VERY PRELIMINARY, PLEASE DO NOT QUOTE

Why do the youth in Jamaica neither study nor work? Evidence from JSLC 2001

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Abstract

In this study, we used discrete choice models to identify the significant determinants of youth (aged 17-29) inactivity in Jamaica using individual data generated from the Jamaica Survey of Living Conditions (JSLC), 2001. We fitted probit models to predict the probability of being inactive and being out of the labour force. In addition, we fitted a multinomial logit model (after rejected the null while testing for Independence of Irrelevant Alternatives-IIA) to predict the probability of in any of the activity categories reported by the youth. In general, the probit and multinomial logit estimates indicate that both supply side factors (e.g. training and educational qualification) and demand side factors (e.g. location) are important in affecting the probability of inactivity, being out of the labour force and activity status. This suggests that the Jamaican government needs to intensify the provision of its training opportunities for its youth via better targeting and create the necessary condition to improve the economy by focusing on investment projects that might boost demand for labour. The econometric results corroborate the findings reported in the descriptive statistics reported earlier. Effective targeting of educational and training policies (e.g. encouraging men to participate in such schemes) is

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a non-trivial issue in the Jamaican context. This is due to the fact that our econometric estimates strongly show that the absence of skills and training opportunities is more detrimental to the activity status of males than females. Another focus can be to give particular attention to disadvantaged parishes relative to the capital, Kingston to address some of the factors significantly responsible to youth inactivity.

Key words: *Youth Unemployment, Poverty, crime, micro-evidence*

JEL classification: E24, I31, J21, O12

1. Introduction

Within recent times, rising global unemployment has impacted quite heavily on young people (defined by the UN as persons between 15-24 years of age). According to ILO (2004), between 1993 and 2003 the number of unemployed youth worldwide increased steadily to approximately 88 million. This figure amounted to roughly 47% of the total unemployed. Given that youth make up only 25% of the working age population this trend has become an increasing source of concern for policy makers worldwide, particularly in developing countries where the problem is more pronounced.

Furthermore, youth in both developed and developing countries are not only more likely to find themselves among the unemployed; they are more likely to be working longer hours, on short-term and/or informal contracts, with low pay and little or no social protection (UN, 2003). Consequently, questions relating to the integration of young people into decent work have assumed a central position in both Government Policy issues and at the international level through the joint efforts of the UN, World Bank and ILO.

In the Caribbean, Jamaica is among the countries with the highest level of youth unemployment. In 2002, the youth unemployment rate stood at 30.8%[2] (at the start of the 1990s it was 30.9%), which was more than double the total unemployment rate of 15.1%

[2] Other researchers put the figure at a much higher level (see for e.g. Pantin, 2005).

and roughly three times the adult unemployment rate of 10.3%. [Jamaica: Medium Term Socioeconomic Policy Framework, 2005].

In Jamaica, the issue of unemployment has possible links with fundamental development challenges such as poverty and rising crime rates. Hence investigating the issue is of significance and the purpose of this study is to accomplish the analysis using micro-level evidence using microeconometric techniques. To that effect, we employ econometric techniques (both binary and multinomial discrete choice models) to investigate factors responsible for youth inactivity, choice of activity status and factors contributing to the youth being out of the labour focre using data from Jamaica's Survey of Living Conditions (JSLC) to examine the factors determining youth unemployment in Jamaica. A key part of the data for our analysis is the special Youth Module for persons 17-29 years that was undertaken as part of the SLC in 2001. Based on our analysis, we attempt to identify the potential policy implications that are relevant in the context of Jamaica.

The paper is organised as follows. In section 2, we give a brief background about education, training and labour markets in Jamaica, followed by a discussion of our econometric framework in section 3. In section 4, we outline the data we used in our analysis with some descriptive statistics. In section 5, we discuss the econometric results from the probit and multinomial logit models we estimated. Finally the paper concludes.

2. Education, training and labour markets

Enrolment rates for secondary schools increased from 505 in 1991 to 88% in 2002, however enrolment rates continued to be low in the older age groups. It is important to note that the relatively higher enrolment rate of females at the upper secondary and tertiary level had not been translated into larger opportunities in the labour market. The female unemployment rate (20% in 2002) continued to remain at approximately twice as large the male unemployment rate (10.6%). Approximately 62.2% of the first seekers entering the labour force reported not having any academic certification, while 69.4% had no formal job training. The government has provided programmes to address the need for

job training such as HEART Trust/NTA and the National Youth Service (NYS), which offer educational instruction, on-the-job placement and apprenticeship training (Government of Jamaica, 2005). The National Youth Policy (NYP) 1994 represents Jamaica's first comprehensive policy on youth. It covers those between the age range 15-24 (Government of Jamaica, 2003).

Youth unemployment has continued to remain relatively high, as in 2002 the youth unemployment rate of 30.8%, was more than twice the total unemployment rate of 15.1% and 3 times the adult (i.e. 5 years and over) unemployment rate of 10.3%. The gender differential in unemployment rates continued as the youth female unemployment rate (39.7%) was almost twice as high as that for males (23.6%) (Government of Jamaica 2005).

