THE IMPACT OF INFLATION AND REAL WAGES ON GROSS PROFIT MARGINS FOR LQ 45 COMPANIES IN INDONESIA STOCK EXCHANGE

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ABSTRACT

The purpose of this study is to find out the impact both inflation (INF) and real wages (RW) have on gross profit margins (GPM) for LQ 45 companies in Indonesia. The LQ 45 companies are the most liquid companies in Indonesia Stock Exchange and were chosen as the most appropriate object of study. This study analyzed the data by using panel data regression models for 78 companies collectively for years 2004 to 2012. The results indicate that gross profit margins are negatively correlated to inflation and positively correlated to real wages. Future research may include companies that participated in the months of August to December.

Keywords: Indonesia, LQ 45 companies, gross profit margins, Inflation, Real wages, panel data analysis.

INTRODUCTION

Inflation is an ongoing phenomena being experienced by most of the countries in the world today. It is commonly referred to as an increase in the price of commodities over a period of time.

Indonesia is one of the fastest growing emerging countries and is estimated to be developed by 2025 (World Bank Report, 2011). Indonesia is currently, a member of G-20, G-15, OPEC, and ASEAN among others.

Indonesia experienced hyperinflation from 1962 to 1967 at an average of 239.55 %. The main cause of hyperinflation during the period mentioned above was that the Indonesian government decided to print money in order to finance its budget deficits. While at the same time, foreign debt had accumulated from the Western countries and the then Soviet Union. Simultaneously, Indonesia couldn’t get any financial aid as it had already isolated itself from international bodies such as International Monetary Fund (IMF), United Nations (UN) and World Bank (WB).

A remedy for the crisis was implemented from 1966 to 1973. In order to stabilize the economy, Indonesia decided to return to IMF, UN and WB so as to get the financial aid it needed. Also, the Indonesia Rupiah was devalued as a way of making exports cheaper.

In 1998, Indonesia faced another crisis. The Indonesian rupiah depreciated from Rp. 2400 against the U.S dollar to Rp. 16000 (Levinsohn et al., 2003). This depreciation was caused by an increase in inflation. In 1998, inflation in Indonesia rose to 75.3%. The situation was worsened by the selling of rupiah for dollars by Indonesian companies with dollar-denominated debt. As a preventive measure, the government of Indonesia liquidated 16 private domestic banks and bailed out the remaining banks to avoid a total bank crisis.
In 2008, an increase in global food prices led to an upsurge in inflation in Indonesia up to 18.1% as a result of the global economic crisis. The government of Indonesia decided to reduce bank reserve requirements and introduced new foreign exchange regulations requiring documentation for foreign exchange purchases exceeding U.S. $100,000 per month.

Some of the ramifications inflation has on a company's performance are as follows: Inflation which is a rise in the general price level often leads to currency depreciation, this makes exports cheaper. For companies importing raw materials, they will have to pay more which results in higher input costs. Consequently, the higher input costs will eventually lower the company's profits. To avoid this, companies prefer increasing the price of its goods. The price increase causes the workers to have a low purchasing power and eventually demand for a higher income. Should the companies give in to the demands of their workers and raise their incomes, this will cause an increase in the cost of labour which will lower the company's profit. This is commonly referred to as wage-spiral. On the other hand, in the banking industry, low interest rates are unattractive to savers who prefer keeping their own money this reduces the profitability of the banks.

During inflation budgeting in a company becomes difficult as the anticipated inflation may end up being more than expected. On the other hand, in order to finance its budget the government may among other factors increase taxes. The increase in taxes will be passed on to the consumers by the companies in the form of higher prices.

There is a literature gap as few journals have been written about inflation, real wages and gross profit margins. Hence this becomes a motivation for this study.

This study will replicate Gunay et al. (2005) work on real wages, profit margins and inflation in Turkey. Hence the main research question for this study is: Do inflation and real wages affect the profit margins of LQ 45 companies in Indonesia stock exchange?

