

OUTPUT AND UNEMPLOYMENT: TESTING OKUN'S LAW IN INDONESIA

Umi Karomah Yaumidin

Economic Researcher at the Economic Research Center

Indonesian Institute of Sciences

Umi_karomah@yahoo.com

umi.karomah.yaumidin@lipi.go.id

ABSTRACT

This paper reports a study of the testing of Okun's Law in the Indonesian economy: we test difference and gap models of Okun's thesis. For this we use annual data on GDP and unemployment rates for Indonesia from 1980 to 2013. The main conclusions are, first, that Indonesia still faces a continuing high unemployment rate according to the results of the output gap model and of the first difference model. Second, in the long term, demand in Indonesia's employment market is inelastic, especially during financial crises. Indonesia needs high economic growth to cause demand for labour to be more elastic to absorb many more into the labour force. Overall, our analyses found that interpretations of Okun's Law might not be applicable to Indonesia's economy.

Keywords: Indonesia, Unemployment, Okun's Law, Output.

JEL Classification: C1, E3, E6

INTRODUCTION

Indonesia has resumed a high economic growth and its performance is close to those of India and China. During the global financial crisis of 2008–09, real GDP grew positively at 6.0 per cent in 2008 and 4.5 per cent in 2009. Moreover, high and inclusive growth of domestic demand,

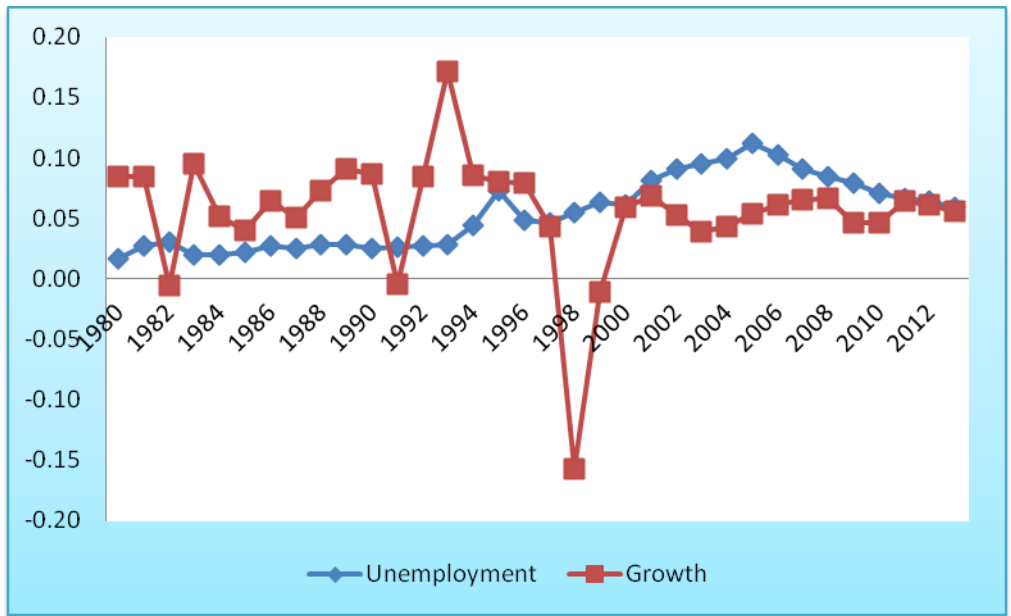
particularly consumption, has made a significant contribution to improving macroeconomic performance. From an economic point of view, higher growth contributes to creating jobs, and to reducing the unemployment rate and the poverty rate, which will then lead to increases in human welfare. Despite

this achievement, unemployment and poverty rates remained high after the financial crisis in 1999. In 2007, the unemployment rate was 9.8 per cent of the total labour force, which is higher than the rate (4.7 per cent) before the 1997 crisis. It is to be inferred that output growth in 2007 only reduced the poverty rate by one per cent.

The main problems of labour in Indonesia are low minimum wages and a high unemployment rate. The reason for these problems is that the annual growth of new-entry job seekers is faster than opportunities for employment. Before the crisis in 1997, Indonesia had its lowest unemployment rates over the period 1971 to 1980. According to Manning (1994), these lower rates were caused by the role of the informal sector in providing jobs; government investment in social infrastructure (labour intensive), such as building public schools and health facilities; programs that absorb the less educated workers; and agricultural

growth increasing significantly, which created job opportunities not only in the agricultural sector itself but it also created other job opportunities in related sectors that support the agriculture sector, such as transport and manufacturing.

However, the unemployment rate doubled from 1.7 per cent to 3.2 per cent over the period 1980 to 1990 (shown in Figure 1). Before the economic crisis, the unemployment rate was below 5 per cent, that is, natural unemployment. The natural unemployment rate is the rate of unemployment that cannot be eradicated. For Indonesia, the natural unemployment rate is around 5 to 6 per cent per annum. This is taken to mean that if unemployment is at 5 per cent, the economy is at full employment (Safrida, 1999).



Sources: World Bank Database, BPS, and various publications.

Figure 1. Indonesia's annual GDP growth and unemployment rate, 1980–2013

There would be no direct correlation between output growth and the unemployment rate from 1980 to 2013. It cannot be said that the higher the output growth, the lower the unemployment rate and vice versa. Output growth was stepped up more than two times from 1990 to 1993 but the unemployment rate also slightly

increased from 2.5 per cent to 2.8 per cent. However, when the financial crisis of 1998–1999 occurred, output fell significantly and the unemployment rate rose slightly as Okun's Law would have it, which posits a negative correlation between output and unemployment.

Broadly speaking, labour problems are always associated with minimum wages policies and other employment policies that attract political attention. Theoretically, there is a possibility that economic growth and employment elasticity have a strong positive correlation; the higher is economic growth, the more elastic are job opportunities. However, this theory did not hold for Indonesia in 2009, a time of economic contraction, when the unemployment rate was less than the previous year.

