# AN EMPIRICAL ANALYSIS OF THE DECLINING LABOUR FORCE PARTICIPATION RATE IN TRINIDAD AND TOBAGO.

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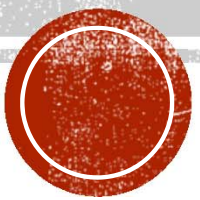


# OVERVIEW

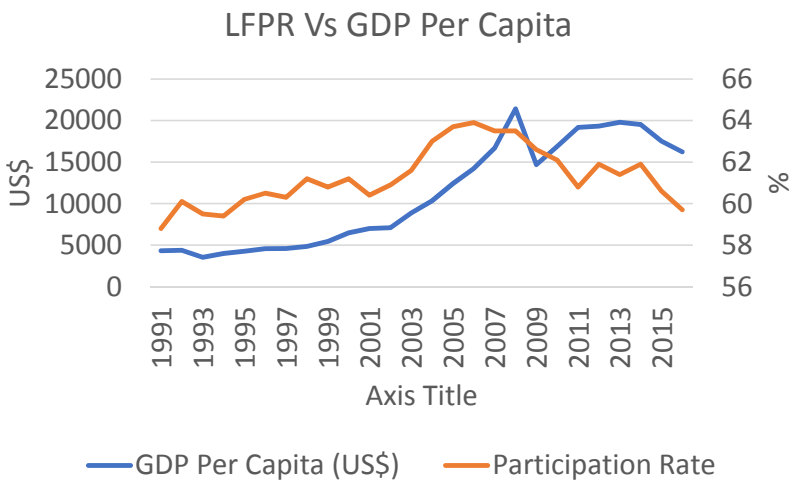
- Introduction
- Literature Review
- Population Aging & Shift Share Analysis
- Model Specification & Results
- Conclusion & Policy Recommendations

# INTRODUCTION

- According to the World Bank the labour force participation rate is defined as the proportion of the population ages 15 and older that is economically active: all people who supply labour for the production of goods and services during a specified period.
- Roopnarine, Ramrattan (2011) in their paper "Female Labour Force Participation: The case of Trinidad and Tobago" defined the labour force participation rate as the ratio of economically active population (persons who are aged 15 to 65, employed and unemployed) to the working age population.

# INTRODUCTION

- Since 2006, the labour force participation rate in Trinidad and Tobago has fallen from 63.9 percent to 59.7 percent in 2016.




| Country | Year | Participation Rate |
|---|---|---|
| T&T | 2016 | 59.7% |
| Caribbean Average | 2016 | 64% |
| LAC (excluding high income) | 2016 | 63% |
| The Bahamas | 2016 | 76% |
| Jamaica | 2017 | 65% |
| Belize | 2017 | 64% |
| Barbados | 2016 | 66% |

# INTRODUCTION

- In this paper, we use two approaches to assess the reasons for the decline in the labour force participation rate.
- Firstly, we use shift share analysis to decompose what portion of the decline is due to an aging population or changing population shares.
- In the second approach, we use cointegration to determine the other determinants of the labour force participation rate such as: (1) labour income and non-labour income, (2) macroeconomic factors (job opportunities).