**LITERATURE REVIEW AND HYPOTHESIS**

**Previous Studies**

Gunay et al. (2005) researched about behaviour of gross profit margins in relation to price inflation, trade liberalization and real wage costs. The variables used were mark up rates, inflation, trade orientation and real wage and were measured by using panel data econometrics so that variation over both the cross-section and time series dimensions could be jointly considered. The data used in the paper was gotten from 29 sectors in the manufacturing industry in Turkey from 1980 to 1996. Findings from the paper indicated that a 1% increase in the level of inflation caused an increase in profit margins by 0.14%. In addition to this, 1% increase in real wages, caused profit margins to increase by 0.219%. Hence the conclusion that profit margins were positively and significantly related both to price inflation and real wage costs.

Gwin (2000) examined whether high inflation allowed businesses to increase profit margins. The author did this by testing whether the industry profit margins depended significantly on inflation and if profit margins were higher in an inflationary environment when the seller's associated buyer's search cost was high. The dependent variables used were annual and quarterly series of industry contribution margins and the independent variables were time trend, inflation, and percentage change in GDP as a proxy for the business cycle. The sample used in the paper was 57 industries in U.S that had the (4-digit) SIC codes. Regression model was used to test both the dependent and independent variables. Findings from the paper indicate that profit margins were relatively higher in an inflationary environment. Not only did the author find out that the profit margins depended significantly on inflation but also, when the seller's associated buyer's search cost was relatively high.

Demirgüç-Kunt and Huizinga (1999), investigated how bank interest spreads were affected by taxation, the structure of the financial system, and financial regulations such as deposit insurance. The paper also, focused on accounting measures of income and profitability, as financial returns on bank stocks were equalized by investors in the absence of prohibitive barriers. The paper used bank-level data for 80 developed and developing countries during the period from 1988 to 1995. Regression analysis was used to examine the underlying determinants of interest spreads and
bank profitability. Findings indicated a positive relationship between inflation and bank profitability which implied that bank income increased more with inflation than bank costs.

Ahlgrim and D'Arcy (2012) examined the effect of inflation or deflation on the property-liability and life insurance industries. The variables used were average inflation rates, underwriting profit margins, net investment income, average stock returns, and average unemployment rate. The data for average inflation rates, underwriting profit margins and net investment income of the property-liability insurance industry from 1914-2009 was gotten from Best's Aggregates and Averages, while stock returns were measured by the change in the S&P 500 Index and the average unemployment rate. The data for inflation was further divided into three parts deflation, normal inflation (which was grouped between 0 and 6%), and high inflation rate (above 6%).

A time series analysis was performed and findings indicated that during periods of moderate inflation, inflation and underwriting profits were negatively correlated. Inflation does push up the value of the investments for the insurance companies especially those that make equity investments. Also, insurance companies make profits on their underwriting.

D'Arcy (1981) the purpose of the paper was to develop a method of inflation immunization for the property-liability insurance industry. Variables used in the paper were inflation and underwriting profit margins among others. The data used was the statutory underwriting profit margin for stock property-liability insurers during the period 1926 to 1981 and was gotten from Best's Aggregates and Averages. Regression model used in the paper was restricted to inflationary conditions and did not apply to periods of deflation (1926-1932). For the period 1933 to 1981, the relationship between underwriting profit margins and inflation, was based on ordinary least squares regression. Findings from the paper indicated the existence of a negative relationship between the inflation rate and underwriting profit margins. The reason for this was that variations in market values of stocks as a result of inflation flowed directly into overall insurance profitability.

Annicchiarico et al. (2011) studied the relationship between output growth and volatility of money shocks in a New Keynesian (NK) model with endogenous growth, nominal rigidities due to both staggered price and wage setting, and Taylor rules. Variables used in the paper were output, consumption, investments and wages. Findings indicate that while a firm's markup increased, real wages, output and investment decreased.

Kandil (2003), the paper investigated the dynamics of nominal wage and price adjustments in the face of aggregate demand shocks. Variables used were real output, price level, money stock, short-term interest rate, government spending, aggregate demand, energy price and nominal wages. The data for the paper was gotten from international financial statistics. Findings indicated an increase in aggregate demand prompted firms to adjust prices upward to maintain or increase their markup of prices over wages.

