THE UNEMPLOYMENT INSURANCE SCHEME IN BARBADOS: A LABOUR MARKET ANALYSIS

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1 Introduction

As economies respond to the changes occasioned by the process of globalisation and periodic economic crises, there is likely to be a fall-out in the labour market. As companies re-organise their production structures and systems in order to enhance their competitiveness and long-term survival, they tend to shed labour (lay-offs, severance, redundancy). The loss of labour income by these workers not only affects their own welfare adversely but also reduces aggregate demand in the economy, thus exacerbating any poor economic conditions. Some governments have responded to the situation by establishing various income support schemes/programs for the unemployed [see Vodopivec, 2004]. These income support programs include unemployment insurance, severance pay, public works programs and social assistance. These programs have been designed to provide the unemployed with some form of income to bridge the gap between unemployed and employed states.

This paper examines the unemployment insurance scheme in Barbados, primarily from a labour market perspective. Unlike several forms of income support, unemployment insurance usually involves a contribution from the worker when he/she is employed (that is partial insurance premium), which goes towards the income the employee receives on becoming unemployed. In effect, the existence of an unemployment insurance scheme protects the employee against unemployment risk with the premium being paid by both the employee and employer and set by the government. The unemployment insurance is therefore a public income support program for persons who involuntarily become unemployed. Barbados is one of few countries in the Western Hemisphere and the only country in the Caribbean with an unemployment insurance scheme. This scheme was established in 1981 and benefits were disbursed in 1982. Since the Unemployment Insurance Scheme is an ***insurance*** scheme contingent on a worker becoming unemployed, it can be examined from several perspectives: actuarial, financial, macroeconomic and labour market. The last perspective is the focus of this paper. Since unemployment insurance benefits change the opportunity cost of leisure, the operation of an unemployment

insurance scheme can affect several labour market variables: re-employment, job search intensity, the labour supply of other household/family workers, reservation wage in a re-employment situation and the choice of regular versus informal work. In addition, the payment of the unemployment insurance premiums represents a 'tax' on both the employee and the employer. From the employer's perspective the partial payments of unemployment insurance premium represents a non-wage cost which increases the overall costs of labour and doing business in general.

The main objective of this paper is to examine aspects of the labour market effects of unemployment insurance (UI) in Barbados. To date, very little analytical work has been undertaken on the general effects of unemployment insurance. By examining aspects of the scheme from a labour market perspective, this paper would provide information on the operations of an unemployment insurance scheme in a small developing country in an era of rapid global change. The structure of the presentation is as follows: in section 2, a review of the theoretical effects of unemployment insurance on labour market behaviour is undertaken. There is a large body of literature on such effects, hence the review will be selective and will provide the analytical framework for the paper. The third section will present the basic features of the unemployment insurance scheme in Barbados – background to the establishment of the scheme, the payment arrangements since its establishment, qualifying criteria and general operational features. The fourth section, a statistical analysis of the scheme is undertaken over the period 1982 to 2004. This analysis will look at the trend in unemployment claims and approvals, the sex, age, sectoral and occupational distribution of the claims and approvals and the distribution of unemployment insurance payment by days paid.

Such an analysis would provide insights into the likely impact on labour market behaviour in Barbados since the inception of the scheme. In section 5, an exploratory econometric analysis of the unemployment insurance scheme is undertaken. It will examine the macroeconomic features underlying the claims submitted and the determinants of the probability of making a claim (a profile analysis). The final section looks at the implications of the empirical analysis and identifies areas for further research.

2 Unemployment Insurance and the Labour Market: An Analytical Review

There is a voluminous body of literature on the theoretical and empirical aspects of unemployment insurance, primarily for developed countries [for surveys, see Topel and Welch, 1980; Atkinson and Micklewright, 1991; Holmlund, 1998; Karni, 1999 and Vodopivec, 2004]. Some work has been undertaken on the labour market implications for unemployment insurance schemes in developing countries [see, for example, Hamermesh, 1992; Mazza, 2000 and Edwards and Manning, 2001]. Hamermesh (1992) has argued that there are two broad goals associated with unemployment insurance schemes: individual and social. In the context of individual-based goals the motivation for introducing an unemployment scheme is based on arguments for consumption (income) smoothing and employment smoothing. Unemployment insurance benefits provide the unemployed worker with an income flow so that he/she can sustain a given level of consumption during the unemployment period. This income flow reduces the welfare loss associated with unemployment, especially if he/she has little savings. With regards to employment smoothing, Hamermesh (1992) notes that "unemployment insurance benefits will provide incentives for greater fluctuations in employment unless taxes that finance them are assessed in an actuarially fair way on the firm that generated the unemployment" (p. 3-4). He however points out that this argument is not a strong one to justify the establishment of an unemployment insurance scheme.