We argue that similar patterns are to be found in other developing countries. One reason may be ascribed to asymmetric information problems, particularly for countries that have political instability and lack good governance (Lal et al., 2010). In addition, that the non-tradable sector in the formation of GDP is too dominant can also be the reason. It is widely known that this sector, the non-tradable sector, is less able to absorb labour in

the short-run as well as in long-run economic cycles. If this condition persists, it will cause instability of macroeconomic condition. Worse macroeconomic performance will act to reduce aggregate demand and unbalance the supply and demand of goods and services. As a consequence of this imbalance, prices will increase and national welfare deteriorate. Therefore, reducing unemployment can be achieved by output growth exceeding the growth rate of productivity (Gabrisch and Buscher, 2006). This would be an important element of aggregate demand growth. In other words, the evolution of labour markets can be completed when unemployment responds to output change, not the institutional and environment changing that distorts the job market in the public sector. Technological progress leads to the reduction of jobs in industry.

The aim of this paper is to test Okun's Law and its validity in

Indonesia. Okun's Law defines an inverse association between cyclical fluctuations in the output gap and the unemployment gap, where the value of the coefficients varies from country to country and from one time period to another. This paper will examine difference and gap models of Okun's Law from 1980 to 2013. This study empirically investigated whether an association between the measures of an unemployment gap and an output gap is statistically significant in the long run. After the introduction, the second section is a theoretical review of economic growth and unemployment. We discuss model specification and data sets in the third section. Section four has a detailed discussion of the results, and an interpretation of the findings. The last section will offer some tentative conclusions.

THEORY REVIEW

Creative destruction as an agent of economic growth

In the context of growth as an exogenous variable, labour factors are usually missing from the calculation. However, when growth is expected as an endogenous variable, labour can be included as an agent of growth. This idea initially came from Schumpeter whose intention was to break the circuit theory of Malthus. In addition, Schumpeter stressed the importance of entrepreneurs as agents of creative destruction that create flows of innovation and technology. These flows were, he believed, to enable change to a better environment for human beings. Advanced technology will fundamentally increase per capita income. It will also improve market structures in capitalist systems, in other words, the power of capitalism is indicated by its capability to create advanced technologies.

Schumpeter admired the entrepreneur in his views on monopoly. The entrepreneur who innovates will enjoy monopoly power as an incentive

and a reward for their effort. This power has a limited time until it is broken and replaced in the chain of creative destruction by other innovators who, in turn, will hold monopoly power. The idea of creative destruction was a theme in many of Schumpeter's works but the first time he demonstrated this concept explicitly was in his first book, *Capitalism, socialism and democracy*.

The opening up of new markets, foreign or domestic, and the organizational development from the craft shop and factory to such concerns as US Steel illustrate the some process of industrial mutation—if I may use that biological term—that incessantly revolutionizes the economic structure *from within*, incessantly destroying the old one, incessantly creating a new one. This process of Creative Destruction is the essential fact about capitalism. It is what capitalism consists in and what every capitalist concern has got to live in. (Schumpeter, 1942, p. 82–83)

Through the concept of creative destruction, Schumpeter was effectively distancing his thought from the standard ideas about economic change. First, he did not consider economic evolution as a simple growth process in which all sectors of the economy expand in a balanced way: in contrast, it was marked by a creation and destruction of old products and processes. Second, many emerging companies and other organisations did not increase their competency smoothly so that, in effect, they changed their area of specialisation. As a result, they were often disadvantaged in the evolutionary process. Third, workers who lose their jobs face social deprivation and welfare loss, which is seen more clearly in the long term.

Schumpeter's concept of creative destruction describes effectively his views on capitalist evolution, but it was not discussed widely as an operational concept in the literature of business

strategies and structural change. It is an open question whether this concept can be implemented in practice or it is just an issue for academic discussion. Helmstadter and Perlman (1946) declared that creative destruction is a careless slogan only, which should not be taken into account.

Aghion and Howitt (1992) refuted Helmstadter and Perlman's argument. They introduced a model of endogenous growth through creative destruction. Vertical innovation and competitive research were major supports in the construction of this model, because those variables represent the fundamental sources of economic growth. They also stated that market equilibrium is measured by the *forward looking difference equation*, meaning that the amount of research in a given period is dependent on the amount of research that is expected in the next period. One of the sources of this inter-temporal relation is creative destruction. The term 'creative

destruction', in their view (Aghion and Howitt), is slightly different from Schumpeter's view. According to them, creative destruction is the future prospect of more research and it discourages current research by threatening to destroy the rents created by current research.

The result of the analysis of the model of economic growth through creative destruction indicates that the conditions for stationary equilibrium assume the number of researchers is a constant and GNP follows a random walk with drift, although the model did not rule out the existence of cyclical equilibrium. The average and the variations in the rate of growth increased in line with the growing number of innovations, which produced the required amount of skilled labour and high research productivity. However, this study also found that economic growth will decrease towards time preference, meaning that if laissez faire conditions

hold, economic growth could be higher or lower than its optimal point. For example, theft of intellectual property contributes to the reduction of innovation, thus economic growth through creative destruction is less than optimal.

Economic growth and unemployment

The relation between growth and unemployment (proxy for labour force) has been discussed among monetarist and classical economists since 1960. The negative relation between growth and unemployment was termed ‘Okun’s Law’. Generally, there are two versions of this law: the first is called a first difference model, which can be formulated as:

$$Y_t - Y_{t-1} = \alpha + \beta(U_t - U_{t-1}) + \varepsilon_t$$

Using United States statistical data, Okun found that the relation between growth and unemployment is about one to three, that is, that every one per cent

decline in the unemployment rate requires about a three per cent increase of real growth of GDP. However, recent data show the Okun coefficient to be one in four (Samuelson and Nordhaus, 1995).

