TECHNICAL ADVANTAGES AND LIMITATIONS FOR THE APPLICABILITY OF OKUN'S LAW AND PHILLIPS CURVE TO MACROECONOMIC ANALYSIS IN THE CONTEXT OF THE MALAWIAN ECONOMY

By

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In an economy people and industries, demand the supply of inputs, services and goods. However the sophisticated relationship between inputs, goods, and the price attached to the goods and inputs is a puzzle as presented by Knotek (2007). He argues that from the beginning of 2003 through first quarter of 2006, real gross domestic product (GDP), a measure of the country's economic success, determined from its output, of the United States (US) grew at an average of 3.4 percent annually and unemployment fell as expected. Over the course of the next year unemployment continued to go down regardless of a slow growth to less than half of earlier growth rate in the economy. The expectation of policy makers and economists was that of increase in unemployment, which was not the case. Further to that Nugent (1982) in studying the economy of Latin America confesses of the controversy that exists in the relationship of the same unemployment and the increase in price levels, commonly known as inflation. He presents that the relationship is unstable, as was the conclusion in the latter case. Same was the finding of Case and Fair (1999) on US economy for 1960-1997, with the breakdown of the relationship in 1970. He then calls it one of the more controversial subjects in macroeconomics during the last two decades. Nevertheless Knotek states that the relationship between unemployment and output enjoys empirical support and Friedman claims that the relationship between unemployment and inflation plays the important role of the "missing equation". The former relationship is what has come to be known as Okuns law taking after the early 1960s economist Arthur Okun, while the latter Phillips curve, named after the finding of the economist Phillip in 1958. The two forms the major discussion of this study with special reference to Malawi, there advantages and limitations in their applicability based on empirical evidence.

The first part of this paper presents an understanding of the Phillips curve and Okun's law, their advantages and limitations. The second part presents the analysis of the Malawi economy, and the applicability of the two theories to the economy.

As earlier stated the Phillips curve generally presents an inverse relationship between unemployment and inflation: inflation rises as unemployment falls, and inflation falls as unemployment rises. Since the two major goals of policy makers are to keep both inflation and unemployment low, Phillips discovery was a conceptual breakthrough at the same time posing a challenge on how to achieve the two at the same time with the existing relationship. The chain of the basic ideas behind this is that as more people work the national output increases, causing wages to increase, causing consumers to have more disposable income *(ceteris-paribus)* resulting in high demand of goods and services, finally deriving the prices of both goods and services up. In comparing countries Bruno and Williams (1998) adds that the counties with low growth have low tax receipts and are therefore tempted to print more money as a revenue source, causing inflation.

The Phillips curve presented a guide to policy makers as regard a choice of unemployment and inflation. Many economists believed there was a permanent stable relationship as Samuelson and Solow in 1960 diverted from wages that Phillips referred to and concentrated on inflation (Wikipedia). Further to that as Friedman claims, the relationship plays the important role of the "missing equation". However studies have shown a breakdown in the relationship. The Case and Fair (1999), Bruno and William (1998) and Nugent (1982) studies stated earlier on, have found that the Phillips curve offers a short-run relationship. Phillips used data for a few periods of 1960s, however over long period the relationship is quite different. Nugent further states that its rationale is best ambiguous and the relationship is unstable. However today the curve has been modified in the short run referred to as "expectations-augmented Phillips curve" since it shifts up with a rise in inflation, and in the long run "NAIRU" OR "LONG RUN Phillips curve" with argument that in the long run monetary policy cannot affect unemployment. Further complication is brought by Lucas with his Lucas monetary misperception (the confusing of a change in demand of a product and a change in demand due to an increase in money supply)

arguing that the inclusion of the misperceptions settles the debate of long or short run relationship *(However is not the focus of this paper)*.

