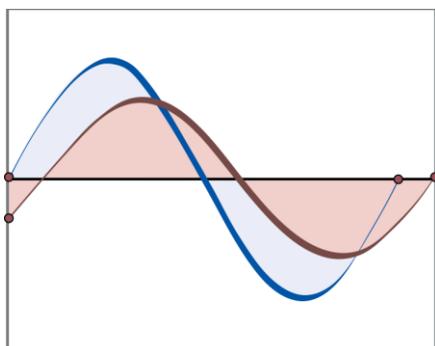


Working Papers

WP 01/2011 June 2011



Female Labour Force Participation: The Case of Trinidad and Tobago

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Research Department

National Surveys reveal a higher incidence of poverty among women compared to men in Trinidad and Tobago. One possible reason is the corresponding lower labour force participation rate of women when compared to men. This study sought to identify factors, which influence the ability or desire of a woman to join the labour force. A probit model utilising variables such as education, age, religion and earnings was used to estimate the probability of participation. A synopsis of the results shows that the level of schooling, age, being the head of the household and being single, have positive influences on female participation. On the contrary, the presence of children in the household, accessing social security programmes, and chronic illness have negative effects on participation. The results of this research can serve as a useful tool for more gender-sensitive policy formulation in Trinidad and Tobago, and even the wider Caribbean region.

JEL Classification: J22

Keywords: Labour force; Participation rate; Female labour force; poverty; Trinidad and Tobago

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Female Labour Force Participation: The Case of Trinidad and Tobago

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1. Introduction

Statistics based on the Trinidad and Tobago economy, such as those derived from the Survey of Living Conditions (SLC) and the Household Budget Survey (HBS), reveal that women have had a higher incidence of poverty than men in all years² these surveys were conducted. One of the major factors affecting poverty among females is their relatively low labour force participation. As in most countries, female labour force participation rates (FLFPR) in Trinidad and Tobago are substantially lower than male participation rates. This research focused on both economic and non-economic factors that affect FLFPRs in Trinidad and Tobago and sought to expand the gender-specific labour market literature on Trinidad and Tobago.

This research is quite topical and important for several reasons. Firstly, as mentioned earlier, Trinidad and Tobago has a lower FLFPR compared to male participation rates, despite the vast improvements in educational achievements of women in Trinidad and Tobago in the last decade. Furthermore, at lower income levels, increases in female participation can help to alleviate poverty, which can have positive inter-generational effects (see Morrison *et al*, 2007 for further details on a conceptual framework linking women's earnings to poverty reduction and economic growth). This research is an empirical investigation into some of the factors that influence a woman's decision and/or ability to join the labour force. A probit model was employed, and data was sourced from the latest Household Budget Survey 2008/2009.

The rest of the paper is as follows: section 2 outlines some of the ideological concepts surrounding female labour force participation alongside a brief literature review of some of the variables under consideration. Section 3 describes the Trinidad and Tobago labour market and the data used, while section 4 presents the methodology and model used. Section 5 discusses the results of the model, and is followed by section 6, which concludes the paper.

¹ The authors are economists in the Research Department of the Central Bank of Trinidad and Tobago. The views expressed in this paper are those of the authors and not necessarily those of the Central Bank.

² Household Budget Surveys were conducted in 1971/1972, 1975/1976, 1981/1982, 1988, 1997/1998/, 2008/2009. Surveys of Living Conditions were conducted in 1992 and 2005.

2. Literature Review

A broad indicator of women's labour market activity is the female labour force participation rate. The labour force participation rate is defined as the ratio of the economically active population (persons who are aged 15 to 65, employed and unemployed) to the working age population. Hence, the FLFPR is the percentage of working age women who are either working or looking for work. A woman's decision to participate (or not) in the labour force will have a direct effect on the supply of labour.