The second version is termed the ‘gap model’, which is usually devoted to forecasting. This model assumes that the $Y_{(t)}$ variable is a gap between potential and actual output. This model also considers economic conditions that can be categorised as underemployment or full employment. Okun’s original paper was motivated to identify a way to measure potential output. In potential output, Okun sought the answer to the question of how much output can the economy produce under conditions of full employment. Unlike many macroeconomic variables, neither potential output nor the level of unemployment that constitutes ‘full employment’ are directly observable.

In the macroeconomic view, aggregate demand in the long term is expected *ceteris paribus* to be at full employment. Full employment, according to James Tobin and JM Keynes, did not mean that natural unemployment had to be zero rate: they argued that zero rate unemployment will never happen under any economic conditions. In the twentieth century, William Beveridge defined full employment to be a condition when unemployment in the economy is about three per cent, but Okun (1962) contended that the figure is about four per cent. In other words, an economy in full employment is always associated with the long-term supply curve. It can be said that if a community's labour force is willing and able to work at the wage rate of that time, full employment also can be defined by the proportion of the workforce in work when the labour market attains equilibrium.

Okun's Law then generated hot debate among economists because of

its assumptions and the terms of the gap may lead to different perceptions. Barreto and Howland (1993) stated that Okun, and many others following in his footsteps, mistakenly assumed that it is valid to use the reciprocal of the slope of the regression of unemployment on output when making a prediction of output given unemployment. In fact, the best linear predictor of output given unemployment is found by regressing output on unemployment.

The key to Okun's ideas was his use of deviations in unemployment from full employment to predict deviations in actual GNP from potential GNP based on the past relations between unemployment and GNP. This idea will work only if there is a consistent relation between the two variables. There is no necessary reason that there should be a stable relation between unemployment and GNP. A modern, sophisticated econometric model of the macro economy would make both variables endogenous. If any of the

structural parameters of the model were to change, the relations between GNP and unemployment would change. Correctly applying Okun's logic, the observed values of GNP and unemployment, in the period for which potential output is to be predicted, should be modelled as drawn from the same process that produced the sample data. Okun's procedure is *not* to be interpreted as estimating parameters of a well specified economic model that captures an unchanging, single linear relation between unemployment and GNP.

Moreover, Barreto and Howland (1993) noticed that there are three methods to measure the relation of output and unemployment rates. First, Okun's Law comes to be known as a simple equation:

$$P = A[1 + .032(U-4)]$$

Where P = potential output, A = actual output, and U = unemployment rate.

It can be inferred from the equation above that when unemployment is stable at 4 per cent, a one percentage point increase in the unemployment rate will imply a 3.2 per cent potential output loss. That percentage point change in unemployment linked to roughly a threefold change in the rate of growth of output was used to generate a potential output series and played a role in determining the direction and magnitude of stabilisation policies throughout the 1960s.

Unfortunately, Okun's procedure for predicting the rate of growth of output associated with a given unemployment rate is incorrect. In each of the three methods he proposed, Okun regressed some measure of employment on a rate of growth of output variable, then took the reciprocal of the estimate of the slope to arrive at a quantitative measure of the Okun coefficient on unemployment, that is, the output loss associated with a given deviation in the

unemployment rate from full employment.

Table 1 reports a replication of Okun's original results and provides correct estimates of the Okun coefficient on unemployment. Thus, it

can be concluded that Okun used the wrong regression line to predict the foregone output for a given deviation in the unemployment rate from full employment and to calculate the GNP gap and potential GNP.

Table 1. Replicating and correcting Okun (1962)

| Estimation Method | Estimated Equation | Reported Okun Coefficient on Unemployment | Estimated Equation | Correct Okun Coefficient on Unemployment |
|---------------------------------------|--|---|---|--|
| Method 1: First Differences | $\Delta U = .3 - .30\% \Delta Q$ (.04)(.04) 1947Q2 - 1960Q4 $R^2 = .58$ D-W = 1.6 | $= 1/30 = 3.3$ "one percentage point more in the unemployment rate means 3.3% less GNP" (Okun [1962], p. 99) | $\% \Delta Q = .94 - 1.95 \Delta U$ (.13) (.23) 1947Q2 - 1960Q4 $R^2 = .58$ D-W = 2.0 | = 1.95 |
| Method 2: Trial Gaps | $\hat{U} = 3.67 + .35\% \text{gap}$ (.14) (.03) 1953Q1 - 1960Q4 $R^2 = .82$ D-W = .49 | $= 1/35 = 2.8$ "an increment of unemployment of one percent is associated with an output loss equal to 2.8% of potential output" (Okun [1962], p. 100) | $\% \text{gap} = 8.0 + 2.35U$ (1.0) (.20) 1953Q1 - 1960Q4 $R^2 = .82$ D-W = .43 | = 2.35 |
| Method 3: Fitted Trend and Elasticity | $\hat{\ln E} = 212 + .40 \ln Q - .32t$ (27) (.04) (.03) 1953Q1 - 1960Q4 $R^2 = .84$ D-W = .54 $R^2_{\ln Q \ln E, t} = .74$ | $= 1/35$ to $1/40$ = 2.8 to 2.5 "Fitted to varying sample periods, $[\hat{\beta}]$ ran .35 to .40, suggesting that each one percentage point reduction in unemployment means slightly less than a 3 percent increment in output" (Okun [1962], p. 100) | $\hat{\ln Q} = 228 + 1.83 \ln E + .75t$ (92) (.20) (.03) 1953Q1 - 1960Q4 $R^2 = .97$ D-W = .57 $R^2_{\ln Q \ln E, t} = .74$ | = 1.83 |

Notes: 1. Variable definitions and data sources:

U = seasonally adjusted quarterly unemployment rate; Bureau of Labour Statistics; published in *Survey of current business* (April 1960, p. 22 and April 1961, p. S-11).

