

# Gender earning differentials among Malaysian paid employee

Presented by

Nor Hanizah Abu Hanit

Manpower and Social Statistics Division, Department of Statistics Malaysia (DOSM)

Co-authored with Noor Ismawati Mohd Jaafar

Social Wellbeing Research Centre (SWRC), University of Malaya (Formally known as Social Security Research Centre, SSRC)

Advised by

Naihiro Ogawa University of Tokyo

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**Robert L. Clark** 

North Carolina State University

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- Wage differentials.
- Over the past three decades, economists have examined the labour market of Malaysia in an effort to determine the size of male female earnings differentials and to estimate the factors that explain the wage gap.
- Studies of the Malaysian labour market reveal a gender wage gap that resembles what is found in other Asian developed countries. Some of these studies have been limited by their lack of access to national surveys and articles reviewed with data that is fairly dated.
- Literature reviews have shown that there is a strong correlation between earning and age and the difference in earning is significant by sex.

- The employment could also be viewed from three-dimensional cubes which consist of production units, activities and jobs (Hussmanns, 2004). Production units refer to the three employment sectors followed by two types of activities.
- This paper focus on working population who were inside the labour force and employed with payment regardless of their production units and jobs.



Hussmanns, R. (2004). Statistical definition of informal employment: Guidelines endorsed by the Seventeenth International Conference of Labour Statisticians (2003). Geneva: International Labour Office. Retrieved from http://ilo.org/public/english/bureau/stat/download/papers/def.pdf

• Paid employees:

individuals who are working full-time, working at least 6 hours a day or at least 20 days a month; contract workers in the government sector, individuals who receive monthly regular and periodic allowances; or volunteer who received fixed allowances.

International Labour Organization. (2003). Guidelines concerning a statistical definition of informal employment. [Online Resource]. Retrieved from http://www.ilo.org/wcmsp5/groups/public/--dgreports/-stat/documents/normativeinstrument/wcms\_087622.pdf

 The existence of relevant data in various surveys conducted by DOSM creates the window of opportunity for researchers to generate more reliable empirical evidences with advance statistical techniques.

# Objectives

- **1. Describe** the age-earning distribution of the population of interest
- Estimate the earning for male and female by employment sector (public & private)
- **3. Compare** the predicted curve between gender by employment sector over the observation period of 2010-2016

# Methodology

- Source of data: Weighted Salaries and Wages Survey (SWS), Malaysia, 2010-2016 (DOSM).
- Statistical analysis:
  - **Descriptive Statistics Analysis** to describe the age-earning distribution.
  - The modified Mincer-type earnings regression to estimate the earnings with a set of predictor variables. (introduced by Mincer & Jovanovic (1979, 1981) and later utilised in articles such as by Hashimoto and Raisian (1985), Clark and Ogawa (1992), Ogawa and Clark (1995) and Lemieux (2006)
  - **Derivative tests** to identify the peak age of earning increment.
- Software: IBM SPSS 25 and Microsoft Excel.

Clark, R., & Ogawa, N. (1992). Employment Tenure and Earnings Profiles in Japan and the United States: Comment. *The American Economic Review*, 82(1), 336-345. Hashimoto, M., & Raisian, J. (1985). Employment Tenure and Earnings Profiles in Japan and the United States. *The American Economic Review*, 75(4), 721-735.

Mincer, J., & Jovanovic, B. (1979). Labor Mobility and Wages (NBER Working Paper 357). MA: Cambridge.

Mincer, J., & Jovanovic, B. (1981). Labor Mobility and Wages. In Rosen, S. (Eds), Studies in Labor Markets (pp 21-64). University of Chicago Press.

Ogawa, N., & Clark, R. (1995). Earnings Patterns of Japanese Women: 1976-88. Economic Development and Cultural Change, 43 (2), 293-314.

Lemieux, T. (2006) "The 'Mincer equation' Thirty Years after Schooling, Experience, and Earnings" in Jacob Mincer: A Pioneer of Modern Labor Economics, Shoshanna Grossbard, ed., Springer: New York. pp. 127–145

# Methodology

- Predictors: Age, Gender, Ethnicity, Marital Status, Education, Rural/Urban, Public/Private.
- Earning
  - Basic salary/wage + allowance + commission + overtime + etc.
  - Before deductibles (EPF, SOCSO, tax etc).
  - Primary occupation.
  - Per month

#### *ln Earning* =

 $a_0 + a_1AGE + a_2AGE^2 + a_3MALE_i + a_4ETHNIC_i + a_5MARITALSTATUS_i + a_6EDUCATION_i + a_7PUBLIC_i + a_8URBAN_i + a_9STATE_i + a_{10}OCCUPATION_i + a_{11}INDUSTRY_i + e_i$ 

Note: State, Occupation, Industry are include in the regression.