Ton (2009), the main objective of the paper was to examine the effect of labor on profitability through its impact on quality by examining both conformance quality and service quality. The object of the research was Beta Corporation. The variables used in the paper were profitability which was proxyed by operating income divided by sales, labor which included wages and benefits as well as service quality and conformance quality. Data for 268 beta stores was used in the paper. The data was obtained through interviews and participant observation. In addition to this, yearly data was gotten for labor, service quality, and profitability from 1999 to 2002. The data was analysed using ordinary least squares (OLS) estimators with heteroskedasticity and maximum likelihood (ML) estimations. Findings from the paper indicated that increasing the amount of labor was associated with higher profitability.

Amadeo (1993) addressed the logic of wage determination in a regime of high and accelerating inflation, and the rational basis of 'overindexation' of wages. The object of study was unions and firms. Using the assumption that unions face incentives and costs to increase the degree of indexation of wages, and that only to the extent of which the marginal benefits are greater than the marginal costs will the level of indexation increase. The author argued that increasing uncertainty over the future path of inflation tends to increase the degree of indexation of wages. An increase in the wage indexation parameter is associated with a lower price parameter and lower profit margins.

Basic Theories

Classical theory of inflation

According to Mankiw (2010) the classical theory of inflation provides both the long run and short-run analysis. In classical theory, prices are assumed to be flexible. Inflation is defined as the
increase in the average level of prices, and where price is the rate at which money is exchanged for goods or services.

The quantity theory of money states that the central bank, which controls the money supply, also controls the rate of inflation. The central bank does this either by keeping the money supply stable, or by increasing it. The result of this will be reflected on price levels as they stabilize or increase together with the money supply. When the government prints money to finance its expenditure, it increases the money supply (buying bonds in cash from the private sector). The increase in the money supply, in turn, causes inflation. The quantity theory of money shows that the rate of money growth determines the rate of inflation.

Demand-pull inflation can be caused by an increase in consumption. This may come about as a result of an increase in income which subsequently raises the purchasing power of the consumers. In addition to this, low interest rates augment spending through credit cards and make it easier for people to secure loans. Also, a depreciating currency will make exports cheaper and most likely the demand for goods and services will increase. Lastly, an increase in economic growth would compel firms to increase production.

Cost-push inflation occurs when there is an increase in the production cost. Examples of production costs are labour, capital et cetera. Cost-push inflation can be caused by an increase in income after successful lobbying by workers union. This increase in income will eventually lead to higher production costs. As a way of maintaining profits, companies will increase the price of goods and services they produce. Increases in prices of commodities such as oil, food et cetera eventually leads to a hike in prices particularly for those countries that import them.

An increase in taxes by the government such as import duty tax, corporate tax to certain sectors such as health industry, insurance industry will eventually lead to increase in prices. Monopoly is another cause of cost push inflation. In Indonesia there has been monopoly in form of having one power company i.e. State Electricity Company (Perusahaan Listrik Negara). An increase in the price of electricity often leads to high production costs for companies which will eventually be passed on to the consumers.

**Keynesian theory of inflation**

According to Mishkin (2004), Keynesian theory indicates that, a rapidly growing money supply will cause the price level to increase continually at a high rate thus generating inflation.

Aggregate demand is the total quantity of an economy's final goods and services demanded at different price levels. Whereas, aggregate supply is the total quantity of final goods and services that firms in the economy want to sell at different price levels. The Keynesian theory analyzes aggregate demand in terms of its four component parts: (i) Consumer expenditure. (ii) Planned investment spending. (iii) Government spending and (iv) Net exports. The Keynesian theory further states that, a lower price level, holding the nominal quantity of money constant, leads to a larger quantity of money in real terms and also causes the interest rate to fall. Resulting in lower cost of financing purchases and stimulates planned investment spending. Lower price level leads to higher demand.

