

It Costs More to Purchase Eggs in Indonesia than in The US

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ABSTRACT

One way to measure the wealth of a nation is by measuring its citizen's purchasing power. The higher the purchasing power, the better. It means that people can consume more products with the same level of wealth. One way to measure purchasing power is by measuring how much people can purchase their essential staple, in this study, egg. Furthermore, if we want to understand whether our purchasing power is strong enough, we measure it with other countries. In this study, we will compare our purchasing power to citizens in the US. This paper will show us that comparing citizens from both countries having a minimum wage costs Indonesians more to purchase eggs.

Keywords: *purchasing power, egg, minimum wage.*

1. INTRODUCTION

Eggs are one of the essential staple foods for Indonesians. Indonesians consumed around 1.5 million tons of eggs annually in 2018 [1]. Indonesia has 267.7 million people, meaning Indonesians consume 5.6 kgs of egg annually. It is equivalent to Indonesians consuming 95 eggs annually, or only one egg every four days. It means that, on average, Indonesians consume 1.5 grams out of 45 - 55 grams of daily protein standards. [2], [3]. Though it contributes minimally to standard daily protein intake, the total consumption of eggs is a massive amount to fulfil. Therefore, it is crucial to provide sufficient supply and reachability to Indonesians.

Similar to Indonesia, Americans consider eggs as one of their basic staples. It is available on most families' fridge shelves. Americans consume a considerable amount of eggs annually. In total, Americans consume 9.173 million eggs annually. Considering the total population of 333,860,677 people [4], average Americans consume 288 eggs annually. In other words, Americans consume less than Indonesian. The facts above have emphasized the importance of eggs in Indonesian households.

Indonesians commonly consume eggs more than other animal protein options, such as beef, lamb, or

chicken. They found that eggs cost the least compared to other animal protein sources. In addition, it is easier to cook eggs than other animal proteins. Furthermore, per 100gr, the egg contains the least amount of protein, 13 grams [5] compared to 27 grams in chicken, 25.4 grams in beef, and 24.8 grams in lamb. [6]. Due to their practicality and accessibility, eggs are one of the favourite staple foods for Indonesians.

Similar to Indonesians, citizens in the US can purchase eggs very quickly. Eggs are available in almost all stores, from Walmart to local grocery stores. It costs the least compared to chicken, lamb and beef. Its prices vary from city to city.

Indonesians purchase eggs in two different units, either in kilograms or pieces. In some cities, people purchase eggs in kilograms, and in other cities, they purchase eggs in pieces. The prices vary from IDR 21.800 (\$ 1,51) to IDR 37.650 (\$ 2.59) per kilogram.

It is unusual to find eggs sold in kilograms in the US. People in the US purchase eggs in dozens. The price ranges from \$ 0.48 per dozen in Lansing, MI, to \$4.49 in Honolulu, HI.

Both Indonesia and the USA produced more than the demand on the supply side. For example, in 2018, Indonesia produced 1.72 million tons of eggs [1]. USA's

egg production in 2018 was 110.073 million eggs [7], exceeding the demand of 96.134,4 million eggs.

Since most people from both countries consume eggs, it is better to compare the purchasing power from similar levels of wealth. In this study, we would like to approach the analysis from people whose wealth is minimum, those who earn minimum wage. Both countries measure how much money their people will earn to support their lives [8]. In this level of wealth, the price of eggs has a significant impact on their consumption decision [9], [10]. We will use minimum wage data from [11] and [12].

In this study, we would like to compare the price of eggs in both countries. We will convert the data into a price per piece to avoid confusion. To convert prices in Indonesia, since the data available are in kilograms, we will assume that it contains 17 pieces of egg per kilogram.

The method in comparing the purchasing power is by using "The Law Of One Price". In simple understanding, The Law of One Price [13] means that a similar product must have a similar value anywhere in the world. It implies that the value of eggs is similar, whether it is in the US or Indonesia. The value of an egg is reflected in its purchasing cost. As we can see from the paragraph above, the egg price between the two countries is different. The first difference is the currency used in each country. The second is that the price itself is different. We can see from the earlier paragraph that the price of eggs varies in price and location. It raises a question: how can we compare purchasing power between the two countries? Why don't we convert the prices using expected exchange rates in the financial market?

The first answer is that the law refers to the purchasing power parity (PPP) concept. By ensuring that the price of similar products has the same value. Should the prices differ, the value will remain the same. The concept leads to the introduction of conversion rate. This rate measures the amount of currency needed to purchase similar products as in the US [14]. For example, the conversion rate for the US - Indonesia in 2018 is IDR 4.759. If a product in the US costs \$1, a similar product will cost IDR 4.759 in Indonesia.

The second answer to the question is that Indonesians purchase eggs from their earnings and Americans. It does not work the other way around. At a glance, it costs less to purchase eggs in USD(\$) in Indonesia than in the US. It means that should Indonesians earn the same income level as those in the US, and they will see the current price as very affordable. The problem is that Indonesia's minimum wage level is different from the US. We will observe whether the minimum wage level in Indonesia can purchase the same amount of eggs like those in the US.

Authors have researched similar studies using Purchasing Power Parity to compare prices among a few

countries and have yet to find similar studies comparing egg prices between Indonesia and the USA. [15] studied the production cost of eggs among 15 countries, but they did not include Indonesia in the comparison.

