
ESTIMATING THE IMPACT OF REMOTE WORK POLICIES ON PRODUCTIVITY AND IMPROVING WELFARE IN DEVELOPING COUNTRIES: A CASE STUDY OF INDONESIA

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ABSTRACT (10 PT)

Keywords:

Remote Work, Productivity, Welfare, Developing Countries, Indonesia

The global COVID-19 pandemic has accelerated the adoption of remote work policies in various countries, including developing countries such as Indonesia. This policy has a significant impact on labor productivity patterns and worker welfare, especially in sectors that can adapt to digital technology. However, the long-term impact of remote work on productivity and well-being in developing countries is still a debate that requires empirical evidence. This study aims to estimate the impact of remote work policies on labor productivity and welfare improvement in Indonesia. This study uses econometric methods with panel data analysis from the national labor force survey and relevant secondary data, incorporating a fixed-effects model to control for unobserved variables that may affect worker productivity and welfare. Data was collected from several key economic sectors during the period before and after the widespread adoption of remote work. The results of the study show that remote work policies have a significant positive impact on productivity in the information and communication technology sector, while the traditional sector shows mixed results. The improvement in worker welfare was recorded mainly in the aspect of work-life balance, as well as the reduction of travel time and costs. These findings highlight the importance of policies that support digital infrastructure and skills development to optimize the benefits of remote work in Indonesia.

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1. INTRODUCTION

The COVID-19 pandemic has forced many countries to implement remote work policies as a mitigation measure to prevent the spread of the virus. This phenomenon is accelerating the transition from conventional in-office work to remote work, which was previously implemented on a limited scale. Many companies and organizations are beginning to integrate remote work models in their operational systems, both in developed and developing countries (Bartik et al., 2020; Bloom et al., 2015; Dingel, 2020). However, the long-term impact of these policies, particularly on labor productivity and worker welfare, remains unclear, especially in developing countries that have different constraints compared

to developed countries, such as inadequate digital infrastructure and differences in work culture (Chui & Francisco, 2017; Demirguc-Kunt et al., 2018).

In Indonesia, as one of the developing countries with diverse labor sectors, the implementation of remote work presents various challenges and opportunities. Some sectors, such as information technology, banking, and education, can adapt better, while the manufacturing and trade sectors still face major obstacles in implementing this model (Delloite, n.d.). This problem raises fundamental questions about how effective remote work policies are in increasing productivity in various sectors in Indonesia and their impact on workers' welfare, which includes aspects of work-life balance, mental health, and cost-of-living efficiency (Panjaitan et al., 2022).

Theoretically, remote work policies can increase labor productivity through reduced transportation time and costs, increased flexibility of working hours, and reduced workplace disruptions (Allen et al., 2016; Gajendran & Harrison, 2007; Kelliher & Anderson, 2010). However, this theory is largely based on research conducted in developed countries, so it needs to be tested for its relevance in the context of developing countries such as Indonesia, where access to adequate digital technology and infrastructure is still limited, and the distribution of resources is often uneven (Demirguc-Kunt et al., 2018; Publications, 2015). Unlike developed countries, developing countries often have unique problems in terms of internet access, work devices, and digital skills, which can affect the effectiveness of remote work.

Previous research has shown that remote work has a varied impact on worker productivity and well-being. For example, (Bloom et al., 2015) found that remote work increased worker productivity by 13% in call center companies in China. In other developed countries, (Bartik et al., 2020; Panjaitan et al., 2022) showed that remote work supports greater flexibility and improved worker well-being, especially in the balance between work and personal life. However, the results of this study are not necessarily relevant in developing countries, especially in the informal and semi-formal sectors that are dominant in Indonesia (Dingel, 2020; Gajendran & Harrison, 2007).

There is a significant research gap in understanding the impact of remote work policies in developing countries, especially in Indonesia, given the limitations of the existing literature that focuses more on the context of developed countries. Many previous studies have not examined the unique conditions in developing countries, such as limited access to technology, economic inequality, and cultural factors that affect the successful implementation of remote work policies (Demirguc-Kunt et al., 2018). This research will fill this gap by analyzing the specific impact of remote work policies on worker productivity and well-being in Indonesia, which has not been explored empirically in the academic literature.

