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INITIAL UNEMPLOYMENT CLAIMS AND THE ECONOMIC CYCLE: THE CASE OF BARBADOS

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Abstract

Initial unemployment claims is one of the key leading indicators of the economic cycle. Yet little work has been done on examining the importance of this variable in the Caribbean. This study attempts to rectify this by utilising a VAR model to investigate the relationship between initial unemployment claims and several key economic variables: the unemployment rate, gross domestic product and inflation. It also considers whether initial unemployment claims improves the forecasting performance of key macroeconomic indicators. Given the relatively higher frequency of initial claims data, it provides useful insight in forecasting both the unemployment rate and output.

Keywords: Initial Unemployment Claims, innovation accounting, Barbados

1. Introduction

Labour market indicators are quite essential in assessing the economic performance of an economy especially during periods of uncertainty as history has shown that higher levels of unemployment usually accompany a reduction in real GDP. A useful indicator of the level of employment in the economy is the number of unemployment claims received within a particular period. Therefore, unemployment claims can aid in determining the performance of the private sector in terms of its general contribution to economic activity, as in the majority of cases during recessions; governments are reluctant or quite slow to lay-off public workers. Thus a fall-off in the labour force is primarily indicative of a reduction in demand within the private sector.

In the literature, unemployment claims is known to have an inverse relationship with the change in employment - an increase in claims is usually associated with a fall-off in employment while a reduction in claims indicates that employment is rising. This relationship among claims, unemployment and real GDP provides a platform for forecasting employment fluctuations and changes in real GDP. This paper examines the impact of initial unemployment claims on growth of real GDP, inflation and unemployment in Barbados and whether this variable is useful for predicting future values of unemployment and fluctuations in economic activity.

The structure of this paper is as follows: section two provides a review of the features of the unemployment insurance scheme in Barbados; in section three, a review of the existing literature is undertaken while section four of the paper presents the data and methodology; section five gives the empirical findings and we discuss the conclusion and policy implications in section six.

2. The Unemployment Insurance Scheme in Barbados

Unemployment insurance (UI) in its basic form provides income support for recently laid-off workers as they try to find new employment. The major motivation for unemployment insurance schemes is consumption stabilisation as benefits are paid to workers whose consumption is likely to contract in the event of unforeseen severance. Unemployment insurance also acts as an automatic fiscal stabilizer although this objective is dependent on its coverage of the labour force and the sufficiency of the Scheme's reserves. Indeed, the three most salient aspects of any scheme are its coverage, benefits, and financing.

The Unemployment Benefit Scheme was introduced on 5 July 1981 as a branch of the National Insurance and Social Security Scheme. At the time of its introduction, the UI scheme was unique in the Caribbean and rare in the developing world. Workers and employers in Barbados paid into the new UI system for about one year in order to build up its reserves after which workers were then eligible to receive benefits the following year. The objective of the Scheme is to provide financial relief to employees, who because of total separation, lay-off or short time, suffer total or partial loss of earnings. Coverage is provided to employed persons between sixteen and sixty-four years. However, permanent government employees and self employed persons are not eligible for unemployment benefits and hence are not required to contribute to the Scheme.

To qualify for unemployment benefit from the Barbados National Insurance Scheme requires an individual to be actively insured for at least thirty-two weeks, as well as to have at least twenty contributions paid or credited in three consecutive quarters ending with the quarter, or one before that, in which the individual became unemployed. Given the start of a claim, one is not allowed to reclaim until a period of fifty-two weeks has passed.

In order to claim for unemployment insurance the worker must have been contributing to the unemployment fund usually when he/she is employed (that is partial insurance premium), which goes towards the income the employee receives on becoming unemployed. An individual is required to complete a claim form, register at the National Employment Bureau and report to the Unemployment Section every two weeks after qualifying. Funds are not paid to an individual during the first three days of unemployment unless the person is unemployed for three weeks or more. The current daily rate of unemployment benefit is 60% of a person's average insurable earnings divided by six days per week as benefit is received for each day excluding Sundays for a maximum of twenty-six weeks providing the individual remains unemployed. Effective 4th January 2010, the maximum monthly insurable earnings limit increased from \$3720 to \$3900.