Contrary to a decrease in unemployment bringing a negative effect on the economy of increased inflation, there exists a positive relationship between unemployment and national output, a finding of Arthur Okun (1962). The Okun's law generally presents a relationship between output gap and unemployment gap. Where, output gap is the deviation of the actual or current GDP from the potential real GDP. The argument is that as more people work the expectation is an increase in output. He quantified the relationship to one percent increase in unemployment above a "natural" level, GDP will decrease by from two to four percent from its potential (Wisegreek.com). Okun's law has been noted for describing a measurable trend of more unemployment and low GDP. People who are nor working don't produce and also cut on their spending significantly in consequence discouraging investment by businesses. Further it has provided an intuitive sense that unemployment has multiplier effect that is not limited to one-for-one type of trade-off. The law has enjoyed empirical support since it is a statistical relationship rather than a structural feature of the economy (Knotek, 2007). He further argues that the law can be used as a forecasting tool. However over long periods he argues that changes in the relationship are hidden, unless one uses rolling regression estimates. It has been found that there is no stable relationship and in addition, there has been no strong relationship. Some economists have argued that Okun's Law is really not a law, but more of a tendency that can vary based on a number of factors. Although it can be expressed mathematically, and holds under real world scrutiny, it is an imperfect theory, as a result of unpredictability in the exact amount unemployment that constitutes natural unemployment, nor can it be. The other imperfection is that the effect of a given increase in unemployment could be magnified or diminished on variable like productivity, and general sentiment regarding the economy. Lastly the definition of unemployment as not having a job but still seeking one, also colors the data slightly because unemployment does not disregard those that stop searching for a job after a certain amount of time (the peeved job seekers).

As observed from the discussion above, the application of the two theories must be exercised with caution. The rest of the paper concentrates the application to Malawi. Adopting the

standard definitions of output, and inflation, the two can be defined as the total production of a country over a specified period of time usually a year and the general increase in price levels respectively. However the labour market of Malawi poses a general challenge as how to define unemployment as observed on limitations of Okun's law above. Similary the International Labor Organisation (ILO) has defines it as those that are 15 years and above ready to work but are not engaged in any work. In a Malawian setting, there has been a variation as regarding those who are in the labour force. Some definitions have targeted those 10 years and above. The definition used in Welfare Monitoring Surveys (WMS) by National Statistics Office (NSO), refers to those not working during the reference period but were looking for and ready to work during the last four weeks preceding the survey, while unemployment rate has been defined as unemployed persons as a proportion of persons in the labour force (NSO, 2008). As presented in the Integrated Household Survey of 2004-2005 by NSO, 80 percent of the population is employed in agro-based industry, leaving 20 percent in formal sector. With such statistics the unemployment rate has been so small hovering around 1-6 percent as those in agriculture and self employed are taken as employed. The determination of the rate in Malawi has been scant because the unemployment data is not constantly collected. However the labour bureaus participation the period before 1992 in collection of registered job seekers data will help in determining the rate in relating to total employed as given by year statistics books by NSO and Economic Planning and Development (EP&D). This will a little compromise on those who did not register with the bureaus, however for analysis sake it is still better than no figure. The years that stand out are only those with WMS or Population Census. The data set used is of 20 years 1980-2009 *(Refer to appendix for data).*

The application of Phillips curve for the Malawi economy does not hold for the long run as stated in its limitations. It is generally unstable. However the analysis of the period 2000-2009 holds signifying the holding in the short run. It shows a negative correlation of 0.3892 and a one unit decrease in unemployment increasing inflation with 1.4409 percent. The graphs below illustrate the relationships. The curve therefore illustrates that there exists a relationship of inflation and unemployment in Malawi in the short run which can offer a guidance on policy.

However the long-run relationship is ambiguous and no relationship can be drawn from the curve.

