Gender Wage Gap is Small Islands: the case of Mauritius

Roshini Brizmohun

INTRODUCTION

- Why study gender wage gap?
  - Reducing gender inequality: efficient tool in economic development
- Relevance to small islands
  - Small islands cannot afford to under-utilize human capital
  - Quantifying gender wage gap helps to monitor progress towards promoting gender equality and economic growth
- Hypothesis:

(i) A gender wage gap exists in Mauritius

(ii) Gender wage gap decreases from 2007 to 2012 with the implementation of the National Gender Policy Framework (2008)

Background

- Social welfare maximization occurs when all productive resources including human resources are fully utilized (Blau, 2012)

- Gender discrimination leads to a lower efficiency as equally skilled labor is wasted.

- Methods for Studying Gender Wage Gap
  - **One equation**

Linear regression however may result in biased estimators in the presence of unobservable effects which are correlated with the error term

Methods for Studying Gender Wage Gap (contd)

- **Two equation (**Oaxaca, 1973; Blinder, 1973**)**
- **Three equation** (Reimers (1983); Neumark (1988); Cotton (1988))
- **Decomposition of wages at different quantiles** (Juhn, Murphy and Pierce,1993; Machado and Mata (2005))
- **Correction for Selection bias**

Empirical Framework

1. **Oaxaca-Blinder Decomposition**

$$\bar{Y}_m - \bar{Y}_f = b_m\bar{X}_m - b_f\bar{X}_f = b_m(\bar{X}_m - \bar{X}_f) + \bar{X}_f(b_m - b_f)$$

- Y is the log of wages
- X is a vector of explanatory variables such as education and experience
- B is a vector of coefficients

Empirical Framework

2. **Quantile Regression**

$P_i = X_{i\beta\theta} + \varepsilon_{\theta i}$ with $\text{Quant}_\theta (\text{Pi}|\text{Xi}) = X_{i\beta\theta}$

- Pi is the logwage for individual I
- Xi is the vector of independent variables
- βθ is the vector of parameters
- Quantθ (Pi|Xi) denotes the θth conditional quantile of P given X

The θth regression quantile, $0<\theta<1$ is defined as a solution to the problem:

$$\text{Min} \{ \sum_{i:Pi>Xi\beta} \theta \, |Pi - Xi\beta\theta| + \sum_{i:Pi<Xi\beta} (1-\theta) \, |Pi - Xi\beta\theta| \} \qquad \beta \epsilon Rk$$

Empirical Framework

3. **Difference-in-difference (in-difference)**
(correcting for selection bias using Heckman two-step correction)

- To assess the effect of National Gender Policy framework on the gender wage gap
- Treatment : Women Control : Man
- Before policy (2007) and After policy (2012)

$$\text{Log(wage)} = \beta_0 + \beta_1 female + \beta_2 educ + \beta_3 age + \beta_4 agesq + \delta_0 Y_{12} + \delta_1 Y_{12} * female + u$$

$$\hat{\delta}_1 = (\bar{y}_{female,12} - \bar{y}_{female,07}) - (\bar{y}_{male,12} - \bar{y}_{male,07})$$

Difference in difference in difference

- $\text{Log(wage)} = \beta_0 + \beta_1 female + \beta_2 educ + \beta_3 age + \beta_4 agesq + \delta_0 Y_{12} + \delta_1 Y_{12} * female + \delta_2 Y_{12} * educ + + \delta_3 female * educ + \delta_4 Y_{12} * female * educ + industry\ variables + occupation\ variables + u$

- $\hat{\delta}_4 = [(\bar{y}_{female,educ,12} - \bar{y}_{female,educ,07}) - (\bar{y}_{female,no\ educ,12} - \bar{y}_{female,educ,07})] - [(\bar{y}_{male,educ,12} - \bar{y}_{male,educ,07}) - (\bar{y}_{male,no\ educ,12} - \bar{y}_{male,no\ educ,07})]$

DATA

- Household Budget Surveys (micro-data) for Mauritius for 2006-2007 and 2012 obtained from Statistics Mauritius