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3. Econometric Framework

In this study, probit and multinomial logit models are used to analyze the factors significantly affecting the activity status of the Jamaican youth.

For the probit specification, suppose we have the following multiple regression model for a dependent variable, y;

$$y = \beta_0 + \beta_1 x_1 + ... + \beta_k x_k + u \qquad (1)$$

where

Y=1 if the respondent is active or inactive (alternatively this can be representing the fact that the respondent is out of the labour force)

Y=0 if otherwise

$x_1, x_2, ..., x_k$ =explanatory variables which can be represented simply by x which represents a vector of explanatory variables

$\beta_1, \beta_2, ..., \beta_k$ =coefficients to be estimated

u=error term which is normally distributed with zero mean [i.e. E(u|X) =0]

Because y can take on only two values, β_j cannot be interpreted as the change in y given a one-unit increase in x_j, *ceteris paribus*. In this case, the dependent variable changes either from 1 to 0 or vice versa or does not change at all.

For the multinomial logit model specification, we constructed a qualitative/discrete data by using the activity status as reported by the youth. These are 0 (studying); 1(working); 2(studying and working) and 3 (neither studying nor working). For such data, standard linear regression models are inappropriate. Qualitative/discrete data are analysed using either binary (as in the above case as far as we collapse all the 4 outcomes into two meaningful binary outcomes) or multinomial logit and probit models. In the context of our study, the most appropriate technique is to use a multinomial logit model because our data consists of four discrete variables or choice categories. Such a statistical formulation gives us the opportunity to identify factors that can be manipulated by policy intervention to improve the activity status of the Youth in Jamaica. For instance, the modelling exercise in this paper helps us to answer the following important question: *what factors influence the youth to be engaged in working, studying, working and studying, or withdraw from both activities?* Therefore, we predict the probability of being engaged in any of the activity status categories as a function of variables such as gender, age, location, training participation, educational qualification and other relevant regressors.

In a general case, suppose that there are k categorical outcomes and - without loss of generally, let the base outcome be 1. The probability that the response for the jth observation is equation to the ith outcome is

$$p_{ij} = \Pr(y_j = i) = \begin{cases} \dfrac{1}{1+\sum_{m=2}^{k}\exp(x_j\beta_m)}, if, i = 1 \\ \dfrac{\exp(x_j\beta_i)}{1+\sum_{m=2}^{k}\exp(x_j\beta_m)}, if, i > 1 \end{cases} \qquad (2)$$

Where x_j is the row vector of observed values of the independent variables for the jth observation and β_m is the coefficient vector for outcome m. The log pseudolikelihood is

$$\ln L = \sum_j w_j \sum_{i=1}^{k} I_i(y_i) \ln P_{ik} \qquad (3)$$

Where w_j is an optional weight and

$$I_i(y_i) = \begin{cases} 1, if, y_j = i \\ 0, otherwise \end{cases} \qquad (4)$$

We used STATA 9.2 to estimate the multinomial logit model and Newton-Raphson maximum likelihood is used.

4. Data and descriptive statistics

The youth module (i.e. pertaining to individuals aged 17-29) has detailed individual levels information about, inter alia, activity status, age, gender, location, income class and training undertaken by the youth. The data is usable for a range of socio-economic studies which are of interest to investigate development issue of concern for Jamaica.

The data we are investigating in this paper is collected in 2001 as part of the Jamaica Survey of Living Conditions (JSLC). For this study, we focus on the activity status and its determinants. Table 1 below gives the distribution of the total sampled individuals among the activity groups identified by the survey. According to the reported results, most of the youth (i.e. about 43.4 % of them) are 'inactive'. An inactive person is defined here a person who is engaged neither in studying nor working. In a separate section, we will define a group of youth who are deemed to be out of the labour force. Given the claim for arbitrary distinction between unemployment and reported labour force, we argue that we can treat our activity status question as a valid labour market variable to analyse the determinants of unemployment of Jamaican youth (Flinn and Heckman, 1983).

Table 1: Distribution of activity status of Jamaican Youth (17-27)

Activity status	Frequency (%)
Studying (S)	447 (16.96)

Working (W)	950 (36.1)
Studying and working (S & W)	87 (3.3)
Neither studying nor working (NS & NW)	1143 (43.4)
Not known (NN)	8 (0.3)
Total	2635 (100.0)

Table 2: Activity status by age

Activity Status	Group 1, freq (%)	Group 2, freq. (%)
S	272 (60.9)	175 (39.1)
W	443 (46.6)	507 (53.4)
S & W	40 (46.0)	47 (54.0)
NS & NW	658 (57.6)	485 (42.4)
NN	5 (62.5)	3 (37.5)
Total	1418 (53.8)	1217 (46.2)

According table 2, the younger ones are more likely to be studying. Conversely, most of the older youth are engaged in working or report to be simultaneously working and studying.

Table 3: Activity status by gender

Activity Status	Male, freq (%)	Female, freq. (%)
S	218 (48.8)	229 (51.23)
W	486 (51.2)	464 (48.8)
S & W	36 (41.4)	51 9 (58.6)
NS & NW	538 (47.1)	605 (52.9)
NN	3 (37.5)	5 (62.5)
Total	1281 (48.6)	1354 (51.4)

Females are more likely to be engaged in both studying and working. For the rest of the activity status, there is almost an even split between males and females.

