The Relationship between Capital Accumulation and Labor Productivity of Marginalized people in the northeastern of Thailand during the Covid-19 Pandemic

Jakkrich Jearviriyaboonya[1], Nattapon Meekaew[2*], Thanapauge Chamaratana[3], Puttharak Prabnok[3], Kritsada Phatchaney[4]

[1]Faculty of Economics, Khon Kaen University, Thailand
[2]Faculty of Education, Khon Kaen University, Thailand
[3]Faculty of Humanities and Social Sciences, Khon Kaen University, Thailand
[4]Faculty of Humanities and Social Sciences, Prince of Songkla University, Thailand
Email: nattame@kku.ac.th

Abstract

Despite extensive research on labor productivity, the relationship between capital accumulation and labor productivity among marginalized populations remains underexplored, particularly in the context of the COVID-19 pandemic. This study addresses this gap by examining the impact of financial, human, social, physical, and natural capital on labor productivity in Nakhon Ratchasima, Khon Kaen, and Udon Thani. Using the Livelihood Framework, labor productivity is measured through daily income. The findings reveal a significant decline in labor productivity post-COVID-19 across all provinces, though future expectations for productivity are higher in Nakhon Ratchasima and Khon Kaen. A weak but significant relationship exists between financial, human, and social capital and labor productivity, while physical capital (excluding mobile phones and the internet) and natural capital show no relationship. Financial capital, especially loans, becomes more critical post-COVID-19, reflecting the importance of access to credit. Human capital, particularly technical skills, is linked to future labor productivity, though health factors are not. Social capital, specifically trust, and coordination with external networks, shows a low but meaningful influence on productivity post-pandemic. These findings suggest that policies enhancing financial access, vocational training, and social capital may improve labor productivity. Further research is needed to examine the long-term effects of these capital types on productivity.

Keywords: Capital accumulation, labor productivity, marginalized people, northeastern Thailand, Covid-19.

1. Introduction

Capital accumulation and labor productivity are critical components in the study of economic development, often serving as indicators of a country's overall productivity and competitiveness (Solow, 1956). Labor productivity, typically measured through the output per worker or income earned, reflects the efficiency of labor utilized in production (OECD, 2001). In the context of

global crises like the COVID-19 pandemic, labor productivity becomes particularly important as economic disruptions directly impact workers' livelihoods (International Labour Organization [ILO], 2021). The pandemic led to unprecedented challenges worldwide, with marginalized populations being hit hardest (United Nations Development Programme [UNDP], 2020). Informal workers, who account for a large portion of the labor force in many developing countries, including Thailand, experienced significant declines in productivity (International Labour Organization [ILO], 2023). The restrictions and lockdowns imposed during the pandemic caused a sharp reduction in economic activity, leaving informal laborers, who lack social protections, especially vulnerable (World Bank, 2020). This study focuses on understanding the relationship between capital accumulation and labor productivity among marginalized populations in northeastern Thailand during the COVID-19 pandemic.

In Thailand, the COVID-19 pandemic profoundly impacted the labor force, especially informal workers, who make up 55% of the total employed population (National Statistical Office, 2019). Informal workers, concentrated in sectors like agriculture, retail, and services, were particularly vulnerable to the economic fallout from the pandemic (International Labour Organization [ILO], 2020). The Thai government responded with income compensation programs, such as the 5,000 baht/month support scheme and the "Khon La Khrueng" (Half-Half) co-payment program, aimed at alleviating financial pressures (World Bank Group, 2022). Despite these measures, marginalized groups in urban areas faced significant hardship, particularly in northeastern provinces like Nakhon Ratchasima, Khon Kaen, and Udon Thani. These provinces, known for their high Gross Provincial Product (GPP) and dense populations, are key urban centers in the Northeastern Economic Corridor (Office of the National Economic and Social Development Council [NESDC], 2022). However, marginalized people in these areas—such as the elderly, disabled, homeless, and informal workers—encountered unique challenges in adapting their livelihoods during the pandemic (United Nations Development Programme [UNDP], 2020). This study investigates how capital accumulation influenced labor productivity among these vulnerable groups in COVID-19.

Despite extensive global research on the economic impact of COVID-19 (McKibbin & Fernando, 2020), there has been limited focus on how capital accumulation influences labor productivity among marginalized populations, particularly in Thailand. While some studies have explored the effects of the pandemic on the informal labor force (International Labour Organization [ILO], 2020), few have examined the role of different types of capital—such as financial, human, and social capital—in shaping labor productivity in vulnerable urban communities (World Bank, 2021). This study aims to fill this gap by investigating how capital accumulation impacts the labor productivity of marginalized populations in key urban centers of northeastern Thailand during and after the pandemic (United Nations Development Programme [UNDP], 2020; Thailand Development Research Institute [TDRI], 2021)