- Base year 2012 =100 convert nominal wages in 2007 to real wages

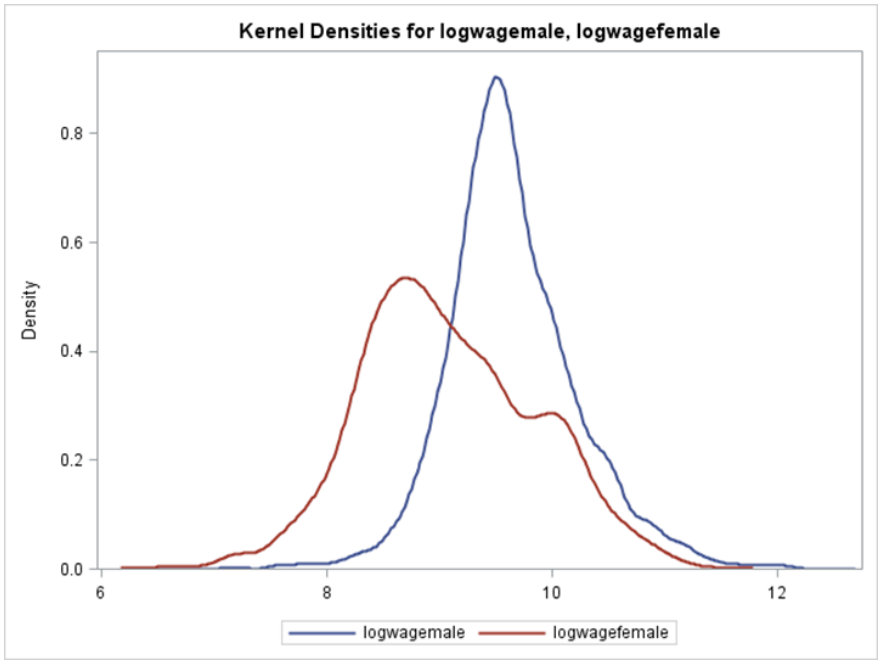
Table 1 List of Variables

	Variable Name	Description
	Logwage	Log of wages received by individual household member limited to head of household or spouse
	Female	1 = female
	Educ	1 = Higher education for those with more than 12 years schooling and 0 for those with less
	Age	Age of individual ranging from 18 to 60
	Agesq	Age square is a proxy for experience
	Hrswked	Hours worked on a weekly basis in the week prior to Household budget survey
Industry	manuf	1= employed in manufacturing sector
	retail	1= employed in retail sector
	educind	1= employed in education field
	Other	1 = employed in 'Services sector'
Occupation	Managers	1 = Work as managers and have responsibilities in the job
	Prof	1 = Professionals in fields like science, engineering, mathematics
	Tech	1 = Technicians
	Clerks	1 = Clerks
	workers	1= Service and sales workers
	operators	1= Plant and machine operators
	elem	1= Elementary occupations
	Public	1 = Work in Public sector
	School	1 = Attended school
	Marstat	1 = Married
	numchld	Number of children in the family