3. Literature Review

Much of the literature on unemployment insurance schemes focuses on their aggregate effects on labour markets. To a large extent, the issue of whether unemployment insurance serves as an incentive to extend joblessness is a traditional one. However, this matter has received an extended examination in recent years with the emergence of job search and labour market turnover theories, which emphasize the dynamic nature of unemployment and its duration. This body of work is wide-ranging [Hall et al (1975), Englander and Director (1986), Girtz and MaCurdy (1997), Solon (1986), and Jurajda and Tannery (2003)]. This paper does not explore these in depth. Rather, the authors focus on whether adding jobless claims to the forecasting tool/kit improves output and unemployment forecast in Barbados and what impact unemployment claims has on macroeconomic variables.

There is in fact considerable literature which argues that labour market data can be used to predict quarterly output. Miller and Chin (1996) and Koenig et al. (2001) argue that monthly hours worked (in the case of the former), and monthly unemployment (in the case of the latter) are significant predictors of current quarter GDP growth. Similarly, Gavin and Kliesen (2002) found that some labour markets do help to predict GDP growth.

The issue of the ability of unemployment to accurately forecast claims in GDP is actually more complex than first appears. McConnell (1998) has argued that the reliability of claims in predicting employment depends on the state of the business cycle. Initial unemployment claims serves as a useful tool in forecasting employment during recessions but very early in economic expansions lose predictive power and actually worsen forecast accuracy. More generally, scholars such as Hall (2005) have argued that the job finding rate is at the front and center of efforts to explain unemployment fluctuations.

To the authors' knowledge, while work in the area of unemployment in Barbados is actually fairly common, research drawing upon the initial claims data is actually limited. Kellman (1996) conducted a comprehensive review of Barbados' National Insurance Scheme, and noted the difficulties faced by the unemployment insurance scheme in ensuring its viability in the late 1980s and into subsequent recapitalization, following a succession of rate increases from 1991. Perhaps, the closest analogue to this paper is Downes and Nunez (2005) who examined the labour market effects of unemployment insurance in Barbados. Econometrically, the authors used an error correction model and found that changes in output better explained claims than changes in unemployment.

More generally, Craigwell and Warner (2000) provided a review of the structural characteristics of the labour market by examining the determinants of the labour force, employment, and wages using an autoregressive distributive lagged approach. Their study also provides a succinct review of the parameters generated by past studies of the Barbadian economy, and in some cases, Trinidadian labour market.

4. Data and Methodology

4.1. Data

This study investigates the impact of initial unemployment claims (IC) on the growth rate of real gross domestic product (GDP), inflation (INF), and unemployment (UN) in Barbados. In addition, it seeks to determine whether initial unemployment claims help forecast unemployment and growth in output. Statistics for GDP, INF and UN were obtained from the Central Bank of Barbados while IC was sourced from the National Insurance Board of Barbados. UN and IC are measured in level form and represent the number of individuals jobless and the number of people submitting a claim, respectively. The database employed consists of quarterly data for the period 1987 to 2009, a total of 92 observations. Table 1 and Figure 1 provide the summary statistics and time series trends for each variable, respectively. The correlations among the variables are given in Table 2, which shows a negative relationship between IC and GDP but a positive correlation between UN and INF.

4.2. Econometric methodology

As a preliminary step to our analysis, we ascertain the order of integration of the variables. We test for unit roots using the augmented Dickey-Fuller (ADF) test by Dickey and Fuller (1979, 1981) and the KPSS test by Kwiatkowski et al. (1992). Under the ADF test, the series is assumed to be non-stationary; thus, failure to reject the null hypothesis suggests that the time series has a unit root. On the contrary, the KPSS test assumes that the series is trend stationary under the null hypothesis. Given that the series used in our analysis are quarterly, there is the need to take into account the issue of seasonality. Therefore, HEGY test proposed by Hylleberg et al. (1990) is utilised to check for seasonal unit roots. For this test, the null hypotheses assume non-stationarity. The unit root results can be found in Table 3 where π_1 and π_2 for the HEGY test[1] represents long-run unit root and semi-annual unit root, respectively.

Given the existence of non-stationary series in levels, the maximum likelihood method developed by Johansen (1988, 1991) is utilised to test for long run equilibrium among the variables. Johansen (1991) proposes two test statistics for testing the number

[1] See Bonham (2005) for greater analysis on the HEGY test

of cointegrating vectors: the trace and the maximum eigenvalue statistics. The null hypothesis for the trace test is that there are at most r cointegrating vectors, while for the max eigenvalue test, the null r = 0 is tested against the alternative that r = 1; r = 1 is tested against the alternative r = 2; and so forth. The Akaike Information Criteria (AIC) is used to select the lag length.