# Methodology

- Social Characteristics of the population of interest:
  - Sample size, n=335 167
  - 60% were males
  - 75% were working in the private sector
  - Refer to poster entitled "Social-demographic, socio-geographic and employment characteristics of the paid Malaysian employees "for more details.



#### • Descriptive statistics of earning



Note: Y=Earning per month in RM, X=Age; Outliers above RM10 000 is not shown. Data: 2010-2016 combined.

#### • The regressions output

Male in public sector

	2010	2011	2012	2011	2014	2015	2016
Constant	5.793(56.2)***	6.044(66.9)***	5.511(53)***	5.693(49.4)***	6.017(51.8)***	5.981(45.9)***	6.337(45.2)***
Age	-0.001(-13.6)***	-0.001(-12)***	0.081(19.7)***	0.074(18.7)***	0.067(16.7)***	0.071(16.7)***	0.051(11.8)***
AgeQ	0.07(18.3)***	0.06(17.2)***	-0.001(-15.5)***	-0.001(-14)***	-0.001(-12.3)***	-0.001(-12.3)***	0(-7.5)***
Chinese	0.112(4.2)***	0.075(3.1)***	0.096(3.1)***	0.083(2.7)***	0.038(1.3)	0.1(3.4)***	0.104(3.2)***
Indians	0.033(1.3)	0(0)	-0.01(-0.4)	0.038(1.3)	0.016(0.6)	-0.009(-0.3)	0.063(2.1)**
Others	-0.022(-0.3)	0.096(1.2)	-0.112(-1.2)	-0.116(-1)	-0.252(-2.6)***	0.036(0.5)	-0.276(-2.7)***
Never married	-0.078(-5.5)***	-0.08(-6.3)***	-0.071(-4.5)***	-0.073(-4.9)***	-0.099(-6.3)***	-0.081(-5.1)***	-0.127(-8)***
Widowed/Separated/Divorced	-0.022(-0.5)	-0.039(-1.1)	-0.012(-0.3)	-0.109(-2.9)***	-0.087(-2.2)**	-0.133(-3.3)***	-0.026(-0.7)
Secondary	0.252(11.1)***	0.22(10.3)***	0.323(13.4)***	0.342(12.7)***	0.254(9.6)***	0.203(6.8)***	0.247(7.8)***
Tertiary	0.485(18.4)***	0.391(15.7)***	0.597(21.2)***	0.593(19.6)***	0.456(15)***	0.418(12.5)***	0.415(11.8)***
The R Square	0.59	0.63	0.55	0.58	0.59	0.59	0.57
					Ν	Male in priv	ate sector
Constant	5.925(133.7)***	5.986(150.9)***	6.025(153)***	6.193(155.3)***	6.27(161)***	6.443(161.2)***	6.437(150.7)***
Age	-0.001(-22.9)***	-0.001(-25.5)***	0.052(29.5)***	0.046(25.9)***	0.047(28.2)***	0.04(23.5)***	0.037(20.4)***
AgeQ	0.053(26.4)***	0.052(29.1)***	-0.001(-25.6)***	0(-22)***	-0.001(-24.4)***	0(-19.6)***	0(-16.2)***
Chinese	0.232(27.8)***	0.243(32.4)***	0.202(26.6)***	0.209(26.8)***	0.217(28.6)***	0.214(27.9)***	0.187(22.8)***
Indians	0.003(0.3)	0.006(0.6)	0.005(0.5)	-0.005(-0.4)	0.04(3.8)***	0.016(1.5)	0.016(1.4)
Others	0.06(2)**	0.02(0.7)	0.02(0.6)	-0.012(-0.4)	0.072(2.1)**	='2015'!\$AP\$17	0.056(1.7)*
Never married	-0.181(-21.1)***	-0.174(-22.8)***	-0.168(-22)***	-0.176(-23)***	-0.172(-23.6)***	-0.189(-25.2)***	-0.163(-20.7)***
Widowed/Separated/Divorced	-0.165(-6.5)***	-0.144(-6.6)***	-0.17(-8.2)***	-0.17(-8.6)***	-0.148(-7.7)***	-0.132(-6.8)***	-0.141(-7.3)***
Secondary	0.195(20.5)***	0.19(21.4)***	0.166(19)***	0.19(21)***	0.165(18.8)***	0.177(19.5)***	0.162(16.7)***
Tertiary	0.44(26.4)***	0.419(27.6)***	0.394(26)***	0.391(25.7)***	0.356(24.1)***	0.342(23.1)***	0.364(23.1)***
The R Square	0.57	0.61	0.6	5 0 F	0.61	0.6	0.59

Note: significant at \*10%, \*\*5%, \*\*\*1%. Other explanatory variable is not shown.