The socially-based arguments for an unemployment scheme relate to its role as an automatic (built-in) fiscal stabilizer, its contribution to the equalization of incomes or redistribution of purchasing power and its facilitation of industrial restructuring. The role of unemployment insurance benefits as an automatic stabilizer is well known in macroeconomics and is linked to its consumption (income) smoothing role. The income received from the unemployed is used to maintain purchasing power. The redistributive role of unemployment insurance is based on the assumption that the ***incidence*** and ***duration*** of unemployment, which underlie the unemployment rate, are negatively correlated with household incomes and the 'taxes' that finance the payment of the unemployment insurance benefits are not very regressive. Finally, it is argued that the

existence of an unemployment insurance scheme allows companies to engage in restructuring by making a decision to shed workers. In some cases, these workers 'double dip', in that they receive a lump-sum payment from the employer in the form or severance/redundancy pay and then an income flow from the unemployment insurance scheme for a stipulated period. The impact of the unemployment insurance scheme on the labour market depends on several design features: the coverage, the eligibility requirements, the benefits paid and the financing of the scheme. Unemployment insurance schemes usually cover employees in formal private sector companies thus excluding government employees who have security of tenure, the self-employed and those working in the informal sector. In terms of eligibility, the payment of an unemployment insurance benefit is associated with involuntary job termination after being employed for a given time period and making payments into the scheme. The unemployed worker is expected to show evidence of active job search during the unemployment spell. The benefits are paid for a stipulated time period at a rate which is a percentage of the workers' previous earnings up to a stipulated maximum level. The more generous the unemployment insurance scheme in terms of the design features the greater the impact on the labour market. Vroman (2002) has suggested that an index of the generosity of unemployment benefits (G) can be specified as

$$G = 100.RR \times (NB/U) \qquad (1)$$

where RR is the ***income replacement rate*** or ***benefit rate*** expressed as a fraction of the average wage; NB is the unemployed who receives benefits and U is the number of unemployed. The ratio of NB to U is called the ***recipiency*** or ***coverage rate***. The higher the income replacement rate and/or the recipiency rate, the more generous the unemployment insurance benefit scheme and hence the greater the impact on the labour market. The impact is even more pronounced when the financing of the scheme – by both employee and employer – is considered.

The impact of unemployment insurance on the labour market depends on the different dimensions of the unemployment insurance scheme (the eligibility conditions, the level of the benefit payments and the duration of the payment to the unemployed persons) and the institutional features of the labour market (existence of unions, job search strategies, degree of segmentation). This heterogeneity can lead to differing analytical results and hence the need for empirical research [see, for example, Cahuc and Zylberberg, 2004 chapters 3 and 11]. Some general relationships between the unemployment insurance scheme and labour market variables can be specified. The generosity of the unemployment insurance scheme (that is, the product of the replacement/benefit rate and the coverage rate) can result in an increase in the unemployment rate (UR) which is defined as:

$$UR = 100xIxD \qquad (2)$$

Where I is the incidence of unemployment (that is, the proportion of workers who become unemployed in any given period) and D is the duration of unemployment (that is, the length of time spent in the unemployed state before obtaining employment or leaving the labour market). Incidence therefore reflects the probability of a worker becoming unemployed, while duration reflects the length of time the worker can be expected to remain unemployed.

The receipt of unemployment insurance benefits can increase the duration of unemployment among eligible recipients by providing them with reasonably adequate income support during their unemployment spell. Such unemployed persons can engage in more thorough job search for higher quality jobs up to the period of their unemployment insurance benefit entitlement. In addition, unemployment benefits reduce the cost of not working and hence the higher the replacement rate, the longer the worker will choose to remain unemployed. The sign and size of the elasticity of the unemployment insurance benefit with respect to the average duration of unemployment depends on the number of persons who are eligible for the receipt of an unemployment insurance benefit.