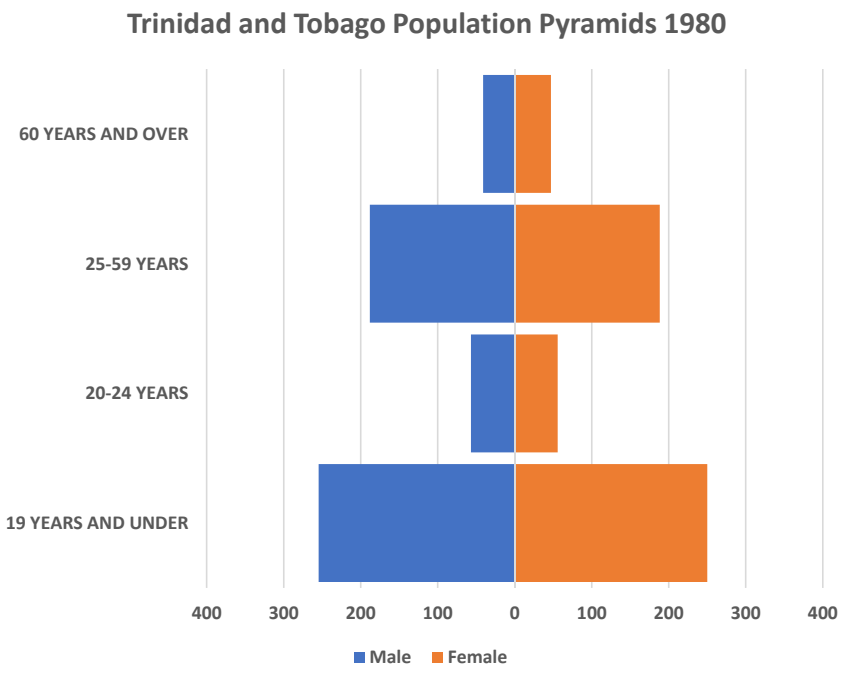
# LITERATURE REVIEW

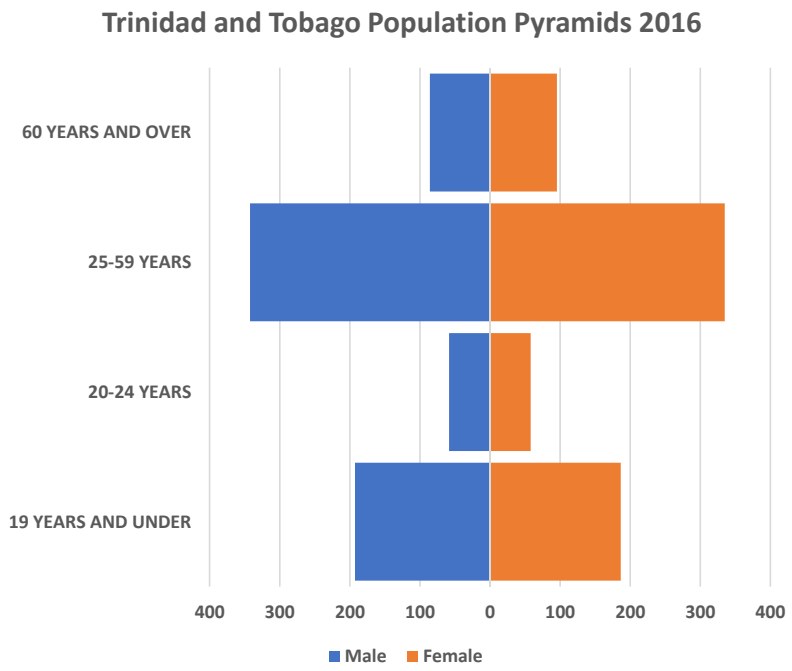
| Authors | Findings |
|---|---|
| Andrei et al (2016) | Applying logit and probit analysis to census data, Andrei et al (2016) concluded each step up the educational attainment ladder is associated with some increase in the LFPR. |
| Shahid (2014) | Studied the relationship between the labour force participation rate, gross capital formation and economic growth. Using the Johansen cointegration test and time series data from 1980 to 2012, this study found that a long run relationship existed among the variables. |
| Cullision (1979) | OLS was used as they applied a reduced form labour supply model in analyzing the real wage proxied by real hourly earnings, Employment opportunity proxied by real GNP, and Government Programs proxied by participation in the food stamp program. Their empirical results were generally consistent with the postulates of the theoretical model. |
| Duval et al (2011) | Found a nexus between Government Social Transfer Programs and the LFPR. |

# LITERATURE REVIEW

| Authors | Finding |
|---|---|
| Aaronson et al (2006) | Using a "shift share" calculation, Aaronson et al (2014) found that aging accounted for 1.3% out of the 2.6% decline in the LFPR in the US from Q4 2007 to Q2 of 2014. |
| IMF WEO October 2017 | Using shift share analysis for a group of 31 advanced economies, the IMF found that the decline in overall participation rates was driven by aging captured by "between changes". |
| Fraker and Moffit (1988) | Found that there was a relationship between the American food stamp program and labour supply. |
| Ehrenberg and Smith (2006) and Borjas (2010) | Indicated that if there is an increase in non-labour income (Transfers and subsidies), while real wage is held constant, this will decrease hours worked or leisure time will rise; this is known as the Income Effect. |