E = 100 - U.

Q = seasonally adjusted quarterly Gross National Product in billions of 1958 dollars; Dept. of Commerce; published in *The national income and product accounts of the United States, 1929–1965*, pp. 4–5.

t = time trend.

% gap = (PotGNP - GNP) as percentage of PotGNP where PotGNP is based on a 3.5 per cent trend line through the middle of 1955.

2. Standard errors are given in parentheses below the coefficient estimates.

$R^2_{\ln E \ln Q, t}$ = the square of the partial correlation coefficient of $\ln Q$ and $\ln E$ given t.

Source: Barreto and Howland (1993).

Today, there are many versions of Okun's Law that are applied to any economy. Hamada and Kurosaka (1984) found extremely large Okun coefficients on unemployment for the Japanese economy. Hamada and Kurosaka (1984, p. 77) report a value of 32.4 for the years 1965–1974; but Tachibanaki and Sakurai (1991, p. 1584) claim that adjustments in the unemployment measure lower Okun coefficients by about 40 to 50 per cent (from, for instance, 67.6 to 40.2). Although these authors use a variety of schemes (including correcting for autocorrelation, different specifications, varying lag lengths,

estimating within sub-periods, and adjustments to the unemployment variable) to lower the Okun coefficient on unemployment to more plausible levels, all fail to recognise that they severely overestimate the predicted output given unemployment when they use the reciprocal of the coefficient from the wrong regression.

Similarly, a study by Knotek (2009) to test Okun's Law for the USA from 1948 to 2007 (quarterly data) concludes that Okun's Law is not a tight relation. There have been many exceptions to Okun's Law, or instances where growth slowdowns have not coincided with rising unemployment.

This study also found that Okun's Law is not a stable relation over time. Part of this variation is related to the state of the business cycle. Last, the data also suggest that a weakening of the contemporaneous relation between output and unemployment has coincided with a stronger relation between past output growth and current unemployment.

For cases of developing economies, Lal et al. (2010) have studied and tested Okun's Law using a co-integration approach but found that the results of their studies do not support the implications of Okun's Law in some developing countries because of

METHOD

Data

Data were collected from online sources or official documentation and from other resources, such as the World Development Indicator (WDI online), statistical data from Indonesia's central bank, and Statistik Indonesia (BPS).

problems of asymmetry. It can be said that the interpretation of Okun's Law might not be applicable in developing countries. Various Asian developing countries are prominent examples of nations that have successfully solved their unemployment problems; for instance, Korea, Malaysia, Singapore and China are the most recent. These countries are growing rapidly because they have political stability and good governance. Pakistani, Bangladeshi, Sri Lankan and Indian governments and political leaders should adopt these role models and follow the example of those Asian countries.

1. Annual GDP at current prices from 1980 to 2013.
2. Annual unemployment rates from 1980 to 2013.
3. GDP growth from 1980 to 2013.

2. Model specifications

After using the two methods of Okun's Law (1962), we also used reciprocal

methods for Indonesia's case, thus we come up with the model of regression output on unemployment rate. We also test a problem of time series analysis to avoid 'spur regression'.

Difference model

$$Y_t - Y_{t-1} = \alpha + \beta(U_t - U_{t-1}) + \varepsilon_t$$

Where: Y_t = GDP growth; Y_{t-1} = first lag of Y_t ; U_t = the actual unemployment rate in year t ; U_{t-1} = first lag of U_t ; T = trend variable; and ε_t = error term.

Gap model

$$Y_t - Y^* = \alpha + \beta(U_t - U^*) + \varepsilon_t$$

Where: Y_t = GDP growth; Y^* = GDP potential (Y_t is regressed on trend variable and consider fitted value as potential output); U_t = the unemployment rate in year t ; and $U^* = 100 - \text{unemployment rate}$.

Okun assumed that one could use trial and error to construct a series for potential output based on the premiss

that potential output should equal actual output when the unemployment rate equals U^* . The problem with Okun's exposition of this approach is its circular logic. Because the output gap is unobservable, Okun assessed the validity of potential output when the unemployment rate was equal to U^* . As a consequence, Okun essentially used the same equation twice. First, he used it to select a good measure for potential output; then he used this measure for potential output to estimate the parameters of the equation. Therefore, in this model specification we measure GDP potential as a fitted value of regressed Y_t on the trend variable.

IV. Analysis and discussion of results

1. Recent figures for Indonesia's labour force

There have been relatively few attempts to systematically unpack the relations between economic growth to

create jobs and poverty reduction. The lack of data for many low-income countries and the difficulty of ascribing causality to correlative relations between changes in income and employment are factors that explain the dearth of research to date.

Moreover, understanding the contribution of economic growth and its relation to employment and poverty reduction cannot be complete using monetary transmission only, but it has also to consider cultural and structural aspects of job seekers and the initial conditions of poverty. In addition, Islam (2004) argue that there is less discussion of employment to explain the links between economic growth and poverty reduction. However, there remains a lack of consensus on which factors are most important for poverty reduction; economic growth or labour productivity. Coxhead and Warr (1995) find that an increase in agricultural productivity reduces poverty but Fane

and Warr (2002) detect that it has only a meagre effect.

A job opportunity in much of the literature has been defined as derived demand from consumer demand on goods and services produced by one unit of labour (Safrida, 1999; Situmorang, 2005). As can be seen in Table 2, in terms of the number of workers, the primary sector, especially agriculture, forestry, hunting and fisheries, is the dominant sector for Indonesia's people to get their income, and it is about 40 per cent of the total labour force. But it has shown a decreasing trend; 2 to 5 per cent over the period 2009–2011. Wholesale trade; community, social and personal services; and the manufacturing industry are also sectors employing vast numbers of workers (about 21 per cent, 15 per cent and 12 per cent respectively). The labour force in the agriculture sector only grew by 5 per cent during 2004–2011. Meanwhile, the growth of labour employment in

mining and quarrying, manufacturing industries, construction, finance, and community sectors, has been making a higher contribution in absorbing labour over the same period; approximately 31 per cent, 24 per cent, 23 per cent, 83 per cent and 62 per cent respectively.

