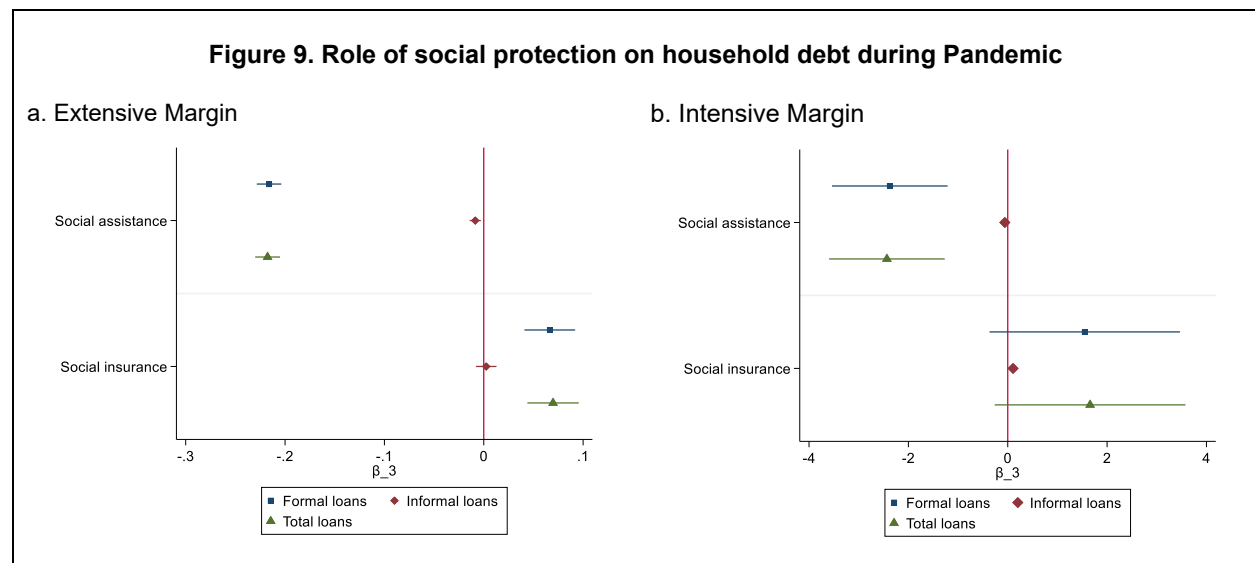
b. Intensive Margin: by loan purposes

Note: The figures show the impact of the pandemic on household debt across income quintiles, relative to the top income group. Each marker represents the estimaed coefficient $\beta_{1,q}$, with the accompanying line indicating the 95% confidence interval. The extensive margin refers to the change in likelihood of households holding the specified type of debt, while the intensive margin refers to the change in the extent of indebtedness measured by DTI ratio.

2. The Role of Social Protection

Social assistance and social insurance played different roles in affecting pandemic's impact on household debt. **Figure 9** presents the estimated coefficients on the interaction terms between the COVID-19 dummy and social protection variables at the extensive and intensive margins. We find that the coefficients for social assistance are mostly negative and statistically significant across loan types, including formal, informal, and total loans, as shown in the upper part of the two charts in **Figure 9**. This suggests that increased access to social assistance mitigated the impact of the pandemic by reducing both the likelihood of households taking on debt and the extent of their indebtedness, relative to the top income group. On the contrary, the estimated coefficients for social insurance are mostly positive, indicating that greater access to social insurance was associated with a larger impact of the pandemic, increasing both the likelihood and extent of indebtedness. This finding on increased access to social insurance leading to more borrowing is not too surprising as in an earlier study

Bornstein and Indarte (2023) also find that social insurance is associated with credit card borrowing because households are less motivated to self-insure through savings, and their improved financial resilience increases their access to credit given that they have social insurance.

Figure 9. Role of social protection on household debt during Pandemic

a. Extensive Margin

b. Intensive Margin

VII. Policy Implications

By demonstrating the effect of social assistance during the pandemic, our study underscores its critical role in mitigating the adverse distributional impact of economic shocks in Thailand. At the same time, it highlights the regressive nature of the current social insurance system, emphasizing the need for reforms to enhance equity. Consistent with the literature, our study also advocates for broader policy measures to improve digital access, expand basic education, strengthen employment opportunities, and develop regional urban centers—all of which could contribute to reducing inequality in Thailand.

Our analysis of Thailand's household debt dynamics during the pandemic reveals that lower-income households were more likely to become indebted following the pandemic, even though their DTI ratios did not rise disproportionately. This suggests that low-income households in Thailand are more prone to accumulate debt during economic shocks, which could worsen financial stability risks and prolong the post-shock recovery due to their increased debt service burdens. Importantly, the findings highlight that adequate social assistance can serve as an effective policy tool to mitigate the impact of economic shocks on households' welfare and debt accumulation.

Overall, as outlined in the 2024 Thailand Article IV Consultation Staff Report, our study supports policy efforts to strengthen Thailand's social protection floor, which would not only help prevent worsening inequality but also address financial stability risks and enhance resilience to future economic shocks. Given Thailand's reduced fiscal space following the pandemic, expanding social assistance should be balanced with efforts to preserve adequate fiscal buffers, including through additional revenue mobilization. Enhancing the effectiveness of social assistance schemes—through improved targeting and delivery mechanisms—will also be essential to minimize leakage and contain fiscal costs. At the same time, expanding social insurance coverage to lower-income

households and reducing labor market informality would help address the regressive nature of the social insurance system and reinforce Thailand's social protection framework.