Table 4: Activity status by location

In what Parish were you born?	Are you currently - studying, working....neither? 1	2	3	4	N	Total
01	61	106	8	113	3	291
	20.96	36.43	2.75	38.83	1.03	100.00
02	59	76	8	96	0	239
	24.69	31.80	3.35	40.17	0.00	100.00
03	3	43	8	46	0	100
	3.00	43.00	8.00	46.00	0.00	100.00
04	15	25	0	34	0	74
	20.27	33.78	0.00	45.95	0.00	100.00
05	33	52	0	77	0	162

	20.37	32.10	0.00	47.53	0.00	100.00
06	49	78	15	66	0	208
	23.56	37.50	7.21	31.73	0.00	100.00
07	6	26	0	23	0	55
	10.91	47.27	0.00	41.82	0.00	100.00
08	3	51	1	98	0	153
	1.96	33.33	0.65	64.05	0.00	100.00
09	19	33	6	49	0	107
	17.76	30.84	5.61	45.79	0.00	100.00
10	7	43	0	68	0	118
	5.93	36.44	0.00	57.63	0.00	100.00
11	15	135	0	88	0	238
	6.30	56.72	0.00	36.97	0.00	100.00
12	13	65	22	95	0	195
	6.67	33.33	11.28	48.72	0.00	100.00
13	84	65	6	79	0	234
	35.90	27.78	2.56	33.76	0.00	100.00
14	52	113	7	178	0	350
	14.86	32.29	2.00	50.86	0.00	100.00
NN	10	22	6	20	0	58
	17.24	37.93	10.34	34.48	0.00	100.00
Total	429	933	87	1,130	3	2,582
	16.62	36.13	3.37	43.76	0.12	100.00

Table 5: Activity status by income class

Activity Status	Middle and Upper class , freq (%)	Working class, freq. (%)
S	94 (44.1)	119 (55.9)
W	162 (33.9)	316 (66.1)
S & W	13 (41.9)	18(58.1)
NS & NW	297 (27.1)	801 (72.9)
Total	566 (31.0)	1254 (68.9)

Another important classification is to split our sample into two groups viz. those 'in the labour force' and 'out of the labour force' using the following criteria. According to our data, individuals have reported their status with regard to studying and working. We cannot define a group of the unemployed because the data which applies to the youth does not directly translate to unemployment status as in other typical labour market or unemployment studies (Byrne and Strobl, 2004). However, we believe that our analysis of the group of individuals out of the labour force can be highly complimentary to the analysis unemployment in Jamaica. Mainly this is due to the similarities of behaviour

displayed by the unemployed and those who are out of the labour force (Flinn and Heckman, 1983). Some argue that the labour market status of many nonworking persons is at the boundary between unemployment and inactivity (Brandolini, et al , 2006).

5. Discussion of econometric results

5. 1. Probit estimates

First we discuss the results reported in tables A1 (probit model for the general sample), A2 (probit model for females) and A3 (probit model for males). The probit models predict the probability of being inactive. Note that those who are inactive are the ones who reported to do neither studying nor working. In our discussion, we only focus on significant parameter estimates. The signs of the parameters are generally consistent with our a priori expectations. For instance, married women and men have lower probability of being inactive. Income class of individuals is a significant factor. However, its significance is more pronounced for the general and the female sample. Income class position of men is not a significant determinant of their activity status. Likewise, being in a younger age group (i.e. between the age of 17 to 22) is not significantly linked to lower probability of inactivity for males while the converse is true for the general sample and females.

Unsurprisingly, lack of education is significantly related with higher probability of inactivity and this is true across the board. When it comes to training, we have in interesting result. In the general and male sample probit results, it is a significant factor but not in the female sample probit results. Meaning having training opportunities is more important for determining the activity status of males than females. In the survey, respondents reported whether they have taken part in any of the training programmes that are available to the youth in Jamaica, viz, NYS, STEP, Youth in Agriculture and HEART training.

The last set of significant variable are related to location. Relative to Kingston, individuals living in St. Mary are more likely to be inactive and this is true both for the

general sample and the two gender groups. Living in St. Elizabeth is related to lower probability of inactivity for males and the general sample while living in St. James is linked to higher probability of inactivity for females and the general sample.

The second set is related to probit models which are estimated on a slightly different sub-sample. Instead of predicting the probability of inactivity, the second set of results summarised below in tables A4, A5 and A6 of the appendix gives us a corresponding set of parameter estimates for individuals who we consider to be out of the labour force (i.e. individuals who are studying and who declared to be neither studying nor working at the time of the survey). Table A4 gives the probit estimates for the whole sample while tables A5 and A6 give us similar estimates but for the female sub-sample and male sub-sample respectively.