Innovation accounting is used to determine the dynamic responses of the variables. The impulse response function traces how macroeconomic variables in Barbados respond over time to a change in IC. Variance decomposition provides information concerning the relative importance of each innovation towards explaining the behaviour of endogenous variables. We use the generalised impulses as described by Pesaran and Shin (1998), which makes results insensitive to the ordering of the variables in the VAR.

To evaluate forecasts for GDP growth and unemployment, we adopt a bivariate autoregressive model similar to Gavin and Kliesen (2002). The general form of the forecasting model is:

$$Z_{j,t} = c + \beta_j \sum X_{j,t-i} + \sum \delta_j Z_{j,t-i} + \varepsilon_t$$

where Z_t is growth in gross domestic product (GDP) or unemployment (UN); and $X_{j,t}$ represents the initial unemployment claims (IC). The variables are indexed by j to indicate which quarter is being used in the forecast and regressed using the OLS technique. This model is compared to an autoregressive model for GDP and UN in order to determine which model gave better forecasts. For both models, various lag lengths are used to test the performance of the models.

5. Results

5.1.Time series

Table 3 presents the results for the unit root tests. The ADF test and KPSS test both suggest that IC is stationary while UN and INF are I(1) series. For GDP, the two unit root tests give conflicting results. However, when the PP test is employed the statistics indicates an I(0) series. The HEGY test suggests that there is no seasonal unit root for all variables.

In Table 4, the Johansen cointegration test shows that both the trace test and the max test indicate the presence of one cointegrating vector. Thus, there is evidence of a long run relationship among the variables. Consequently, a vector error correction model (VECM) is constructed and used to examine the effects of initial unemployment claims on real output growth, unemployment and inflation.

5.2.Impulse Response Functions

For this section, Figure 2 displays the impulse response of each variable to a unitary shock in initial unemployment claims for a 10-quarter forecast horizon. The response of real output growth to a positive movement in IC remains negative throughout the period. Growth in output falls to about 1.5% for the first two quarters, subsequent to further decline but at a decreasing rate. Gavin and Kliesen (2002) provides strong support for this relationship, as they showed that changes in labour market activity negatively impact economic activity. Moreover, this inverse relationship is consistent with prior studies (Sinclair, 2004) as well as the Okun's law. The general response to unemployment, given a rise in claims for unemployment benefits, demonstrates an increasing trend of more persons in the labour force being out of work. This is not too surprising as many economists and financial market analysts in the past and present use initial unemployment claims as an indicator for predicting unemployment (Gavin and Kliesen, 2002).

On the general prices side, the reaction of inflation to higher unemployment claims is higher prices for the first three quarters, which is followed by a deflationary period. This initial response is surprising as one would expect that fewer individuals employed bring about lower aggregate demand, and through the market mechanism of demand and supply give rise to lower prices. This early response, however, may be symptomatic of a delay in the change of consumers' behaviour, as the unemployed may be optimistic of finding a job thus keeping existing spending pattern. The latter movement of the graph can be identified with the inverse relationship attributed to the Philips curve theory.

5.3. Variance Decomposition

Table 5 displays the findings of the variance decomposition which show the proportion of forecast error variance in a variable that is explained by innovations to itself and other variables. The results we are interested in is determining how much of future variation in GDP, UN, and INF is explained by a one standard deviation shock to IC. The findings indicate the importance of IC in projecting all variables throughout the 10-quarter time period. A one standard deviation shock to initial unemployment claims to output variability ranges between 5 percent and 32 percent; the same shock has an even bigger effect on unemployment as the IC innovation contributes between 4 percent and 62 percent of unemployment variance. Though IC explained less than 1 percent of the forecast error variance for inflation for five quarters of the forecast horizon, by the tenth quarter, IC was able to capture over 16 percent of the variability in inflation. The results further suggest that if there is causality between the variables and IC, it should run from IC to GDP, UN, and INF.