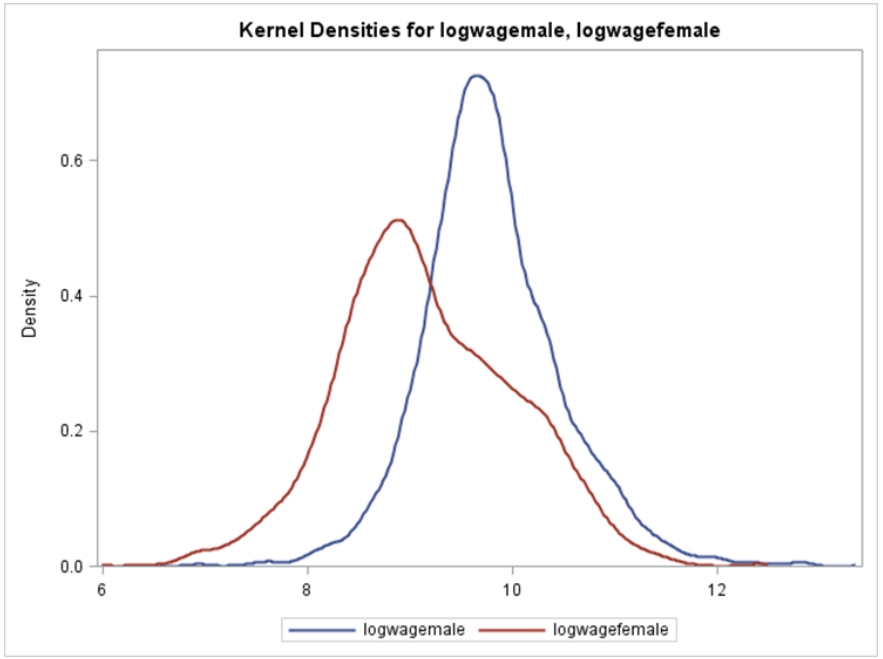
Table 2 Descriptive Statistics

	2007					2012				
	Male n = 3298		Female = 1668			Male = 2902		Female = 1961		
	Mean	Std Dev	Mean	Std Dev	Diff(1-2) p-value	Mean	Std Dev	Mean	Std Dev	Diff(1-2) p-value
Logwage	9.643	0.587	9.078	0.788	<.0001	9.795	0.690	9.169	0.8724	<.0001
educ	0.128	0.334	0.179	0.383	<.0001	0.163	0.370	0.211	0.408	<.0001
age	43.071	9.263	40.534	9.247	<.0001	44.933	8.992	42.304	9.290	<.0001
agesq	19.409	7.870	17.284	7.523	<.0001	20.998	7.910	18.759	7.895	<.0001
hrswked	43.527	12.058	38.137	11.753	<.0001	44.197	12.31	38.095	12.444	<.0001
manuf	0.168	0.374	0.260	0.439	<.0001	0.147	0.354	0.205	0.404	<.0001
retail	0.133	0.339	0.008	0.088	<.0001	0.085	0.279	0.107	0.309	<.0001
educind	0.026	0.159	0.056	0.231	<.0001	0.048	0.213	0.104	0.305	<.0001
other	0.0067	0.0814	0.1433	0.351	<.0001	0.018	0.134	0.185	0.389	<.0001
managers	0.044	0.204	0.036	0.186	<.0001	0.059	0.236	0.035	0.184	<.0001
prof	0.040	0.195	0.039	0.194	0.675	0.067	0.250	0.106	0.307	<.0001
tech	0.103	0.304	0.142	0.349	<.0001	0.123	0.329	0.115	0.319	<.0001
clerks	0.061	0.239	0.153	0.360	<.0001	0.054	0.226	0.125	0.331	<.0001
workers	0.130	0.336	0.107	0.309	<.0001	0.172	0.378	0.147	0.355	<.0001
operators	0.151	0.358	0.142	0.349	0.2265	0.115	0.320	0.066	0.248	<.0001
elem	0.249	0.433	0.308	0.462	0.0019	0.185	0.388	0.348	0.475	<.0001
public	0.319	0.466	0.205	0.404	<.0001	0.300	0.458	0.198	0.399	<.0001

Year = 2007



Year = 2012



RESULTS

1. Oaxaca Decomposition
2. Quantile Regression
3. Difference-in-difference-(in-difference)
   (correcting for selection bias)

Table 3 Oaxaca Decomposition

(with full specification that is controlling for industry and occupation with real wages [base year 2012=100])

	Explained	**Discrimination**	**Wage Gap**
2007	0.111***	0.447***	0.558***
2012	0.074***	0.507***	0.581***