The second set of results has a lot of common features with the first set of probit results. In fact, there are some interesting distinctions which we highlight in our discussion. According to A4, females are more likely to be 'out of the labour force'. Lack of education is significantly related with higher probability of being out of the labour force in the general sample and female sub-sample but not in the male sub-sample results. Across the board, participating in any of the training programmes mentioned above, being in the upper age group (i.e. in the range between 23–29) and living in St. Elizabeth are significantly and negatively related with the probability of being out of the labour force.

The two interesting and distinct results that are worth highlighting are associated with the possession of any kind of skill and illness. According to table A6 (i.e. probit for the male sample), males without any type of skill are more likely to be out of the labour force. Interestingly enough, the skill variable did not feature to be a significant factor for the female sub-sample. Another important follow-up question which was asked in the survey might give an idea of the severity of the problem in relation to the lack of skills in Jamaica. The question asked respondents whether they are interested to learn any skill and surprisingly the majority who responded to the question [i.e. 697 (70%) of them] said

that they would not be interested to get any skills. This might be a support to some of the explanation of the rising youth unemployment problem in Jamaica. Some argue that the unemployment problem in Jamaica is not only a result of supply and demand side factors but also the attitudes of the youth themselves towards skill acquisition and training.

For the first time, morbidity did feature as important determinant of the labour market status of individuals, here males. As expected, males who have reported to have been ill in the last 4 weeks are more likely to be out of the labour force. Finally, as opposed to our activity status probit models, marital status has not been found to be important as a determinant affecting the probability of being out of the labour force.

5. 2. Multinomial logit estimates

In addition to the predicting the probability of being out of the labour force and being inactive, we have also estimated a polychotomous discrete choice model (i.e. a multinomial logit model). This modelling is intended to identify the factors that significantly affect four the activity status of individuals (i.e. *studying, working, studying and working, neither studying nor working*). For identification purposes, the last activity category is used as a base category. Therefore, all the interpretation of the multinomial logit model is in reference to this category.

According to the estimates reported in table A7 below, absence of any educational qualification is negatively and significantly linked to the probability of working, studying or doing both. On the other hand, married individuals are more likely to be studying, working or doing both relative to their unmarried counterparts. Females are less likely to work and training opportunities are linked to higher probability of working. As in the previous set of results, we have mixed results when it comes to location dummies. Individuals who live in St. Thoms and St. Mary are less likely to study and those who live in St. Mary, Trelawny and Manchester are less likely to work.

We also tested for IIA (independence of irrelevant alternatively) and we failed to reject the null. Therefore, it is appropriate to fit the multinomial logit model for our data.

Concluding remarks and extensions

The econometric results corroborate the findings reported in the descriptive statistics reported earlier. In general, the probit results indicate that both supply side factors (e.g. training and educational qualification) and demand side factors (e.g. location) are important in affecting the probability of inactivity and being out of the labour force (ILO, 1988). This suggests that the Jamaican government needs to intensify the provision of its training opportunities for its youth via better targeting and create the necessary condition to improve the economy by focusing on investment projects that might boost demand for labour.

Effective targeting of educational and training policies (e.g. encouraging men to participate in such schemes) is a non-trivial issue in the Jamaican context. This is due to the fact that our econometric estimates strongly show that the absence of skills and training opportunities is more detrimental to the activity status of males than females. Another focus can be to give particular attention to disadvantaged parishes relative to the capital, Kingston to address some of the factors significantly responsible to youth inactivity.

Finally, we believe that more systematic and more careful analysis of the existing household and individual level data via JSLC (Jamaica Survey of Living Conditions) 2001 will reveal more about the labour market status of Jamaican youth. We expect to report more results in the final draft of this study.

References

Brandolini, A., Cipolline, P. and E. Viviano (2006) Does the ILO definition capture all Unemployment, *Journal of the European Economic Association*, vol. 4(1):153-179.

Bryne, D. and E. Strobl (2004) Defining Unemployment in Developing Countries: Evidence from Trinidad and Tobago, *Journal of Development Economics*, vol. 73(1): 465-476.

Flinn, C. J and Heckman, J. J. (1983) Are Unemployment and Out of Labour Force Behaviourally Distinct Labour Force States, *Journal of Labour Economics*, vol. 1(1) 28-42.

Government of Jamaica (2005) Medium term Socio-economic Policy Framework, 2004-2007, February, Draft.

Government of Jamaica (2003) National Youth Policy, Ministry of Education, Youth and Culture, Jamaica.

ILO, (1988) The Challenge of Youth Unemployment in the Caribbean: the Role of Youth Employment Training Programmes, Caribbean Office and Multidisciplinary Advisory Team.

O'Higgins, N. (2001) Youth Unemployment and Employment Policy: Global Perspective, ILO, Geneva.

Pantin, (2005) Revisiting the Challenge of Youth Employment in the Caribbean, in D. Pantin (ed), *The Caribbean Economy*: A Reader, (Ian Randle Publishers, Kingston, Jamaica), 412-433.