PHILLIPS CURVE FOR MALAWI (BASED ON 1980-2009 DATA)
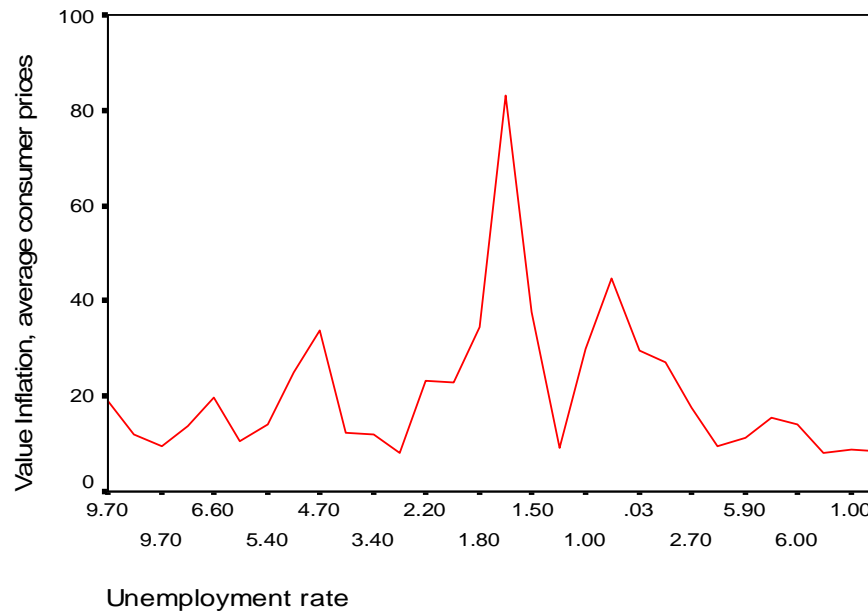
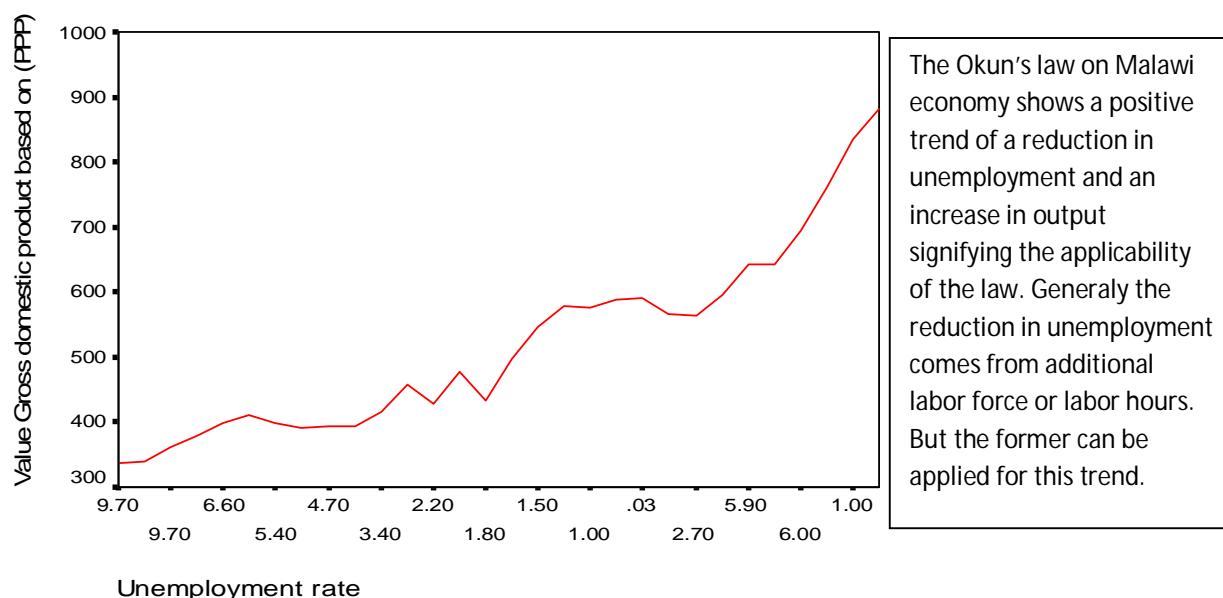## PHILLIPS CURVE FOR MALAWI (BASED 2000-2009 DATA)
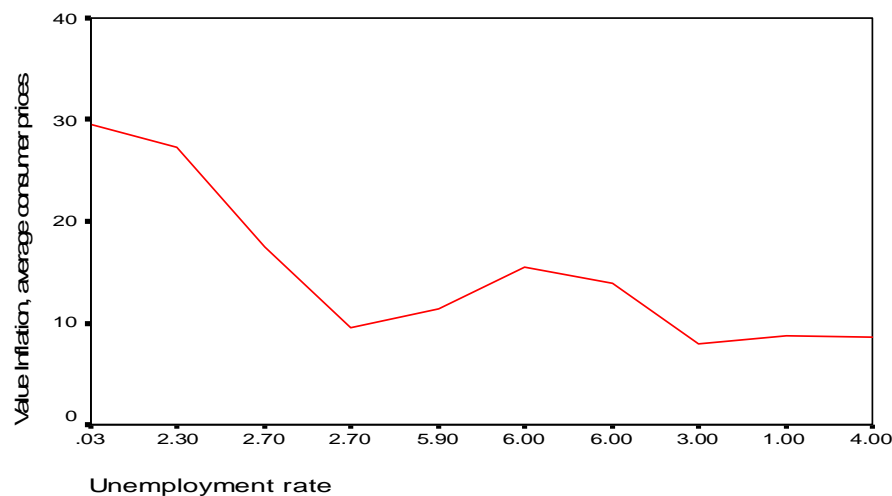
In the short run there exists a relationship between unemployment and inflation. The data set of 200-2009 shows a declining trend in inflation with increase in unemployment.