The paper has several limitations. First, it relies exclusively on data from the Thailand Household Socio-Economic Survey, and is therefore subject to the limitations of self-reported income data. Potential underreporting by high-income households and nonresponse from individuals in the informal sector may lead to an underestimation of overall inequality in Thailand (UN SDG, 2022). Moreover, the data covers only up to 2023, potentially obscuring the longer-term effects of the pandemic on inequality in Thailand. Additionally, the household survey does not provide a panel dataset, which limits the ability to track the same households over time. Future research could benefit from access to alternative microdata sources, such as tax records or household credit registry data to provide a more comprehensive and accurate analysis. Given the constraints in identifying informal employment within the household survey data, we encourage future work to assess the impact of informality on inequality, especially considering the significant share of informal employment in Thailand. Lastly, the unique nature of the COVID-19 pandemic and the unprecedented policy responses suggest that caution should be exercised when generalizing the study's results to other types of economic shocks.

# Annex I. Diverse Dimensions of Inequality in Thailand

1. Regional Disparities

Income inequality is significant across regions in Thailand. Average household income in Bangkok is nearly double that of the poorest Northeast region. The gap is even more pronounced in terms of regional GDP per capita, with Bangkok's GDP per capita being more than 6.5 times that of the Northeast region (**Figure 1, panels a and b**). This disparity is largely attributed to economic activity being heavily concentrated around Bangkok and the Central region, leading to an uneven distribution of resources and employment opportunities. Bangkok benefits from higher employment rates and better wages, supported by more diversified industries. In contrast, poorer regions rely heavily on agriculture and small-scale industries, which typically offer fewer job opportunities with worse employment outcomes. For instance, youths in the Northeast region are less likely to have sustained employment and are more likely to move to unemployment. Similarly, individuals from the Northeast region have much-reduced likelihood of moving to non-vulnerable employment, even after controlling for other factors such as education level or gender (Hawley et al., 2024).

Regional disparities are also apparent in household debt holdings. In richer regions like Bangkok and the Central region, real estate loans constitute the largest share of household debt. In poorer regions however, consumption loans have the largest share, followed by agriculture loans, with these two categories accounting for the majority of household debt (**Figure 1, panel c**). Households in poorer regions also face higher debt burdens relative to their income while having smaller net income balances (i.e., difference between household income and expenditures) compared to those in the richer regions (**Figure 1, panel d**). This suggests that insufficient household income to cover the spending needs may be one of the drivers of household debt accumulation in these regions.

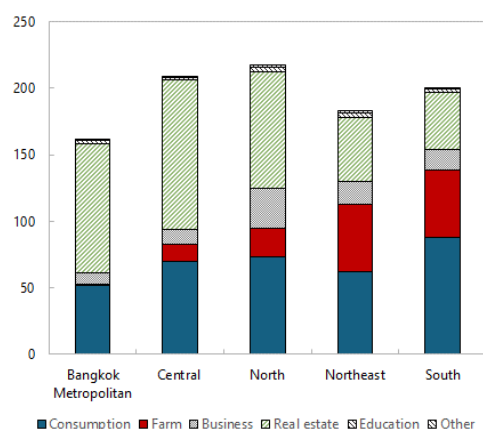**Annex I Figure 1. Regional Disparities in Thailand**
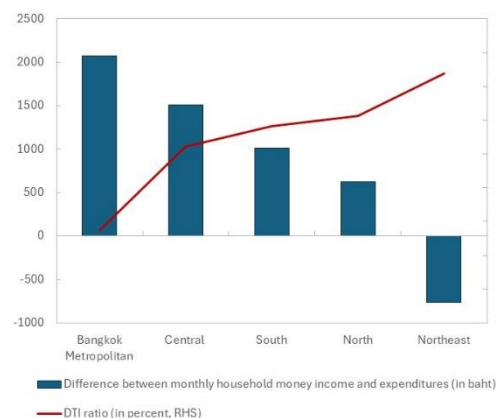
a. Average houshold Income by provinces (2021)
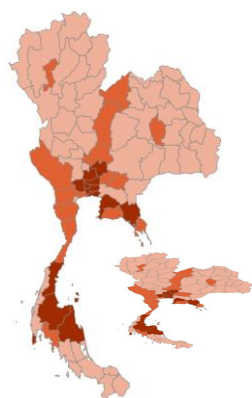
b. Regional GDP per capita (in thousands of THB, 2022)
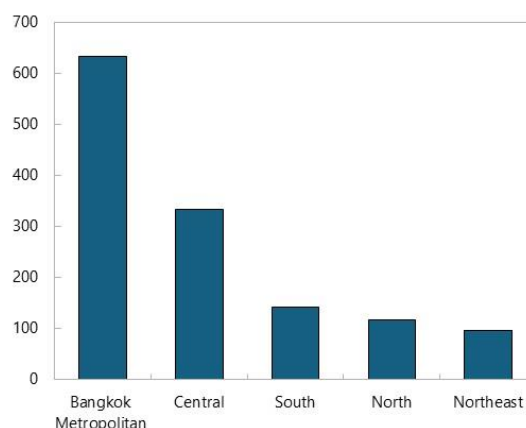
c. Average houshold debt and purposes by region
(in thousands of THB, 2023)

d. Average household monthly net income balance and
Debt-to-Income (DTI) ratios by region (2023)

Sources: Thailand NSO, Office of the National Economic and Social Development Board (NESDC), authors' calculation.

2. Inequality Across Sectors

Sectoral disparities also contribute to income inequality in Thailand. Wage gaps are large across sectors, particularly between agriculture and non-agriculture sectors. The average monthly wage in the non-agriculture sector is around 16,000 THB, more than twice as high as in the agriculture sector (**Figure 2, panel a**). This discrepancy largely reflects productivity gaps. The agriculture sector employs approximately 30 percent of the total workforce in Thailand—a proportion significantly higher than that of other countries at similar income levels (**Figure 2, panels b and c**). Yet agriculture accounts for less than 9 percent of GDP in Thailand, translating into very low value added per worker (**Figure 2, panel d**). As a result, wages in the agriculture sector have stagnated, and the households in the sector have the highest poverty rate, similar to the levels observed among the unemployed (UN SDG, 2022).