Labour shifting from the agriculture and manufacturing sectors to the services sector has two important effects for the labour market in

Indonesia. First, services sectors require high skills and education, thus the demand for highly skilled labour is greater than for low-skilled labour. Second, women workers are taking advantage of this opportunity: the number of women workers has increased 4.7 per cent per year in wholesale trade, hotel and restaurant sectors from 2004 to 2009.

Table 2. Numbers of workers in economic sectors, 2004–11

| Main industry | 2004 (Feb) (‘000) | 2005 (Feb) (‘000) | 2006 (Feb) (‘000) | 2007 (Feb) (‘000) | 2008 (Feb) (‘000) | 2009 (Feb) (‘000) | 2010 (Feb) (‘000) | 2011 (Feb) (‘000) |
|---|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Agriculture, forestry, hunting and fishery | 40,608 | 41,814 | 42,323 | 42,609 | 42,690 | 43,029 | 42,826 | 42,475 |
| Mining and quarrying | 1,035 | 809 | 947 | 1,021 | 1,062 | 1,139 | 1,189 | 1,352 |
| Manufacturing industry | 11,070 | 11,652 | 11,578 | 12,094 | 12,440 | 12,615 | 13,053 | 13,696 |
| Electricity, gas, and water | 228 | 187 | 207 | 247 | 208 | 209 | 208 | 257 |
| Construction | 4,540 | 4,417 | 4,374 | 4,397 | 4,734 | 4,611 | 4,845 | 5,591 |
| Wholesale trade, retail trade, restaurants and hotels | 19,119 | 18,897 | 18,555 | 19,425 | 20,684 | 21,837 | 22,213 | 23,240 |
| Transport, storage and communications | 5,481 | 5,553 | 5,467 | 5,575 | 6,014 | 5,948 | 5,818 | 5,585 |
| Financing, insurance, real estate and business services | 1,125 | 1,043 | 1,153 | 1,252 | 1,440 | 1,485 | 1,640 | 2,059 |
| Community, social and personal services | 10,516 | 10,577 | 10,572 | 10,962 | 12,778 | 13,612 | 15,615 | 17,026 |
| Total | 93,722 | 94,948 | 95,177 | 97,583 | 102,050 | 104,485 | 107,406 | 111,282 |

Sources: BPS, 2011

Despite its achievement in absorbing large numbers of workers, the manufacturing sectors are showing

symptoms of sunset industries, indicated by low labour productivity in industries, such as textiles and apparel,

as shown in Table 3. These data also point out that the government is setting minimum wages for industrial sectors, minima that tend to be flexible. One fundamental reason is that the minimum wage in this sector is still very low compared to other developing countries in ASEAN.

Meanwhile, other data show that productivity will increase when the workers get fair compensation and benefits. In other words, the higher the wage rate, the higher the productivity of workers. However, it should be noted that such relations are only valid for those jobs that require fairly high expertise, such as motor vehicles, basic metals industries, and metal goods and equipment. According to Suryahadi (2003) and Safrida (1999), a minimum wage policy is basically not responded to by less educated workers, and for the types of jobs that do not require high skills. This is because the demand for labour in the agricultural sector is inelastic in the short term, although in

the long run it is elastic. In the meantime, a minimum wage policy would provide higher income for workers at a status above supervisor because of the increase in the minimum wage of blue-collar workers.

Julia (2003) conducted a study that measured the effect of real wages on the productivity of workers in the textile industry in West Java. Her study shows that real wage rates have a significant effect on worker productivity. An increase in real wages of 100 dollars a month is projected to increase worker productivity by 6.6 percentage points. The rationalisation behind a rise in real wages increasing production was, first, that labour productivity increased because of the continued improvement in nutrition and consequent greater resistance to disease, and this increases motivation to improve living standards. Second, the increase in education, skills and expertise will continue to improve labour productivity and ultimately will

have an effect on earnings. Thus, the results of this study support the theory of wages efficiency.

Table 3. Labour productivity in Indonesia

| Sub-sector | | 2006 ('000,000 rupiah) | 2007 ('000,000 rupiah) | 2008 ('000,000 rupiah) | 2009 ('000,000 rupiah) | 2010 ('000,000 rupiah) |
|------------|--|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 1 5 | Food and beverages | 337 | 449 | 633 | 654 | 655 |
| 1 6 | Tobacco | 222 | 298 | 365 | 348 | 344 |
| 1 7 | Textiles | 180 | 200 | 214 | 243 | 225 |
| 1 8 | Apparel | 78 | 90 | 88 | 102 | 125 |
| 1 9 | Leather and leather goods | 99 | 105 | 159 | 138 | 144 |
| 2 0 | Wood, products of wood and woven goods | 128 | 171 | 189 | 175 | 170 |
| 2 1 | Paper and paper products | 569 | 683 | 756 | 893 | 905 |
| 2 2 | Publishing, printing and reproduction | 198 | 266 | 232 | 338 | 307 |
| 2 3 | Coal, oil and gas and nuclear fuel | 1,348 | 835 | 1,746 | 1,188 | 1,029 |
| 2 4 | Chemical and goods from chemicals | 708 | 812 | 1,353 | 1,486 | 1,440 |
| 2 5 | Rubber and plastic goods | 287 | 308 | 440 | 419 | 692 |
| 2 6 | Excavation of goods other than metal | 208 | 251 | 303 | 311 | 308 |
| 2 7 | Basic metals | 1,256 | 1,685 | 1,777 | 1,694 | 2,105 |
| 2 8 | Metal goods and equipment | 289 | 318 | 319 | 505 | 480 |