The Livelihood Framework (Department for International Development [DFID], 1999) outlines five types of capital that shape labor livelihoods: financial capital, human capital, social capital, physical capital, and natural capital. In economic theory, capital serves as one of the factors of production, alongside land, labor, and entrepreneurship (Samuelson & Nordhaus, 2009). This process of capital accumulation drives productivity in the economic system. Marxist theory

critiques the relationship between capital and labor, particularly how employers derive surplus value from labor beyond its cost (Marx, 1967). Similarly, Polanyi argued that capital is a fictitious commodity that does not exist on its own but is intertwined with labor, land, and money (Strassman, 2016). These perspectives offer valuable insights into the dynamics between capital and labor productivity, especially when applied to marginalized populations in northeastern Thailand. Understanding these theoretical relationships is crucial for analyzing how capital accumulation influences the labor productivity of vulnerable groups during the economic disruption caused by the COVID-19 pandemic.

Capital accumulation is directly related to labor productivity, particularly through human capital, which encompasses the accumulation of knowledge, experience, and skills (Becker, 1993). Human capital is critical in creating income disparities across different genders and occupations. Wages or labor compensation indicate labor productivity, reflecting the ability of labor to contribute to production (Mincer, 1958). This concept of human capital and its effect on productivity becomes especially relevant when examining marginalized workers, who often face barriers to education and skill development, further widening the productivity gap (Psacharopoulos & Patrinos, 2018).

During the COVID-19 pandemic, Thailand's government-imposed lockdowns significantly impacted sectors like retail, restaurants, and transportation, with informal workers, such as restaurant staff and general laborers, facing severe income losses due to their inability to work remotely (Marome & Shaw, 2021; ILO, 2020). In urban centers like Nakhon Ratchasima, Khon Kaen, and Udon Thani, marginalized populations—comprising informal workers, the elderly, and disabled—were further disadvantaged by limited access to jobs, education, and healthcare (UNDP, 2020). This study examines how capital accumulation influenced labor productivity among these groups by addressing two questions: a) How did labor productivity change during the COVID-19 pandemic? and b) What is the relationship between capital accumulation and labor productivity during this period? Using the Livelihood Framework (DFID, 1999), labor productivity is measured by average daily income. Understanding this relationship is essential for shaping policies that boost economic resilience and labor productivity in marginalized communities in Thailand and similar contexts, ultimately contributing to recovery efforts in post-crisis environments.

2. Theoretical Framework

The concept of "capital" encompasses various definitions across disciplines. In economics, capital is one of the primary factors of production, alongside land, labor, and entrepreneurship, used to generate goods and services. While many equate capital with capital funding, they are distinct: capital funding refers to financial resources, whereas capital primarily consists of tangible assets such as machinery, equipment, factories, and inventories. From an economic standpoint, capital funding serves as the financial input that enables the transformation of production factors into goods and services. In contrast, Karl Marx (1867) introduced a different view of capital, focusing on the exploitation within labor-capital relationships. He argued that

capital accrues through surplus value—the value produced by labor that exceeds the wages paid to workers (Resnick & Wolff, 1989).

The concept of capital within the Livelihood Framework (DFID, 1999) takes a more holistic approach, recognizing capital as vital for sustaining livelihoods beyond its economic function. The framework defines capital as comprising five types: (a) Financial capital, which includes income, savings, debts, and assets; (b) Human capital, which accumulates through education, training, experience, and healthcare over an individual's lifetime (Schultz, 2003); (c) Social capital, which emphasizes generosity, trust, social networks, and cooperation, though its definition can vary (Glanville et al., 2016), for example, highlights trust, information sharing, and social norms; (d) Physical capital, such as housing and infrastructure; and (e) Natural capital, referring to access to natural resources like land, water, and forests. These forms of capital are essential for enabling individuals and communities to secure their livelihoods and improve their well-being.

Robert Solow's economic growth model (Solow, 1956) highlights the interaction between two key factors: labor and capital. The model emphasizes capital accumulation and depreciation, assuming constant returns to scale, steady population growth, and technological progress as exogenous factors. Solow's theory underscores that capital accumulation is crucial in increasing a country's output and income over time. This concept aligns with classical economic theory, which suggests that developed countries with significant capital accumulation can enhance labor productivity. Additionally, technological advancements contribute to this increase by improving the efficiency of production processes.

Empirical studies also highlight the relationship between capital, especially human and social capital, and labor productivity. Research using firm-level data, such as studies by Di Guilmi et al. (2008), Sabatini (2008), Rukumnuaykit and Pholphirul (2016), and Roth (2019), indicates that investments in human capital (education, skills, and experience) and social capital (trust, networks, and cooperation) positively influence labor productivity. These studies demonstrate that labor productivity can be measured at both macroeconomic and microeconomic levels, with proxies for productivity drawn from both primary and secondary data sources.

