

# The Relationship Between Education Investment and Income Outcomes Among Young Thai Workers

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## Abstract

The acceleration of remote work arrangements during and following the global COVID-19 pandemic has spotlighted the need to understand its impacts on labor productivity, particularly within service sectors of emerging economies. This study investigates the effects of remote work on labor productivity in Thailand's service sector, examining individual, organizational, and environmental determinants. Data were collected from 412 employees across financial services, business process outsourcing (BPO), customer support, and hospitality administration using a structured online survey. Descriptive, bivariate, and multivariate analyses, including Ordinary Least Squares (OLS) regression, revealed that productivity is significantly influenced by individual capabilities (education, digital skills, self-leadership), organizational and job-related factors (work design, managerial support, communication practices), and environmental conditions (home workspace suitability, internet connectivity). Frequent technical interruptions negatively affected productivity. The findings suggest that remote work can enhance labor productivity when employees are well-equipped, organizations provide structured support, and infrastructural conditions are favorable. Implications for policymakers and managers include the promotion of digital skill development, provision of managerial support, and improvement of home work environments to sustain productivity in the service sector.

**Keywords:** Education investment, Income outcomes, Labor productivity, Young Thai workers

## 1. Introduction

### 1.1 Principles and Rationale

Thailand's service sector is rapidly growing and plays a vital role in national economic development, yet its productivity growth remains slower than that of manufacturing. Research indicates that a 1-3% increase in service-sector labor productivity can raise real GDP by 1.75-2.64% (Luksamee-Arunothai et al., 2020). Comparable trends have been observed in other emerging Asian economies, highlighting structural productivity challenges in service-oriented labor markets (Timmer et al., 2021).

Productivity-enhancing factors, including innovation and R&D, are well recognized in the global literature. Studies in OECD countries show that service firms with strong innovation capabilities achieve higher labor productivity and competitiveness (OECD, 2021) Thai

evidence aligns with this pattern, where service firms with greater R&D intensity demonstrate higher innovation output and productivity (Charoenporn & Choksawatpaisan, 2024).

The COVID-19 pandemic accelerated remote work adoption worldwide. International surveys show that 40–60% of employees globally reported equal or higher productivity when working remotely (Bloom et al., 2023; Microsoft Work Trend Index, 2022). In Thailand, 70% of employees reported improved productivity or work quality under hybrid arrangements. Similar outcomes were observed in Japan, Singapore, and South Korea, where remote work reduced commuting time and increased task efficiency (OECD, 2021).

However, research emphasizes that productivity gains depend heavily on digital infrastructure, work design, and organizational support (Wang et al., 2021; Felstead & Reuschke, 2020). Despite these trends, there remains limited empirical knowledge on how remote work arrangements specifically influence labor productivity in Thailand's service sector – a segment characterized by diverse sub-sectors (financial services, customer support, hospitality administration, business process outsourcing) and varying levels of technology adoption and digital infrastructure readiness. The Thai corporate survey suggests that organizational norms and job-motivation mediate the relationship between remote work and productivity (Tanpipat et al., 2021). In addition, challenges such as uneven broadband access, home-workspace suitability and supervisory practices may moderate remote work outcomes in the Thai context.

Given the service sector's critical role in Thailand's economic growth and the rise of remote and hybrid work, examining the impact of remote work on labor productivity is highly relevant. This study investigates how remote working arrangements affect productivity in Thailand's service sector, focusing on key antecedents such as digital infrastructure, organizational readiness, home-work conditions, employee self-leadership, and job demands. The research contributes to understanding remote work in an emerging economy context and provides practical guidance for managers and policymakers to enhance productivity and optimize remote work practices.

### **1.2 Research Objective**

The study aims to achieve the following specific objectives:

1. To identify key individual-level factors (e.g., education, digital skills, self-leadership) that influence productivity under remote work conditions.
2. To assess organizational and job-related determinants (e.g., work design, platform support, communication practices, incentives) that affect employee performance in remote work settings.
3. To evaluate the role of infrastructural and environmental factors (e.g., internet connectivity, home workspace suitability, access to technology) in moderating the effects of remote work on productivity.

## 2. Literature Review

Thailand's service sector has historically demonstrated slower productivity growth compared with manufacturing, prompting concern among policy-makers and researchers. Meanwhile, service firms in Thailand with higher R&D intensity exhibited stronger innovation output, which in turn correlated with higher productivity, indicating that internal firm capabilities matter for service productivity (Pungnirund, 2025; Charoenporn & Choksawatpaisan, 2024). These findings establish that enhancing productivity in Thailand's service industry is not only desirable but also feasible when structural factors are addressed.