In another study, [16] studied the importance of the availability of eggs, comparing between developing countries and developed countries. Their comparison includes poorer countries such as Sub-Saharan Africa and South Asia. Unfortunately, the study did not specify Indonesia. They only showed Indonesia in a graph of egg availability throughout the world. The graph showed that Indonesia is one of the lower levels of egg availability compared to the other countries.

2. PROBLEM STATEMENT

In the introduction section, we have learned the difference between egg prices in Indonesia and the US, including the complexity of comparing them using standard exchange rates. We also understand that humans need to consume a standard daily protein intake; one of them is by consuming eggs. According to [16], people in middle and high-income countries (e.g. USA) enjoy relatively affordable egg prices.

This paper will analyze whether it costs more for Indonesians to purchase eggs than Americans. By analyzing this issue, we want to suggest whether we need to match the minimum wage in the US, using purchasing power parity conversion rates, to enable Indonesians to purchase eggs at the same value that Americans enjoy.

3. RESEARCH PURPOSE

In this study, we will investigate whether it costs more to purchase eggs in Indonesia, or in the US. We will collect data of egg price, PPP conversion ratio, convert them into price per piece and take their average and conduct a mean test on the data.

4. RESEARCH METHOD

In this research, we conduct the following steps

1. Data collection from the internet.

The data that we need are as follows :

- a. Egg price in Indonesia in 2018.
- b. Egg price in the US in 2018
- c. PPP Conversion ratio USD-IDR in 2018
- d. Minimum Wage in Jakarta, Indonesia, and
- e. Minimum Wage in Washington DC, USA.

We chose 2018, since the egg price data in the US was only available until 2018. In order to make the comparison relevant, we also use egg price data in Indonesia as well as PPP conversion rate in 2018.

2. We convert egg price data in the US using PPP conversion ratio and stored in into variable x_1 .
3. We converted egg price in the Indonesia into and stored in in x_2
4. We use a mean test to understand which one of the prices is pricier.

In this research, we obtain the following data:

Table 3 PPP Conversion rates for USD-IDR [17]

2018	4.759,089
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Table 4 Minimum wage in Jakarta, Indonesia [11] and in Washington DC, USA [12]

City, Country	
Jakarta, Indonesia	IDR 4.267.349 per month
Washington DC, USA	(\$7.25 per hour) Equivalent to \$1.256 per month Equivalent to IDR 4,591,094.48 per month

We will assign X_1 as the egg price data in the US (in IDR per piece) from table 4, and X_2 as the egg price in Indonesia (in IDR per piece) from table 3. We use z-Test: Two Sample for Means [18] to compare the mean price per egg in both countries. We will hypothesize that the egg price in the US is the same as in Indonesia, in which its average price is the same. The alternative hypothesis is that egg prices in the US are less than in Indonesia. The hypothesis is shown the following:

Hypotheses: (assume $\alpha = 5\%$)

$$H_0: \mu_1 = \mu_2$$

$$H_1: \mu_1 < \mu_2$$

Using Z-test : two sample for means, we obtain as follows:

	x_1	x_2
Mean	587.27	1,582.44
Known Variance	54,815.97	59,946.2
Observations	51	34
Hypothesized Mean Difference	0	
z	-18.68	
P(Z<=z) one-tail	0	
z Critical one-tail	-1.64	

Since z is less than z Critical one-tail ($-18.86 < -1.64$) we can reject the null hypothesis and accept the alternate hypothesis, that the average egg price in the US cost less than those in Indonesia.

5. CONCLUSION

We have found out that, on average, it costs less to purchase eggs in the US than in Indonesia. Using the PPP conversion ratio to compare egg prices from both countries can be valuable and fair. Although egg prices in Indonesia seem to be less than in the US, it costs more to Indonesians to purchase the same amount of eggs than in the US. Consequently, Indonesians can purchase less than US citizens using the exact value of money. It implies that Indonesians may consume fewer eggs, therefore lessening their daily protein intake than US citizens.

In this study, in order to enable Indonesians to purchase eggs at the same value as in the US, we can use PPP conversion rates to suggest the level of minimum wage that matches US minimum wage. Society can benefit from this, that is Indonesians have the same purchasing power as Americans.

By multiplying US minimum wage, as in Table 5, and PPP Conversion Rate, we obtain

$$\begin{aligned} & \text{USD } 1.256 \times 4.759,089 \\ & = \text{IDR } 5,977,415.78 \sim \text{IDR } 6 \text{ Million} \end{aligned}$$

From the calculation above, we have seen that obtaining the same purchasing power as Americans suggests that Indonesians' minimum wage is as low as IDR 6 Million. Our current minimum wage is insufficient to afford similar purchasing power as Americans.

6. FURTHER DISCUSSION

It is important for the Indonesian government to enable their citizens to consume more eggs to reach basic daily protein intake. This can be in the form of the following

- reducing the price of eggs, or
- raising the minimum wage, or
- Establishing the poverty-income threshold. A threshold to categorize people, whether they are poor or not, based on their yearly income.

All options will yield another problem and challenges. Reducing egg price will lead to company and supply chain efficiency. Raising the minimum wage will challenge job availability, thus threatening investment and poverty level, also macroeconomics situations. While the third option can bring a novel alternative to the current definition of poor households. We believe that the definition of low-income or poor household is not practical and measurable. Should we be able to introduce a poverty-income threshold, we believe that we can identify poor households easier and thus the government can swiftly provide support for those households.

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