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The Phenomenon of Laundry Industries in Indonesia

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Aims: This study aims to analyze the effect of the use of technology, wages, and capital on employment in the laundry industry.
Study Design: This study is a mix method of qualitative and quantitative research.
Place and Duration of Study: This sample is industry laundry in Pontianak City between January-June 2023
Methodology: This study shows the effect of capital, wages, amount of production, and technology on the absorption of labour in the laundry industry in Pontianak using a multiple regression model. This study used 60 samples of the laundry industry from the Pontianak City Trade Office. To get a complete phenomenon, further observations and in-depth interviews were carried out with the respondents.
Results: the results of the study show that changes in wages and technology have a significant effect on labour with a significance level of 5% and 10%, while changes in wages and production values have no significant effect on labour.
Conclusion: This research that capital and technology affect the number of workers in the research area. This shows that the addition of capital and technology will encourage an increase in

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the number of workers which will have an impact on increasing economic growth. This is due to the additional capital and technology that will be used to increase the number of equipment and consumables that will be used by the Company, including the addition of modes of transportation. This indicates the need for more workers so that production continues to increase.

Keywords: labor absorption; wages; capital; production value; technology.

1. INTRODUCTION

The laundry industry is a type of industry that has developed since the mid-1980s. The use of increasingly sophisticated technology with "automatic" washing machines and dryers as well as the lower cost of laundry technology has made individual households switch to commercial laundry facilities [1]. The laundry industry has several advantages such as environmental benefits by using simple processing of raw materials; economic benefits such as reduced costs on energy use and water consumption; as well as gain employment opportunities and improved quality of life by providing refurbished and household appliances at low prices for low-income households [2]. However, this may not be the case in all United States Regions, in some areas, industrial laundry has higher costs due to revised efficiency, plus drying cycles that take longer [3]. Another factor, the use of high technology is not always favored by companies, because most companies depend on a full workforce which in aggregate has lower costs than the use of technology, plus the existence of complexity and long industrial chains and is difficult to let go, as well as high machine costs so reduce the profit level of the company itself [4].

This industry moves based on technological updates with the use of the Internet of Things (IoT), cloud support, and big data & analytics [2]. Even so, traditional methods are still used, such as weighing, payment, and washing processes. Based on the results of the author's interview, respondents mentioned the most common problem that arises in the laundry industry is transaction services, including delays in consumers picking up their laundry. Therefore, a more effective system is needed that can improve the accuracy of transactions and prevent some of the problems that often arise when using laundry services. One of them is using an IoT system and implementing a self-service laundry system. This service is run by customers using mobile phones to operate machines, which have been integrated with digital payment systems such as the Quick Response Code Indonesian Standard or QRIS, so they have several payment options. After a successful payment, the machine will automatically turn on and start the washing process.

Meanwhile, in terms of manpower, this industry uses the main workforce, namely household labour. The laundry industry usually uses low-skilled labor. This is because the tools used during work are easy to use, making it possible for the laundry business to absorb labour even though the workforce has only low education, especially women. The use of female labour is supported by the notion that women can be paid cheaper than men, plus there are no health and safety facilities for female workers who must be exposed to chemical hazards from detergents every day [1]. The problem of low wages for workers in the laundry sector is a factor that causes the shift to coin laundry [1]. Most of the laundry industry cannot pay high wages because of the limited income and capital they get [5], and income will be received based on the ability of the business owner and agreement with workers [6]. Lack of venture capital is also a common problem. This is because most of the companies are closed companies and depend on small capital from their owners. Sufficient capital is needed to purchase equipment and consumables for the Laundry business, as well as other operational costs such as electricity and water [7]. Nonetheless, the laundry industry continues to develop slowly.