The lower value of a country's currency which comes as a decline in the exchange rate makes domestic goods cheaper and causes net exports to increase. In addition to this, a decrease in government taxes leaves consumer with more income to spend therefore the consumer expenditure rises.

In terms of aggregate supply, the quantity of output supplied is determined by the profit made on each unit of output. Profit on a unit of output equals the price for the unit minus the cost of producing it. Factors that influence the cost of production in the short run are: (i) Wages which are fixed for periods of time by labor contracts. (ii) Raw materials that are often bought by firms under long-term contracts with fixed price. Since higher price level results in higher profits in the short run, firms increase production and the quantity of aggregate output supplied rises.

**Gross Profit Margin Theory**

According to Healy & Palepu (2008), gross profit margin is an indication of the extent to which revenues exceed direct cost associated with sales. Gross profit margins are influenced by two factors: (i) The price premium that a firm's products or services command in the market place. (ii) The efficiency of the firm's procurement and production process. The price premium a firm's products or services can command is
influenced by the degree of competition and the extent to which its product are unique.

According to Subramanyam & Wild (2009), gross profit margin is a key performance measure. Gross profits vary across industries depending on factors like competition and differences in the factors of production such as production wage rates, cost of raw materials etc. Changes in gross profits are often derived from one or a combination of the following: (i) Increase / decrease in sales volume. (ii) Increase / decrease in unit selling price. (iii) Increase / decrease in cost per unit.

According to Lincoln Indicators Pty Ltd (2010), a company's gross profit margin may also be viewed as a measurement of production efficiency. A company with a gross profit margin higher than that of its competitors, or the industry average, is deemed to be more efficient and is therefore preferred by investors.

According to Jagelavicius (2013), companies which have higher gross margin tend to be more profitable and tend to have stronger free cash flow. High cash flow can be returned to shareholders in form of dividends or re-invested into the business, allowing the business to expand, without necessarily having to rely on debt.

This study will use the model found in Gunay et al. (2005)

\[
MR_{it} = \alpha + \beta_1 INF_{it} + \beta_2 O_{it} + \beta_3 RW_{it} + \epsilon_{it}
\]

Where:
- \( MR \): mark-up rates,
- \( INF \): inflation,
- \( O \): openness,
- \( RW \): real wage costs,
- \( i \): individual LQ 45 companies and
- \( t \): time.

Gunay et al. (2005) searched for econometric evidence on the behaviour of mark-ups in relation to inflation, openness and real wage costs in Turkish manufacturing industry for the post-1980 period. They found out that gross profit margin was positively related to both inflation and real wages. The interpretation of this is that manufacturing sectors in Turkey had responded to shocks of acceleration of inflation and real wage costs by increasing their indigenous profit margins.

On the other hand, there was a negative correlation between openness and gross profit margins. This can be interpreted to mean that the manufacturing sector in Turkey showed some resistance to increased competition.

Inflation, gross profit margins and real wages will be considered in this study whereas, openness will not. The aim for this study is to see whether inflation and real wages have any effect on gross profit margins.

**Efficiency-wage theory**

According to Mankiw (2010) there are four efficiency wage theories. The first efficiency theory states that wages influence the nutrition of an employee. Better-paid workers can afford a more nutritious diet and are healthier and more productive. A firm may decide to pay a wage above the equilibrium level to maintain a healthy workforce.

The second efficiency-wage theory states that high wages reduce labor turnover. The more a firm pays its workers, the greater is their incentive to stay with the firm. By paying a high wage, a firm lowers the employee turnover and in doing so it reduces the time and money spent on hiring and training new workers.

The third efficiency-wage theory states that the average quality of a firm's work force depends on the wage it pays its employees. If a firm reduces its wage, employees will leave the firm. By paying a wage above the equilibrium level, the firm improves the average quality of its workforce, and thereby increase productivity.

The fourth efficiency-wage theory states that high wages improves workers effort. According to this theory, firms cannot perfectly monitor their employees' work. Workers can choose either to work hard, or to shirk and risk getting caught or even being sacked. When a firm pays high wages, employees tend not to shirk and this increases the firm's productivity. A firm operates more efficiently and is profitable when it pays its workers a high wage.