| | | | | | | |
|----|---|--------|-----|-------|-------|-------|
| 29 | Machinery and equipment | 230 | 255 | 338 | 448 | 820 |
| 30 | Office, accounting and data processing | 112 | 80 | 302 | 110 | 121 |
| 31 | Electrical machinery and apparatus | 398 | 408 | 1,120 | 620 | 696 |
| 32 | Radio, television and communication equipment | 328 | 310 | 327 | 423 | 373 |
| 33 | Medical equipment, gauges, and navigation, optical and chronometric equipment | 238 | 179 | 122 | 138 | 186 |
| 34 | Motor vehicles | 812 | 903 | 1,043 | 1,116 | 1,344 |
| 35 | Other transport equipment | 638 | 841 | 982 | 1,218 | 893 |
| 36 | Furniture and manufacturing | 86 | 135 | 125 | 101 | 106 |
| 37 | Recycling | 223 | 209 | 120 | 118 | 167 |
| | National Productivity | 271,79 | 272 | 334 | 437 | 461 |

Sources: National labour survey, BPS.

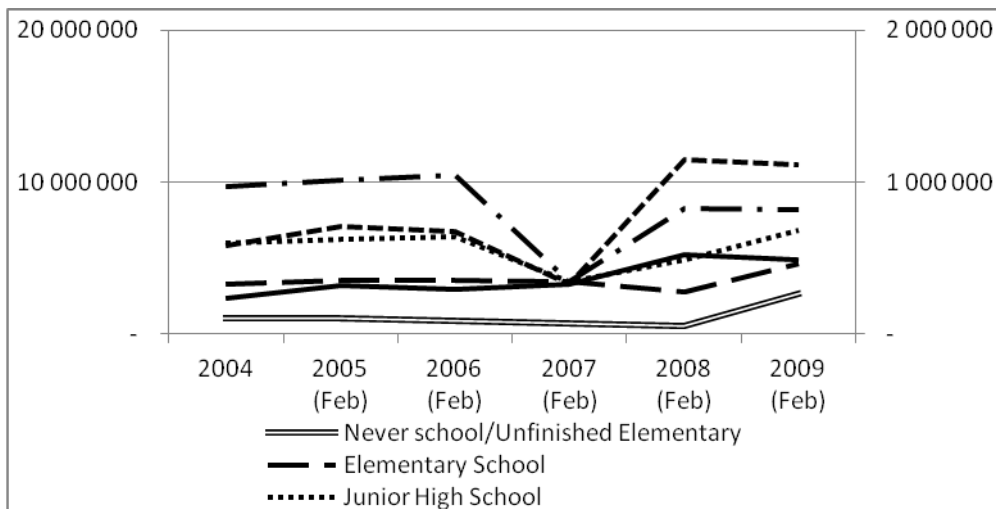
A minimum wage policy is often a cause of conflict in industrial relations between labour and employers. In 2013, local government in DKI Jakarta, for instance, decided to increase the nominal monthly minimum wage by 40 per cent, from 1.5 to 2.2 million rupiah. This policy pushed companies to relocate their business and factories from Jakarta to East and Central Java.

The increase in the cost of labour is higher than the cost of building new factories and new capital investment in land and machinery.

If we look at the skills of the labour force and their educational attainment, we will find that most of the unemployed have not graduated from junior high school, senior high schools, or other academies. The explanation for

this is that, for people in this educational category, very many have been laid off, particularly in the period 2004–06. Despite unemployment remaining high in 2007, the unemployment rate for those in this educational category fell significantly, but has increased since 2008. These figures also tell us that the unemployment rate is relatively constant for those with a poor education, indicating that workers with a low education are willing and able to

do the kind of jobs that require few skills and, consequently, they are offered lower wages. It also should be noted that the unemployment rate for such workers with low education will decrease significantly when the unemployment rate for those with middling and higher education goes up slightly, as in 2008–2009. We might argue that these figures indicate a mismatch between supply and demand for labour.



Sources: BPS National Labour Survey, various editions.

Figure 2. Unemployment rate based on education level

Recent revisions of the dual labour market model have challenged the notion of the informal sector as a free-entry sector of last resort. Informal sector employers may feel compelled to offer terms and conditions of employment that are comparable to those in the formal sector to attract good workers and reduce turnover. Instead of representing a distortion-free sector, the informal sector will be subject to spillover effects of formal sector regulations. Other responses to the standard dual model have asserted that it is insufficient to explain the 'multi-faceted employment dynamics in developing economies' (Chen et al., 2005). Suggesting that the formal and the informal sectors are subject to internal segmentation, these models draw attention to 'upper tier' and 'easy entry' activities in all sectors of the economy (Fields, 2005). They accept that 'more productive' and 'less productive' jobs can exist in

agriculture, in the urban formal sector, and in self-employment.

2. Okun's difference and gap model analysis

Among economists, it is agreed that output growth in Indonesia is currently under its potential because its growth has been below 6 to 7 per cent in every year. It might be argued that there is some cost to pursuing high economic growth. The government should maintain internal and external balances for the national budget as well as macroeconomic indicators. If the government were to give a greater priority to high economic growth, other macroeconomic components of the economy would not be in harmony. Therefore, to avoid distortions the government decided to maintain the stability of all macroeconomics indicators and to keep economic growth positive and in a sustainable range of 5 to 6 per cent.