5.4. Bivariate Autoregressive Forecast

The OLS results of the linear models described in subsection 4.2 are corrected for autocorrelation and heteroscedasticity using the Newey-West HAC standard error and covariances. After testing these models using varying lag lengths, a bivariate autoregressive model with six lags provided better forecast indicators for projecting unemployment and growth in output. Table 6 presents the summary statistics of the in-sample forecasts for both models. In comparing which variable initial unemployment claims predicts better, the Theil inequality coefficient is considered since the root mean square error (RMSE) and the mean absolute error are best used when analysing forecasts for the same variable across different models. For the Theil inequality, a coefficient of zero indicates a perfect forecast. Since the unemployment model recorded a value near zero, it can be argued that IC is better suited in forecasting unemployment in Barbados rather than real economic growth. The components of the Theil inequality coefficient: bias and variance proportion, also performed better for projecting unemployment.

6. Conclusion and Policy Recommendations

This study utilizes innovation accounting to investigate the impact of initial unemployment claims on the unemployment rate, growth in real gross domestic product and inflation. It also considers the importance of initial unemployment claims in helping forecast real economic growth and unemployment. To some extent, our findings mirror those in the literature. Our results imply that the initial jobless claims are in fact statistically significant predictors of both employment and output. Though the relationship between initial claims and UN seems to be more statistically robust than that between claims and GDP both cases do provide valuable economic information. Consequently, there are clear benefits to incorporate initial jobless claims into economic analysis for Barbados. It would be of more benefit for the country if data on initial claims is reported on a weekly basis and in a timely fashion as this would reduce the time lag in forecasting unemployment.

Appendix

Table 1: Descriptive Statistics

	IC	GDP	UNN	INF
Mean	3362.620	1.263913	18476.09	3.593913
Median	3225.000	2.120000	16850.00	3.660000
Maximum	5716.000	15.00000	35200.00	8.610000
Minimum	1634.000	-8.810000	9500.000	-1.250000
Std. Dev.	890.4780	4.416050	6326.473	2.487514
Skewness	0.526248	-0.075803	0.888870	0.043885
Kurtosis	2.944715	3.443334	2.886446	1.960105
Jarque-Bera	4.258089	0.841530	12.16413	4.174827
Probability	0.118951	0.656544	0.002283	0.124007
Sum	309361.0	116.2800	1699800.	330.6400
Sum Sq. Dev.	72158554	1774.636	3.64E+09	563.0832
Observations	92	92	92	92

Table 2: Correlation

Correlation	IC	GDP	UNN	INF
IC	1.000000			
GDP	-0.608712	1.000000		
UNN	0.080437	-0.087216	1.000000	
INF	0.163157	-0.167763	-0.059660	1.000000

Table 3: Unit Root Tests

	ADF		KPSS		HEGY		Decision
	Level	1st Diff	Level	1st Diff	$\pi 1$	$\pi 2$	
IC	-3.86***	n.a	0.077	n.a	-3.47***	-3.14****	I(0)
GDP	-2.15	-8.01***	0.092	n.a	-2.31*	-5.12***	I(0)
UN	-1.78	-3.13***	0.731**	0.151	-1.47	-2.38**	I(1)
INF	-2.37	-4.63***	0.191**	0.048	-2.98**	-7.62***	I(1)

Notes: ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Table 4: Johansen Co-integration Test

Null hypothesis	Alternative hypothesis	Test statistics	p-value
Trace test			
r = 0	r ≤ 1	85.04***	0.00
r = 1	r ≤ 2	31.39	0.12
Max. eigenvalue test			
r = 0	r = 1	53.66***	0.00
r = 1	r = 2	21.29*	0.07
r = 2	r = 3	7.04	0.67

Notes: *** indicates significance at the 1% level.
P-values obtained from using response surfaces as in MacKinnon et al. (1999).

Table 5: Variance Decomposition

Dependent variable	Period	S.E	IC	GDP	UN	INF
IC	1	525.21	100.00	0.00	0.00	0.00
	5	953.77	94.81	2.45	0.29	2.45
	10	1147.10	92.55	3.38	1.61	2.46
GDP	1	2.59	5.97	94.03	0.00	0.00
	5	4.35	39.48	58.73	0.64	1.15
	10	4.99	31.95	60.47	2.08	5.50
UN	1	1447.21	3.96	6.37	89.67	0.00
	5	3607.56	40.69	8.26	46.06	5.00
	10	6296.53	61.77	4.77	28.99	4.46
INF	1	0.65	0.33	0.48	13.16	86.03
	5	2.54	0.79	0.83	41.48	56.90
	10	3.08	16.23	2.50	36.88	44.39

Table 6: Summary Statistics of Forecasts

Forecast sample: 2009Q1 2009Q4		
Forecast	**GDP**	**UN**
Root Mean Squared Error	3.18	1.10
Mean Absolute Error	2.73	1.01
Theil Inequality Coefficient	0.36	0.057
Bias Proportion	0.74	0.09
Variance Proportion	0.23	0.08