The neoclassical theory of the allocation of time describes labour supply decisions (to participate or not to participate in the work force) of individuals. Based on this theory, individuals are assumed to value their time according to his/her preferences that maximize utility, and then he/she decides whether to participate in the labour market. The individual compares the value of his/her time in the labour market with the value of time spent on non-market (household) activities. If the value of time spent on market activities exceeds the value of non-market activities, all other things remaining constant, the individual would decide to participate in the labour market (Güvenç-Lisaniler and Bhatti, 2005).

The value of market activities will depend on the prevailing market wage rate, whilst the value of non-market activities is determined by the individual's tastes and preferences plus his/her time demands for non-market activities such as child rearing and the number of dependents living at home, including sick and elderly persons. Traditionally women have been homemakers and caregivers, and as such their reservation wage (the minimum wage rate at which a woman will accept employment) tends to be high given the (high) value women tend to place on their non-market activities at home. Consequently, in general, this prevents several women from participating in the labour market. For example, based on a national household survey in the Kyrgyz Republic, some 25 per cent of inactive women (compared to a negligible 1.5 per cent of inactive men) cited household duties/responsibilities as preventing them from participating in the labour market (World Bank, 2007).

Several factors, including the average market wage rate and the number of dependents living in the household, influence a woman's decision to participate in the labour market. Some of these include her level of educational attainment, marital status, access to social security programmes and residence (urban versus rural). In this research, the following *a priori* relationships were tested:

1. The more educated the woman becomes, the higher the probability of her participating in the labour market – schooling tends to increase the opportunity cost of a woman's time spent in the household;
2. If she is single as opposed to in a relationship, the higher the probability of her participating in the labour force;

3. Access to non-labour income through social security programmes will decrease the probability of labour market participation;
4. It is expected that women who are heads of households will be more likely to participate in the labour force;
5. Females in households with children are expected to have a lower probability of participating in the household;
6. Chronic disease negatively impacts the probability of a woman participating in the labour force; and
7. Women living in urban areas are more likely to participate in the labour market since, in general, urban dwellers tend to have a greater acceptance towards women entering the labour force.

3. National Data

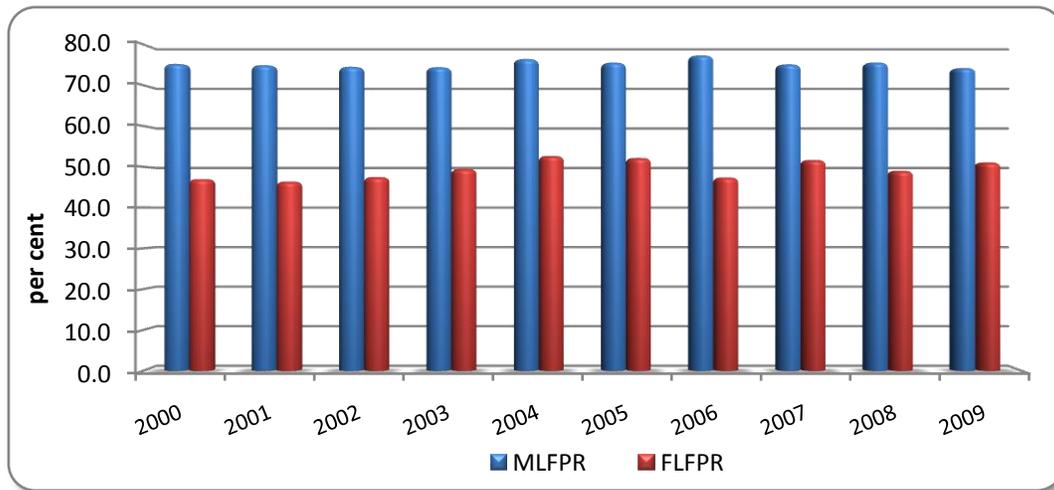
The research utilized information sourced from various SLCs, HBSs and Continuous Sample Surveys of the Population (CSSP). The SLC provides statistics on living conditions within Trinidad and Tobago including data on expenditure, demographics, income, educational level and housing conditions. The HBS focuses on the provision of reliable documentation on the expenditure patterns of private households. The CSSP considers labour market and employment characteristics of the population, providing estimates of levels of unemployment, participation rates and education levels, among other characteristics.