**Hypothesis**

During inflation, the cost of production such as labour, raw materials increase. At the same time, companies tend to increase the prices of their goods and services in order to get more profits. For companies with higher profit margins they can lower their prices in order to increase sales as business strategy. However, this cannot be done for long as it can lead to a decrease in the profit margins. In addition to this, companies using LIFO (last in first out) accounting method, tend to have lower gross profit margins as opposed to those using FIFO (first in first out). The reason for this is the cost of goods produced has been increasing over the years.
According to the efficiency wage theory, a firm Kumar et al. (2009) indicated that higher real wages operates more efficiently if it pays its workers a high wage. The firm may find it also more profitable to keep wages above the level that balances supply and demand.

Gunay et al. (2005) indicated that profit margins were positively and significantly related both to price inflation and real wage costs. This was further supported by Gwin (2000) who discovered that profit margins were relatively higher in an inflationary environment. In addition to this, Demirguc-Kunt and Huizinga (1999) found out that a positive relationship existed between inflation and bank profitability which implied that bank income increased more with inflation than bank costs.

**H1 : Inflation has a positive effect on profit margins.**

**RESEARCH METHOD**

**Type of the research**
This is study is an explanatory in nature in that it seeks to find out the cause and effect inflation and real wages have on gross profit margins. This study, also intends to discover the predictions in the theories used by testing the hypothesis.

**Population**
The population for this study will be LQ 45 companies that meet the following criteria of having: (i) Cost of goods sold or Cost of sales. However, financial institutions and other companies such as the telecommunication companies that have participated in LQ 45 companies will be excluded from this study since they have cost of service and not cost of goods sold. (ii) Companies that have participated in LQ 45 index from 2004 to 2012 for the months of February up to July.

**Variable classification and Operational definition**
The variables that will be used in this study are: inflation (independent), gross profit margins (dependent), real wage cost as the control variable for gross profit margins.

**Inflation**
Inflation is the change in the Consumer Price Index (CPI) from one year to another and will be measured in index. The data for CPI will be gotten from *Badan Pusat Statistik*.

**Gross profit margins**
Gross profit margin (GPM) is an indicator of a company’s efficiency. Gross margin ratios will be used as a proxy for gross profit margins. The data for gross margin ratio will be gotten from the summary of financial reports of the individual LQ 45 companies from Indonesia Capital Market Directory (ICMD).

**Real Wage Costs**
In this study, real wages refer to the changes in real wages from one year to another and will be measured by using ratios. This research will use real wages data from the manufacturing industry as a proxy for real wage cost. The data will be gotten from *Badan Pusat Statistik*.

**Location and time of Research**
This study will be conducted in Indonesia from 2004 to 2012 a period of 9 years. The reason why Indonesia has been chosen as a location for this study is that: (i) Availability of data. (ii) The LQ45 Index, was launched in February 1997 hence the choice of period from 2004 to 2012.

**Model analysis**
The data in this study will be regressed by using panel data analysis. To find the correlation of inflation and real wages on gross profit margin, this study will follow Gunay et al. (2005) model which is:

\[ MR_t = \alpha + \beta_1 I N F_a + \beta_2 R W_t + \epsilon_t \]  

**Where:**
MR : denotes mark-up rates,       
INF : denotes inflation and RW denotes real wage costs, i is the number of LQ 45 companies and t is time from (2004-2012).
Technical Analysis
The steps for the technical analysis in this study will be as follows:
Step 1: Scatter plot will be used to check the linearity otherwise the exploratory analysis.
Step 2: A regression analysis will be done on gross profit margins (MR), inflation (INF) and real wage (RW) as the explanatory variables.
Step 3: Estimates of $\alpha$, $\beta_1$, $\beta_2$ will be gotten from the above regression.

The assumption in this study is that gross profit margins as the dependent variable follows a normal distribution.