Sectoral inequality is entrenched due to limited labor mobility. Historically, the movement of labor from agriculture to higher-productivity sectors has contributed to productivity and wage growth, reducing poverty and inequality. However, this progress has nearly stalled since the mid-2010s. Skill gaps and distortions due to policy interventions have hindered sectoral reallocation (Klyuev, 2015), leading to an unproductive and oversized agricultural sector in Thailand. On the flipside, Thailand is experiencing shortages of skilled labor in higher-productivity sectors. For instance, by September 2023, Thailand's electric vehicle industry faced difficulties in filling over 53,000 positions, of which 44,000 required vocational training and the remainder required higher education (ILO, 2024). Furthermore, the Thai agriculture sector's role as an "employer of last resort" makes it even more difficult to reduce its employment share. As observed during the pandemic, when people lose jobs in Thailand, particularly in the informal tourism-related activities, many return to the agriculture sector rather than remain unemployed, possibly due to insufficient social protection. While this helps absorb excess labor supply during the shock periods, it weighs on labor productivity and potentially prolongs recovery from the shock, as workers who shift to agriculture and migrate to rural areas may take longer to return to their previous jobs (Klyuev, 2015).

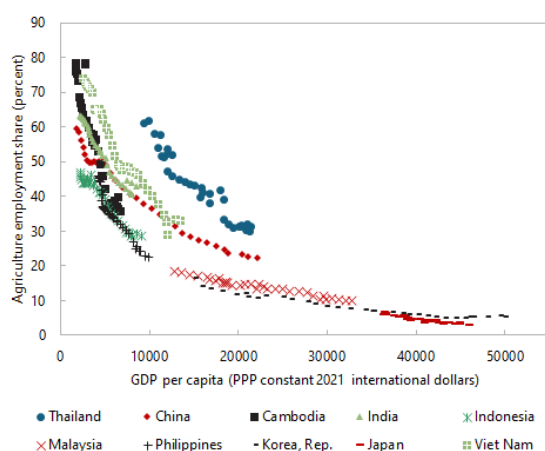**Annex I Figure 2. Inequality Across Sectors in Thailand**

a. Monthly average wage by sectors
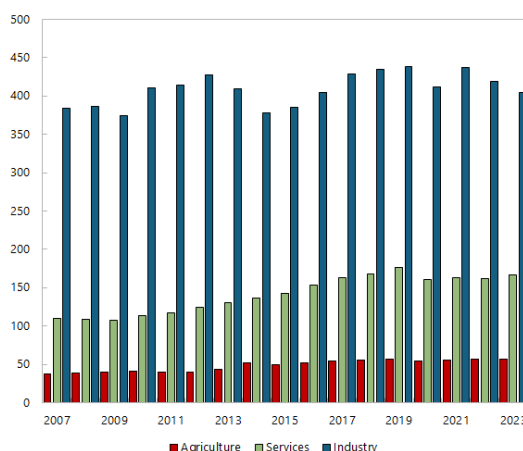   (in thousands of THB)
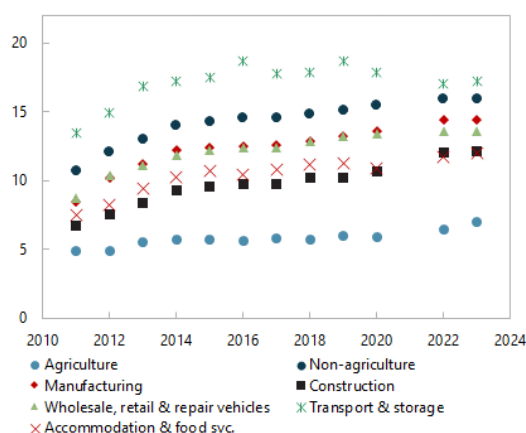
b. Share of employment by sectors, selected Asian
   countries (in percent, 2023)
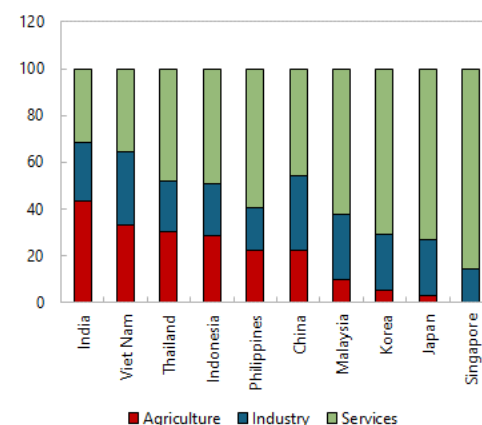
c. Evolution of agriculture employment share and GDP
   per capita, selected Asian economies (1991-2023)

d. Value added per worker by sectors in Thailand
   (in thousands of THB)

Sources: Thailand NSO, CEIC, World Bank World Development Indicators Database.

3. Formal vs. Informal Employment[8]

Thailand has large informal employment. Among the 40.1 million people employed as of end-2023, 21 million (52 percent) are estimated to be informal workers.[9] The majority of these workers are employed in the agriculture sector, followed by low-end services such as wholesale and retail trade, and accommodation and food services. Generally, there are more male than female informal workers, although the gender distribution varies across different sectors (**Table 1**). Informal workers tend to have lower educational attainment—52

---

[8] While the definition of informal employment can vary, in this paper the term indicates workers who, in some respects, are not registered and recorded, not declared (and therefore not covered) for tax and social security and not subject to employment laws regarding decent work (e.g., working hours, safety at work).

[9] ASEAN countries have relatively high level of informal employment. As of 2017, the average share of informal employment to total employment in ASEAN countries was 78.6 percent, higher than 69.9 percent for non-ASEAN developing and emerging countries in the Asia and the Pacific, and 61.2 average for the world (ILO 2019).

percent of informal workers have primary education or less, compared to 21 percent among formal workers (**Figure 3, panel a**). Additionally, informal employment is unevenly distributed across regions, with significantly higher proportions found in the Northeastern, Northern, and Southern regions, mirroring income disparities (**Figure 3, panel b**). Informal employment also varies across ages, exhibiting a U-shaped pattern with the highest levels seen among the oldest age group (**Figure 3, panel c**). Studies show that personal and job-related characteristics such as gender, age, marital status, area of residence, years of schooling, working hours, and wage types are determinants of informal employment in Thailand (Korwatanasakul, 2021).