The application of the Okun's Law holds for the Malawi Economy for the entire period of study. A simple regression of the data set shows a negative relationship between unemployment and output, with a negative coefficient of 20.4641, and a negative correlation coefficient of 0.3879 signifying a weaker relationship as observed by Knotek (2007) in his study of how useful is

Okun's Law. This can also be shown by graph on Malawi below. The negative coefficients signify that increase in unit unemployment rate will lower the country's output by 20.4641 percent. With such an explanation it is clear that the law can provide a measurable trend as earlier stated, it has enjoyed empirical evidence on its applicability in Malawi and can be used for forecasting as given by the coefficients. However as stated the weaker relationship limits the application with all easy. It then shows that the GDP also depends on other factors more than the employment. The other limitation to Malawi is that unemployment data is not collected as assumed by the model. This brings issues of interpolating hence adding to the trade-off from the actual point being forecasted.

OKUN'S LAW AND MALAWI (BASED ON 1980-2009 DATA)

The Okun's law on Malawi economy shows a positive trend of a reduction in unemployment and an increase in output signifying the applicability of the law. Generaly the reduction in unemployment comes from additional labor force or labor hours. But the former can be applied for this trend.

The availability of the natural rate of unemployment is a farfetched scenario as to how to get it empirically in Malawi. Lastly the rate of that Okun gave as stated above does not apply to Malawi as shown by the analysis.

YEAR	Gross domestic product based on purchasing-power-parity (PPP) per capita GDP	Gross domestic product Percent Change	Inflation, average consumer prices	Inflation Percent Change	Unemployment rate
1980	337.664		19.19		9.7
1981	340.356	0.797242229	12	-37.4674	8.1
1982	360.859	6.023986649	9.524	-20.6333	9.7
1983	378.421	4.866720797	13.768	44.56111	7.3
1984	399.635	5.605925675	19.745	43.41226	6.6
1985	411.937	3.078308957	10.638	-46.1231	6.7
1986	397.779	-3.436933317	14.183	33.32393	5.4
1987	391.254	-1.640358088	25.053	76.64105	0.6
1988	393.102	0.472327439	33.838	35.06566	4.7
1989	392.812	-0.073772202	12.453	-63.1982	4.1
1990	415.237	5.708837816	11.857	-4.786	3.4
1991	456.726	9.991643327	8.227	-30.6148	2.7
1992	428.081	-6.271812859	23.236	182.4359	2.2
1993	477.124	11.45647669	22.775	-1.98399	2
1994	433.984	-9.041674701	34.659	52.18002	1.8
1995	497.999	14.7505438	83.148	139.9031	1.7
1996	547.303	9.900421487	37.733	-54.6195	1.5
1997	579.212	5.83022567	9.137	-75.7851	1.4
1998	575.93	-0.566631907	29.779	225.9166	1
1999	588.866	2.246106298	44.759	50.30391	0.2
2000	591.388	0.428280797	29.597	-33.8748	0.03
2001	566.852	-4.148883643	27.247	-7.93999	2.3
2002	564.317	-0.447206678	17.43	-36.0297	2.7
2003	596.09	5.630346064	9.586	-45.0029	2.7
2004	643.835	8.009696522	11.424	19.1738	5.9
2005	642.843	-0.154076743	15.464	35.36415	6
2006	694.569	8.046443688	13.922	-9.97155	6
2007	760.913	9.551822785	7.949	-42.9033	3
2008	835.715	9.830558816	8.71	9.573531	1
2009	880.883	5.404713329	8.6	-1.26292	4