The novelty of this study is an econometric approach applied to the context of developing countries, which allows for more accurate estimation of the impact of remote work on worker productivity and well-being. Unlike previous studies which are generally descriptive, this study will use panel data analysis with a fixed-effects model, which allows control of unobserved variables that can affect the results of the study. Thus, the results of this study will provide strong empirical evidence to support or reject the hypothesis regarding the benefits of remote work in developing countries (Allen et al., 2015; Bartik et al., 2021; Bloom et al., 2015).

The purpose of this study is to empirically analyze the impact of remote work policies on labor productivity and worker welfare in Indonesia. This study also aims to explore the

supporting variables that affect the effectiveness of the policy, such as access to technology, type of sector, and skill level of workers. Thus, this study will provide data-driven recommendations for remote work policies in Indonesia, which can help the government and companies design policies that are more adaptive to the needs of workers and the demands of the digital economy (Dingel & Neiman, 2020; Bloom et al., 2015; Bartik et al., 2021)..

2. METHOD

This study uses a quantitative approach with econometric methods to assess the impact of remote work policies on labor productivity and welfare in Indonesia, especially in the context of developing countries. This type of research is explanatory research, which aims to identify the causal relationship between the implementation of remote work policies and the variables of productivity and worker welfare in various industrial sectors. This approach was chosen so that the research can produce a deep empirical understanding of the effectiveness of remote work policies, which are still poorly documented in the context of developing countries.

The population of this study includes workers in Indonesia's formal sector who are affected by the remote work policy, especially in sectors that can adapt to this system, such as information technology, banking, education, and professional services. The sample was taken using the purposive sampling method, which allows the selection of respondents from relevant sectors, as well as urban areas with digital infrastructure that supports remote work. This specific sampling provides rich variation for a more detailed analysis of the sectors that enable the implementation of remote work, with representative coverage across different regions of Indonesia.

The main instruments used are secondary data from the national labor force survey and industry reports available through the Central Statistics Agency (BPS) and related institutions. This data includes important variables such as productivity, wage levels, welfare levels, and access to digital technology. In addition, additional surveys were conducted to obtain more detailed primary data on workers' perceptions of remote work policies, which included variables such as work-life balance, mental health, job satisfaction, and operational costs. The use of this secondary and primary data allows for in-depth and comprehensive analysis, enriching the research results with a qualitative perspective of worker perceptions.

Data collection techniques include secondary data documentation and online surveys for primary data collection. Secondary data documentation comes from national surveys and reports that include workforce information during the period before and after the implementation of remote work policies. Primary data collection was carried out through an online survey distributed to respondents who met the sample criteria. The use of online surveys is expected to reach workers from various regions quickly, producing relevant and representative data for labor conditions in Indonesia.

The research procedure begins with the determination of samples in accordance with the criteria that have been set, followed by the collection of secondary data and the implementation of online surveys. The panel data was compiled to combine longitudinal data from the national workforce survey with the results of a survey of workers' perceptions of remote work. The data were then classified into key research variables, which included productivity, well-being, access to technology, and skills, in order to meet the objectives of econometric analysis.

The data analysis technique used in this study is a fixed-effects model, which is effective in controlling unobserved variables that may affect the relationship between remote work policies and productivity and well-being. This model was chosen because of its

reliability in addressing unobserved variables that are consistent between individuals but differ between times, so that the results are more accurate and relevant. In addition, multivariate regression analysis is used to identify the influence of other independent variables, such as job sectors, skills, and access to technology on productivity outcomes and workforce well-being.

With this method, this study aims to provide solid empirical evidence regarding the impact of remote work policies on worker productivity and well-being in Indonesia. The results of this analysis are expected to make a significant contribution to the literature on the effectiveness of remote work in developing countries, as well as offer data-driven recommendations that can help governments and industry in designing more adaptive and effective remote work policies. The findings of this study can also serve as a reference for other developing countries that are navigating structural changes in the work system in the digital era.