According to the 2009 Central Statistical Office (CSO) Pocket Digest, 48 per cent of the population of Trinidad and Tobago or 653,100 persons were female. Of these females, 254,300 comprise the female labour force or approximately 41 per cent of the total labour force. The female unemployment rate was 6.2 per cent compared to a male unemployment rate of 4.5 per cent (CSO, 2009).

Historically, national labour force participation rates have had a large disparity between men and women, as shown in Chart 1. Notwithstanding this, the disparity has been decreasing over the period 2000-2009. During this period, the participation rate for women hovered around 50 per cent. Although females exhibited a lower overall participation rate, many women seek higher education (more than men when UWI enrolment is examined). Further, HBS data showed that among persons whose highest level of education achieved was tertiary, women constituted 55 per cent of the sample. During the period 2000 to 2009, the FLFPR averaged 51.5 per cent compared to 77.1 per cent for males. More noteworthy however, is that Trinidad and Tobago's FLFPR over the ten-year period 2000-2009 was lower than some of its neighbouring countries; Barbados and Jamaica's FLFPRs averaged 65.1 per cent and 57.4 per cent, respectively, over the same ten-year period³.

³ Data was sourced from the *Key Indicators of the Labour Market Database*, International Labour Organisation (ILO).

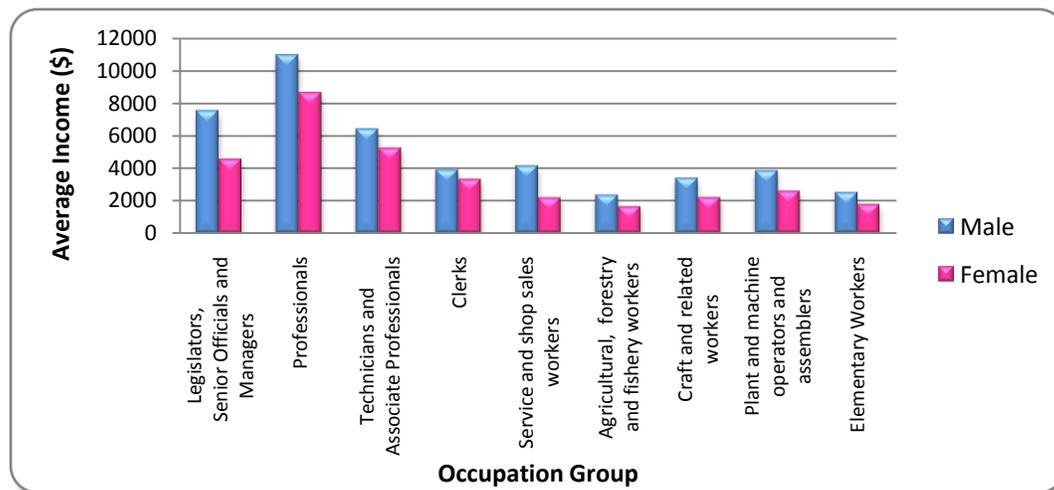
Chart 1
Labour Force Participation Rates in Trinidad and Tobago by Gender, 2000-2009



Source: Key Indicators of the Labour Market Database, International Labour Organisation (ILO).

The Continuous Sample Survey of the Population (CSSP) showed that in 2007, the average income for men exceeded women across all listed occupational groupings (Chart 2). Noticeably, the spread was largest at the professional and legislator/senior managers' groupings and smallest across the elementary occupations. This difference in wages poses the potential for decreased participation of women in the workforce due to a lack of motivation and sentiments of unfair treatment. While this is a valid and important issue, the concept of wage differentials and its impact on FLFPRs reaches beyond the scope of this paper.