The generosity of an unemployment insurance scheme can also increase the number of lay-offs especially in seasonal or cyclically sensitive industries (tourism, construction, agriculture) where firms may have to engage in labour shedding (lay-offs) for some period of time. The unemployment insurance scheme may also be associated with the attraction of persons into the labour force from demographic groups that usually experience higher unemployment rates. The generosity of the unemployment insurance scheme can be an attraction to queue up for jobs

which create an entitlement to unemployment insurance benefit, thus increasing the measured unemployment rate. Indeed, such persons may lower their reservation wage in order to receive the unemployment insurance benefit in the long term.

Workers are likely to make the transition out of their unemployed state as they near the end of the benefit period as the costs of job search increases and the 'asking wage' declines with the duration of unemployment. In some unemployment insurance schemes, there is an incentive for the worker to intensify job search and hasten the transition from unemployment to employment. The agency managing the unemployment insurance scheme is faced with a 'moral hazard' (asymmetric information) problem with respect to the verification of the active job search behaviour of the unemployed. By lowering the benefit paid over the spell of the unemployment state, the opportunity cost of leisure increases and hence there is an incentive to actively find a job. In effect, the unemployment insurance benefit can be regarded as a temporary subsidy to job search. It has been suggested that the exit rate from unemployment to employment increases towards the entitlement period especially for better qualified job seekers who can find jobs more easily than less qualified workers who have to compete amongst themselves for a limited number of job openings. There is however the possibility of some skill depreciation during the unemployment spell which can make job seeking difficult. Some workers overcome this by engaging in training programs to enhance job skills and thus their marketability during their spell of unemployment.

Unemployment insurance schemes also affect the reservation wage of workers. The generosity of unemployment insurance benefits can increase the post-employment wages of eligible workers. The unemployment insurance benefit becomes an important determinant of the post-unemployment reservation wage, as workers seek to increase their earnings in the next employment state. Furthermore, if the unemployment insurance benefit allows the worker to enhance his/her human capital during the unemployment spell, then the 'asking wage' increases (especially if the labour market conditions improve significantly). For those who are ineligible, the unemployment insurance benefit can lower their reservation wage as they seek work which can provide them with a benefit in the future.

Unemployment insurance schemes can have a positive effect on labour productivity as the benefits received over the unemployment spell can permit some workers to be more selective about the quality of jobs they are willing to accept and encourage firms to create such jobs [Acemoglu and Shrimer, 2000].

The payment of unemployment insurance premiums by employers represents a non-wage labour cost. An increase in the contribution of employers to the unemployment insurance pool can result in a decrease in labour demand unless there is a compensating effect on wage costs. It is expected that in a bargaining situation both the level of premium and the generosity of the unemployment insurance benefit contingent on involuntary unemployment would also be critical to wage determination and hence employment creation. Employers may decide to increase the overtime allocated to workers, outsource production work or have workers for periods within the eligibility constraint when faced with an increase in demand. On the other hand, a decrease in demand may cause the firm to lay-off workers or engage in labour hoarding depending on the employer's rate of contribution to the unemployment insurance scheme. In general, it is expected that a decline in the economy will result in an increase in the number of claims for unemployment insurance benefit.

This brief overview has indicated that, in general, the generosity of the unemployment insurance scheme can affect the unemployment rate through the duration of unemployment spells of workers; the reservation wage of the unemployed worker, the labour productivity of certain categories of workers and the labour demand by firms. As Cahuc and Zylerberg (2004) have pointed out, the sign, size and significance of these effects must be determined empirically because of the heterogeneity of the schemes and the institutional features of the labour market.

3 Basic Features of the Barbados Scheme

Worker campaigns for Unemployment Insurance eventually resulted in the government's decision to introduce a scheme spurred on by recessionary conditions in 1981. The new scheme was carefully designed to provide only for workers who had become temporarily and involuntarily unemployed.

Benefits at 40% of insurable earnings for a maximum period of 13 weeks were paid as from 1982 and contributions were collected from employers and workers at the rate of 2.0% of those earnings (up from an initial 6 month rate of 1.5%). Several changes both to the contribution and benefit rates were made in the following years as shown below.

Permanent (but not Temporary) Government workers and the Self-Employed are excluded. Eligibility requirements include active registration in the scheme for 52 weeks and 20 weeks actual or credited contributions in 3 consecutive quarters. A new period of claim cannot begin before 52 weeks have elapsed since the start of the current claim.