This research measures labor productivity among marginalized groups, including informal workers, individuals with disabilities, and those engaged in small-scale employment and trading. For these populations, traditional productivity metrics are often inadequate. Therefore, wages and compensation are used as proxies for labor productivity, reflecting the additional output generated by labor. In this context, average daily income is employed as a practical proxy for labor productivity, offering a reliable measure of workers' economic contributions in informal sectors.

3. Research methodology

3.1 Research Design

This study adopts a quantitative research design to examine the relationship between capital accumulation and labor productivity among marginalized populations in northeastern Thailand.

The research focuses on informal workers, the elderly, disabled people, homeless people, and other vulnerable groups in urban areas of northeastern Thailand. The study uses structured interviews to collect data and employs statistical methods to analyze labor productivity and its relationship to different types of capital. The study design is cross-sectional, capturing data at a specific time, with retrospective components to measure changes before and after the COVID-19 pandemic.

3.2 Population and Sample

The population for this study consists of marginalized groups residing in three major urban municipalities in northeastern Thailand: Nakhon Ratchasima Municipality, Khon Kaen Municipality, and Udon Thani Municipality. These municipalities were selected due to their high gross provincial product (GPP), significant urban growth, and substantial informal employment sectors, making them representative of the region's economic disparities and vulnerable populations.

The sample size for this study was calculated using Cochran's (1977) formula, resulting in a total of 384 participants. A multi-stage sampling method was employed to ensure a representative sample of marginalized groups. First, Nakhon Ratchasima, Khon Kaen, and Udon Thani were selected based on economic and population density data from the National Statistical Office, as these provinces have the highest gross provincial product (GPP) and population in northeastern Thailand. Next, these provinces' most densely populated urban municipalities were chosen, where informal employment and economic vulnerability are prevalent. The sample was further stratified by marginalized groups, including the elderly, disabled individuals, homeless people, and informal workers, with the proportion of each group determined from available demographic data. Finally, random sampling was conducted within each stratum to select individuals for interviews, ensuring proper representation of all vulnerable groups.

3.3 Data Collection

Data was collected through structured interviews which were developed based on insights from the literature review and prior qualitative studies. The interview form was designed to capture information on five key types of capital (financial, human, social, physical, and natural) and data on labor productivity (measured via daily wages/income). The interviews included questions about participants' socioeconomic status, access to resources, and experiences before and after the COVID-19 pandemic.

The study employed structured interviews to measure both independent and dependent variables. The independent variables consisted of five types of capital, adapted from the Livelihood Framework (DFID, 1999): (a) Financial capital, measured through questions on income, savings, and assets; (b) Human capital, assessed via participants' education levels, skills, and health status; (c) Social capital, measured by the strength of social networks, trust, and community cooperation; (d) Physical capital, evaluated by housing conditions and access to essential infrastructure; and (e) Natural capital, measured by access to natural resources such as land and water. The dependent variable, labor productivity, was measured using average daily income as a proxy, with participants reporting their daily earnings from informal employment or trade

activities. This measure provided insight into marginal productivity before and after the COVID-19 pandemic.

The data collection process spanned two months, with trained interviewers conducting face-to-face interviews while adhering to COVID-19 safety protocols. When face-to-face interaction was not possible, interviews were conducted via video calls. This research was ethical approved by the Institutional Review Board (IRB), ensuring compliance with ethical standards. Participants were fully informed of the study's purpose and their rights, and informed consent was obtained before data collection. Confidentiality and anonymity were strictly maintained to protect the identities and sensitive data of the vulnerable populations involved.

3.4 Data Analysis

The data were analyzed using univariate and bivariate statistical methods to explore the distribution of capital types and their relationship to labor productivity. Univariate analysis employed descriptive statistics to examine the prevalence of key variables, including financial, human, social, physical, and natural capital. Each variable was measured using a 3-level Likert scale (low, medium, high), allowing for an easy interpretation of capital distribution among marginalized populations. This provided a clear picture of how different types of capital were distributed across the study sample.

For the bivariate analysis, statistical tests such as Pearson's Chi-Square and Contingency Coefficient were used to identify differences in labor productivity, measured by daily wages or income, before and after the COVID-19 pandemic. These tests also examined variations in labor productivity across the three municipalities—Nakhon Ratchasima, Khon Kaen, and Udon Thani. Additionally, correlation analysis using the Pearson Correlation Coefficient was conducted to determine the relationship between capital accumulation and labor productivity. The analysis focused on identifying significant correlations between the five types of capital and labor productivity, with particular emphasis on the role of financial and human capital in enhancing productivity among marginalized groups.

3.6 Limitations

Potential limitations of this study include the reliance on self-reported income data, which may introduce bias or inaccuracies, particularly among marginalized populations such as informal workers, the elderly, and the homeless. These groups may have difficulty recalling exact figures or underreport their income due to distrust or privacy concerns. Additionally, there were challenges in reaching the most vulnerable populations, especially in urban areas of Nakhon Ratchasima, Khon Kaen, and Udon Thani, where physical barriers, safety concerns, and mobility limitations can restrict access to marginalized groups. The study was conducted in a region with significant economic disparities and informal employment, which may limit the generalizability of the findings to other regions with different economic contexts.