Annex I Table 1. Informal Employment in Thailand
(in millions of people unless otherwise specified)

Sector of Employment	Formal	Informal	o.w., Male	o.w., Female	Proportion of Informal	Sectoral Share of Informal
Agriculture, forestry & fishing, mining	1.0	11.6	6.8	4.8	92%	55%
Manufacturing	5.1	1.1	0.5	0.6	18%	5%
Construction	1.2	0.9	0.8	0.1	44%	4%
Wholesale and retail trade	3.3	3.4	1.6	1.8	51%	16%
Transportation and storage	0.9	0.5	0.5	0.0	37%	3%
Accommodation and food services	1.3	1.9	0.6	1.3	60%	9%
Others	6.2	1.4	0.7	0.7	19%	7%
Total	19.1	21.0	11.5	9.4	52%	100%

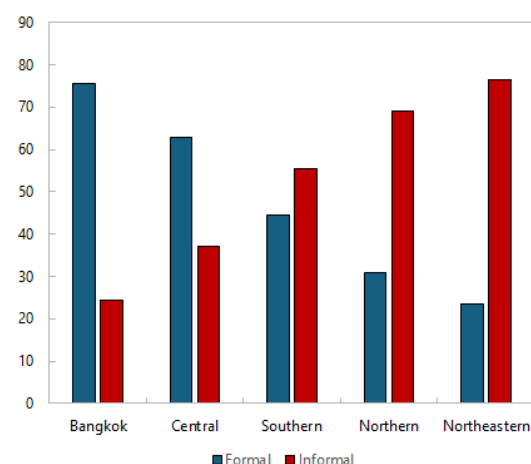Source: Thailand NSO Informal Employment Survey 2023.

Informal workers in Thailand experience poorer employment outcomes, often with adverse knock-on effects such as lower education, poorer health status, and social exclusion, which can exacerbate poverty and inequality. Wages of informal workers are not very different across sectors, but they are significantly lower than those of the formal workers (**Figure 3, panel d**). While not all informal workers are low-paid, the proportion of informal workers declines sharply as income levels rise. For instance, informal workers represent 87% of those in the lowest employment income quintile, but account for 42% in the second quintile, and merely 14% in the top income quintile. The earnings gap between the formal and informal workers is well-documented in the literature. Dasgupta et al. (2015) shows that, even after controlling for other factors, informal workers systemically earn less than formal workers, and the difference increases with the level of earnings. Similarly, Korwatanasakul (2021) finds a negative relationship between informal employment and wages, particularly among workers in the lowest tail of the wage distribution. Additionally, Korwatanasakul (2021) finds a positive association between informal employment and occupational risks, particularly injuries with high severity. Wasi et al. (2019) show that workers who stay in the formal sector have higher median wages than hybrid workers who move between formal and informal employment. Muthitacharoen and Burong (2023) show that workers in less-formal jobs have much lower upward mobility than those in more-formal employment.

Annex I Figure 3. Formal vs. Informal Employment in Thailand

a. Share of educational attainment for formal and informal workers (in percent, 2023)
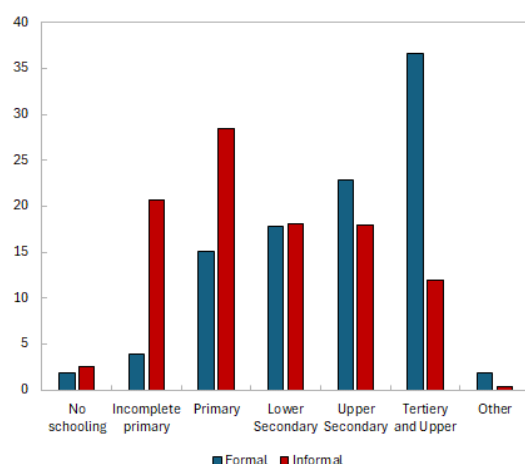
b. Proportion of formal and informal workers across different regions (in percent, 2023)

c. Proportion of informal employment across different age groups (in percent, 2019-2023)
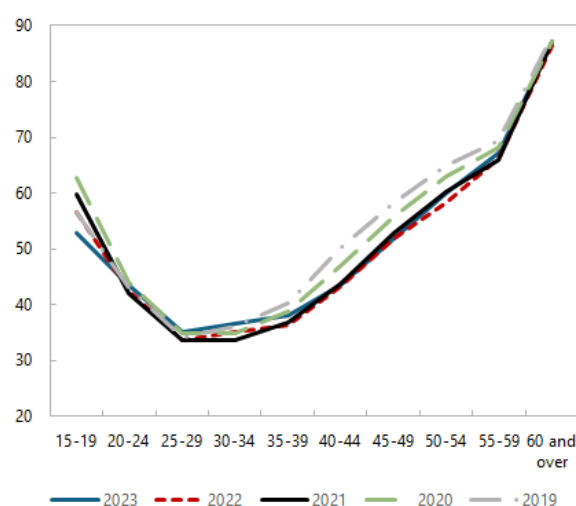
d. Monthly wages of formal and informal workers across different sectors (in thousands of THB, 2023)
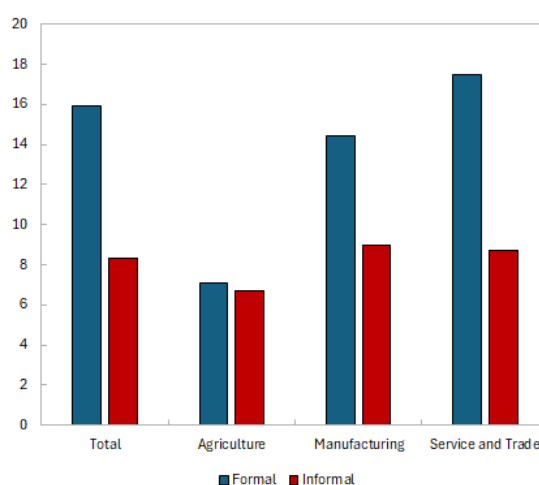
Source: Thailand NSO The Informal Employment Survey 2023.