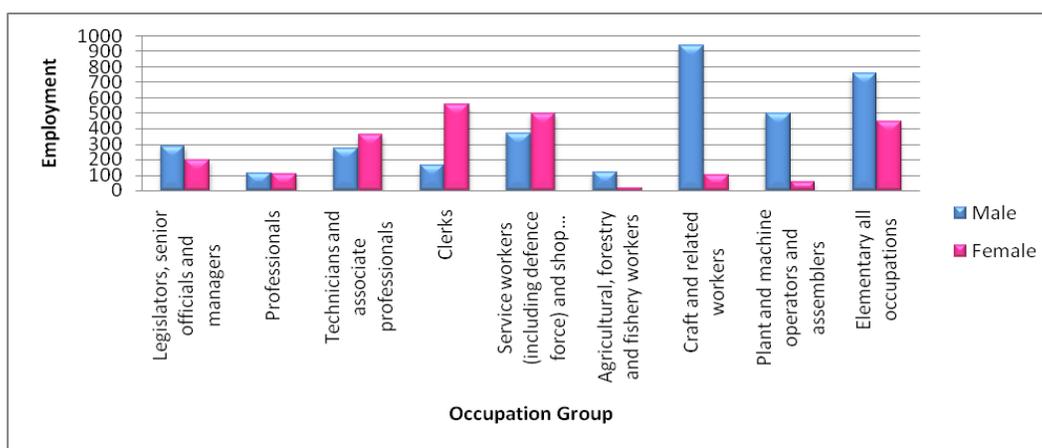
Chart 2
Average Income by Occupational Group and Gender, 2007



Source: Continuous Sample Survey of the Population (CSSP) 2007.

Chart 3 shows employment disaggregated by gender from data arising out of the CSSP 2007. The data revealed that women are dominant in the service industry and as clerks and associate professionals. There is some level of parity at the professional level, while men have a greater presence at senior levels. The nature of the enrolment at the tertiary level is something that has potential for further discussion, to ascertain whether the labour market reflects the gender composition of the persons with qualifications or whether women are not offering themselves for employment or not obtaining equitable opportunities for employment.

Chart 3
Employment by Occupational Group and Gender, 2007



Source: Continuous Sample Survey of the Population (CSSP) 2007.

The HBS 2008/2009 sampled 10,805 persons as is shown in Table 1. The sample of women represented approximately 41 per cent of the total sample. The enumeration period of the HBS ran from May 2008 to April 2009. The initial sample was 7,680 households but due to an overall non-response rate of 7.7 per cent, this fell to a realized sample of 7,090 (HBS 2008/2009). The HBS captured information regarding consumption expenditure, demographic information and socio-economic status in addition to other key variables. The disaggregation of the data by gender proved useful for the purpose of this study. The HBS also provided data on cross-sectional expenditure patterns and demographics of households.

The largest percentage of the women in the sample were found to be in the middle-income area (49 per cent) compared with 52 per cent of men falling in this income bracket. The data thus showed that there seems to be an equal proportion of men and women in the low and in the middle-income areas. However, one quarter of the female population live in high-income households, as opposed to a little over one fifth of males residing in such households. This data suggests that a larger proportion of females live in households with a better economic standing than their male counterparts.

The data from the HBS in Table 2 shows that 64 per cent of women live in urban areas compared with 57 per cent of sampled males. Thus, a larger proportion of the female population resides in the more developed economic areas of the country and has a general “closeness” to economic opportunities.

Table 1
Income Area and Gender Cross Tabulation HBS 2008/2009

Income Area		Male	Female	Total
Low	Count	1,672	1,125	2,797
	% within Income Area	59.79	40.22	100.00
	% within Gender	26.44	25.10	25.89
Middle	Count	3,300	2,202	5,502
	% within Income Area	59.98	40.02	100.00
	% within Gender	52.19	49.13	50.92
High	Count	1,351	1,155	2,506
	% within Income Area	53.91	46.09	100.00
	% within Gender	21.37	25.77	23.19
Total	Count	6,323	4,482	10,805
	% within Income Area	58.52	41.49	100.00
	% within Gender	100.00	100.00	100.00

Source: Household Budget Survey 2008/2009.