The laundry industry is not only talking about technology and wages but also production values. Solow-Swan (1950) stated that the value of production will depend on three main things, namely capital accumulation, the level of the number of workers, and technological progress. In the case of the laundry industry, production values can also be determined by other factors such as the weather. The demand for laundry will decrease during the rainy season or a pandemic due to a decrease in activities outside the home and a lack of travel. Production value can ideally describe the productivity of labour in this sector, although not all use of labour affects business activities because this business also depends on

the type of technology used [8]. The higher the production value, the company can expand its business which will make the company increase the number of workers.

In Pontianak City, there are sixty laundry business units with a workforce of 99 people (Diskumdag Pontianak City, 2022). With the largest number of business units in the Southeast Pontianak region with a total of 18 business units (Diskumdag Pontianak City, 2022). This is because the Southeast Pontianak region is the centre of higher education so the laundry business is developing around student dormitories and residences. The increase in the volume of goods produced every year indicates a factor of technological progress. A 1% increase in technological progress can result in output more than doubling, along with increased productivity of capital and labour [9]. The findings of this study support the theory of the Solow-Swan Model which states that technological progress will affect the increase in output and worker productivity [10]. Employees needed for a laundry business with an IoT system are not as many as kilo laundry businesses. Because employees in the digital laundry franchise business are only needed as guides or supervisors of customer activity in stores.

There is a contradiction between the use of labour with low wages but there are demands for the use of high technology so that companies are more efficient which can shift the role of labour, making this research aim to analyze the effect of the use of technology, wages, and capital on employment in the laundry industry. This research has a focus on Pontianak City, Indonesia

2. LITERATURE REVIEW

Updating technology in an industry is a sign of a change from labour incentives to capital incentives. The higher the growth of an industry, the use of labour will decrease and be replaced by high technologies [4]. Technology, together with capital and labour are factors that can increase the value of production (Solow-Swan, 1950). The high value of production can increase employment. The use of labour-intensive labour encourages higher economic growth so the impact on the opening of new jobs is also higher in the Taiwan Region [11]. This is supported by Hiks [12] which states that the consistency of developing countries using labour-intensive and capital-intensive labour encourages development and accelerates industrial areas, even though it has an impact on industrial structures that will absorb labour in an irregular and less conducive manner. In India, the effect of a gradual increase in capital in capital-intensive industries causes a decrease in employment. This is caused by the demand for labour which is more demanding of the education level of job seekers and has an impact on slowing economic development that specializes in labour [11,13].

Over the last few years, the use of technology has shifted the use of labour from low-skilled workers to high-skilled workers and replaced it with artificial intelligence (AI). However, this labor shift phenomenon does not occur in all countries. In the United States, about forty-seven per cent of jobs will be displaced over 20 years [14]. But in Germany, only twelve percent of the workforce will be replaced by AI, and in Japan fifty-five percent. This workforce shift will occur more in the informal sector which is vulnerable to the sophistication of computer technology.

However, the use of technology can also create new employment opportunities. In the process of shifting technology, the Company will add capital incentives that will create new jobs, especially in the energy-focused industrial sector. For example, companies that use low-carbon energy and emerging renewable industries will absorb more workers. Labour absorption due to the use of technology will also grow rapidly in the tertiary sector and urban areas [15]. Absorption of this workforce will also be supported by several factors such as the feasibility and quality of the work environment, and the wages received by the workforce.

Digital technology in the long term will lead to an increase in the digital economy in a region. The use of digital technology will encourage an increase in labour productivity and an increase in the amount of production which in general will have an impact on increasing economic growth. This digital economy will trigger changes in the demand for workers with different skills, namely an increase in high-skilled labour and a decrease in low-skilled labour. As a result, the labour market will require job seekers to be able to improve their skills and knowledge. This will ultimately result in workers having higher wages due to the use of technology [15].

At the same time, in industries with micro, small and medium scale, the demand for low-skilled workers will continue without any significant

shifts. This is because MSMEs are only able to provide low wages to their workforce. Plus, technology does not necessarily reduce the number of workers, even though technology increases the amount of production [16,17].