4. Gender Inequality

Gender inequality in Thailand has improved significantly over time. As of 2023, the female labor participation rate stands at 60.6 percent, which is relatively high compared to peer countries with similar income levels. Additionally, the wage gap between genders has narrowed significantly and nearly dissipated. In recent years, average wages for female workers have surpassed those of male workers. This trend is largely due to compositional effects—women generally have higher educational attainment than men, and a larger proportion of female workers are employed in higher-paying sectors such as services, with fewer in agriculture or informal employment.

However, when comparing employment outcomes on a like-by-like basis, women tend to fare worse than men. Among employees with similar education and/or skill levels, wages for female workers are lower than those for male workers, particularly for jobs requiring higher education and advanced skills (**Figure 4, panel a**). Moreover, there are areas where gender equality can be further enhanced. For example, although the proportion of women in senior- and middle-management positions has steadily increased from 27.1% in 2013 to 34.7% in 2023, it can increase further given the superior educational achievements of women. Also, women continue to bear the majority of unpaid family work—35 percent of married women compared to just 10 percent of men—which adversely affects their employment prospects. As a result, female workers in Thailand are more likely to exit the labor market earlier than their male counterparts (**Figure 4, panel b**).

Annex I Figure 4. Gender Inequality in Thailand

a. Ratio of female to male monthly earnings across different education levels (in percent, 2013-2023)
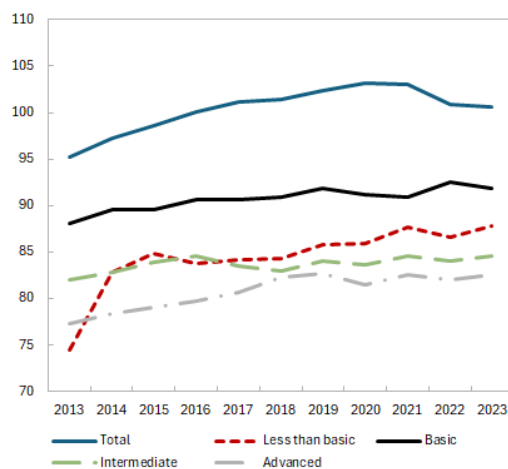
b. Male and female labor force participation rate by different age groups (in percent, 2023)
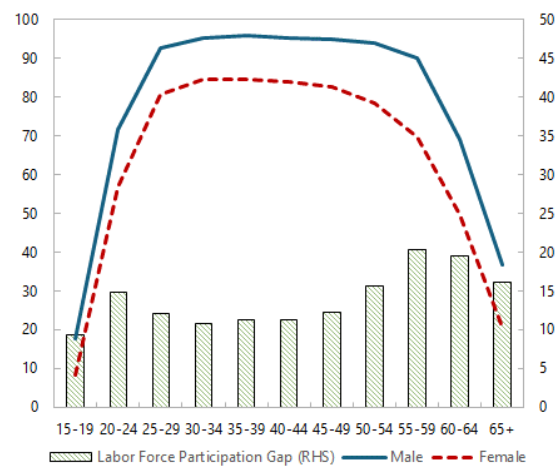
Source: ILOSTAT database, authors' calculation.

Annex II. Tables and Charts

Annex II Table 1. Variables' Definitions

| Variable	Definitions
Dependent variables	
Income	Household monthly total income (Unit: million Baht)
Total Loans	Dummy: =1 if household has any type of loans; =0 otherwise.
	DTI ratio = total loans/total income, percentage.
Informal Loans	Dummy: =1 if household has informal loans; =0 otherwise.
	DTI ratio = total informal loans/total income, percentage.
Formal loans	Dummy: =1 if household has formal loans; =0 otherwise.
	DTI ratio = total formal loans/total income, percentage.
Consumption loans	Dummy: =1 if household has loans for consumption purpose; =0 otherwise.
	DTI ratio = total loans for consumption purpose/total income, percentage.
Education loans	Dummy: =1 if household has loans for education purpose; =0 otherwise.
	DTI ratio = total loans for education purpose/total income, percentage.
Business loans	Dummy: =1 if household has loans for business purpose; =0 otherwise.
	DTI ratio = total loans for business purpose/total income, percentage.
Agriculture loans	Dummy: =1 if household has loans for agriculture operation purpose; =0 otherwise.
	DTI ratio = total loans for agriculture operation purpose/total income, percentage.
Independent variables	
Employed	=1 if the household head is employed; =0 otherwise.
Primary	=1 if the household head's highest education is primary school; =0 otherwise.
Secondary	=1 if the household head's highest education is secondary school; =0 otherwise.
Post-secondary	=1 if the household head's highest education is post-secondary school; =0 otherwise.
College	=1 if the household head's highest education is college and above; =0 otherwise.
Male	=1 if the household head is male; =0 otherwise.
Age	Household head's age.
Size	Number of household members.
Married	=1 if the household head is married; =0 otherwise.
Urban	=1 if the household is from urban area; =0 if the household is from rural area.
Region	Region of the household
Internet Access	Average number of household members with internet access, that is the number of members accessed internet/number of household members.
Social Assistance	Average number of social assistance schemes each household member has
Social Insurance	Average number of social insurance schemes each household member has.
Education	=1 if the household head has less than primary education; =2 if the household head has primary education; =3 if the household head has lower secondary education; =4 if the household head has upper secondary education; =5 if the household head has post-secondary education; =6 if the household head has education of college and above.
Covid	=1 if survey conducted in 2023; =0 if survey conducted in 2019
q.Income	Quintile of total income, weighted by survey weights.