Table 4 Decomposition of logwage at selected quantiles for 2007 and 2012

	2007					2012				
	0.1	0.25	0.5	0.75	0.9	0.1	0.25	0.5	0.75	0.9
Intercept	7.167***	7.501***	7.727***	8.287***	8.326***	7.18***	7.546***	8.042***	8.577***	9.053***
	(0.207)	(0.158)	(0.14)	(0.152)	(0.173)	(0.262)	(0.165)	(0.158)	(0.168)	(0.215)
female	-0.496***	-0.497***	-0.457***	-0.424***	-0.383***	-0.52***	-0.486***	-0.463***	-0.445***	-0.445***
	(0.024)	(0.018)	(0.02)	(0.019)	(0.025)	(0.026)	(0.018)	(0.019)	(0.019)	(0.024)
educ	0.394***	0.368***	0.326***	0.358***	0.387***	0.53***	0.472***	0.456***	0.427***	0.491***
	(0.039)	(0.029)	(0.03)	(0.028)	(0.044)	(0.037)	(0.025)	(0.026)	(0.031)	(0.041)
age	0.034***	0.036***	0.041***	0.022***	0.034***	0.05***	0.047***	0.040***	0.029***	0.014
	(0.010)	(0.007)	(0.01)	(0.008)	(0.009)	(0.012)	(0.008)	(0.007)	(0.008)	(0.010)
agesq	0.032***	0.034***	0.040***	-0.017*	-0.028**	-0.05***	0.049***	0.042***	0.028***	-0.008
	(0.011)	(0.009)	(0.01)	(0.009)	(0.011)	(0.015)	(0.009)	(0.008)	(0.009)	(0.012)
hrswked	0.012***	0.010***	0.009***	0.010***	0.010***	0.01***	0.012***	0.011***	0.009***	0.010***
	(0.001)	(0.001)	(0.00)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)

Standard errors in parentheses. ***p<0.01, **p < 0.05, *p<0.1
Industry and occupation estimates omitted from the table

Table 5a. Effect of interaction terms using Difference in Difference (in Difference) to assess effect of National Gender Policy Framework in Mauritius

	Eqn 1	Eqn 2	Eqn 3
Intercept	8.273***	8.125***	8.100***
	(0.114)	(0.095)	(0.092)
educ	1.117***	0.373***	0.464***
	(0.016)	(0.027)	(0.016)
age	0.022***	0.033***	0.035***
	(0.005)	(0.005)	(0.004)
agesq	-0.013*	-0.028***	-0.031***
	(0.006)	(0.005)	(0.005)
female	-0.562***	-0.545***	-0.608***
	(0.030)	(0.026)	(0.027)
hrswked	0.012***	0.010***	0.010***
	(0.000)	(0.000)	(0.000)
y12_female	-0.047*	-0.005	0.102***
	(0.024)	(0.022)	(0.022)
y12	0.084***	0.036***	-0.034**
	(0.015)	(0.013)	(0.013)
Female_educ		0.190	
		(0.040)	
female_public			0.448***
			(0.030)
y12_educ		0.132***	
		(0.035)	
y12_female_educ		0.004	
		(0.053)	
y12_public			0.327
			(0.020)
y12_female_public			-0.320***
			(0.043)

Standard errors in parentheses. ***p<0.01, **p < 0.05, *p<0.1
Industry and occupation estimates omitted from the table

Results (contd)

- In both 2007 and 2012, there is a decreasing trend in the wage gap along the distribution.
- At the 10^{th} percentile, the wage gap is 0.496 log points and decreased to 0.383 log points at the 90^{th} percentile in 2007 representing 23% less at higher percentile than low percentile.
- Comparing the real gender wage gap for the after-policy effect in Mauritius, the values at 10^{th}, median and above percentiles are higher in 2012 than those in 2007 (real wages).
- At 90^{th} percentile, there is a 16% increase in wage gap from 2007 to 2012

Difference-in Difference

- Gender wage gap increases after policy
- Educated female after policy implementation – no significant effect
- Women employed in public sector after policy implementation – significant negative effect (wage gap: 0.320 log points)
- Rho/Inverse Mills ratio – not statistically significant indicating that selection bias is not an issue

Conclusion

- Firstly, the gender wage gap exists and gender wage discrimination has increased over the period of study using Oaxaca decomposition.
- Secondly, from quantile regression, women earning wages at the 10th , median and above percentiles of the wage distribution have seen the wage gap widen from 2007 to 2012.
- Thirdly, women in the public sector have not seen a reduction in the gender wage gap over this period.
- Need for stronger policy measures

Suggested improvements

- Structure of the paper to focus more on description of labor market in Mauritius and elaborate further on policy measure

- Methodology:

- Use quantile diff-in-differences with Heckman two-stage selection model as a new approach to measure the gender wage gap

Thank you.

Further comments: rzb0048@auburn.edu