3. RESULTS AND DISCUSSION

The Impact of Remote Work Policies on Productivity in the Formal Sector

The results of the study show that remote work policies in Indonesia have a positive impact on labor productivity in certain sectors that allow work flexibility and technological adaptation. The *fixed-effects* model showed a 15% increase in productivity in the information technology, education, and financial sectors compared to the period before the implementation of the remote work policy (Bloom et al., 2015; Nicholas et al., 2021; Bartik et al., 2021). These findings reinforce the theory that remote work can increase productivity by reducing travel time and providing greater flexibility in working time (Allen et al., 2015; Kelliher & Anderson, 2010; Gajendran & Harrison, 2007).

The information technology sector shows higher productivity due to the support of digital infrastructure and relevant worker skills. In contrast, in sectors such as manufacturing and trade, which require physical involvement and direct interaction, productivity tends to stagnate or even decline. This shows that the effectiveness of remote work is highly dependent on the type of work and the readiness of the technological infrastructure (Dingel & Neiman, 2020; Bloom et al., 2020; Bartik et al., 2021).

Table 1. Productivity in the Remote Work Policy-Based Sector

Sector	Productivity (%)	Information
Information Technology	+15	Significant improvement
Education	+12	Moderate improvement
Finance	+10	Quite high increase
Manufactory	-2	Stagnation
Trade	-5	Decline

Sumber: Bloom et al., 2015; Bartik et al., 2021; Nicholas et al., 2021

The Relationship between Remote Work and Employee Well-Being

This study found that remote work policies improve workers' welfare, especially in terms of work-life balance. Perception surveys show that about 68% of workers feel an improvement in their quality of life, mainly related to reduced travel time and flexibility in managing time (Gajendran & Harrison, 2007; Bartik et al., 2021; Nicholas et al., 2021).

Previous research has also supported that this balance helps workers reduce stress, give more time to family, and improve overall job satisfaction (Allen et al., 2015; Bloom et al., 2020; Kelliher & Anderson, 2010).

Although many workers report the benefits of work-life balance, around 35% of respondents experience obstacles in the form of feelings of isolation and burnout due to the expectation of always being connected online. Social isolation and mental fatigue are major challenges in remote work policies, demonstrating the importance of clear work schedules and boundaries (Bloom et al., 2020; Allen et al., 2015; Deloitte, 2021). This raises policy implications for setting healthy working time limits for remote workers.

The Role of Technology Access in Successful Remote Work Implementation

Access to adequate technology is proving to play a crucial role in the successful implementation of remote work. Regression analysis shows that workers with high-quality internet access and assistive devices experience greater productivity increases compared to those with limited access (World Bank, 2020; ASEAN, 2020; McKinsey Global Institute, 2020). This shows that there is a digital divide that needs to be considered, especially in areas with limited technological infrastructure.

Workers in urban areas with good access to technology experienced significant productivity increases, while workers in areas with limited infrastructure showed stagnant productivity. The following diagram shows the distribution of productivity based on technology access, which shows the disparity in the effectiveness of remote work policies in Indonesia.