Initially there were several exclusions relating to loss of benefit where workers had been dismissed 'for cause' or had voluntarily quit their jobs or took up full time study/training (therefore unavailable for work) or had not registered with the government employment agency. However several easements were made in 1988. Firstly a maximum loss of benefits was set at 6 weeks of benefit out of a possible 26 weeks by then. Secondly the requirement to register with the official employment agency was removed altogether. No subsequent surge in claims were observed coming out of these changes.

With large surpluses going into the fund in the early years benefits were increased to 60% of earnings payable for an increased maximum period of 26 weeks and at the same time (1985) the contribution rate was cut to 1.00%. there followed a history of seesawing of contribution rates with benefit changes through the recession of 1991/1993. The Fund survived in fairly good shape.

The history of these changes follow :

Contribution Rate History

July1981 – Dec 1981 : 1.50%
Jan1982 – May1985 : 2.00%
June1985 – Sep1991 :1.00%
Oct1991 – Nov1991 : 2.75%
Dec1991 – Dec1993 : 5.50%
Jan1994 – Aug1998 : 3.00%
Sep1998 – July 2005 : 1.50%

Benefit History

July1982 – Apr1984 : 40% for a maximum of 13 weeks
May1984 – May1985 : 50% for a maximum of 13 weeks
June1985 – Sep1991 : 60% for a maximum of 26 weeks
Oct 1991 – May 1996 : 60% for 1st 13 weeks falling to 40% for next 13 weeks maximum
June 1996 – July 2005 : 60% for a maximum of 26 weeks

4 Unemployment Claims Statistics 1982-2003

The experience of the Barbados scheme relative to economic and other variables since inception will now be analysed as far as the available data will permit at the present time. With improved computerization at the National Insurance and Social Security Scheme of Barbados it is hoped that further work can be carried out as more detailed data becomes available.

Table 1

UNEMPLOYMENT CLAIMS TRENDS

Year	GDP	Unempl Rate	Received Claims	Approved Claims	Days Paid 000s
1982			1,228	810	
1983	0.5	15.0	4,505	3,675	127
1984	3.6	17.1	8,082	7,000	211
1985	1.1	18.7	9,814	9,717	398
1986	5.1	17.8	10,409	9,818	n.a.
1987	2.6	17.8	8,628	8,520	681
1988	3.5	17.2	7,635	6,776	346
1989	3.6	15.6	11,431	9,252	460
1990	-3.3	15.0	13,549	12,141	653
1991	-3.9	17.3	18,209	16,573	577
1992	-7.2	23.0	20,396	19,662	829
1993	0.8	24.3	16,097	14,767	609
1994	4.6	21.8	11,586	10,775	507
1995	2.4	19.6	8,830	7,607	293
1996	3.1	15.8	11,948	10,136	410
1997	3.3	14.6	12,105	10,416	426
1998	4.4	12.2	13,903	12,275	669
1999	6.2	10.4	12,283	10,570	718
2000	0.5	9.4	13,438	10,533	706
2001	-2.8	9.9	18,066	15,946	1104
2002	-0.4	10.3	16,445	13,652	942
2003	2.2	11.0	14,956	12,437	952

Table 2

UNEMPLOYMENT APPROVED CLAIMS BY AGE-GROUP AND GENDER

Age Group	1984* M	F	Total	1987* M	F	Total	1991 M	F	Total
16 - 19	46	23	69	74	37	111	201	123	324
20 - 29	896	761	1,657	1,818	2,097	3,915	2,891	2,955	5,846
30 - 39	565	569	1,134	1,216	1,927	3,143	2,326	3,611	5,937
40 - 49	242	225	467	529	721	1,250	1,120	1,612	2,732
50 - 59	165	140	305	330	316	646	592	726	1,318
Over 60	86	44	130	187	118	305	262	154	416
Total	2,000	1,762	3,762	4,154	5,216	9,370	7,392	9,181	16,573

Age Group	1993 M	F	Total	1996 M	F	Total	Approx% Claim M	1996 Intensity** F
16 - 19	102	104	206	65	57	122	2	2
20 - 29	1,807	2,070	3,877	1,389	1,743	3,132	11	14
30 - 39	1,939	3,359	5,298	1,297	2,095	3,392	10	15
40 - 49	1,336	2,093	3,429	875	1,424	2,299	8	13
50 - 59	684	817	1,501	422	475	897	7	9
Over 60	233	233	466	158	135	293	7	9
Total	6,101	8,676	14,777	4,206	5,929	10,135		