Annex II Table 2. Summary Statistics

Variable	Obs	Mean	Std.Dev.	Min	Max
Income	142,065	0.026	0.043	-1.090	7.857
Total Loans DTI	95,247	6.139	146.799	-653.595	44753.85
Informal Loans DTI	95,247	0.127	3.660	-29.879	915.332
Formal loans DTI	95,247	6.012	146.737	-653.595	44753.85
Consumption loans DTI	95,247	2.285	12.487	-400.955	2347.619
Education loans DTI	95,247	0.134	1.774	-110.375	126.976
Business loans DTI	95,247	0.533	14.394	-98.814	4020.729
Agriculture loans DTI	95,247	1.862	145.249	-282.089	44753.85
Mortgages DTI	95,247	1.286	8.635	-457.516	1065.53
Other loans DTI	95,247	0.039	1.185	0	161.184
Employed	142,065	0.707	0.455	0	1
Education	142,065	2.956	1.477	1	6
Primary	142,065	0.547	0.498	0	1
Secondary	142,065	0.238	0.426	0	1
Post-secondary	142,065	0.039	0.195	0	1
College	142,065	0.129	0.335	0	1
Male	142,065	0.576	0.494	0	1
Age	142,065	55.633	15.217	11	99
Size	142,065	2.737	1.539	1	20
Married	142,065	0.612	0.487	0	1
Urban	142,065	0.567	0.496	0	1
Internet Access	142,065	0.640	0.386	0	1
Social Assistance	142,065	0.740	0.657	0	6
Social Insurance	142,065	1.132	0.315	0	6
Covid	95,247	0.521	0.450	0	1

Annex II Figure 1. Average Education Level by Quintile
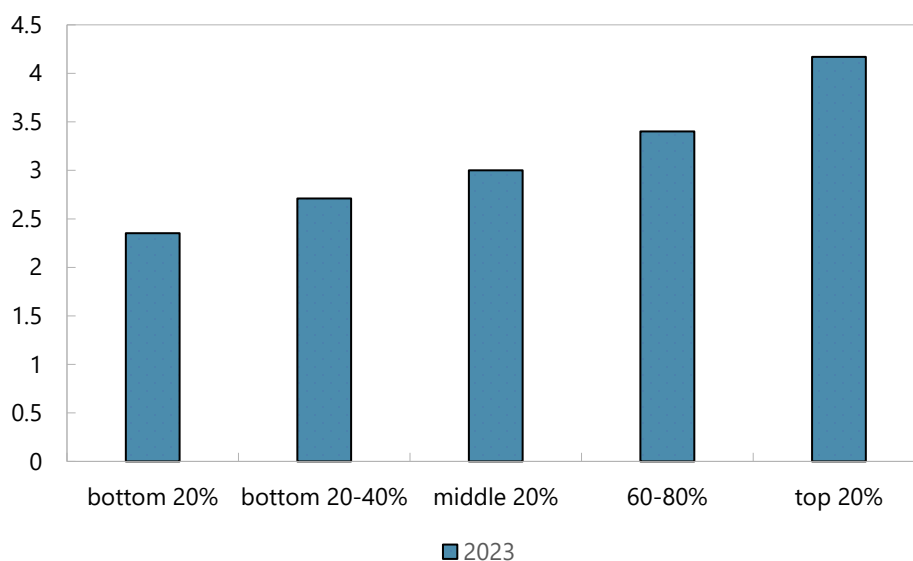
Annex II Table 3. Decomposition of Income inequality pre- and post-pandemic – Unexplained

Income inequality measures	(1) Gini	(2) Top 10	(3) Top 5
c. Unexplained			
HH head: employed	-0.00435	-0.00748	-0.0114
	(0.0107)	(0.0122)	(0.0134)
Internet access	-0.0362***	-0.0264***	-0.0260***
	(0.00640)	(0.00692)	(0.00739)
Social assistance	-0.00352	-0.00971**	-0.0103**
	(0.00412)	(0.00465)	(0.00516)
Social insurance	0.136***	0.159***	0.169**
	(0.0506)	(0.0591)	(0.0661)
HH head: Male	0.00462	0.00146	0.00314
	(0.00619)	(0.00704)	(0.00765)
HH head: Age	0.0543**	0.0662**	0.0702**
	(0.0246)	(0.0279)	(0.0300)
Household size	-0.0292**	-0.0197	-0.0165
	(0.0131)	(0.0153)	(0.0169)
HH head: married	0.0172**	0.0145*	0.0167*
	(0.00739)	(0.00847)	(0.00935)
HH head: primary	0.00513	0.00905	0.0105
	(0.00674)	(0.00645)	(0.00678)
HH head: secondary	-0.00613*	-0.00427	-0.00320
	(0.00334)	(0.00340)	(0.00361)
HH head: post-secondary	-0.00285***	-0.00213*	-0.00145
	(0.00110)	(0.00123)	(0.00130)
HH head: college	-0.0107***	-0.00873***	-0.00453
	(0.00295)	(0.00331)	(0.00354)
urban	0.00701	0.00497	0.00502
	(0.00501)	(0.00572)	(0.00629)
cons	-0.0861	-0.122*	-0.143*
	(0.0573)	(0.0659)	(0.0732)
Region FE	Y	Y	Y

Annex II Table 4. Distributional Effect of the Pandemic on Household Debt: Holding Debt