Furthermore, the cross-sectional nature of the research limits the ability to infer causal relationships between capital accumulation and labor productivity. Since data were collected at one point, the study cannot account for changes in productivity or capital accumulation over

time. Future research would benefit from a longitudinal design to better understand the dynamics of capital accumulation and labor productivity in the post-COVID-19 context.

4. Results

This section presents the results in three parts. First, the patterns of capital accumulation among marginalized populations in Nakhon Ratchasima, Khon Kaen, and Udon Thani during the COVID-19 pandemic are explored, focusing on financial, human, social, physical, and natural capital. Second, an analysis of labor productivity, both before and after the COVID-19 pandemic, is provided to examine changes in productivity among these populations. Finally, the relationships between capital accumulation and labor productivity are examined, highlighting how financial, human, social, physical, and natural capital interact with labor productivity in the northeastern region.

4.1 Capital accumulation pattern

The study revealed that marginalized populations relied on financial, human, and social capital to sustain their livelihoods. Financial capital included physical assets, such as cars and motorcycles, and financial assets, such as savings accounts, funeral funds, and community or village funds. However, a significant portion of financial capital was tied to debt, particularly loans from banks related to their occupations, which served as a key source of financial capital.

Regarding human capital, technical occupational skills were the most prevalent among marginalized individuals, with expertise mainly acquired through hands-on experience and, to a lesser extent, through formal training. Despite this, their occupational expertise was lower than their health investment, with households prioritizing clean and hygienic food, regular meals, and adequate rest.

Social capital played a crucial role, particularly in cooperation. Households demonstrating strong adherence to community rules and regulations scored the highest among the social capital indicators. However, trust within the community scored the lowest, indicating weaker social bonds in this area.

Regarding physical capital, most marginalized households lived in single-storey concrete homes. Infrastructure, including electricity, tap water, consumer goods, and access to mobile phones and the internet, was widely available and supported livelihood activities. Lastly, the utilization of natural capital—such as access to land and natural resources—was notably low in contributing to livelihoods.

4.2 Labor productivity

The results indicate that labor productivity among marginalized populations in the study area experienced a significant decline due to the COVID-19 pandemic. Before the pandemic, the average daily income, which serves as a proxy for labor productivity, was 575 baht. However, this average dropped to 442 baht in the post-pandemic period, representing a notable 23 percent decrease in labor productivity (Table 1). This decline reflects the widespread economic impact of the pandemic on informal workers and vulnerable groups.

Table 1 Labor Productivity by Pre-Covid, Post-Covid and Future

Period	Average daily income (baht)	Change (percent)	Quantity Interviewee
Pre- Covid- 19	574.68	-	384
Post- Covid- 19	442.23	- 132.45 (-0.23)	384
Future	939.10	496.87 (1.12)	384

Despite this decline, the participants were optimistic about their future labor productivity. On average, respondents projected a 112 percent increase in their future daily income, suggesting that they anticipate improvements in their livelihoods through vocational training, career development, and education (Table 2). This optimism is crucial as it reflects potential pathways for economic recovery among marginalized groups.

Table 2 Hypothesis testing on the difference between the average values of labor productivity.

	Mean	SD	t	df	Sig (2-tailed)
Pre-Covid Income - Post-Covid Income	132.458	822.32	3.156	383	0.002
Post-Covid Income – Future Income	-496.88	2060.54	-4.725	383	0.000

When analyzing labor productivity across different provinces, interesting regional differences emerge. Before the pandemic, Nakhon Ratchasima had the highest labor productivity compared to Khon Kaen and Udon Thani. However, post-pandemic, Nakhon Ratchasima saw the largest decline, with its productivity falling below that of Khon Kaen and Udon Thani, resulting in a more even distribution of labor productivity across the three provinces (Table 3). In contrast, expectations for future labor productivity show that all three provinces anticipate significant income growth, with Udon Thani leading with a projected daily income of 1,000 baht, followed by Nakhon Ratchasima at 992 baht, and Khon Kaen at 806 baht.

Table 3 Labor productivity by province

Period	Location		
	Nakhon Ratchasima Average daily income (baht)	Khon Kaen Average daily income (baht)	Udon Thani Average daily income (baht)
Pre- Covid- 19	670.64	495.5	550.77
Post- Covid- 19	409.56	439.08	476.65
Future	992.36	806.49	1,003.33

Additionally, the analysis of future income expectations revealed that marginalized populations have varying levels of optimism depending on their province. In Nakhon Ratchasima, nearly 48 percent of respondents expect to earn more than 600 baht per day in the future. Meanwhile, 63 percent of respondents in Udon Thani expect to earn less than 300 baht per day, indicating lower levels of optimism in this province. Khon Kaen displayed a more balanced expectation of future income across different income groups (Table 4).