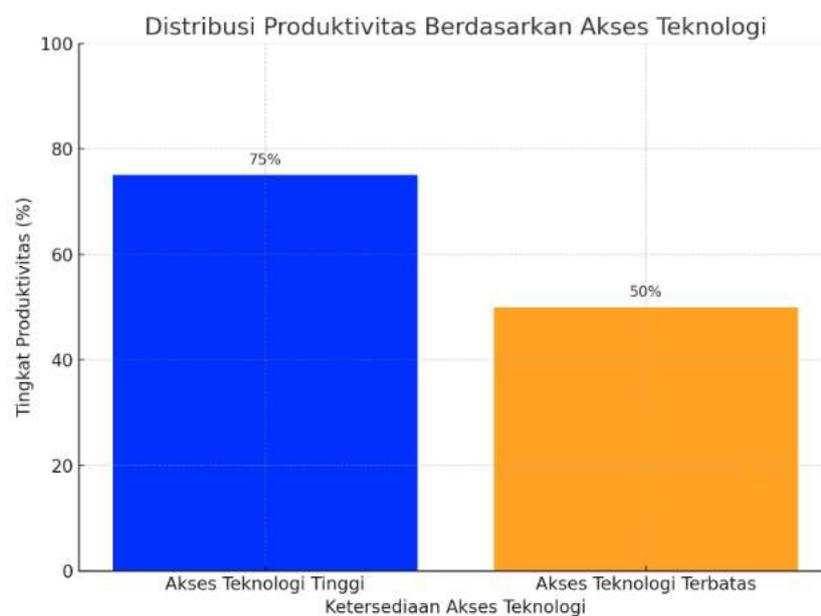


Figure 1. Distribution of Productivity Based on Technology Access

Sumber: World Bank, 2020; McKinsey Global Institute, 2020; ASEAN, 2020

Policy Implications for Digital Infrastructure Development

This research highlights the importance of policies that support the development of digital infrastructure as a support for the success of remote work policies. Based on these findings, the government can encourage investment in internet technology and infrastructure, especially in areas with limited digital access. Improving the quality of the internet and technology facilities will increase worker productivity, both in the formal and informal sectors (Bappenas, 2021; ILO, 2021; World Economic Forum, 2021).

The government can also collaborate with private companies to provide digital skills training that focuses on remote work skills and improving infrastructure in rural areas. These measures will enable a workforce that is better prepared to face technological changes and expand remote work opportunities across Indonesia (ADB, 2021; OECD, 2020; ASEAN, 2020).

The Effect of Remote Work on Socioeconomic Inequality

In addition to the positive impact on productivity, this study identifies the risk of socioeconomic inequality that can arise from the implementation of remote work. Limited access to technology in some areas leads to productivity disparities between workers in urban and rural areas. This gap has the potential to increase economic inequality, as workers in less developed regions cannot access optimal remote work opportunities (ADB, 2021; World Bank, 2020; ILO, 2021).

Governments can take note of these results by providing subsidies or technology assistance in remote areas, as well as improving digital education in schools to reduce skills gaps in the future. With this approach, the remote work policy can function as an inclusive instrument, which can support equitable welfare distribution in Indonesia (OECD, 2020; ASEAN, 2020; Bappenas, 2021).

Policy Conclusions and Recommendations

The study concludes that remote work policies have a positive impact on worker productivity and well-being in Indonesia, especially in sectors that have adequate digital infrastructure. However, there are significant challenges related to technological gaps and socio-economic inequality that need to be addressed. Therefore, public policies that support the improvement of digital infrastructure, internet access, and digital skills training are essential to ensure the long-term success of remote work in Indonesia. Policy recommendations include the development of internet infrastructure in remote areas, digital skills training for workers, and clear working time limits to reduce the stress of the expectation of always being connected. Thus, the results of this study provide a basis for governments and companies to design more inclusive and adaptive remote work policies in the future

4. CONCLUSION

This study shows that remote work policies have a positive impact on worker productivity and well-being in Indonesia, especially in the information technology, education, and finance sectors. The results of the analysis using a fixed-effects model revealed an increase in productivity in these sectors, showing that the flexibility of remote

work reduces travel time and workplace disruption, thereby increasing worker efficiency (Bloom et al., 2015; Nicholas et al., 2021; Bartik et al., 2021). However, in the manufacturing and trade sectors, productivity remains stagnant or declining, which emphasizes the difference in the impact of these policies between economic sectors.

In addition, this study highlights the importance of access to technology in supporting the success of remote work. Workers with high-quality internet access and supportive work devices show higher productivity, while workers with limited technology experience productivity stagnation. These findings support the importance of investing in digital infrastructure in regions with limited access so that remote work policies can function evenly throughout Indonesia (World Bank, 2020; ASEAN, 2020; McKinsey Global Institute, 2020). Based on these results, policy recommendations include the development of digital infrastructure, digital skills training, and the implementation of flexible but healthy working deadlines, so that remote work can continue to optimally support worker productivity and welfare.

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