Then the problem becomes whether this rate of economic growth can reduce unemployment. The Ministry of Manpower (2011) has reported that Indonesia's labour market has not fully recovered from the financial crisis in 1997. The number of workers in the informal sector remains high and so to is underemployment, and opportunities for young people to enter the labour market have lessened in the past decade. The national unemployment rate in 2009 was 8.14 per cent but for younger workers, that is, those aged 15 to 24 years, it was 22.2 per cent, and it was noted as the highest in the world at the time. Indonesia's government should pay more attention and take

responsibility for solving this problem quickly.

As mentioned earlier, Okun's Law has implications for economic policy in helping to anticipate further development of unemployment for a given projected growth level. We confirm that all variables relate to time series data from 1980 to 2013. Data are stationary already, with no trend indicated, so we can run OLS methods to regress between two variables. Okun's model is *not* significant at the 95 per cent level of confidence as calculated in Tables 3 and 4. Unfortunately, the result of OLS regression for first and second models is not significant for constant as well as unemployment variables.

Table 4. Regression result of Y on X of Okun's Law difference model

| Source | SS | Df | MS | Number of obs = 33 F(1, 31) = 0.72 Prob > F = 0.4012 R-squared = 0.0228 Adj R-squared = -0.0087 Root MSE = 6.2092 | |
|------------------|------------|------------|------------|--|-----------|
| Model | 27.9304007 | 1 | 27.9304007 | | |
| Residual | 1195.16476 | 31 | 38.5537018 | | |
| Total | 1223.09516 | 32 | 38.2217236 | | |
| | | | | | |
| ΔY_t | Coef. | Std. error | t-test | P>t | Beta |
| | | | | | |
| $\Delta \ln X_t$ | -.9527711 | 1.119394 | -0.85 | 0.401 | -.1511153 |
| _cons | .033383 | 1.090225 | 0.03 | 0.976 | . |

Sources: Stata result, 2013

According to this estimate, the difference model of Okun's Law states that there is no linear relation between output and unemployment rate for Indonesia from 1980 to 2013. However, the sign of β coefficient is negative, similar to traditional Okun's Law. This sign indicates that one percentage increase of output growth will cause a reduction of 0.95 per cent in the

unemployment rate. But, this interpretation could not hold because the t-test and its probabilities do not show significance. Therefore, it could be other factors that have a significant influence in reducing the unemployment rate or boosting economic growth.

Table 5. Regression result of Y on X of Okun's Law gap model

| Source | SS | Df | MS | | Number of obs = 34 F(1, 28) = 0.00 Prob > F = 0.00 | |
|-------------------|------------|-----------|------------|-------|---|-----------|
| Model | .001152453 | 0 | . | | R-squared = 0.0143 | |
| Residual | .07969852 | 33 | .002415107 | | Adj R-squared = -0.0143 | |
| Total | .080850973 | 33 | .002450029 | | Root MSE = .04914 | |
| | | | | | | |
| Gapy ² | Coef. | Std. Err. | T | P>t | [95% Conf. | Interval] |
| | | | | | | |
| gapx ² | .0011431 | .0000891 | 12.84 | 0.000 | .0009619 | .00132 |

Sources: Stata result, 2013

The gap model of Okun's Law shows there is a linear relation between the gap of output and the gap of unemployment. Because potential output is a fitted value of an output predictor at 0.053 and the natural rate of unemployment is 100 per cent less the real unemployment rate, then, without including constant terms, this model shows significant relations and thus this study supports Lal's studies. The study by Lal et al. (2010) was to examine the gap between output and unemployment in some selected Asian countries and to show that the interpretation of Okun's Law might not

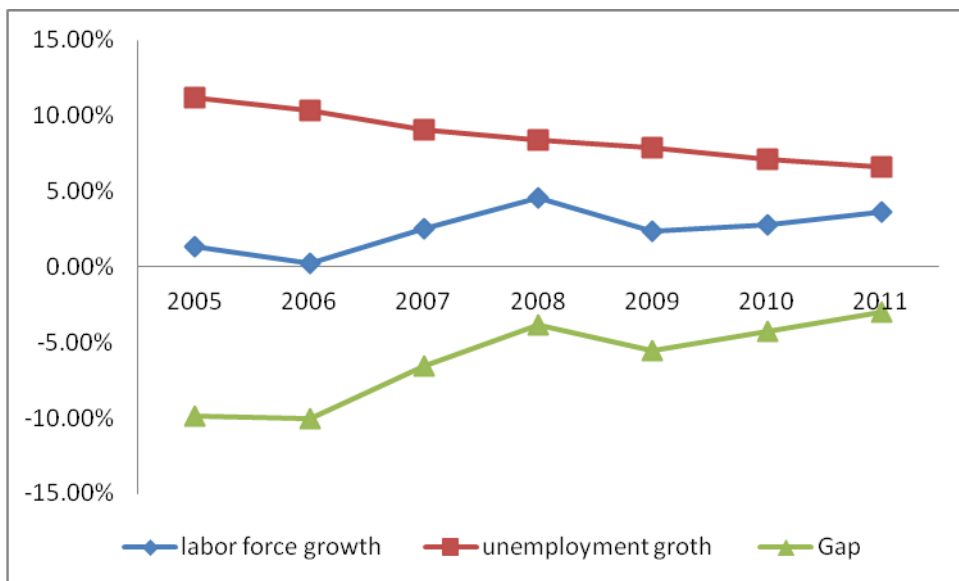
apply to all countries. Their study concluded that one important finding from various studies analysing the application of Okun's Law in developing economies, is the positive relation in fluctuations between growth and unemployment, where a smaller output gap will be followed by a lesser unemployment rate, and vice versa (Lal et al., 2010).

China, Korea and Taiwan have been able to create many jobs, although disguised unemployment remains high compared to the unemployment rates in those countries (Li, 2003). However, we cannot compare China with other

South Asian countries and with Indonesia; these countries have less opportunity to create jobs because of the low skills and competency of their workforces.