Table 4 Future labor productivity expectations by province

Future income grouping by province		Province			Total
		Nakhon Ratchasima	Khon Kaen	Udon Thani	
Less than 300 baht	Frequency	52	38	63	153
	% within research area	39.70%	32.20%	46.70%	39.80%
Between 300 -600 baht	Frequency	31	44	42	117
	% within research area	23.70%	37.30%	31.10%	30.50%
More than 600 baht	Frequency	48	36	30	114
	% within research area	36.60%	30.50%	22.20%	29.70%
Total	Frequency	131	118	135	384
	% within research area	100.00%	100.00%	100.00%	100.00%

These findings suggest that while labor productivity has decreased during the pandemic, there is significant optimism for recovery and income growth across the provinces. However, differences in future expectations across regions highlight the need for targeted interventions to support recovery efforts, particularly in provinces where optimism for future labor productivity remains lower.

4.3 The relationship between capital accumulation and labor productivity

Based on the study's objective, the key results indicate that financial, human, and social capital have significant relationships with labor productivity. In contrast, physical capital (except for mobile phones and the internet) and natural capital show no evidence of a relationship. The Pearson Correlation Coefficient was employed to examine these relationships in-depth, as summarized in Table 5.

The relationship between financial capital and labor productivity indicates a statistically significant correlation at 95 percent confidence. Although the relationship remains weak, it has strengthened slightly from the pre-COVID-19 to post-COVID-19 periods, particularly in relation to financial capital in the form of assets such as vehicles and household conveniences like TVs and mobile phones. Future expectations, however, show that savings are not significantly related to labor productivity. This may suggest that savings levels among marginalized populations are insufficient to influence daily income. On the other hand, borrowing has become increasingly significant in the post-COVID period and for future expectations, although no relationship was found pre-COVID-19. This indicates that access to loans has become more critical for marginalized groups in maintaining daily wages or compensation during the pandemic.

Regarding human capital, the study found that expertise in craftsmanship and learning through trial and error is significantly related to labor productivity in the future. Additionally, skills gained from vocational training have positively influenced labor productivity during the post-COVID period, though this relationship does not extend to future expectations. Interestingly, skills related to the service industry, which were associated with productivity before the pandemic, no longer have the same influence post-COVID-19, likely due to the prolonged impact of the pandemic on service businesses such as restaurants and hotels, which will take time to recover. Contrary to previous studies, the health status of household members showed no significant relationship with labor productivity in any of the observed periods (pre-, post-, or future), despite prior research indicating the importance of health as a component of human capital.

Social capital presents a statistically significant, though weak, relationship with labor productivity across all dimensions. Specifically, trust and coordination with networks outside the community, including the government and private sector, significantly correlate with labor productivity in pre- and post-COVID periods. However, this relationship diminishes slightly post-COVID and may not be significant in the future. Generosity, where households have close relatives or friends to rely on, is also significantly related to labor productivity in both pre- and post-COVID periods, indicating the importance of personal networks in supporting daily income. Additionally, trust in caring for neighbors' children shows a weak but significant relationship with future labor productivity, highlighting the potential role of informal social

support systems in marginalized communities. However, no significant relationship between cooperation and labor productivity was found, despite previous studies suggesting that cooperation is an essential form of social capital for marginalized groups.

Physical capital, particularly access to mobile phones and the internet, was found to significantly correlate with labor productivity in both pre- and post-COVID periods. However, this relationship does not appear to influence future labor productivity. Other forms of physical capital, such as housing and infrastructure, showed no significant relationship with labor productivity.