Appendix
Regression Results

A1: Probit for the total sample: models predicting probability of being 'inactive'

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Probit regression                                 Number of obs   =       1122
                                                  LR chi2(23)     =     117.40
                                                  Prob > chi2     =     0.0000
Log likelihood = -707.56585                       Pseudo R2       =     0.0766

------------------------------------------------------------------------------
    inactive |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      female |    .143071   .0805087     1.78   0.076    -.0147231    .3008652
       class |   .1508075   .0884434     1.71   0.088    -.0225383    .3241533
     married |  -.2387695   .0983878    -2.43   0.015    -.4316062   -.0459329
        none |   .5543981   .0988939     5.61   0.000     .3605696    .7482266
       basic |  -.0149366   .1794138    -0.08   0.934    -.3665812     .336708
     general |   .0088251   .1451655     0.06   0.952     -.275694    .2933442
     noskill |   .1159564     .08233     1.41   0.159    -.0454073    .2773202
    training |  -.3636814   .1395853    -2.61   0.009    -.6372635   -.0900994
     illness |  -.0066575    .126661    -0.05   0.958    -.2549086    .2415935
      andrew |  -.1408092   .1602825    -0.88   0.380    -.4549572    .1733388
      thomas |   .2113612   .2124139     1.00   0.320    -.2049625    .6276848
    portland |   .1283294   .2388254     0.54   0.591    -.3397598    .5964186
        mary |   .6682523   .2098165     3.18   0.001     .2570195    1.079485
         ann |  -.1251814   .1857455    -0.67   0.500    -.4892358     .238873
    trelawny |   .3927643   .3278515     1.20   0.231    -.2498129    1.035342
       james |   .4310285   .1751604     2.46   0.014     .0877205    .7743366
     hanover |  -.1421592   .2098386    -0.68   0.498    -.5534353     .269117
    westmore |   .3198875   .2157658     1.48   0.138    -.1030058    .7427808
    elizbeth |  -.3144254   .1550877    -2.03   0.043    -.6183918    -.010459
    manchest |   .5372221   .1892092     2.84   0.005      .166379    .9080653
    clarendn |   .1939086   .1840921     1.05   0.292    -.1669053    .5547224
    cathrine |   .1574185   .1412313     1.11   0.265    -.1193898    .4342268
    agegroup |  -.2275552   .0953794    -2.39   0.017    -.4144953   -.0406151
       _cons |  -.2228895    .140535    -1.59   0.113     -.498333     .052554
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A2: Probit for inactive Females

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Probit regression                                 Number of obs   =        596
                                                  LR chi2(22)     =      85.45
                                                  Prob > chi2     =     0.0000
Log likelihood = -359.80602                       Pseudo R2       =     0.1061

------------------------------------------------------------------------------
    inactive |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       class |   .3103554   .1209461     2.57   0.010     .0733054    .5474053
     married |  -.2276544   .1358113    -1.68   0.094    -.4938397    .0385308
        none |   .6928418   .1400985     4.95   0.000     .4182539    .9674297
       basic |   .0546045   .2435836     0.22   0.823    -.4228106    .5320196
     general |   .0994403   .1902854     0.52   0.601    -.2735123    .4723929
     noskill |   .0918416   .1171179     0.78   0.433    -.1377052    .3213885
    training |  -.2232663   .1903166    -1.17   0.241      -.59628    .1497473
     illness |  -.1627315   .1601518    -1.02   0.310    -.4766233    .1511604
      andrew |   .0498207   .2193456     0.23   0.820    -.3800887    .4797302
      thomas |   .4643897   .2905954     1.60   0.110    -.1051668    1.033946
```

portland	.4615142	.3489683	1.32	0.186	-.2224512	1.14548
mary	.719155	.3069037	2.34	0.019	.1176348	1.320675
ann	.0452222	.2634845	0.17	0.864	-.4711979	.5616423
trelawny	.5918791	.5464068	1.08	0.279	-.4790585	1.662817
james	.5931879	.2578098	2.30	0.021	.08789	1.098486
hanover	-.1379527	.2824542	-0.49	0.625	-.6915527	.4156473
westmore	.4467661	.3060424	1.46	0.144	-.1530659	1.046598
elizbeth	-.2001363	.2287716	-0.87	0.382	-.6485203	.2482478
manchest	.6678745	.2560996	2.61	0.009	.1659285	1.169821
clarendn	.2824704	.2556995	1.10	0.269	-.2186915	.7836322
cathrine	.270211	.1926472	1.40	0.161	-.1073705	.6477925
agegroup	-.4641821	.1352754	-3.43	0.001	-.729317	-.1990471
_cons	-.1974246	.1926197	-1.02	0.305	-.5749524	.1801031

A3: Probit for inactive Males

Probit regression — Number of obs = 526; LR chi2(22) = 52.00; Prob > chi2 = 0.0003; Log likelihood = -336.40202; Pseudo R2 = 0.0717

inactive	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
class	-.060189	.1326486	-0.45	0.650	-.3201754	.1997974
married	-.2840734	.1459528	-1.95	0.052	-.5701356	.0019888
none	.4345393	.1440149	3.02	0.003	.1522752	.7168034
basic	-.1577245	.2761382	-0.57	0.568	-.6989455	.3834965
general	-.049097	.2341368	-0.21	0.834	-.5079966	.4098027
noskill	.161403	.1195756	1.35	0.177	-.0729608	.3957668
training	-.5403009	.2128457	-2.54	0.011	-.9574708	-.123131
illness	.3127963	.2189214	1.43	0.153	-.1162817	.7418743
andrew	-.3507983	.2410563	-1.46	0.146	-.82326	.1216634
thomas	-.0841296	.3194064	-0.26	0.792	-.7101546	.5418954
portland	-.1638626	.3411287	-0.48	0.631	-.8324625	.5047373
mary	.6236085	.2926912	2.13	0.033	.0499442	1.197273
ann	-.2578495	.2660544	-0.97	0.332	-.7793066	.2636075
trelawny	.1531366	.4301375	0.36	0.722	-.6899175	.9961907
james	.3384103	.2431119	1.39	0.164	-.1380802	.8149009
hanover	-.0614656	.3237094	-0.19	0.849	-.6959245	.5729932
westmore	.2549461	.3121557	0.82	0.414	-.3568678	.8667599
elizbeth	-.4314415	.2160297	-2.00	0.046	-.8548519	-.0080311
manchest	.384111	.2869571	1.34	0.181	-.1783145	.9465365
clarendn	.1997091	.2695566	0.74	0.459	-.3286122	.7280304
cathrine	.0036053	.2137714	0.02	0.987	-.4153789	.4225895
agegroup	.0310357	.139533	0.22	0.824	-.2424439	.3045153
_cons	-.0763705	.195521	-0.39	0.696	-.4595845	.3068436

A4: /*probit for out of labour force for total sample*/

Probit regression — Number of obs = 1122; LR chi2(23) = 91.33; Prob > chi2 = 0.0000; Log likelihood = -647.50159; Pseudo R2 = 0.0659

out	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
female	.1600589	.0838759	1.91	0.056	-.004335	.3244527
class	.1378916	.0911167	1.51	0.130	-.0406938	.316477
married	-.001666	.1005976	-0.02	0.987	-.1988336	.1955016
none	.2141252	.1020876	2.10	0.036	.0140372	.4142132
basic	-.2436685	.1831583	-1.33	0.183	-.6026522	.1153152
general	-.1620414	.1481092	-1.09	0.274	-.4523301	.1282473