Statistical Hypothesis
The level of significance (p-value) that will be used in this study for testing $H_0$ will be 5%.
(a) Impact inflation has on gross profit margins

$H_0$: $\beta_1 = 0$

Meaning inflation has a negative effect on gross profit margins.

$H_1$: $\beta_1 > 0$

Meaning inflation has a positive effect on gross profit margins.

(b) Impact real wages have on gross profit margins

$H_0$: $\beta_2 = 0$

Meaning real wages have a negative effect on gross profit margins.

$H_2$: $\beta_2 > 0$

Meaning real wages have a positive effect on gross profit margins.

FINDINGS AND ANALYSIS
Data Analysis
The statistics descriptive is represented below. (See table 1)

Normally, central tendency is measured by mean, median or mode. From table 1, the median for gross profit margin, inflation and real wages are less than their respective mean values. This is an indicator of a positive skew. Positive skew means that the distribution of data for all the variables used in this study with exception to real wages have a long right tail. Hence, in this study the mean values will be considered as measure the central tendency since the data have a skewed distribution. The range for the variables used can be gotten by subtracting the minimum values from the maximum values. However, it cannot be used as a measure of variability. Standard deviation is the best measure of variability as it shows how the variables deviate from the mean. In this study, real wages deviate the furthest followed by inflation and gross profit margins respectively. According to Gujarati (2003), for a normally distributed variable, both skewness and kurtosis are equal to 0 and 3 respectively. In table 1, only real wages have a normal distribution. In addition to this, kurtosis for both gross profit margins and inflation is greater than 3 and this indicates that they have a fat tail distribution which is more concentrated around the mean (leptokurtic). While real wages have a kurtosis value of less than 3 meaning they are less concentrated around the mean (platykurtic).

From table 2, inflation is statistically insignificant, while real wages is statistically significant at 5%. At the same time, there is the existence of a negative relationship between inflation and gross profit margins. While on the other hand, real wages and gross profits are positively related. R-squared measures the percentage of the total variation of the dependent variable. In table 2, gross profit margins vary at an approximate rate of 70.1%. While the value of adjusted r-squared is 0.708407 which is less than r-squared 0.708822. The Durbin-Watson value in table 2 is 0.893234 which indicates the possibility of positive autocorrelation in the residuals. Of all the three information criterions i.e Akaike, Schwarz and Hannan-Quinn, Schwarz has the least value of -1.591659.
From table 3, inflation is statistically insignificant, while real wages is statistically significant at 5%. Inflation and real wages are negatively and positively related to gross profit margins respectively. From the R-squared value it indicates that gross profit margins as the dependent variable vary at an approximate rate of 83%. While the value of adjusted r-squared is 0.811896 lower than r-squared. The Durbin-Watson value is 1.552272 which indicates the test is inconclusive for autocorrelation in the residuals. From the three information criterions that is Akaike, Schwarz and Hannan-Quinn, Schwarz has the least value of -1.419949.

Discussion

Real wages were used the control variable since From table 1, gross profit margins are stipulated they have a direct effect to gross profit margins.

To have a positive skew. This nullifies the assumption that gross profit margin have a normal distribution.

A comparison of both tables 2 and 3 show that inflation is insignificant at 5% whereas real wages are significant. R-squared value in table 3 has increased significantly as well as the Durbin-Watson value. For model selection, the Schwarz criterion in table 3 has been chosen as it has the least value as compared to other information criterion in both tables 2 and 3. In overall, the panel data regression model using pooled Least Squares with fixed effects, table 3 has been chosen as the ideal model for this study.

In this study, the null hypothesis for $\beta_1$ was accepted meaning inflation has a negative effect on gross profit margins. While the null hypothesis for $\beta_2$ was not accepted meaning that real wages have a positive effect on gross profit margins. Although inflation is not statistically significant, 1% increase in inflation will cause gross profit margins to decrease by approximately 0.001%. Whereas, 1% increase in real wages will cause gross profit margins to increase by approximately 0.001%.