Figure 1: Plot of Variables (1987-2009)

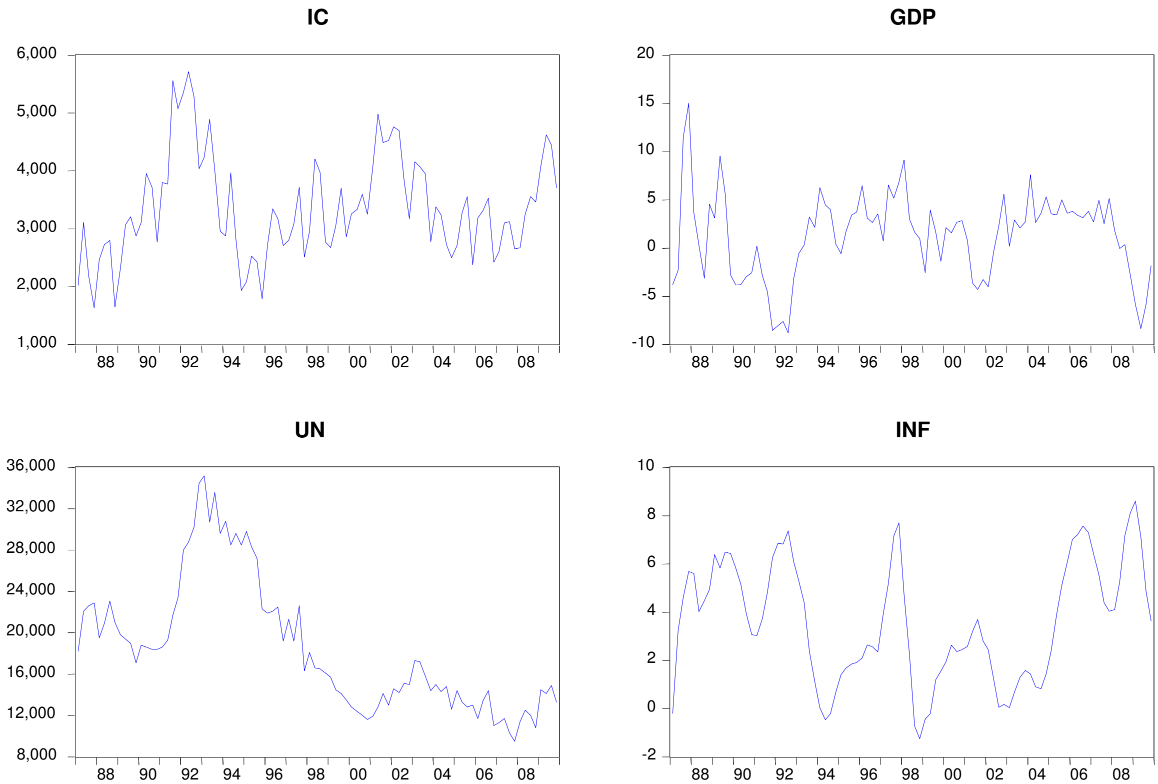
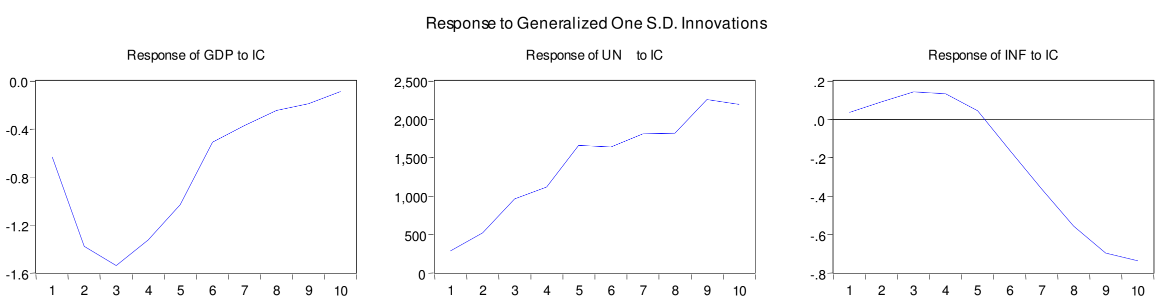


Figure 2: Impulse Response Function



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