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Non-Linear Analysis of Post Keynesian Phillips Curve in Canada Labor Market

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Abstract

This paper aims to analyze Post-Keynesian Phillips Curve by using non-linear ARDL approach and non-linear Granger causality method for the period from 1957 to 2015 in Canada. This study is differed from other empirical paper by using non-linear ARDL method which determined there is long-run asymmetric relationship between the selected macroeconomic variables for Canada. Canada exhibits bi-directional causality relationship between inflation-unemployment, unemployment-economic growth and inflation-economic growth which refers that the country has flexible labor market.

1. Introduction

Phillips Curve is one of the most controversial issue among school of economic thought which is a considerable first approach to realizing the implications of that relationship for economic policy. Namely, it implies a fundamentally empirical relation between labor markets and monetary policy (Cooley and Qandrini, 1999).

Although it is commonly known that the structural composition of inflation and unemployment bases on Phillips (1958)'s study, the first statistical scatter diagram and downward-sloping convex trade-off curve of Phillips Curve, was presented by A. J. Brown (1955) and Paul Sultan (1957). The scatter diagrams plotted the relationship between annual wage inflation rates and unemployment rates for the United Kingdom from 1880 to 1914 and from 1920 to 1951 and additionally for the United States from 1921 to 1948. By these diagrams it is deduced that the two

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variables are inversely related and the relationship between these variables is nonlinear because wages change at a faster rate at low rates of unemployment than at high rates. Thus, it can be stated that the Sultan Schedule is the first diagrammatic representation of the Phillips Curve which represents a stable trade-off between inflation and unemployment (Humphrey, 1985).

The original Phillips Curve was constructed by Phillips (1958) and gained popularity by Samuelson and Solow (1960). He proposed a negative and stable relationship between the rates of unemployment and nominal wage changes in United Kingdom over the period 1861 and 1957 in his famous paper. This model was examined in industrialized countries and a stable long-run trade-off between the variables was obtained. Accordingly, there was a stable long-run trade-off between the variables and the economy could reach to higher level of productivity and employment rate only at the expense of a persistently higher rate of inflation (Wang, 2004).

By the oil crises in the 1970s, many countries have experienced an usual change in relation between inflation and unemployment such that inflation and unemployment positively correlated rather than negatively related. Stagflation led to controversion of Phillips Curve which became an unreasonable, most debated macroeconomic point and criticized severely by Friedman (1968), Phelps (1968), Lucas (1973), Fischer (1973), Taylor (1980) and among others asserting that the Phillips Curve relationship is only a short-run fact, in the long-run trade-off between inflation and unemployment does not occur. Instead, theory estimates that the trade-off between the variables vary with changes in agents' inflation expectations, and inflation expectation of agents covary with economic environment changes. Thus, theory predicts that the relationship between current unemployment and future inflation is expected to change as economic conditions alter and there is no stable relationship (Atkeson, Ohanian; 2001).

After 1970s, by Friedman-Phelps's (1968) model, consumers' inflation expectations have gained popularity and played a critical role in new interpretation of Phillips Curve. According to this theory, an upsurge in aggregate demand, reduces unemployment and enhances inflation. However, decreasing unemployment is not so possible since economic agents have adaptive expectations which means they generate forecasts of future expectations based on their former experience. In other words, workers realize that high inflation diminishes their real wages hence they demand higher wages to compensate for the reduction. This situation causes unemployment augmentation. As a result, the unemployment situation returns to its previous condition. At that point, the output impact also disappears.

In this model of the Phillips Curve, adaptive inflation expectation depiction points out that in the short run, real inflation is greater than expected inflation but in the long run, inflation expectations are fully realized and hence real inflation is equal to expected inflation. The short-run Phillips Curve is downwardly sloping yet, it becomes vertical in the long-run. The actual unemployment rate is the same as the natural rate of unemployment (which later became commonly known as NAIRU or non-accelerating inflation rate of unemployment). Thus, running up nominal demand as a means to lower the unemployment rate yields best results in the short-run but not in the long-run. In a similar manner, money could not be neutral in the short-run but is in the long-run. One of the major policy inferences is that the natural rate of unemployment (NAIRU) is independent of the inflation rate. Lucas (1972,1973) replaced "adaptive expectations" with "rational expectations" so it does not promote any trade-off between the variables not only in the long-run but also in the short-run (Pattanaik and Nadhanael, 2013).

Phillips Curve relation depends on NAIRU is widely accepted after 1970s has pointed out an inverse and stable relationship between the variables. This was a significant contribution because of being a prioneering and frame-breaking development of macroeconomic policy which was described as unemployment rate that would correspond to zero wage inflation.

Lucas's (1972, 1973) rational expectations approach substitute for adaptive expectations approach. Accordingly, economic agents consider their past information to predict future thus they do not make mistake in their future expectations. Thus, not only in the long-run but also in the short-run, inflation and unemployment have no trade-off relation which means short- and long-run Phillips Curve stays vertical. Only as a consequence of "surprise shocks" deviations from natural rate may occur.