### 2.1 Remote Work and Productivity: Global and Thai Evidence

The shift to remote work, accelerated by the COVID-19 pandemic, has drawn attention to its effects on productivity. International evidence reveals mixed but generally positive effects of remote work on productivity. Studies in the United States and the United Kingdom found that remote workers often report higher productivity due to autonomy, reduced commuting, and improved work-life balance (Bloom et al., 2023; Barrero et al., 2021). In Thailand, ABeam Consulting (2020) found that 50% of employees felt more productive working remotely. Methawaranthon and Samantreeporn (2024) show that self-leadership and employee satisfaction significantly influence productivity under remote work. Organizational norms also play a major role in perceived productivity, as shown in Thai corporate settings (Tanpipat et al., 2021).

### 2.2 Determinants and Moderators of Productivity under Remote Work

The literature identifies multiple factors—individual, job-related, organizational, and infrastructural—that shape the impact of remote work on productivity. At the individual level, digital skills, autonomy, and self-leadership consistently predict higher performance, a pattern supported by Thai studies showing that digital competence and self-management enhance remote work outcomes (Rojanaporn, 2022). Job and organizational factors, including clear role expectations, structured communication, and supportive leadership, are also critical, with Thai evidence confirming that organizational support strongly influences productivity under remote conditions (Baker et al., 2020; Ponlajun & Sriboonlue, 2025). Finally, infrastructure and environmental conditions play a decisive role globally and in Thailand, where suitable home-work environments and stable ICT infrastructure are linked to improved remote performance (Felstead & Reuschke, 2020; OECD, 2021).

### 2.3 Gaps in the Literature and Relevance for Thailand's Service Sector

Despite growing research, gaps remain in Thailand's service sector: most studies focus on manufacturing or office workers, rely on self-reported productivity, overlook service-specific processes, and are cross-sectional, leaving long-term effects underexplored. Given the importance of the service sector for Thailand's economic growth and the increasing shift toward remote or hybrid work models, it is critical to systematically investigate how remote work influences labor productivity in the service sector, and under what conditions this effect is maximized or hindered.

### 3. Research Methodology

This study adopts a quantitative research design to examine the effects of remote work on labor productivity in the service sector in Thailand. A cross-sectional survey was conducted to collect primary data from employees across diverse service sub-sectors, including financial services, business process outsourcing (BPO), customer support, and hospitality administration. The research employs both descriptive and inferential statistical analyses to identify patterns, relationships, and determinants of labor productivity under remote working arrangements.

#### 3.1 Population and Sample

The target population consists of employees in Thailand's service sector who have experience with remote or hybrid work arrangements. A stratified random sampling technique was used to ensure representation across sub-sectors and regions. Based on the estimated population size and using Cochran's formula, a sample of approximately 400 employees was targeted to achieve statistical power at a 95% confidence level and 5% margin of error.

#### 3.2 Data Collection

Data were collected using a structured online questionnaire distributed through email, corporate channels, and professional networks. The survey covered demographics, remote work characteristics, job-related factors (workload, supervision, communication, incentives), and organizational support (training, platform and leadership support). Labor productivity was measured via self-reported performance scales and objective indicators where available (e.g., tasks completed, turnaround time, output quality), with attitudinal and perception items rated on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree).

#### 3.3 Data Analysis

*Descriptive Statistics:* Descriptive analyses were conducted to summarize the characteristics of the sample and the distribution of key variables.

*Bivariate Analysis:* Bivariate techniques were applied to examine unadjusted relationships between labor productivity and explanatory variables. Pearson correlation coefficients assessed linear associations among continuous variables, while independent-samples t-tests and one-way ANOVA tested for differences in productivity across categorical groups.

*Multivariate Analysis:* Ordinary Least Squares (OLS) regression was used to estimate the effects of independent variables on labor productivity while controlling for other covariates.

### 4. Results

The study demonstrates that labor productivity in Thailand's service sector under remote work is influenced by a combination of individual capabilities, organizational support and job design, and environmental/infrastructural conditions. Employees with higher digital skills, self-leadership, and educational attainment performed better remotely, especially when supported by clear processes, managerial support, and adequate home work environments.

### **4.1 Descriptive Analysis**

A total of 412 valid responses were collected from employees across multiple service sub-sectors, including financial services (28%), business process outsourcing (22%), customer support (25%), and hospitality administration (25%). The sample comprised 52% females and 48% males, with an average age of 34.6 years (S.D. = 7.8) and an average of 8.4 years of work experience (S.D. = 5.6). Approximately 65% of respondents reported engaging in remote work at least three days per week, while 22% worked fully remotely.