Dummy (have loans=1)	Formal loans (1)	Informal loans (2)	Mortgages (3)	Consumption loans (4)	Education loans (5)	Business loans (6)	Agriculture loans (7)	Other loans (8)	Total loans (9)
1.income×COVID	0.0400***	0.0185***	-0.0114	0.00533	0.0107***	0.0167***	0.0422***	0.00292*	0.0491***
	(0.0121)	(0.00524)	(0.00876)	(0.0123)	(0.00372)	(0.00581)	(0.00784)	(0.00163)	(0.0122)
2.income×COVID	0.0436***	0.0167***	-0.00688	0.0115	0.00720**	0.0154***	0.0304***	0.00139	0.0475***
	(0.0122)	(0.00526)	(0.00873)	(0.0125)	(0.00359)	(0.00561)	(0.00741)	(0.00150)	(0.0123)
3.income×COVID	0.0303**	0.0115**	-0.00975	0.00981	0.00467	0.0111*	0.0157*	0.000264	0.0322**
	(0.0127)	(0.00522)	(0.00900)	(0.0130)	(0.00374)	(0.00598)	(0.00733)	(0.00162)	(0.0128)
4.income×COVID	0.0400***	0.0119**	-0.00339	0.0485***	0.00752*	0.000468	0.00311	0.000394	0.0491***
	(0.0133)	(0.00546)	(0.0101)	(0.0137)	(0.00387)	(0.00647)	(0.00698)	(0.00172)	(0.0133)
Social assistance ×COVID	-0.216***	-0.00875***	0.00522	-0.173***	-0.0164***	-0.0237***	-0.0976***	-0.00475***	-0.217***
	(0.00629)	(0.00285)	(0.00326)	(0.00669)	(0.00204)	(0.00320)	(0.00522)	(0.00110)	(0.00638)
Social insurance × COVID	0.0651***	0.00312	-0.00910	0.0311**	0.0171***	0.0118**	0.0482***	0.00378**	0.0693***
	(0.0130)	(0.00524)	(0.00834)	(0.0127)	(0.00486)	(0.00533)	(0.00639)	(0.00164)	(0.0131)
_cons	0.219***	0.0312***	0.0945***	0.318***	0.0143***	-0.0236***	-0.161***	0.00178	0.236***
	(0.0188)	(0.00828)	(0.0113)	(0.0190)	(0.00524)	(0.00842)	(0.0117)	(0.00230)	(0.0191)
N	95231	95231	95231	95231	95231	95231	95231	95231	95231
Other household characteristics	Y	Y	Y	Y	Y	Y	Y	Y	Y
Regional FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y

Standard errors in parentheses. * $p < 0.1$. ** $p < 0.05$. *** $p < 0.01$

Annex II Table 5. Distributional Effect of the Pandemic on Household Debt: DTI Ratios

Debt-To-Income	Formal loans (1)	Informal loans (2)	Mortgages (3)	Consumption loans (4)	Education loans (5)	Business loans (6)	Agriculture loans (7)	Other loans (8)	Total loans (9)
1.income×COVID	-2.136*	0.0435	-1.181***	0.105	0.0973**	-0.323	-0.819	0.0281	-2.093
	(1.296)	(0.0567)	(0.316)	(0.314)	(0.0396)	(0.205)	(1.184)	(0.0280)	(1.297)
2.income×COVID	-0.0296	0.0368	-0.860***	0.432**	0.101***	-0.209	0.521*	0.0228	0.00721
	(0.453)	(0.0271)	(0.269)	(0.197)	(0.0285)	(0.159)	(0.268)	(0.0227)	(0.454)
3.income×COVID	-0.309	0.00506	-0.913***	0.346**	0.0654***	-0.226*	0.386	0.0375	-0.304
	(0.411)	(0.0244)	(0.266)	(0.169)	(0.0254)	(0.124)	(0.238)	(0.0384)	(0.411)
4.income×COVID	-0.452	0.0344	-0.876***	0.305*	0.0850***	-0.197	0.236	0.0283	-0.418
	(0.426)	(0.0275)	(0.328)	(0.170)	(0.0246)	(0.127)	(0.180)	(0.0178)	(0.426)
Social assistance ×COVID	-2.404***	-0.0587***	0.345***	-1.177***	-0.142***	0.0110	-1.458***	-0.0424*	-2.463***
	(0.581)	(0.0190)	(0.122)	(0.348)	(0.0189)	(0.0931)	(0.429)	(0.0242)	(0.582)
Social insurance × COVID	1.654*	0.108**	-0.351	-0.246	0.119***	0.451**	1.674**	0.115	1.762*
	(0.936)	(0.0445)	(0.274)	(0.336)	(0.0425)	(0.210)	(0.778)	(0.0860)	(0.938)
_cons	-0.620	-0.0732	2.416***	1.158***	0.0613	-1.120***	-3.096***	-0.112*	-0.693
	(1.178)	(0.0650)	(0.456)	(0.294)	(0.0431)	(0.246)	(0.993)	(0.0671)	(1.180)
N	95228	95228	95228	95228	95228	95228	95228	95228	95228
Other household characteristics	Y	Y	Y	Y	Y	Y	Y	Y	Y
Regional FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y

Standard errors in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

References

Agarwal, S., S. Chomsisengphet, H. Kiefer, L. C. Kiefer, and P. C. Medina. 2021. "Refinancing Inequality During the COVID-19 Pandemic." Working Paper 2021-08, Federal Deposit Insurance Corporation, Center for Financial Research, Arlington, VA.

Alfani, Guido. 2022. "Epidemics, Inequality, and Poverty in Preindustrial and Early Industrial Times." Journal of Economic Literature 60 (1): 3-40.

An, X., L. R. Cordell, L. Geng, and K. Lee. 2021. "Inequality in the Time of COVID-19: Evidence from Mortgage Delinquency and Forbearance." Working Paper 21-09, Federal Reserve Bank of Philadelphia.

Angelopoulos, Konstantinos, et al. 2021. "Pandemic-Induced Wealth and Health Inequality and Risk Exposure."

Aslan, G., C. Deléchat, M. Newiak, et al. 2017. "Inequality in Financial Inclusion, Gender Gaps, and Income Inequality." IMF Working Paper 17.

Bank of Thailand. 2003. "Inflation Report, October 2003"

Barrett, Philip, S. Das, G. Magistretti, E. Pugacheva, and P. Wingender. 2021. "After-Effects of the COVID-19 Pandemic: Prospects for Medium-term Economic Damage." IMF Working Paper, WP/21/203. International Monetary Fund.

Bornstein, Gideon, and Sasha Indarte. 2023. "The Impact of Social Insurance on Household Debt." Available at SSRN 4205719.

Cherry, S. F., E. X. Jiang, G. Matvos, et al. 2021. "Government and Private Household Debt Relief During COVID-19." National Bureau of Economic Research.