In support of the existence of a negative relationship between inflation and gross profit margins in the findings in this study, Ahlgrim and D'Arcy (2012) indicated that during periods of moderate inflation, inflation and underwriting profits were negatively correlated. Also, D'Arcy (1981) discovered the existence of a negative relationship between the inflation rate and underwriting profit margins. The positive relationship between real wages and gross profit margins as per the findings in this study is corroborated by Gunay et al. (2005) they indicated that profit margins were positively and significantly related both to price inflation and real wage costs. Kandil (2003) stated that an increase in aggregate demand prompted firms to adjust prices upward to maintain or increase their markup of prices over wages. Whereas, Ton (2009), discovered that increasing the amount of labour was associated with higher profitability.

Real wages were used the control variable since they have a direct effect to gross profit margins. When wages are increase, the companies will pass on the extra cost to the consumers by increasing the prices of its goods and services. The increase in prices will result in high profit margins.

According to Gujarati (2003), in the fixed effect model, the intercept may differ across individuals (78 companies), each company does not vary across time. Meaning that, it is time invariant. In this study, the cross section intercepts can be distinctly grouped in to high and positive intercepts, low and negative intercepts as well as zero intercepts.

The companies having high intercepts can be interpreted to mean that they have a high gross profit margin. The high gross profit margin can also be an indicator that the companies are being run efficiently. Low individual company intercepts could mean that the companies cost of goods sold including the expenses are high thus narrowing the gross profit margins. In addition to this, companies that have zero intercepts could be interpreted to mean that the companies are less profitable and have a high risk of failure.

According to Baye (2008), profits signal to resource holders where resources are most highly valued by society. Resources will flow into industries that are most highly valued by society.
CONCLUSIONS

The objectives for this study were to investigate the impact of inflation and real wages had on profit margins. From this study, it can be deduced that gross profit margins are affected negatively by inflation and positively by real wages. The effect of inflation on gross profit margins though small can be supported by the quantity theory of money which states that the central bank, which controls the money supply, has ultimate control over the rate of inflation. The rate of inflation in Indonesia is controlled by Bank Indonesia under a policy known as inflation targeting. Bank Indonesia will normally raise the BI Rate if inflation is high and lower the BI Rate if inflation is low. This helps the public to better prepare for inflation. Whereas the effect of real wages on gross profit margin, is further supported by the efficiency wage theory which states that, if a firm reduces its wages its best employees may take jobs elsewhere. Hence by paying wages above the equilibrium level, the firm may improve the average quality of its workforce, and thereby increase productivity. The Indonesia government increases minimum wages periodically. This increase in wages will eventually cause companies to adjust the price of their goods and services upwards.

Recommendations

This study was conducted for LQ 45 companies that participated in Indonesia Stock Exchange from 2004-2012 for months of February to July. Future research may include companies that participated in the months of August to December.

Some of the ways to mitigate the effect of inflation in a company's performance would be to alternate the raw material with a cheaper one. The company can also buy raw materials in bulk in anticipation of high inflation in the future. The company can budget for inflation by adding an extra 20% in its initial budget. Lastly, companies can form alliances with other companies in order to share risks.

Limitations

Only LQ 45 companies were used as an object of study. This may not fully represent all the public traded companies in Indonesia.

In Indonesia, LQ 45 companies begun in 1997. However, the time period for this study was from 2004 to 2012 owing to the availability of data.