Table 2
Location and Gender Cross tabulation HBS 2008/2009

Location		Male	Female	Total
Urban	Count	3,607	2,884	6,491
	% within Urban/Rural	55.57	44.43	100.00
	% within Gender	57.05	64.35	60.074
Rural	Count	2,716	1,598	4,314
	% within Urban/Rural	62.96	37.04	100.00
	% within Gender	42.95	35.65	39.93
Total	Count	6,323	4,482	10,805
	% within Urban/Rural	58.52	41.48	100.00
	% within Gender	100	100	100

Source: Household Budget Survey 2008/2009.

4. Methodology

The CSO of Trinidad and Tobago provided data from the HBS 2008/2009 for females between the ages of 15-64⁴. The data was analyzed using the probit estimation technique, which utilizes a binary format of the dependent variable, in this case whether the female participates or does not participate in the labour force (given values of one

⁴ The dataset was limited only to information relevant to the research being conducted, with no identifiers of respondents or sensitive information.

and zero, respectively) and the results are shown in Table 4. The variables used in this study included non-labour income (that is, income from the social sector), health, age, religion, ethnicity, household headship, education and location (urban versus rural).

The first stage involved the identification of the variables for the probit model. All variables faced significance tests at all conventional levels of alpha⁵. Those variables that were not significant at any conventional level of alpha were dropped from the model. Some of the insignificant variables included income status of household, disability and location by Regional Corporation. The variables that were included were placed into groupings to identify the socio-economic factor that it helps to explain. For example, the variable measuring whether any chronic illness is present can be utilized as one measure of the impact of health on the FLFPR.

Further, to enable future cross-country comparisons, the authors adopted a model that was similar to other literature on countries such as Barbados (Downes, 1998), Jamaica (MacKinnon, 1992), Ghana (Sackey, 2005), Chile (Contreras and Plaza, 2010), and North Cyprus (Güven-Lisaniiler and Bhatti, 2005). For this reason, the base model was built similar to these studies and changes were made following tests of significance of variables and inclusion of country-specific variables, for example ethnicity.

The probit model explains the direction of the relationship between the independent variables and participation. In order to have some guide of the magnitude of the impact of these variables on participation the marginal effect needed to be calculated (Table 3). Particular variables were “dummified”, that is, placed into particular groupings and treated as an ordinal variable, meaning the value represents a particular group and there is no linear relationship. For example, age was used as an age grouping (20-24 years old), access to government and non-government social programmes into non-labour income and location into urban and rural.

The variables that were tested and accepted at all conventional levels of alpha were the level of schooling, age (at last birthday), being the head of the household and relationship status of the woman (single versus couple), the presence of children in the household, non-labour income (as measured by accessing social security programmes), and chronic illness.

The variable single measured the size of the impact of being single on the FLFPR. The measure that was applied to being single versus a couple was based on whether the parties were ‘living together’, ‘married living with spouse’ or ‘living common-law’ being regarded as a couple. Those who were previously married or in a relationship but no longer living together and those never married or never had a partner were considered as single. For purposes of the probit, the variable couple was treated as the reference and was omitted.

⁵ The conventional levels of alpha used were 1, 5 and 10 per cent.

The variable non-labour income focused on whether the individual was a beneficiary of financial aid either from government or non-government sources. This variable provides insight into the impact of such sources of income on the probability of participation in the labour force. The omitted variable was not receiving any such form of income.

The ages of the women were placed into 5-year groupings. The 15-19 age group was treated as the reference, while the 60-64 was not significant at all levels of alpha. Other variables included religion, where religions other than Roman Catholic and Hindu⁶ were grouped as other and treated as the reference. In addition, education categories included primary, secondary and tertiary, with no education treated as the reference; while African and Indian were the major ethnicities⁷, with the others being treated as the reference. The role of the female in the household (headship), presence of children and health of the individual were also included in the model. Rural was the reference variable for location, with urban as the variable within the model.