* The split for 1984 and 1987 were given for Recipients not Claims
The split for years after 1996 are not available for the same age groups
** These figures represent the ratio of the number of claims to the numbers insured

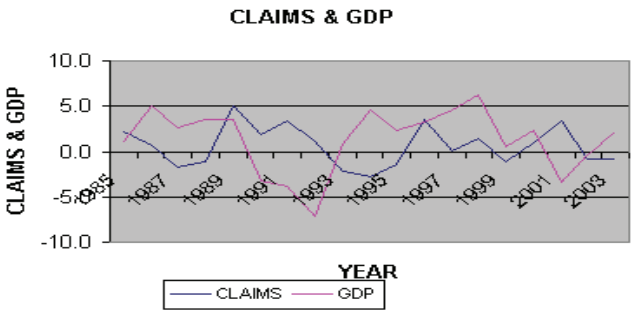
Received claims rise dramatically in the years 1991/1992 and 2001/2002 which might be expected on the basis of the trends in the economy at those times. However lags with the

unemployment rate itself can be observed in the same periods. This aspect is analysed in more detail in Section 5. Care must be exercised in interpretation of days paid as the intervention of the end-of-year date (Dec31) will have pushed days paid into a following year. Further research into the link (or lack of) with numbers of claims after correcting for the latter may yield interesting results.

The female claim rate after 1984 remains above the male rate reflecting the well known higher unemployment rate. The last two columns give an approximate rate of claim for 1996 based on the numbers insured at those age-sex groups.

The following graphs compare Unemployment and GDP with Claims received. We would expect negative correlation with GDP but as can be seen this relationship is not so clear.

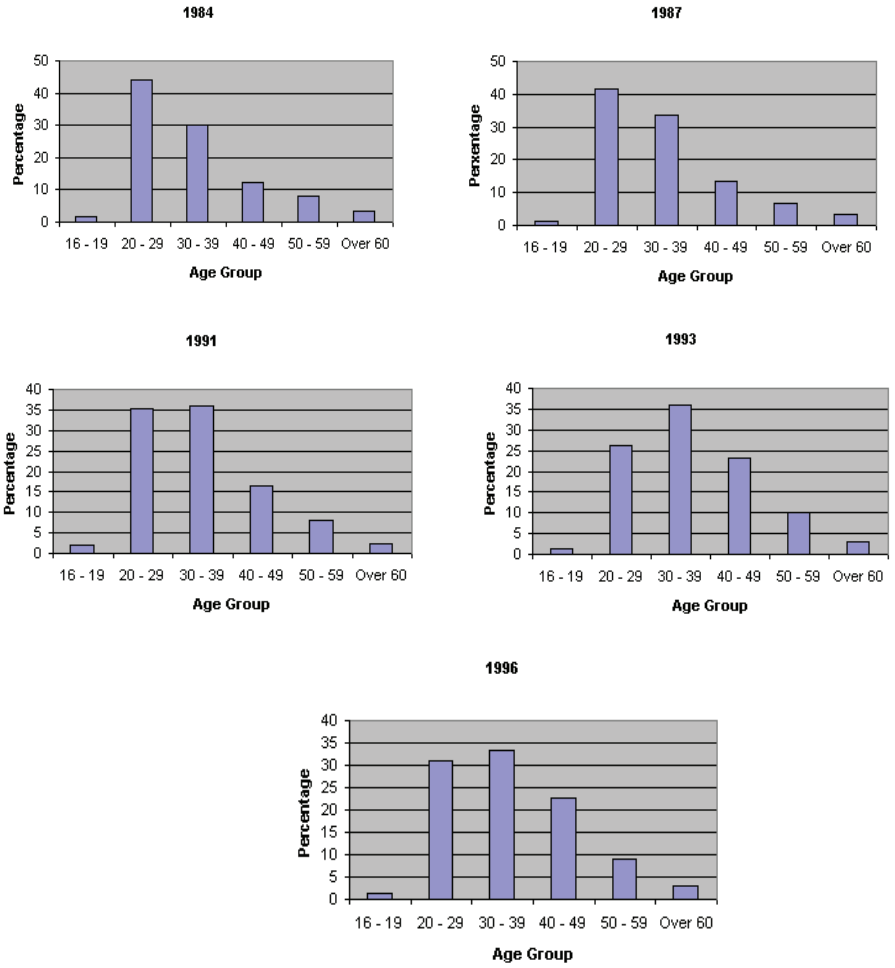
Figure 1



Note: In prints without colour Claims is the darker line

The following graphs show the split of claims received between the different age groups:

Figure 2



The development of the age split in claims over the period indicates a continuing preponderance of claims at young ages but with a steady growth in the relative proportion in the 30 – 39 age group compared to the 20 –29 age group. Data for the years following 1996 were available only by a very different age grouping and therefore not comparable.