Chongvilaivan, A., and J. Kim. 2016. "Individual Income Inequality and Its Drivers in Indonesia: A Theil Decomposition Reassessment." Social Indicators Research 126: 79-98.

Cooper, Cheryl R., Lida R. Weinstock, and Maura Mullins. 2021. "COVID-19: Household Debt During the Pandemic." Congressional Research Service (CRS) Reports and Issue Briefs.

Darvas, Zsolt. 2024. "Income Inequality Hardly Changed During the COVID-19 Pandemic." Brugel Analysis, February.

Dasgupta, Sukti, et al. 2015. "Earnings Differentials Between Formal and Informal Employment in Thailand."

Davydiuk, T., and D. Gupta. 2021. "Income Inequality, Debt Burden and COVID-19." Working Paper, Carnegie Mellon University, Pittsburgh, PA.

Firpo, Sergio, Nicole M. Fortin, and Thomas Lemieux. 2009. "Unconditional Quantile Regressions." Econometrica 77 (3): 953-973.

Firpo, Sergio P., Nicole M. Fortin, and Thomas Lemieux. 2018. "Decomposing Wage Distributions Using Recentered Influence Function Regressions." Econometrics 6 (2): 28.

Furceri, D., et al. 2021. "Will COVID-19 Have Long-Lasting Effects on Inequality? Evidence from Past Pandemics."

Hacıoğlu-Hoke, Sinem, Diego R. Känzig, and Paolo Surico. 2021. "The Distributional Impact of the Pandemic." European Economic Review 134: 103680.

Hawley, J., and N. Wichitaksorn. 2024. "Measuring Labour Market Transitions of Youths in Thailand: Evidence from Rotation Groups (2012–21) in the Labour Force Surveys." ILO Working Paper 110. Geneva: International Labour Office.

Horvath, A., B. S. Kay, and C. Wix. 2021. "The COVID-19 Shock and Consumer Credit: Evidence from Credit Card Data." Finance and Economics Discussion Series 2021-008, Board of Governors of the Federal Reserve System, Washington, DC.

International Labour Organization. 2024. "Navigating Transformational Changes and Transitions: The Skills Development and Employment Landscape in Thailand's Automotive Manufacturing Sector."

International Labour Organization. 2020. "Actuarial Valuation of Thailand Social Security Fund as of 31 December 2020."

International Monetary Fund. 2022. "G-20 Background Note on Minimizing Scarring from the Pandemic."

International Monetary Fund. 2025. "Thailand: 2024 Article IV Consultation-Press Release; Staff Report; and Statement by the Executive Director for India." Country Report No. 2025/045. International Monetary Fund.

Klyuev, V. 2015. "Structural Transformation — How Does Thailand Compare?" IMF Working Paper No. 15/51. International Monetary Fund, Washington D.C.

Korwatanasakul, Upalat. 2021. "Determinants, Wage Inequality, and Occupational Risk Exposure of Informal Workers: A Comprehensive Analysis With the Case Study of Thailand." Discussion Paper 160. Puey Ungphakorn Institute for Economic Research. https://www.pier.or.th/dp/160/.

Motonishi, Taizo. 2006. "Why Has Income Inequality in Thailand Increased?: An Analysis Using Surveys from 1975 to 1998." Japan and the World Economy 18 (4): 464-487.

Muthitacharoen, A., and T. Burong. 2023. "How High Can You Climb? Earnings Inequality and Intragenerational Earnings Mobility in a Developing Country: Evidence from Thai Tax Returns." PIER Discussion Papers, 196.

Nolan, B., M. G. Richiardi, and L. Valenzuela. 2019. "The Drivers of Income Inequality in Rich Countries." Journal of Economic Surveys 33 (4): 1285-1324.

Paweenawat, Sasiwimon Warunsiri, and Robert McNown. 2014. "The Determinants of Income Inequality in Thailand: A Synthetic Cohort Analysis." Journal of Asian Economics 31: 10-21.

Rehme, G. 2007. "Education, Economic Growth and Measured Income Inequality." Economica 74: 493-514.

Sayed, Adham, and Bin Peng. 2021. "Pandemics and Income Inequality: A Historical Review." SN Business & Economics 1 (4): 54.

Stantcheva, Stefanie. 2022. "Inequalities in the Times of a Pandemic." Economic Policy 37 (109): 5-41.

Suphannachart, Waleerat. "What Drives Labour Productivity in the Ageing Agriculture of Thailand." Advances in Management and Applied Economics 7 (2017): 1-6.

Suphaphiphat, N., and Y. Shi. 2022. "Economic Scarring Channels: Channels and Policy Implications." IMF Working Paper, WP/22/248. International Monetary Fund

Tyson, L., and S. Lund. 2021. "The Post-Pandemic Labor Market's Long-Term Scars." Project Syndicate.

United Nations, Joint SDG Fund. 2022. "Thailand Social Protection Diagnostic Review."

United Nations. 2022. "Thailand Social Protection Diagnostic Review: Expanding access to social security for all workers in Thailand."

Wasi, N., S. W. Paweenawat, C. D. N. Ayudhya, P. Treeratpituk, and C. Nittayo. 2019. "Labor Income Inequality in Thailand: The Roles of Education, Occupation and Employment History." Pier Discussion Papers, 117.

World Bank. 2021. "Towards Social Protection 4.0: An Assessment of Thailand's Social Protection and Labor Market Systems."

World Bank. 2023. "Bridging the Gap: Inequality and Jobs in Thailand."

Xu, Y. 2022. "Unconventional Monetary Policy and Household Credit Inequality." Available at SSRN 3771130.

Xu, Y. 2025. "Household Deleveraging: International Practices." IMF Selected Issues Paper, Asia and Pacific Department, SIP/2025/055. Washington, D.C.: International Monetary Fund

Yannelis, Constantine, and Livia Amato. 2023. "Household Behavior (Consumption, Credit, and Investments) During the COVID-19 Pandemic." Annual Review of Financial Economics 15 (1): 91-113.

![International Monetary Fund — PUBLICATIONS]