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**APPENDIX**

**Table 1:** Statistics Descriptive.

<table>
<thead>
<tr>
<th>Variable</th>
<th>GPM</th>
<th>INF</th>
<th>RW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>0.146311</td>
<td>3.093205</td>
<td>112.3861</td>
</tr>
<tr>
<td>Median</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
</tr>
<tr>
<td>Maximum</td>
<td>0.980000</td>
<td>17.110000</td>
<td>297.07000</td>
</tr>
<tr>
<td>Minimum</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>0.200592</td>
<td>4.499007</td>
<td>130.6252</td>
</tr>
<tr>
<td>Skewness</td>
<td>1.151367</td>
<td>1.614893</td>
<td>0.31446</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>3.445043</td>
<td>5.201786</td>
<td>1.128127</td>
</tr>
<tr>
<td>Jarque-Bera</td>
<td>160.8938</td>
<td>446.9217</td>
<td>114.0589</td>
</tr>
<tr>
<td>Probability</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
</tr>
<tr>
<td>Sum</td>
<td>102.7100</td>
<td>2171.4300</td>
<td>78895.0500</td>
</tr>
<tr>
<td>Sum Sq. Dev.</td>
<td>28.20634</td>
<td>14188.99</td>
<td>11961125</td>
</tr>
<tr>
<td>Observations</td>
<td>702</td>
<td>702</td>
<td>702</td>
</tr>
<tr>
<td>Cross sections</td>
<td>78</td>
<td>78</td>
<td>78</td>
</tr>
</tbody>
</table>

**Table 2:** Panel data regression model using pooled Least Squares.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>INF?</td>
<td>-0.001098</td>
<td>0.001460</td>
<td>-0.752220</td>
<td>0.4522</td>
</tr>
<tr>
<td>RW?</td>
<td>0.001326</td>
<td>4.63E-05</td>
<td>28.67567</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

R-squared     0.708822  Mean dependent var  0.146311
Adjusted R-squared 0.708407  S.D. dependent var  0.200592
S.E. of regression  0.108319  Akaike info criterion  -1.604634
Sum squared resid  8.213053  Schwarz criterion  -1.591659
Log likelihood  565.2264  Hannan-Quinn criter  -1.599619
Durbin-Watson stat  0.893234
## Table 3: Panel data regression model using pooled Least Squares with fixed effects.

Dependent Variable: GPM  
Method: Pooled Least Squares  
Date: 07/20/14   Time: 19:09  
Sample: 2004 2012  
Included observations: 9  
Cross-sections included: 78  
Total pool (balanced) observations: 702

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.010558</td>
<td>0.004967</td>
<td>2.125816</td>
<td>0.0339</td>
</tr>
<tr>
<td>INF</td>
<td>-0.000788</td>
<td>0.001208</td>
<td>-0.652239</td>
<td>0.5145</td>
</tr>
<tr>
<td>RW</td>
<td>0.001230</td>
<td>4.56E-05</td>
<td>26.98905</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Fixed Effects (Cross)

- **TRUB--C**: -0.045202  
- **TBLA--C**: -0.035253  
- **BMTR--C**: 0.009687  
- **BKSL--C**: 0.000798  
- **BISI--C**: 0.012946  
- **SGRO--C**: -0.004832  
- **AKRA--C**: -0.066819  
- **WIKA--C**: -0.034387  
- **ADRO--C**: -0.005517  
- **BYAN--C**: -0.027720  
- **ELSA--C**: -0.081974  
- **INDY--C**: -0.057739  
- **ITMG--C**: -0.004406  
- **JSMR--C**: 0.148928  
- **MIRA--C**: -0.025943  
- **HEXA--C**: -0.027670  
- **DEWA--C**: -0.045448  
- **BRAU--C**: -0.001033  
- **DOID--C**: -0.054576  
- **ASRI--C**: 0.046535  
- **BSDE--C**: 0.025634  
- **BTEL--C**: 0.044522  
- **ISAT--C**: -0.029922  
- **TLKM--C**: -0.014576

R-squared: 0.833094  
Adjusted R-squared: 0.811896  
S.E. of regression: 0.086999  
Sum squared resid: 4.707798  
Log likelihood: 760.5594  
F-statistic: 39.2945  
Prob(F-statistic): 0.000000  
S.D. dependent var: 0.146311  
Akaike info criterion: 0.146311  
Schwarz criterion: -1.938916  
Hannan-Quinn criter.: -1.419949  
Durbin-Watson stat: 1.552272

- **Mean dependent var**: 0.146311  
- **S.D. dependent var**: 0.200592  
- **Akaike info criterion**: 0.146311  
- **Schwarz criterion**: -1.938916  
- **Hannan-Quinn criter.**: -1.419949  
- **Durbin-Watson stat**: 1.552272