```
     noskill |   .1382531   .0852375     1.62   0.105    -.0288093    .3053156
    training |  -.4611516   .1402141    -3.29   0.001    -.7359661   -.1863371
     illness |   .0307662   .1316737     0.23   0.815    -.2273095    .2888419
      andrew |   -.042784   .1655891    -0.26   0.796    -.3673326    .2817646
      thomas |  -.2490037   .2154538    -1.16   0.248    -.6712853     .173278
    portland |   .0016251   .2495485     0.01   0.995    -.4874809    .4907311
        mary |   .3360239   .2222484     1.51   0.131    -.0995751    .7716228
         ann |  -.0552322   .1933778    -0.29   0.775    -.4342457    .3237812
    trelawny |   1.075629   .5093833     2.11   0.035     .0772562    2.074002
       james |  -.0864184   .1771953    -0.49   0.626    -.4337149    .2608781
     hanover |  -.1832419   .2159656    -0.85   0.396    -.6065266    .2400429
    westmore |   .2051621   .2288476     0.90   0.370    -.2433709    .6536951
    elizbeth |  -.6385906   .1581836    -4.04   0.000    -.9486247   -.3285564
    manchest |    .161421   .1958608     0.82   0.410    -.2224591     .545301
    clarendn |   .2738022   .2004819     1.37   0.172    -.1191351    .6667394
    cathrine |  -.0310637   .1466794    -0.21   0.832    -.3185502    .2564227
    agegroup |  -.3983251   .1003359    -3.97   0.000    -.5949799   -.2016702
       _cons |   .5384407   .1471135     3.66   0.000     .2501035    .8267779
------------------------------------------------------------------------------
```

.

A5. /*probit for out of labour force females*/

.

```
Probit regression                                 Number of obs   =        587
                                                  LR chi2(21)     =      55.83
                                                  Prob > chi2     =     0.0001
Log likelihood = -324.43976                       Pseudo R2       =     0.0792

------------------------------------------------------------------------------
         out |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       class |   .2647727   .1252664     2.11   0.035     .0192552    .5102902
     married |  -.0400484   .1400964    -0.29   0.775    -.3146322    .2345354
        none |   .3842052   .1454798     2.64   0.008       .09907    .6693404
       basic |  -.0978694   .2534743    -0.39   0.699    -.5946699    .3989311
     general |  -.1764412   .1920328    -0.92   0.358    -.5528186    .1999361
     noskill |   .0299088   .1223058     0.24   0.807    -.2098061    .2696237
    training |  -.4416209   .1914682    -2.31   0.021    -.8168917   -.0663501
     illness |   -.105933   .1649769    -0.64   0.521    -.4292817    .2174158
      andrew |   .1486365   .2266823     0.66   0.512    -.2956528    .5929257
      thomas |  -.0913689   .2916503    -0.31   0.754     -.662993    .4802553
    portland |   .2830085   .3715467     0.76   0.446    -.4452097    1.011227
        mary |   .3268861   .3210705     1.02   0.309    -.3024006    .9561728
         ann |   .2957148   .2905156     1.02   0.309    -.2736853    .8651148
       james |   .0711619   .2595979     0.27   0.784    -.4376406    .5799645
     hanover |   -.393382   .2853439    -1.38   0.168    -.9526457    .1658817
    westmore |   .2351193   .3203798     0.73   0.463    -.3928135    .8630521
    elizbeth |  -.5504825    .231754    -2.38   0.018    -1.004712   -.096253
    manchest |   .3057972   .2660217     1.15   0.250    -.2155959    .8271902
    clarendn |   .3871329   .2798976     1.38   0.167    -.1614563     .935722
    cathrine |   .1641988   .2011764     0.82   0.414    -.2300996    .5584973
    agegroup |  -.4678831   .1427166    -3.28   0.001    -.7476026   -.1881637
       _cons |   .5515555   .2024639     2.72   0.006     .1547336    .9483775
------------------------------------------------------------------------------
```

A6./*probit for out of labour force males*/

.