5. Results

In testing the goodness of fit of the model, the Hosmer-Lemeshow test was utilized. The prob (chi-sq) values were significant at all conventional levels of alpha for both the H-L statistic and Andrews test statistic. In addition, the variables have p-values less than alpha at the 1, 5 and 10 per cent levels, signifying their significance in the model. The prob (LR) statistic is significant at all levels of alpha.

The data showed that the variables non-labour income, chronic illness, Hindu, presence of children and East Indian had negative coefficients. A negative coefficient implies an inverse relationship between these variables and the probability of participating. The other variables had a positive relationship, meaning that women in these groups have a higher likelihood of participating in the labour force. The probit model established the direction of the relationship. Concerning magnitude, the marginal effect was calculated to enable an understanding of the size of the relationship between the dependent and independent variables (Table 3).

The results support the notion that the relationship status of a woman influences her decision to participate in the labour force. Single women had a positive relationship with participation in the labour force, with a 6 per cent greater likelihood of participating as opposed to women in a relationship. Women who were the head of the household were 16 per cent more likely than women who were not heads of households to participate in the labour force.

Hindus showed a greater probability of not participating in the labour force; in fact, Hindu women are 4 per cent less likely to participate in the labour force as compared to other religions. Roman Catholics exhibited the opposite relationship with 4 per cent more likely to participate. Another country-specific factor, which exhibited a strong

⁶ The 2000 Census showed Roman Catholics constituted 26.0 per cent of the population and Hindus 22.5 per cent.

⁷The 2000 Census showed persons of African descent constituted 37.5 per cent of the population and East Indians 40.0 per cent.

correlation with participation, was ethnicity. East Indian women were 10 per cent less likely to participate compared to other ethnicities, while women of African descent were 10 per cent more likely to participate.

The presence of children also exhibited a significant impact on the FLFPR. Women with children were 10 per cent less likely to participate in the labour force as compared to women without children. In addition, the age groupings influence the FLFPR. The highest probabilities to participate occurred in the 25-29 and 40-44 age groups, 56 and 57 per cent respectively. However, the probabilities diminished as women get older, with probabilities of participation of 47, 38 and 29 per cent for the 45-49, 50-54 and 55-59 age groups, respectively.

The other variable under consideration was the level of schooling. As stated earlier, persons with their highest level of education attained falling outside of the primary, secondary and tertiary system, were treated as the reference group. The data revealed that for women whose highest level of education attained was primary and secondary level, the probability to participate was 13 and 14 per cent, respectively. Surprisingly, women with tertiary level education had a probability of participation of only 8 per cent. This is a very intriguing result and lends itself to the need for further analysis of the issue. There is a probability that women who have completed university education may choose to spend some time with their families before joining the labour force. However, validation of such an assumption or any others runs beyond the scope of this research. Women living in urban areas were 7 per cent more likely to participate in the labour force than those living in rural areas.

Table 3
Probit Model: Coefficients and Marginal Effects

* The Probability Density Function of 0.3972 was used in the calculation of the marginal effects.

Variable	Coefficient	Marginal Effect*	Variable	Coefficient	Marginal Effect*
Single	0.1709	0.0679	Hindu	-0.0959	-0.0381
Non-Labour Income	-0.3421	-0.1359	Head of Household	0.4131	0.1641
20-24	1.2040	0.4783	Presence of Children	-0.2391	-0.0950
25-29	1.4147	0.5620	Primary	0.3155	0.1253
30-34	1.3744	0.5459	Roman Catholic	0.0940	0.0373
35-39	1.3475	0.5353	Secondary	0.3519	0.1398
40-44	1.4307	0.5683	Tertiary	0.2127	0.0845
45-49	1.1721	0.4656	Urban	0.1744	0.0693
50-54	0.9522	0.3782	African	0.2596	0.1031
55-59	0.7321	0.2908	East Indian	-0.2607	-0.1035
Chronic Illness	-0.1613	-0.0641			