Turning to Indonesian experience, the gap between the unemployment rate and labour growth reduced significantly from 2005 to 2011 as shown Figure 3. This implies that, in dealing with unemployment problems, the government should create new jobs and provide facilities to support job opportunities or job creation. According to Hull (2009, p. 74–75), there are three stages in observing

correlations between employment and productivity growth, poverty reduction and the broader institutional and policy environment. First, it separates economic growth into changes in the quantity and the quality of jobs. Second, it ascertains whether improvements in employment or productivity are most readily associated with poverty reduction, and whether this pattern changes by sector. Third, it highlights the broader policy and institutional environment that is associated with a poverty-reducing pattern of growth.



Sources: BPS National Labour Survey, various editions.

Figure 3. Unemployment rate, growth of labour and the gap between unemployment and labour

The government of Indonesia has issued some popular policies that focus on an alleviation strategy that is commonly called the ‘triple track strategy’. This strategy consists of promoting policies that are related to the slogans ‘pro-growth’, ‘pro-poor’, and ‘pro-employment’. But how to realise these policies in the real world? It might be easy to calculate the economic benefits and to justify what

the government has done to implement the strategy, but to apply all the strategies intensively in the real world for all economic policies in a holistic and comprehensive manner is a hard work for all government agencies.

According to Indonesia’s national planning strategy, all policies should be well-coordinated in efforts to reduce poverty, achieve high economic growth and to create jobs. However, it is not

easy to coordinate and integrate all the policies systematically. It is commonly known that Indonesian bureaucratic reform is running slowly, although governance is intended to be world-class by 2025. Bureaucratic reform goals include increasing the capacity, performance and accountability of bureaucrats; establishing clean government, free of corruption, collusion and nepotism; and increasing the quality of public services. The main objective of all reformation agenda is establishing good governance in a most competitive community.

According to World Economic Forum survey in 2009 to capture a broad range of factors affecting an economy and its business climate, for Indonesia, the greatest handicap for creating a climate conducive to investment is inefficient government bureaucracy and the least problem, among ten indicators, is an inadequately educated workforce. Currently, Indonesia has problems of

high unemployment, increasing numbers of people who work in the non-formal sector; low labour productivity; high disparities in minimum wages between Indonesia's regions; declining productivity in manufacturing; and an increasing number of unemployed youth (defined as those 15 to 19 years of age). To overcome these problems, there are two kinds of policies; demand side and supply side policies. In terms of aggregate demand policies, the government should reduce inflation and ensure that it is kept under control at a low rate. Such a policy is important to ensure that the real minimum wage of workers is adequate for their needs. The government should also set interest rates that are sufficient to stimulate investment in those productive sectors that it believes to be drivers of economic growth. In addition, with fiscal policy, the government must provide incentives that will encourage the creation of an investment climate

that will lead to the creation of jobs and absorb labour in large numbers.

On the other hand, there are supply side policies that comprise, first, government efforts to create flexible labour markets, opportunities for jobs, improvements in the quality of human resources through education, training and health. Second, the government should make regular updating part of the implementation of various programs in order to expand opportunities for employment. Third, improve policies related to labour migration, and improve labour market efficiency by supporting programs that will enable the dissemination of labour market information. Fourth, arranging a variety of job fairs, as well as improving training for job seekers. However, it should be noted that these policies are important, but not sufficient, conditions to guarantee welfare; labour issues will always be related to conflict and problems between employees and employers.

Since 2000, various government policies have been launched: law 21 of 2000 on trade/labour unions; act 13 of 2003 on manpower; law 2 of 2004 concerning industrial relations disputes settlement; and law 39 of 2004 on the protection and development of Indonesian workers abroad. In essence, those laws and regulations are intended to deal with layoffs and labour disputes only, and have not solved the core labour problems that are caused by systemic problems consequent on economic crises or other policies that make working conditions more onerous.

Currently the Indonesian government is attempting to revise (manpower) act 13 of 2003. The act has been criticised for discouraging entrepreneurial activities and hindering foreign investment in Indonesia, and, as a result, increasing unemployment significantly. The surplus of employees' social safety funds should be returned to labour organisations to build housing for workers in industrial

centres. Thus, workers will be able to set aside income to improve their living standards. The situation now is that any surplus from employees' social security funds is taken as national income. Indonesia should set up and maintain coordination programs for government officials, employers and labour organisations to enable them to solve jointly and in good faith a variety of employment problems, thus making for win-win solutions.

CONCLUSION

The purpose of economic development is to improve public welfare by reducing poverty and unemployment. Theoretically, the relation between economic growth and unemployment, according to Okun's Law, is negative. However, our study found that the Okun's Law difference model cannot be applied to the Indonesian economy because growth is not an influential factor in reducing the unemployment rate. In fact, the unemployment rate

tends to be influenced by previous performance. However, the second model of Okun's Law might work for the Indonesian economy, because the output gap has a linear relation to the unemployment rate gap. It can be said that the economy is below its potential, meaning that Indonesia should have higher economic growth. Therefore, it is recommended that Indonesia should continue to implement reforms to achieve higher economic growth and sustainable development.

Indonesia's unemployment is more probably influenced by the current problems of the national labour force. There are several problems that need to be solved quickly. These include a high unemployment rate; an increasing number of people who work in the non-formal sector; low labour productivity; large disparities in minimum wage settings among Indonesia's regions; declining productivity in manufacturing; and increasing rates of youth unemployment (that is, those

aged 15 to 19 years). Thus, applying demand and supply side policies that are in harmony can improve the quality of labour as well as reduce the unemployment rate. In addition, in terms of increasing endogenous factors of growth by increasing the quality of human resources, the government should promote shifting job opportunities from primary sectors to secondary or tertiary sectors; this strategy will help to increase labour absorption. Moreover, the more intensive use of information and communication technology in all economic sectors will drive economic growth by creating closer and faster links between producers, markets and consumers.

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