Table 5 Relationship between capital accumulation and labor productivity

Capital			Period	Pearson correlation coefficient	
				Relationship	Statistical significance
Financial capital		Vehicle asset value	Pre-Covid-19	0.16	0
			Post-Covid-19	0.304	0
			Future	0.111	0.03
		Facilities	Pre-Covid-19	0.17	0
			Post-Covid-19	0.259	0
			Future	0.085	0.09
		Savings (and welfare)	Pre-Covid-19	0.119	0.02
			Post-Covid-19	0.167	0
			Future	0.048	0.35
		Borrowing	Pre-Covid-19	0.077	0.13
			Post-Covid-19	0.199	0
			Future	0.178	0
Human capital (expertise)		Craftsmanship	Pre-Covid-19	0.034	0.502
			Post-Covid-19	0.061	0.236
			Future	0.105	0.039
		Handicraft	Pre-Covid-19	0.089	0.082
			Post-Covid-19	0.032	0.531
			Future	0.111	0.029
		Service work	Pre-Covid-19	0.102	0.047
			Post-Covid-19	0.066	0.196
			Future	0.01	0.842
		Trial	Pre-Covid-19	0.069	0.178
			Post-Covid-19	0.027	0.599
			Future	0.107	0.037
		Receive news on training to improve vocational skills.	Pre-Covid-19	0.083	0.105
			Post-Covid-19	0.09	0.078
			Future	0.046	0.374
		Take advantage of the knowledge and experience gained from professional training. Come and further your career	Pre-Covid-19	0.088	0.087
			Post-Covid-19	0.104	0.041
			Future	- 0.025	0.618
Social capital	Generosity generous	Relatives are ready to help you when you have problems in your relationship with your neighbors.	Pre-Covid-19	0.053	0.297
			Post-Covid-19	0.145	0.004
			Future	-0.003	0.951
		Does your household have close relatives or friends who listen to your problems?	Pre-Covid-19	0.105	0.041
			Post-Covid-19	0.14	0.006
			Future	0.005	0.925
	Social Network	Ask your neighbors for help.	Pre-Covid-19	0.06	0.908
			Post-Covid-19	0.114	0.025
			Future	- 0.061	0.231
		Attended a meeting with the Community Fund Committee.	Pre-Covid-19	- 0.036	0.477
			Post-Covid-19	- 0.007	0.891
			Future	- 0.12	0.019
	Trust	Trusting in taking care of neighbors' children	Pre-Covid-19	- 0.01	0.851
			Post-Covid-19	- 0.001	0.986
			Future	0.09	0.079

		Capital	Period	Pearson correlation coefficient	
				Relationship	Statistical significance
Physical Capital	Cooperation	Trust in coordinating with networks outside the community	Pre-Covid-19	0.144	0.05
			Post-Covid-19	0.11	0.032
			Future	0.052	0.308
		Trust in coordinating with government agencies	Pre-Covid-19	0.131	0.01
			Post-Covid-19	0.089	0.081
			Future	0.029	0.565
		Trust in coordinating with private sector agencies	Pre-Covid-19	0.138	0.007
			Post-Covid-19	0.122	0.017
			Future	0.034	0.511
		Cooperate with your neighbors and help maintain the safety of community members.	Pre-Covid-19	- 0.017	0.738
			Post-Covid-19	0.028	0.59
			Future	- 0.86	0.093
		Mobile phones and the internet	Pre-Covid-19	0.106	0.038
			Post-Covid-19	0.105	0.04
			Future	0.069	0.177

5. Discussion

This study examined the relationship between capital accumulation and labor productivity among marginalized populations in the northeastern urban areas of Nakhon Ratchasima, Khon Kaen, and Udon Thani during the COVID-19 pandemic. The research employed the Livelihood Framework (DFID, 1999) to assess financial, human, social, physical, and natural capital accumulation and measured labor productivity using a micro-level approach, following Ferguson's economic theory (1978). In line with Syverson (2011), labor productivity was measured through wages or labor compensation, reflecting the labor production ability in competitive markets.

The key findings reveal that financial, human, and social capital are significantly related to labor productivity, albeit with low correlation levels. Marginalized people experienced a decline in labor productivity during the post-COVID-19 period, but they expressed optimism about future productivity growth through career development and vocational training. Notably, future labor productivity expectations were higher in Nakhon Ratchasima and Khon Kaen compared to Udon Thani, suggesting regional differences in recovery potential.

First, the results highlight the importance of financial capital, specifically access to loans, in improving future labor productivity. Financial capital in the form of borrowing was significantly related to labor productivity in the post-COVID-19 period and for future expectations. This finding aligns with Blackmore et al. (2023), who emphasize the role of accessible loan sources in enhancing productivity among marginalized populations. The ability to secure loans provides the necessary capital for marginalized individuals to invest in livelihood activities that boost daily income.

Second, while human capital related to skills and expertise was found to have a significant relationship with labor productivity, health-related human capital did not significantly correlate with labor productivity in this study. Previous studies, such as Lee et al. (2007), have emphasized the importance of public health in improving work readiness and long-term productivity. However, the findings suggest that, despite the focus on household health in the

marginalized communities of northeastern Thailand, health factors did not translate into higher daily income or productivity. This discrepancy may be due to the complexity of quantitatively measuring the impact of health on productivity, as health is often viewed as a quality of life indicator rather than directly tied to labor income.

Third, expertise in technical work and experience gained through trial were found to be significantly related to future labor productivity. This finding supports Becker's (1993) assertion that increased experience is linked to higher income, although the increase may diminish over time. Additionally, this study confirms that vocational training, whether formal or informal (Mincer, 1962; Rukumnuaykit & Pholphirul, 2016), contributes to increased productivity, further supporting the role of skill development in enhancing labor outcomes for marginalized populations.

Fourth, social capital accumulation, particularly in the form of trust and coordination with external networks (e.g., government, private sector, and community groups), also demonstrated a positive relationship with labor productivity in the post-COVID-19 period. This finding aligns with the broader context of the pandemic, where external networks played a critical role in alleviating economic and social challenges. The reliance on external support systems during the crisis likely strengthened the connection between social capital and labor productivity. Additionally, trust in caring for neighbors' children was related to future labor productivity, suggesting that childcare responsibilities could influence work productivity and provide more employment opportunities for marginalized individuals in the future.