The amount of production that increases in the long run illustrates increased economic growth so that it has an impact on increasing wages as well. This increase in wages will open up opportunities for new job offers. In aggregate, wages have a major role in increasing employment opportunities [18]. Wages also have a strong relationship to labour productivity because wages are considered an incentive for workers [19]. Referring to Rowthorn (1999), capital, innovation, and technology in the long run do not have a large impact on employment, but wages do. On the other hand, Wihastuti and Rahmatullah [20] & Sulistiawati [21] found that wages harm employment, meaning that increased wages are not attractive to job seekers. This is supported by environmental factors and quality of work. Another cause is that the wages received by workers cannot improve the welfare of workers. This indicates that the wages received by workers are relatively low. This low wage occurs in many MSMEs, including the laundry industry.

Capital-intensive technology requires workers with high levels of capital and human capabilities. As a result, reducing the relative wages of skilled labour will reduce the overall cost of the capital-intensive production process and drive the trend of change in capital-intensive technology [22]. Capital-intensive technology has better advantages in terms of product quality, cost reduction and production time, global competitiveness and knowledge transfer [23]. Denbi also stated that construction technology, both capital and labour-intensive, had not been properly applied to deliver the expected benefits to society. The use of technology, in the long run, will result in less labour being used, which will increase unemployment and slow down Indonesia's economic growth [24]. This result is consistent with Solow's theory, according to which a country's economic growth cannot be separated from labour participation in the production process. According to Solow, capital is a new machine that absorbs new technology without any modification to the workforce in this situation. Bedo et al. [25] state that technology adoption has a positive impact on unemployment and social welfare and the adoption of new capital-intensive technologies also has a positive impact on output growth rates. Furthermore, Bedo et al also stated that the presence of high unemployment drives adoption, suggesting that there may be trade-offs between the adoption of capital-intensive technologies and employment.

3. METHODS

This study uses primary data from a total of 60 laundry business actors. Selection of 60 laundry businesses based on laundry businesses registered at the Pontianak City Micro and Small Business Office in 2022.

The variables used in this study consist of labor (L) which shows the number of workers absorbed in the laundry industry in 2023; log(wages), which shows the percentage change in wages; log(cap), which shows the percentage change in capital; production indicating the number of goods produced within one month; technology, which shows the amount of technology used by business actors. The technology in this study consisted of washing machines, steam irons, and the use of online payment methods (QRIS).

This study uses a mathematical model with the following equation:

$$L_i = \propto + \beta_1 Log(Wag)_i + \beta_2 Log(Cap)_i + \beta_3 Prod_i + \beta_4 Tech_i + \varepsilon_i$$

Where:

$\propto_0$ = Constanta
β_1, β_2, β_3, β_4 = coeficient
L= Labor
Log(Wag) = persentase perubahan upah
Log(Cap) = persentase perubahan modal
Prod = Total production
Tech = jumlah teknologi yang digunakan oleh pelaku usaha
ε = error term
i = unit cross section (individual)

In this study, steps such as in-depth interviews and observations were also carried out to get answers to a complete picture of the laundry industry in Pontianak City.

4. RESULTS AND DISCUSSION

The research results are as follows:

Table 1. Regression result

Variable	Coefficient	t-statistic	Prob.	Conclusion
Log(Wag)	0.042214	0.052674	0.9582	Not significant
Log(Cap)	0.999670	2.073959	0.0427*)	Significant
(Prod)	3.323536	0.027788	0.9779	Not significant
(Tech)	0.194140	1.847134	0.0700*)	Significant
F-statistic	4.154048			
Prob(F-statistic)	0.005128*)			
R-squared	0.228822			

**) = significant at 5%; **) = significant at 10%*
Source: Calculated by Authors

Based on Table 1 it is known that changes in capital and technology significantly affect the number of workers. Every 1% increase in capital will increase the number of workers by 0.99 or 1 worker. Then, every increase of 1 unit of technology will increase 0.19 or 1 workforce.