Table 3

UNEMPLOYMENT APPROVED CLAIMS BY INDUSTRY/SECTOR

Year	1987*		1993		1999		2002	
Industry/Sector	No.	%	No.	%	No.	%	No.	%
Agriculture and Fishing	901	9.62	552	3.74	119	1.13	1,348	9.85
Mining and Quarrying	5	0.05	182	1.23	4	0.04	-	-
Manufacturing	3,412	36.41	5,143	34.83	2,927	27.69	2,293	16.76
Electricity, Gas and Water	55	0.59	11	0.07	-	-	31	0.23
Construction	652	6.96	1,063	7.20	955	9.04	1,864	13.62
Wholesale and Retail	1,143	12.20					1,401	10.24
Restaurant and Hotels	1,471	15.70	4,735	32.06	730	6.91	3,429	25.06
Transport, Storage & Comm	227	2.42	834	5.65	766	7.25	223	1.63
Finance, Insce, Real Estate & Bus	521	5.56	877	5.94	2,560	24.22	1,411	10.31
Government and Defence	-	-	187	1.27			245	1.79
Community and Social	266	2.84	660	4.47	2,446	23.14	462	3.38
Personal and Household	286	3.05	481	3.26	-	-	387	2.83
International and Territorial	-	-	42	0.28	-	-	-	-
Other Activities	418	4.46	-	-	-	-	588	4.30
Not Stated	13	0.14	-	-	63	0.60	-	-
Total	**9,370**	**100.00**	**14,767**	**100.00**	**10,570**	**100.00**	**13,682**	**100.00**

Note : The Wholesale&Retail industrial sector was put together with Restaurant&Hotels for the years 1991 to 1999

The Table above shows that the Manufacturing, Wholesale & Retail and the Restaurant & Hotels sectors were the main sources of claims with the Manufacturing sector falling off in the later years. Further analysis should take into account the numbers insured in each of these sectors. That will have to await a later date when more detailed data is available.

The generosity of the Unemployment Insurance Scheme is regarded as a significant factor influencing the degree of job search and the duration of an unemployment spell. As indicated earlier, a generosity index can be specified as the product of the replacement and coverage rates. In practice, these rates are not easy to calculate given the unavailability of data and the heterogeneity of Unemployment Insurance schemes across countries [see Cahuc and Zylberberg, 2004, chapter 11].

In developing countries such as Barbados, the average wage/earnings data of workers are difficult to obtain, hence replacement rates cannot be easily calculated. An alternative approach to the calculation of the generosity of the unemployment insurance scheme is to determine the maximum total payment an unemployed worker would receive for the full period of entitlement. In the case of Barbados, this index can be calculated in two steps:

(i.) find the maximum total payment (MTP) to a worker for the full period of entitlement. This is given by the formula,

$$MTP = BRxMTExMBPP \quad (3)$$

where BR is the benefit rate, MTE is the maximum weekly earnings and MBPP is the maximum benefits payment period. The benefit rate is calculated on the insurable earnings of the worker.

(ii.) Convert the monetary values to index number form using a simple relative index number formula given as:

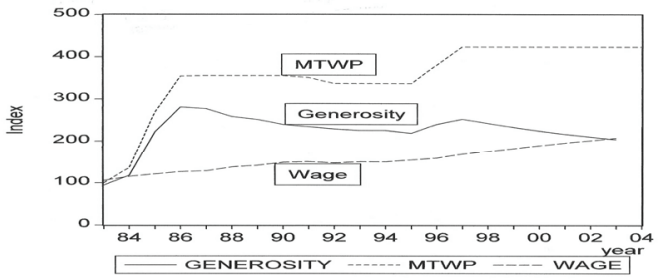
$$IMTP_t = MTP_t/MTP_0 \quad (4)$$

Where IMTPt is the MTP index at time t, MTPt and MTPo are the maximum total payment at time t and time o (base period), respectively.