The mean self-reported productivity score was 3.78 out of 5 (S.D. = 0.62). Employees reported high satisfaction with time saved from commuting (Mean = 4.12, S.D. = 0.71) and generally adequate internet connectivity (Mean = 3.95, S.D. = 0.79). However, home workspace suitability varied, with 38% rating it as insufficient for sustained productivity.

### **4.2 Bivariate Analysis**

Correlation analysis revealed significant positive relationships between labor productivity and individual factors such as digital skills ( $r = 0.41, p < 0.001$ ) and self-leadership ( $r = 0.38, p < 0.001$ ). Work design and organizational support were also positively correlated with productivity ( $r = 0.35-0.42, p < 0.001$ ). Conversely, inadequate home workspace and frequent technical interruptions were negatively correlated with productivity ( $r = -0.27, p < 0.01$ ).

Independent sample t-tests indicated that employees with higher education (bachelors degree or higher) reported significantly higher productivity (Mean = 3.87) than those with lower education (Mean = 3.65),  $t(410) = 4.18, p < 0.001$ . One-way ANOVA showed productivity differences across sub-sectors ( $F = 6.42, p < 0.01$ ), with BPO and financial services employees reporting higher average productivity under remote work than hospitality administration.

### **4.3 Multivariate Analysis**

OLS regression was used to examine the determinants of labor productivity under remote work, with the model explaining 53% of the variance ( $R^2 = 0.53, F = 42.67, p < 0.001$ ). Table 1 summarizes the regression results.

**Table 1 Determinants of Labor Productivity in Remote Work (OLS Estimates)**

<b>Variable</b>	<b>Coefficient (<math>\beta</math>)</b>	<b>Std. Error</b>	<b>t-value</b>	<b>Sig.</b>
Constant	2.542	0.314	8.10	0.000
Education (Bachelor's=1)	0.127	0.041	3.10	0.002
Digital Skills	0.154	0.032	4.81	0.000
Self-leadership	0.118	0.029	4.07	0.000

Variable	Coefficient ( $\beta$ )	Std. Error	t-value	Sig.
Work Design (clarity/structure)	0.102	0.028	3.64	0.000
Organizational Support	0.091	0.025	3.64	0.000
Home Workspace Suitability	0.076	0.022	3.45	0.001
Internet Connectivity	0.068	0.021	3.24	0.001
Frequency of Technical Interruptions	-0.087	0.026	-3.35	0.001

The OLS regression results indicate that labor productivity in remote work is positively influenced by individual factors such as education, digital skills, and self-leadership. Job- and organization-related factors, including clear work design and organizational support, also significantly enhance productivity. Environmental conditions, specifically home workspace suitability and reliable internet connectivity, contribute positively, while frequent technical interruptions negatively affect performance. Overall, these findings underscore that productivity under remote work is multifaceted, shaped by employee capabilities, organizational support, and environmental conditions. Interventions targeting skill development, managerial practices, and infrastructural improvements can effectively enhance labor productivity in Thailand's service sector.

## 5. Conclusion

This study examined the effects of remote work on labor productivity in Thailand's service sector and identified the individual, organizational, and environmental determinants of employee performance. The findings show that productivity is positively associated with individual-level capabilities—particularly education, digital skills, and self-leadership—highlighting the critical role of human capital in enabling effective remote work. Organizational and job-related factors, including clear work design, managerial support, and structured communication systems, were also significant predictors of productivity. Additionally, environmental and infrastructural conditions such as ergonomic home workspaces and stable internet connectivity had substantial impacts, whereas frequent technical disruptions hindered performance.

These findings are consistent with both Thai and international research. Prior studies in Thailand emphasize that employees with strong digital literacy and self-management capabilities can maintain high performance in remote settings (Rojanaporn, 2022; Methawaranthon & Samantreeporn, 2024; Charoenporn & Choksawatpaisan, 2024). These results also align with international evidence showing that digital competencies and self-regulation improve task efficiency and adaptability in remote environments (Wang et al., 2021). Similarly, organizational support and structured communication practices identified in this

study correspond with international literature demonstrating that clear expectations, managerial guidance, and supportive remote work policies are crucial for sustaining productivity (Bloom et al., 2023; Ipsen et al., 2021).

Overall, the study provides empirical evidence that remote work can enhance labor productivity in Thailand when employees are digitally competent and organizations establish structured support mechanisms. The results have practical implications for managers and policymakers: enhancing digital-skills training, improving organizational communication systems, and ensuring adequate remote work infrastructure are essential for maximizing productivity gains. Future research should investigate the long-term effects of remote work, explore sector-specific variations, and incorporate objective productivity metrics to develop more comprehensive strategies for sustainable remote work practices in Thailand.

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