#### • The regressions output

Female in public sector

	2010	2011	2012	2011	2014	2015	2016
Constant	5.665(51.5)***	5.599(52.8)***	5.816(46.8)***	6.337(45.2)***	5.994(46.1)***	6.36(47.6)***	6.082(39.4)***
Age	0(-7.6)***	-0.001(-10.2)***	0.062(14)***	0.051(11.8)***	0.062(14.7)***	0.059(14)***	0.059(13.6)***
AgeQ	0.054(12.7)***	0.062(15.6)***	-0.001(-9.2)***	0(-7.5)***	-0.001(-9.7)***	0(-8.9)***	0(-8.6)***
Chinese	0.033(1.7)*	0.005(0.3)	0.04(1.9)*	0.104(3.2)***	0.029(1.5)	0.046(2.5)**	0.045(2.3)**
Indians	-0.034(-1.3)	-0.015(-0.6)	-0.005(-0.2)	0.063(2.1)**	0.033(1.1)	0.01(0.4)	-0.036(-1.2)
Others	0.024(0.3)	0.039(0.3)	-0.035(-0.3)	-0.276(-2.7)***	-0.024(-0.2)	-0.055(-0.6)	0.034(0.4)
Never married	-0.038(-3)***	-0.039(-3.4)***	-0.035(-2.7)***	-0.127(-8)***	-0.056(-4.2)***	-0.036(-2.9)***	0.003(0.3)
Widowed/Separated/Divorced	-0.057(-2.7)***	-0.068(-3.3)***	-0.073(-3.3)***	-0.026(-0.7)	-0.017(-0.8)	-0.009(-0.4)	-0.029(-1.4)
Secondary	0.664(13.9)***	0.594(12.4)***	0.48(8.3)***	0.247(8.5)***	0.254(9.6)***	0.203(6.8)***	0.293(3.9)***
Tertiary	0.885(18)***	0.814(16.6)***	0.758(12.8)***	0.414(13.5)***	0.456(15)***	0.418(12.5)***	0.475(6.2)***
The R Square	0.56	0.56	i 0.53	0	0.59	0.56	0.54
					Fei	male in priv	ate sector
Constant	5.653(109.9)***	5.741(117.2)***	5.863(122)***	6.108(121.3)***	6.112(128.9)***	6.238(132.6)***	6.166(125.5)***
Age	-0.001(-14.6)***	0(-13.9)***	0.042(16.5)***	0.034(13.1)***	0.038(15.8)***	0.034(14.4)***	0.035(14.4)***
AgeQ	0.049(18)***	0.044(16.9)***	0(-13.7)***	0(-11)***	0(-13.6)***	0(-11.8)***	0(-11.5)***
Chinese	0.191(18.5)***	0.205(21.4)***	0.182(18.8)***	0.211(20.8)***	0.197(20.7)***	0.192(20.5)***	0.206(21.1)***
Indians	-0.031(-2.2)**	-0.045(-3.3)***	0.018(1.3)	-0.004(-0.3)	-0.004(-0.3)	0.014(1.1)	-0.015(-1.1)
Others	0.013(0.3)	0.038(0.8)	0.095(2.1)**	-0.005(-0.1)	0.092(2)**	0.047(1.1)	0.047(1.1)
Never married	-0.01(-1)	-0.035(-3.7)***	0.206(21.1)***	-0.039(-3.9)***	-0.032(-3.5)***	-0.032(-3.5)***	-0.028(-3)***
Widowed/Separated/Divorced	-0 12(-7 9)***	-0.063(-4.2)***	-0.049(-3.6)***	-0.042(-3)***	-0.014(-1)	-0.052(-3.9)***	-0.043(-3.2)***
Socondany	0.12(7.3)						
Secondary	0.225(15.4)***	0.268(19.2)***	0.207(15.2)***	0.2(14.4)***	0.203(15.1)***	0.195(13.9)***	0.175(12.2)***
Tertiary	0.225(15.4)*** 0.435(23)***	0.268(19.2)*** 0.505(28.2)***	0.207(15.2)*** 0.443(24.8)***	0.2(14.4)*** 0.406(22.6)***	0.203(15.1)*** 0.414(24)***	0.195(13.9)*** 0.419(23.9)***	0.175(12.2)*** 0.377(21.1)***

Note: significant at \*10%, \*\*5%, \*\*\*1%. Other explanatory variable is not shown.

















increases in 2016.

#### • Data: Single year data of SWS2010-2016



The average differences in earning between public and private sectors.

 $\Delta$ RoC is the average rate of change in the predicted earning computed based on the rate of change of earning between 2 years for every single age.

#### • Comparison of 7 years of observations:

#### Male (Public VS Private)

#### **Conclusion:**

 Earning at Public sector was higher than private sector at any year of observation for male.