Overall, the results underscore the importance of capital accumulation—particularly financial, human, and social capital—in improving labor productivity among marginalized groups in northeastern Thailand. Although the relationships are not always strong, the potential for future growth through skill development, access to loans, and reliance on social networks is evident. Targeted interventions to enhance these forms of capital may help accelerate productivity recovery and foster sustainable livelihood strategies in the post-pandemic era.

6. Conclusion

This study found that labor productivity among marginalized populations in Nakhon Ratchasima, Khon Kaen, and Udon Thani provinces decreased in the post-COVID-19 period. However, despite this decline, respondents expressed optimism about improving their future labor productivity, particularly through career capital and vocational training. Nakhon Ratchasima, which had the highest productivity before the pandemic, experienced the largest decline, bringing it in line with the other provinces. Future productivity expectations in Nakhon Ratchasima and Khon Kaen remain significantly higher than in Udon Thani.

The analysis revealed that financial, human, and social capital are significantly related to labor productivity, though the relationship is generally weak. Apart from mobile phones and the internet, physical capital and natural capital were not related to labor productivity. Key findings include the growing importance of financial capital in the form of loans and the relevance of

technical skills in driving future labor productivity. At the same time, health factors showed no relationship with productivity.

These findings suggest several avenues for future research. Future studies should explore the long-term impact of financial and vocational training programs on labor productivity, particularly focusing on how different forms of capital interact to influence marginalized populations' livelihoods. Additionally, the role of social capital in supporting labor productivity, especially in the context of post-pandemic recovery, warrants further investigation. Longitudinal studies could provide deeper insights into how capital accumulation affects productivity over time, offering more robust recommendations for interventions that can drive sustained economic improvement.

These results also have policy implications. Policymakers should focus on increasing access to financial resources, particularly loans, to support the economic recovery of vulnerable groups. Furthermore, vocational training programs should be expanded to develop technical skills, which have been shown to positively affect future productivity. Finally, strengthening social capital through community support systems and trust-building initiatives may offer additional pathways to improve labor outcomes in these regions.

Acknowledgments

The authors express their sincere gratitude to Khon Kaen University for the financial support provided through the Fundamental Fund 2023, which enabled the successful completion of this research project. This study is part of the larger research project entitled "Livelihood Strategies and Capital Accumulation for Value Creation among Marginalized Urban Communities in Northeast Thailand during the COVID-19 Pandemic." We extend our heartfelt appreciation to the residents of the urban fringe communities in Khon Kaen, Udon Thani, and Nakhon Ratchasima provinces, who generously shared their experiences and insights through interviews and focus group discussions. Their valuable contributions formed the foundation of this research, providing a nuanced understanding of livelihood strategies, capital mobilization, and resilience mechanisms employed during the COVID-19 pandemic.

WORKS CITED

World Bank Group. (2022). World Bank Group. 2022. Thailand Economic Monitor: Fiscal Policy for a Resilient and Equitable Future. World Bank, Bangkok. https://documents1.worldbank.org/curated/en/099245012132249289/pdf/P1797380511f390920aab30472d7e1f8276.pdf

Becker, G. S. (1993). Human capital: A theoretical and empirical analysis, with special reference to education (3rd ed.). National Bureau of Economic Research. https://www.nber.org/books-and-chapters/human-capital-theoretical-and-empirical-analysis-special-reference-education-third-edition

Blackmore, I., Iannotti, L., Rivera, C., Waters, W. F., & Lesorogol, C. (2023). A formative assessment of vulnerability and implications for enhancing livelihood sustainability in Indigenous communities in the Andes of Ecuador. Journal of Rural Studies, 97, 416–427. https://doi.org/10.1016/j.jrurstud.2022.12.033

International Labour Organization (ILO). (2023). Women and men in the informal economy: A statistical update. International Labour Office. https://www.ilo.org/publns

Chaloemwong, Y. (2020). Urgent measures to help workers and employees from impact of the COVID-19 outbreak. Thailand Development Research Institute. Retrieved on June 23, 2024, from https://tdri.or.th/2020/03/labor-measures-covid19/

Department for International Development. (1999). Sustainable livelihoods guidance sheets. https://www.livelihoodscentre.org/documents/114097690/114438878/Sustainable+livelihoods+guidance+sheets.pdf/594e5ea6-99a9-2a4e-f288-cbb4ae4bea8b?t=1569512091877

Di Guilmi, C., Clementi, F., Di Matteo, T., & Gallegati, M. (2008). Social networks and labor productivity in Europe: An empirical investigation. Journal of Economic Interaction and Coordination, 3(1), 43–57. https://doi.org/10.1007/s11403-008-0034-6