Table 4
Probit Model

Dependent Variable: Female Participation				
	Coefficient	Std. Error	z-Statistic	Prob.
C	-1.233000	0.078342	-15.73870	0.0000
Marital Status				
Single	0.170897	0.021433	7.973384	0.0000
Income Source				
Non-Labour Income	-0.342081	0.037202	-9.195142	0.0000
Age Grouping				
20-24	1.204038	0.056113	21.45727	0.0000
25-29	1.414732	0.057807	24.47353	0.0000
30-34	1.374383	0.061942	22.18820	0.0000
35-39	1.347535	0.062278	21.63758	0.0000
40-44	1.430652	0.062586	22.85906	0.0000
45-49	1.172134	0.061586	19.03246	0.0000
50-54	0.952155	0.061530	15.47457	0.0000
55-59	0.732107	0.070562	10.37544	0.0000
Health				
Chronic Illness	-0.161252	0.039306	-4.102520	0.0000
Religion				
Roman Catholic	0.093983	0.025977	3.617865	0.0003
Hindu	-0.095911	0.025717	-3.729531	0.0002
Household				
Head of Household	0.413105	0.042110	9.810154	0.0000
Presence of Children	-0.239106	0.032473	-7.363329	0.0000
Education				
Primary	0.315507	0.063504	4.968287	0.0000
Secondary	0.351925	0.058861	5.978946	0.0000
Tertiary	0.212687	0.075476	2.817943	0.0048
Location				
Urban	0.174433	0.031266	5.578918	0.0000
Ethnic Background				
African	0.259606	0.027022	9.607252	0.0000
East Indian	-0.260652	0.029590	-8.808874	0.0000
McFadden R-squared	0.169901	Mean dependent var		0.536494
S.D. dependent var	0.498697	S.E. of regression		0.440990
Akaike info criterion	1.151670	Sum squared resid		1599.731
Schwarz criterion	1.170389	Log likelihood		-4727.487
Hannan-Quinn criter.	1.158067	Restr. log likelihood		-5695.089
LR statistic	1935.203	Avg. log likelihood		-0.573168
Prob(LR statistic)	0.000000			
Obs with Dep=0	3823	Total obs		8248
Obs with Dep=1	4425			

6. Conclusions

It is widely known that increasing the welfare and earnings of women can help alleviate poverty, stimulate economic growth in the short-term through higher consumption expenditures, and increase long-term growth through higher savings (Morrison *et al*, 2007). This research highlighted that in Trinidad and Tobago female labour force participation rates have been substantially lower than male participation rates. FLFPRs in Trinidad and Tobago are also lower than female participation rates in other Caribbean countries, namely Jamaica and Barbados. Further research is needed to ascertain the reason(s) for this trend.

The results of the model broadly fell in line with *a priori* expectations, with a few surprises. Summarily, the level of schooling, age, being the head of the household and being single all had positive influences on female participation. However, the fact that women with tertiary education are only 8 per cent more likely to participate in the labour market was an unexpected result; the authors thought the likelihood of participation by these women would have been much higher. This exists although there is a high enrolment rate of females in tertiary learning institutions – about 65 per cent of total students enrolled at UWI, St. Augustine campus in 2009/2010 were female. The low marginal effect for tertiary education suggested that for some reason there was not a large incentive for women with such qualifications to participate in the labour force. Variables that negatively impacted the FLFPR included the presence of children in the household, accessing social security programmes, and chronic illness.

Country-specific variables like ethnicity and religion were also tested. For instance, women of East Indian descent and Hindus were 10 per cent and 4 per cent, respectively, less likely to participate in the labour force. Positive relationships were found between women of African descent (10 per cent) and Roman Catholic women (4 per cent). However, further analysis is required to discern a deeper understanding regarding both the direction and magnitude of these impacts and to identify some possible remedies for the low FLFPR in Trinidad and Tobago.

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