# POPULATION AGING & SHIFT SHARE ANALYSIS



# POPULATION AGING & SHIFT SHARE ANALYSIS

- $\Delta LFPR_t = \Sigma^4_{i=1} (\Delta LFPR_i^t \, PS_0^i + LFPR^i_0 \, \Delta PS^i_t + \Delta LFPR^i_t \, \Delta PS^i_t)$
- Where $PS^i_t = pop^i_t / pop_t$ is the population share and t = 0 refers to the base year.
- $\Sigma \, (LFPR^i_0 \, \Delta PS^i_t)$ – **Between Changes:** By holding the LFPR constant at the base year level for each age cohort we can decompose the impact of changes in population shares amongst the age cohorts.
- $\Sigma \, (\Delta LFPR_i^t \, PS_0^i)$ – **Within Changes:** By holding the population shares constant at the base year level for each age cohort we can decompose the impact of changes in participation rates of the age cohorts.
- $\Sigma \, (\Delta LFPR^i_t \, \Delta PS^i_t)$ – **Interaction Term:** The interaction term usually has a small impact.

# POPULATION AGING & SHIFT SHARE ANALYSIS

- Period 1 – (1991 – 2006)

| Shift Share Analysis Deviation from Base Period 1 (1991 to 2006) | | | | |
|---|---|---|---|---|
| **Age** | Between Changes | Within Changes | Interaction Term | Total change |
| **15-19** | -0.8% | -0.8% | 0.1% | -1.5% |
| **20-24** | 0.5% | 0.8% | 0.0% | 1.3% |
| **25-59** | 0.2% | 4.3% | 0.0% | 4.5% |
| **60 & OVER** | 0.2% | -0.1% | 0.0% | 0.1% |
| **TOTAL** | **0.2%** | **4.1%** | **0.2%** | **4.5%*** |

Source: CSO data & Author Calculated *Based on adjusted LFPR.

- Over that period Real GDP per capita increased by 138% form USD 6,672.4 per capita in 1991 to USD 15,892.3 per capita in 2006. The unemployment rate fell from 18.5% in 1991 to 6.2% in 2006.

# POPULATION AGING & SHIFT SHARE ANALYSIS

- Period 2 - (2006 to Q2 2017)

| Shift Share Analysis Deviation from Base Period 2 (2006 to Q2 2017) | | | | |
|---|---|---|---|---|
| **Age** | Between Changes | Within Changes | Interaction Term | Total change |
| **15-19** | -0.9% | -0.9% | 0.3% | -1.6% |
| **20-24** | -3.7% | -1.8% | 0.6% | -4.8% |
| **25-59** | 1.4% | 0.5% | 0.0% | 2.0% |
| **60 & OVER** | 1.0% | -0.3% | -0.1% | 0.6% |
| **TOTAL** | **-2.1%** | **-2.5%** | **0.8%** | **-3.8%*** |

Source: CSO data & Author Calculated *Based on adjusted LFPR.

- Over the period Real GDP per capita declined by 3.4% form USD 15,892.3 per capita in 2006 to USD 15,350.9 per capita in 2017. The unemployment rate in quarter 2 of 2017 returned to 2006 levels of 6.2% after falling as low as 3.3% in 2014.

# POPULATION AGING & SHIFT SHARE ANALYSIS

- Period 3 - (1991 to Q2 2017)

| Shift Share Analysis Deviation from Base Period 3 (1991 to Q2 2017) | | | | |
|---|---|---|---|---|
| **Age** | Between Changes | Within Changes | Interaction Term | Total change |
| **15-19** | -1.9% | -2.0% | 0.8% | -3.0% |
| **20-24** | -2.9% | -1.0% | 0.3% | -3.5% |
| **25-59** | 1.5% | 4.8% | 0.2% | 6.5% |
| **60 & OVER** | 1.3% | -0.4% | -0.2% | 0.7% |
| **Total** | **-2.0%** | **1.5%** | **1.1%** | **0.7%*** |

Source: CSO data & Author Calculated *Based on adjusted LFPR.