Ferguson, D. G. (1978). International capital mobility and comparative advantage: The two-country, two-factor case. Journal of International Economics, 8(3), 373–396. https://doi.org/10.1016/0022-1996(78)90002-8

International Labour Organization. (2020). COVID-19 employment and labour market impact in Thailand. https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/documents/briefingnote/wcms_747944.pdf

International Labour Organization. (2021). ILO Monitor: COVID-19 and the world of work. Seventh edition. https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/briefingnote/wcms_767028.pdf

Lee, A., Kiyu, A., Milman, H. M., & Jimenez, J. (2007). Improving health and building human capital through an effective primary care system. Journal of Urban Health, 84(1), 75–85. https://doi.org/10.1007/s11524-007-9175-5

Marome, W., & Shaw, R. (2021). COVID-19 Response in Thailand and Its Implications on Future Preparedness. International Journal of Environmental Research and Public Health, 18(3), 1089. https://doi.org/10.3390/ijerph18031089

Marx, K. (1967). Capital: A critique of political economy (Vol. 1). International Publishers. (Original work published 1867)

McKibbin, W., & Fernando, R. (2020). The global macroeconomic impacts of COVID-19: Seven scenarios. Asian Economic Papers, 19(2), 1-30. https://doi.org/10.1162/asep_a_00796

Mincer, J. (1958). Investment in human capital and personal income distribution. Journal of Political Economy, 66(4), 281–302. https://doi.org/10.1086/258055

Mincer, J. (1962). On-the-Job Training: Costs, Returns, and Some Implications. Journal of Political Economy, 70(5), 50–79. http://www.jstor.org/stable/1829104

National Statistical Office. (2019). The informal employment survey 2019. Bangkok: Office of Forecast Statistics National Statistical Office.

Strassman, P .W. (2016). The livelihood of man. Journal of Economic Issues, 15(1), 229-231.

OECD. (2001). Measuring productivity - OECD manual: Measurement of aggregate and industry-level productivity growth. OECD Publishing. https://doi.org/10.1787/9789264194519-en

Office of the National Economic and Social Development Council. (2024). Gross Regional and Provincial Product, Chain Volume Measures 2022. https://www.nesdc.go.th/ewt_dl_link.php?nid=15104&filename=gross_regional

Glanville, J. L., Paxton, P., & Wang, Y. (2016). Social Capital and Generosity: A Multilevel Analysis. Nonprofit and Voluntary Sector Quarterly, 45(3), 526-547. https://doi.org/10.1177/0899764015591366

Psacharopoulos, G., & Patrinos, H. A. (2018). Returns to investment in education: A decennial review of the global literature. Education Economics, 26(5), 445-458. https://doi.org/10.1080/09645292.2018.1484426

Puangprayong, K. (2021). Situation of impact, need for assistance and adaptation of working-age people during the COVID-19 pandemic: An empirical study in Bangkok. Suthiparitat Journal, 35(1), 266–286. https://so05.tci-thaijo.org/index.php/DPUSuthiparithatJournal/article/view/249546/169898

Resnick, S. A., & Wolff, R. D. (1989). Knowledge and class: A Marxian critique of political economy. University of Chicago Press.

Roth, F. (2019). Intangible capital and labour productivity growth: A review of the literature (Hamburg Discussion Papers in International Economics, No. 4). University of Hamburg, Chair of International Economics. https://hdl.handle.net/10419/207163

Rukumnuaykit, P., & Pholphirul, P. (2016). Human capital links to labor productivity: Implications from Thai manufacturers. Journal of Education and Work, 29(8), 922–955. https://doi.org/10.1080/13639080.2015.1104658

Sabatini, F. (2008). Does social capital improve labor productivity in small and medium enterprises? International Journal of Management and Decision Making, 9(5), 454–480. https://doi.org/10.1504/IJMDM.2008.019782

Samuelson, P. A., & Nordhaus, W. D. (2009). Economics (19th ed.). McGraw-Hill Education.

Schultz, T. P. (2003). Human capital, schooling, and health. Economics & Human Biology, 1(2), 207–221. https://doi.org/10.1016/S1570-677X(03)00013-0

Solow, R. M. (1956). A contribution to the theory of economic growth. The Quarterly Journal of Economics, 70(1), 65–94. https://doi.org/10.2307/1884513

Syverson, C. (2011). What determines productivity? Journal of Economic Literature, 49(2), 326–365. https://doi.org/10.1257/jel.49.2.326

UNDP. (2020). The social and economic impact of COVID-19 in the Asia-Pacific region: Position note. United Nations Development Programme, Regional Bureau for Asia and the Pacific. https://www.undp.org/publications/social-and-economic-impact-covid-19-asia-pacific-region

United Nations Development Programme (UNDP). (2020). Social and Economic Impact of COVID-19 in Asia-Pacific [Position Note]. United Nations Development Programme. https://www.undp.org/publications/social-and-economic-impact-covid-19-asia-pacific