This shows that laundry owners in Pontianak City are taking advantage of additional capital to increase production. As a result, businesses need more workers. Although business actors will get the most out of their current workforce. The increase in the number of workers is the result of demand that is more than expected or determined for laundry services, which necessitates more new workers. The amount of capital for a laundry service company will have an impact on how much labour it absorbs. If capital increases, employment will also increase, and vice versa. When capital is small, the amount of labour absorption is also low. Capital expenditures are made by the business sector to acquire newer, more modern capital goods or to replace old, ineffective or obsolete capital goods. The amount of capital owned by a laundry service company will certainly increase the quality and quantity of the goods it produces. Laundry service companies will consider how closely their performance skills are related to the number of requests made by the laundry service company. This additional capital will also be used by business actors to add equipment and consumables such as equipment such as washing machines and dryers, sufficient space or land to carry out all work activities serving customers in terms of laundry services, and various chemicals such as detergents, bleach, and other items. Of course, all of this can support the operational activities of laundry services.

Other Phenomena Most of the business actors serve the shuttle system to make it easier for consumers to use the laundry company's services. Depending on whether the items being washed are large or small, or can only be transported by motorcycle, accommodation is usually provided in the form of cars and motorbikes. Thus, the additional capital is also used to purchase transportation equipment.

And the more widespread laundry service companies are in the city of Pontianak, laundry service companies need to absorb labour from some of the capital related to work operational activities because of course the owner of a laundry service business cannot maintain and run a laundry work system alone. Laundry service companies decide and develop several standards for prospective workers who will work in their laundry service companies. As a result, the laundry service company will not suffer losses because all the workers employed have been carefully selected and are unquestionably qualified.

The more machines a company invests, the less labour it absorbs because they don't have to spend a lot of money on wages and employee compensation. Conversely, if the capital is in the form of a small machine, the company will employ many people to help with the laundry work or the laundry order can be completed. Most of the capital needed to start a laundry MSME in Pontianak City is obtained from their capital.

On the technology side, the majority of MSME laundry in Pontianak City have technology or machines of one to four units per MSME laundry, but from the findings of the data collected from respondents, it can be seen that this technology has a positive and significant effect on employment. This is an interesting research finding in today's modern era, technology is used by companies that are accustomed to using machines or technology to increase production efficiency while reducing the need for excess labour. This does not happen to MSME Laundry

in Pontianak City, because humans are the main component in production in providing laundry services there. It is necessary to know more, as Handoko said that there are various types of production technology. The technology or machines used to produce laundry services are categorized as factory technology, which is at the second level and is known as machine-made work, where machines provide power but humans are still needed to operate the machines or equipment. Although this technology eliminates physical labour, it still requires someone to operate it.

Workers in MSME laundry in Pontianak City who use steam irons to smooth wrinkled clothes, washing machines to help wash and clean clothes, and so on, where they are the controllers of these machines, can demonstrate the inclusion of technology or machines used by MSME laundry in Pontianak City is a working machine technology. Technology or machines do reduce the use of labour from workers, but these workers still have to master the technology. Only three or four technologies are used by several laundry MSMEs in Pontianak City. Therefore, MSME laundry business owners in Pontianak City will usually add workers to operate the technology or machine when they add technology or machines to increase the productivity of laundry services. The results of this study support research conducted by Putri & Kesumajaya [26], which found technology to have a positive and significant effect on employment, where it can be seen that increasingly modern technology will require a large absorbed workforce.

Based on the results of multiple linear regression, the production value variable which has the largest regression coefficient value has the greatest influence on employment in MSME laundry in Pontianak City among the four independent variables (wages, capital, production values, and technology). The value of the regression coefficient on production value is 3.3235, the highest of the other variables. In the production process, production value is one of the factors that influence employment.

5. CONCLUSION

This research that capital and technology affect the number of workers in the research area. This shows that the addition of capital and technology will encourage an increase in the number of workers which will have an impact on increasing economic growth. This is due to the additional capital and technology that will be used to increase the number of equipment and consumables that will be used by the Company, including the addition of modes of transportation. This indicates the need for more workers so that production continues to increase.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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