The IMTP is then compared with the nominal wage index. The ratio of the IMTP and the wage index can provide an indication of the degree of generosity of the unemployment insurance benefit scheme.

The results of the above calculations are given below:

Figure 3



While there has been upward trends in the IMTP and the wage index over the 1982-2003 period, there has been a decline in the relative generosity of the unemployment insurance benefit scheme since 1986. The scheme was relatively generous during the early stages of its implementation. The benefit rate was raised from 40 percent in 1982 to 60 percent in 1986, while the maximum insurable weekly earnings were increased from $506 to $598 between 1982 and 1984. The maximum benefits period was also lengthened from 13 weeks in 1982 to 26 weeks in 1985. There was an upward movement in the degree of generosity in 1996 when the benefit rate was changed from 60 percent for the first 10 weeks and 40 percent for the next 16 weeks to 60 percent for the full 26 weeks. Since the mid-1990s, there has been an erosion in the generosity in the unemployment insurance benefit scheme.

The decline in the degree of generosity may partly explain the relatively short unemployment spells of workers. Over 55 percent of the recipients received benefits for 78 days or less (where 78 days is equivalent to the 3 month period used to define search activity associated with the Barbadian definition of an unemployed person). It is likely that workers seek employment before the end of the entitlement period in order to minimize any significant loss in economic welfare, especially where the expected income from being employed is significantly higher than the benefits obtained from the unemployment insurance scheme.

5 Econometric Analysis of Claims

From the viewpoint of the agency, it is important to understand the factors underlying the number of claims made for unemployment insurance benefits. In addition, it would also be useful to know the profiles and labour market behavioural patterns of the claimants. These issues are important for financial management and also for reducing the exposure to the 'moral hazard' problem. With the removal of the need to register for job search purposes in 1988, the NIS is subject to the full payment of benefits. The empirical evidence suggests however that a small percentage of workers generally remain unemployed for the full 26 weeks.

Changes in the macroeconomic conditions of the country tend to influence the total number of claims made by workers. The total number of claims is influenced by changes in the level of output (real gross domestic product) and the level of unemployment; that is,

$$C_t = C_t(RGDP_t, NUN_t) \qquad (5)$$

where C_t is the total number of claims at time t, RGDP is real gross domestic product and NUN is the number of unemployed. It is expected that as the real GDP falls (that is, a recession in the economy), there will be a rise in the number of claims (a ***negative*** relationship). A rise in the number of persons unemployed would result in a rise in the number of claims (a ***positive*** relationship).

The relationship given in equation (5) is estimated using the Pesaran et al (2001) bounds testing procedure, that is, an unrestricted error correction modelling(UECM) procedure which allows for the incorporation of short- and long-run information in a single equation. The claims equation can be specified in the following form for annual data as:

$$d \ln C_t = b_0 + b_1 \, dln \, RGDP_t + b_2 \, dln \, NUN_t + b_3 \ln C_{t-1} + b_4 \ln RGDP_{t-1} + b_5 \ln NUN_{t-1} + e_t$$

where d indicates change, ln is natural logarithm, b's are regression coefficient, e is the error term.

Pesaran et al (2001) recommended a testing procedure based on the Wald or F-statistic to investigate the existence of a long-run relationship. The asymptotic distribution of the F-statistic is non-standard under the null hypothesis that no cointegration relationship exists among the variables, irrespective of whether they are stationary (that is, integrated of order zero or one). The null hypothesis of no cointegration is tested in the above equation by excluding the lagged variables ($\ln C_{t-1}$, $\ln RGDP_{t-1}$ and $\ln NUN_{t-1}$), yielding a testing procedure:

H_0: $b_3 = b_4 = b_5 = 0$ (null hypothesis)
H_A: not all are zero (alternative hypothesis)

For a given level of statistical significance ($\forall = 0.05$), if the calculated Fstatistic is higher than the critical bound, then the null hypothesis of no cointegration is rejected.
The short run elasticities are given by b_1 and b_2, while the long-run elasticities are given by (b_4/b_3) and (b_5/b_3). The order of integration of the explanatory variables must be known before any clear conclusions can be derived.