```
Probit regression                                 Number of obs   =        526
                                                  LR chi2(22)     =      48.67
                                                  Prob > chi2     =     0.0009
Log likelihood = -311.61278                       Pseudo R2       =     0.0724

------------------------------------------------------------------------------
         out |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       class |   -.050193   .1370481    -0.37   0.714    -.3188024    .2184164
     married |   .0145528   .1483504     0.10   0.922    -.2762086    .3053142
        none |   .0767766   .1476911     0.52   0.603    -.2126926    .3662458
```

```
           basic |  -.4417264   .2776262    -1.59   0.112    -.9858638    .1024109
         general |  -.0467722   .2439102    -0.19   0.848    -.5248275    .4312831
         noskill |   .2484333   .1231689     2.02   0.044     .0070268    .4898399
        training |  -.5155424   .2130888    -2.42   0.016    -.9331888   -.0978959
         illness |   .3918242   .2333242     1.68   0.093    -.0654829    .8491313
          andrew |  -.1870659   .2475199    -0.76   0.450    -.6721959    .2980641
          thomas |   -.404229   .3263905    -1.24   0.216    -1.043943    .2354847
        portland |  -.2043706   .3474631    -0.59   0.556    -.8853858    .4766446
            mary |   .3603064   .3134334     1.15   0.250    -.2540116    .9746245
             ann |  -.3094137   .2707681    -1.14   0.253    -.8401094    .2212819
        trelawny |   .6545659   .5582521     1.17   0.241    -.4395881     1.74872
           james |  -.1874603   .2468197    -0.76   0.448    -.6712179    .2962974
         hanover |   .2427526   .3580503     0.68   0.498     -.459013    .9445183
        westmore |    .286563   .3370189     0.85   0.395    -.3739819     .947108
        elizbeth |  -.7080531   .2216987    -3.19   0.001    -1.142575   -.2735315
        manchest |   .0044803   .2945276     0.02   0.988    -.5727833    .5817438
        clarendn |   .2369801   .2936922     0.81   0.420     -.338646    .8126063
        cathrine |  -.2692299   .2205267    -1.22   0.222    -.7014543    .1629945
        agegroup |  -.3181414   .1455004    -2.19   0.029    -.6033168   -.0329659
           _cons |   .7179661   .2079961     3.45   0.001     .3103012    1.125631
------------------------------------------------------------------------------
```

A7. /*running multinomial logit model for activity status*/

```
.

Multinomial logistic regression                 Number of obs   =       1122
                                                LR chi2(69)     =     271.88
                                                Prob > chi2     =     0.0000
Log likelihood =  -995.0267                     Pseudo R2       =     0.1202