- Over that period Real GDP per capita increased by 130% form USD 6,672.4 per capita in 1991 to USD 15,350.9 per capita in 2017. The unemployment rate fell from 18.5% in 1991 to 5.3% in 2017.

# MODEL SPECIFICATION & RESULTS

- In this model, we use independent variables aimed to integrate and analyze two dimensions of the determinants of the LFPR in order to fully capture the within changes decomposed by the shift share analysis:
- 1. A labour supply dimension utilized by Ehrenberg and Smith (2008) and Borjas et al (2010) that estimates the effect of labour income (real wages/salaries) and non-labour income (Transfers and subsidies to the population)
- 2. A macroeconomic aspect that investigates the effects of job opportunities (indicated by real GDP Growth) Shahid (2014).

# MODEL SPECIFICATION & RESULTS

- The dependent variable in this models is the LFPR. The independent variables are:
- 1. Average Weekly Earnings (AWE) (Kitov and Kitov, 2013)
- 2. Transfers and Subsidies (TS) (Fraker and Moffit, 1988)
- 3. Real GDP Growth (RGDPG) (Shahid, 2014)
- Model: $LFPR = a_0 + a_1AWE_t + a_2TS_t + a_3RGDPG_t$
- ADF test was conducted and all the variables were I(1) at 5% significance.
- VAR Lag Order selection criteria was conducted and a lag length of 1 was chosen.

# MODEL SPECIFICATION & RESULTS

- Cointegration test
- Max-eigenvalue test indicates 1 cointegrating equation at the 5% significance level
- Since we have identified the existence of one cointegrating equation, we can say that a stable equilibrium relationship is present.
- Analyzing the normalized cointegrating coefficient in the VECM allows us to understand how the variables adjust in the long-run.
- $\mathbf{LLFPR_t = 0.02LAWE_t - 7.02LTS_t + 0.22RGDPG_t + 58.34}$

| | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C(1) | -0.617157 | 0.167736 | -3.679342 | 0.0017 |

- The coefficient of the error correction term is negative and significant. Therefore, we can conclude that there is long run causality running from LAWE, RGDPG and TS to LFPR.

# MODEL SPECIFICATION & RESULTS

- Wald Test

| Variable | Results | Decision |
|---|---|---|
| **AWE** | Chi-square 0.123; Prob 0.726 | There is no short run causality running from AWE to LFPR. |
| **TS** | Chi-square 5.858; Prob 0.016 | There is short run causality running from TS to LFPR. |
| **RGDPG** | Chi-square 2.781; Prob 0.095 | There is short run causality running from RGDPG to LFPR. |

- Impulse Response Functions
- The results of the impulse response functions was inline with A Priori expectations.

# CONCLUSION & POLICY RECOMMENDATIONS

- The findings in this paper suggest that approximately half of the decline in the labour force participation rate in Trinidad and Tobago since 2006, is due to demographic influence.
- This paper also indicates that real GDP growth, average weekly earnings and transfers and subsidies, together have a significant long-run impact on the labour force participation rate.
- Findings also indicated that there was short-run causality running from transfers and subsidies to labour force participation rate and from real GDP growth to the labour force participation rate.

# CONCLUSION & POLICY RECOMMENDATIONS

- Going forward, demographics will likely continue to have a significant impact on the aggregate labour force participation rate. This presents an interesting dilemma for policymakers.
- Increase the retirement age allowing individuals to stay in the labour force longer.
- Seek to get younger individuals into the labour force earlier by subsidizing tertiary education based on merit, thus allowing youths who are not as academically inclined to enter the labour force earlier.
- Slackened work permit restrictions for Venezuelans and CARICOM members could be allowing them to fill the gap in the labour force.
- Reduce transfers and subsidies and increase the minimum wage.