Using the Augmented Dickey-Fuller and Phillips-Perron test statistics for an unit root, the variables C, RGDP and NUN are integrated of order 1, that is, their log levels are non-stationary [see Table xxx].

The unrestricted error correction model (UECM) was estimated using ordinary least squares (OLS) for the period 1983 to 2003 and produced the following result:

d ln C = 1.44 – 2.52 d ln RGDP + 0.16 d ln NUN – 0.58 ln C (-1) + 0.63 ln RGDP (-1)
(0.15) (-1.32) (0.25) (-4.01) (0.45)
-0.06 ln NUN(-1)
(-0.17)

where the figures in brackets are t statistics.
Adj $R^2 = 0.80$ SER = 0.16 F= 16.51 DW = 2.31

This result suggests that there are redundant variables in the regression equation given the statistical significance of only ln C(-1) at the 5 percent level. A redundant variable test based on the exclusion of all the log level variables ln C(-1), ln RGDP(-1) and ln NUN (-1), yields a F statistic of 26.08, which suggests that these log level variables are important to the equation. Furthermore, the bounds testing procedure suggests that these log level variables form a cointegrating (long-run) relationship. The insignificance of the d ln RGDP and d ln NUN suggest that there is some degree of correlation between these variables. Pairwise Granger causality tests suggest that at the 5 percent level of significance C and NUN are influenced by RGDP. After experimentation with the use of NUN and RGDP in the C equation, the use of RGDP proves to be a better variable in explaining changes in C (that is, the data generating process).

The estimated equation is given as:

$$d \ln C = 1.00 - 3.14\, d \ln RGDP - 0.59 \ln C(-1) + 0.69 \ln RGDP(-1)$$

(0.35) (-2.98) (8.81) (1.50)

adj $R^2 = 0.81$ S.E.R. = 0.16 F = 30.16

D.W = 2.31 BG (LM) = 0.48 ARCH = 0.83

NORM = 1.89 RAMSEY (RESET) = 0.68 CHOW (Forecast) = 0.52

Where adj R^2 is the adjusted coefficient of multiple linear determination, SER is the standard of the regression equation; F is the F statistic for the overall fit of the regression line; DW is the Durbin-Watson Statistic for the first order autocorrelation in the regression residual; BG(LM) is the Breusch-Godfrey serial correlation LM test (F statistic version); ARCH is the F test statistic for autoregressive conditional heteroscedasticity; NORM is the Bera-Jarque statistic for normality in the residuals; RAMSEY (RESET) is the F statistic for misspecification of functional form in the regression equation and CHOW (Forecast) is the F statistic for structural stability with a break at 1998.

The OLS regression results suggest that the regressors provide adequate explanation of changes in claims made for unemployment insurance benefits. Changes in real GDP provide a better barometer of changes in claims than changes in the number of unemployed or the unemployment rate. The short-run elasticity is -3.14, that is, one percent decrease in real GDP results in a 3.14 percent increase in claims. The long-run elasticity is 1.17 but of the wrong sign and statistically insignificant (that is, it is not statistically significant different from zero).

6 Conclusions

We can list our conclusions on the above so far as follows :

1. Throughout the existence of the Barbados scheme claim numbers have been rising steadily from about 10,000 per year in the early 80's to a present level of about 15,000. Peaks in that progression have occurred at times of economic recession in the early 1990's and 2001.
2. The sectors of the economy giving rise to the greatest number of claims are Manufacturing and Tourism. The former has decreased in significance in recent years partly due to a lesser level of activity and therefore numbers of workers covered.
3. Females have made a much higher number of claims throughout the period although females form a lower proportion of the labour force – between 44% in the 1980's rising to 48% at present.
4. The level of Short-Term Claims has been high throughout the period including periods of recession.
5. Changes in the level of claims are more closely dependent on changes in GDP than on the Unemployment Rate. This latter is borne out by the econometric analysis.

7 Further Work

The examination carried out in this paper led to several further questions and indications for further investigations likely to yield useful results. These may be summarised as follows:

- Correlation of Generosity Index with Claim numbers and duration
- The effect of changes in the Contribution Rate on demand for labour employment
- A model relating Claims to the Economy – separately for Short-Run and Long-Run effects
- Examination of profile of claimants with a view to developing a system of Experience Rating

As abovementioned there is an expectation that with an improved IT system now undergoing completion at the National Insurance Department more detailed data will become available for such further work.

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