------------------------------------------------------------------------------
      status |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
0            |
      female |    -.09664   .2094899    -0.46   0.645    -.5072327    .3139527
       class |  -.1981949   .2228467    -0.89   0.374    -.6349665    .2385767
     married |   1.028287   .2608494     3.94   0.000     .5170315    1.539543
        none |  -1.514653   .2476011    -6.12   0.000    -1.999943   -1.029364
       basic |  -.5269595   .4756164    -1.11   0.268    -1.459151    .4052315
     general |  -.3399374   .3497517    -0.97   0.331    -1.025438    .3455634
     noskill |  -.0318563    .216406    -0.15   0.883    -.4560043    .3922917
    training |  -.0430199   .4078387    -0.11   0.916    -.8423691    .7563294
     illness |   .1778755   .3452254     0.52   0.606    -.4987538    .8545048
      andrew |   .2975207   .3433408     0.87   0.386    -.3754149    .9704563
      thomas |  -2.436587   1.049577    -2.32   0.020    -4.493721   -.3794534
    portland |  -.4168434   .5622962    -0.74   0.458    -1.518924     .685237
        mary |  -1.758572    .646707    -2.72   0.007    -3.026094   -.4910492
         ann |   .2014251   .3980892     0.51   0.613    -.5788154    .9816655
    trelawny |   .2212441   .5966708     0.37   0.711    -.9482092    1.390697
       james |  -36.77855   1.93e+07    -0.00   1.000    -3.78e+07    3.78e+07
     hanover |   .1179497   .4960453     0.24   0.812    -.8542812    1.090181
    westmore |  -.5687398   .5428125    -1.05   0.295    -1.632633    .4951532
    elizbeth |  -1.192639    .570337    -2.09   0.037    -2.310479   -.0747988
    manchest |  -1.918824   .6447471    -2.98   0.003    -3.182505   -.6551426
    clarendn |   .0034207   .4082393     0.01   0.993    -.7967137    .8035551
    cathrine |  -.6596366   .3490546    -1.89   0.059    -1.343771    .0244979
    agegroup |  -.3239765   .2499347    -1.30   0.195    -.8138396    .1658866
       _cons |  -.1665201   .3198049    -0.52   0.603    -.7933261     .460286
-------------+----------------------------------------------------------------
1            |
      female |  -.2900886   .1476897    -1.96   0.050     -.579555   -.0006221
       class |  -.2514025    .162497    -1.55   0.122    -.5698908    .0670858
     married |   .1675407   .1784402     0.94   0.348    -.1821957    .5172771
        none |  -.6200621   .1859892    -3.33   0.001    -.9845943   -.2555299
       basic |   .3099013    .316482     0.98   0.327    -.3103919    .9301946
     general |   .0956208   .2681545     0.36   0.721    -.4299523     .621194
     noskill |  -.1992034   .1504725    -1.32   0.186    -.4941241    .0957173
    training |   .8176352   .2419525     3.38   0.001     .3434171    1.291853
     illness |   .0148341   .2296855     0.06   0.949    -.4353412    .4650094
```

andrew	.1833648	.3104403	0.59	0.555	-.425087	.7918166
thomas	.1979145	.3727261	0.53	0.595	-.5326152	.9284443
portland	.0510443	.4394827	0.12	0.908	-.8103259	.9124146
mary	-.7729784	.4088653	-1.89	0.059	-1.57434	.0283829
ann	.3098616	.3478955	0.89	0.373	-.372001	.9917243
trelawny	-1.760569	1.060162	-1.66	0.097	-3.838447	.3173101
james	-.1060874	.3076707	-0.34	0.730	-.7091108	.4969361
hanover	.4445655	.3782287	1.18	0.240	-.296749	1.18588
westmore	-.3404992	.4055305	-0.84	0.401	-1.135324	.4543259
elizbeth	.9966398	.2737403	3.64	0.000	.4601186	1.533161
manchest	-.5583003	.3595545	-1.55	0.120	-1.263014	.1464135
clarendn	-.3729885	.3658191	-1.02	0.308	-1.089981	.3440039
cathrine	-.0185465	.26367	-0.07	0.944	-.5353302	.4982371
agegroup	.597652	.1794236	3.33	0.001	.2459882	.9493158
_cons	-.5223196	.2701867	-1.93	0.053	-1.051876	.0072365
2						
female	-.2457013	.4746788	-0.52	0.605	-1.176055	.6846521
class	-.2496298	.4964053	-0.50	0.615	-1.222566	.7233067
married	.6856229	.5159659	1.33	0.184	-.3256517	1.696897
none	-1.525364	.6041016	-2.53	0.012	-2.709381	-.3413463
basic	-.4273548	1.109704	-0.39	0.700	-2.602334	1.747625
general	.6636262	.5979875	1.11	0.267	-.5084078	1.83566
noskill	-.6789859	.5049107	-1.34	0.179	-1.668593	.3106208
training	-.5929973	1.060393	-0.56	0.576	-2.671329	1.485334
illness	-1.054668	1.074158	-0.98	0.326	-3.159979	1.050644
andrew	.1747304	.632036	0.28	0.782	-1.064037	1.413498
thomas	-.9431316	1.138708	-0.83	0.408	-3.174958	1.288695
portland	-36.55966	6.32e+07	-0.00	1.000	-1.24e+08	1.24e+08
mary	-36.70467	5.25e+07	-0.00	1.000	-1.03e+08	1.03e+08
ann	-36.20943	5.03e+07	-0.00	1.000	-9.86e+07	9.86e+07
trelawny	-36.72535	9.89e+07	-0.00	1.000	-1.94e+08	1.94e+08
james	-1.777037	1.107067	-1.61	0.108	-3.946849	.3927739
hanover	-35.96165	5.46e+07	-0.00	1.000	-1.07e+08	1.07e+08
westmore	-36.19315	5.27e+07	-0.00	1.000	-1.03e+08	1.03e+08
elizbeth	-36.03376	4.03e+07	-0.00	1.000	-7.90e+07	7.90e+07
manchest	-.751883	.847331	-0.89	0.375	-2.412621	.9088551
clarendn	-36.28451	5.03e+07	-0.00	1.000	-9.86e+07	9.86e+07
cathrine	-.451342	.6600569	-0.68	0.494	-1.74503	.8423458
agegroup	1.271122	.6825262	1.86	0.063	-.0666052	2.608848
_cons	-2.426311	.7914225	-3.07	0.002	-3.977471	-.8751519

(status==3 is the base outcome)
0= studying
1= working
2= studying and working
4= neither studying nor working.