15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65

 $\Delta$ RoC is the average rate of change in the predicted earning computed based on the rate of change of earning between 2 years for every single age.

#### • Comparison of 7 years of observations:

#### Female (Government VS Private)

Conclusion: 1. Earning at Public sector was higher than private sector at any year of observation for female.



15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65



- Peak age is the instantaneous rate of change in earning.
- The age showing an increasing trend for both gender, regardless of sector but the age is lower among male and female at private sector.
- Private sector: As age
   approached 50, earning starts to decreases.

Note: The age-earning function, f(x) is presented by  $f(x) = ax^2 + bx + c$ . Hence the first derivative is presented by f(x)' = 2ax + b. When f(x)' = 0 and f(x)'' < 0 the respective x where  $x = \frac{0-b}{2a}$  represent the peak age and the correspond  $f(x) = ax^2 + bx + c$ . The earning increases to age  $x = \frac{0-b}{2a}$  at In of earning of  $f(x) = ax^2 + bx + c$ . The earning decreases after age  $x = \frac{0-b}{2a}$ .



- Data: SWS2016
- Comparison with data JANM2016, reveals the earning among female is higher as compared with male in the public sector.
- 2. Evidence of **underreporting** in SWS2016.
- However, data JANM2016 cannot be directly compared with data 2016 as data JANM excludes IPTA, The State Civil Service, local authorities (PBT), nurse trainees and GLCs.
   \*JANM= Accountant General's Department of Malaysia



Note: Y=Earning, X=gender and data source Outliers is not fully shown.

# Conclusion

- In general the earning of paid Malaysian employees
  - Varies by gender and employment sector.
  - Increases with age except in private sector.
- Comparison by gender shows that
  - Male earns more as compared with female at private sector.
  - Female earns more as compared with male at public sector.
  - Female and male earns more at public sector as compared with employees at private sector.
  - Earning **gap is wider** between female at public and female at private sector.
- Evidence of **underreporting** among public servants.

# Thank you **Terima Kasih**

Additional slide:

(excluding the regular KGT)

### Salary increment for Government Employees

KGT=Kenaikan gaji tahunan = annual salary increment JGMM=Jadual Gaji Minimum-Maksimum= Table on maximum-minimum of salary

 2010
 2011
 2012
 2013
 2014
 2015
 2016

SCHEM	E	DATE OF ENFORCEMENT	ADJUSTMENT RATE/SLARY INCREMENT
1	Salary adjusment	1/1/2000	10%
2	Salary adjusment	1/1/2002	10%
3	Sistem Saraan Malaysia, (SSM)a new	1/11/2002	JUSA and above: RM110, P&P : RM65, Support staffs : RM15
	salary scheme		
4	Salary increment	1/7/2007	JUSA and above: 7.5% P&P: 15% Support staffs category 1: 25% Support staffs category 2: 35%
5	Salary increment and JGMM	1/1/2012	KSN, TURUS 1 : 7% TURUS 2 & 3 : 8% JUSA/Special rate: 9% P&P and Support staffs : 13%
6	Imporvement of JGMM	1/1/2013	+3 KGT at maximum salary
7	Pemberian Pemindahan Gaji (literally	1/7/2013	Faedah Pemberian Gaji (literally translated as granted salary benefit) + 1 KGT
	translated as granted Salary transfer)		
8	Imporvement of JGMM	1/11/2013	+2 KGT at maximum salary
9	Rationalisasi of the service scheme	1/7/2016	1 KGT and + 4 KGT at maximum salary

Source: Wan Nur Izzati binti Wan Yusoff, PP(S)G1A Bahagian Saraan, Jabatan Perkhidmatan Awam, T: 03-88855648, izzati.yusoff@jpa.gov.my

### Additional slide: Comparison of top and bottom 25%

	Overall				
Variable	Lowest	Highest			
	Quartile	Quartile			
Constant	6.366(310.1)***	7.125(285.7)***			
Age	0.014(23.3)***	0.029(27.6)***			
AgeQ	0.000(-24.7)***	0.000(-16.1)***			
Male	0.099(40.5)***	0.061(24.1)***			
Chinese	0.052(13.7)***	0.007(2.2)**			
Indian	0.013(3)***	0.002(0.5)			
Others	0.031(3)***	0.044(2.1)**			
Never married	-0.033(-11.4)***	-0.022(-6.4)***			
Widowed/Separated/Divorced	-0.027(-6)***	-0.017(-2.5)**			
Secondary	0.044(14.4)***	0.09(9)***			
Tertiary	0.075(13.1)***	0.215(20.5)***			
Public	0.051(4.3)***	-0.009(-1.4)			
Rural	-0.044(-19.8)***	-0.045(-16.2)***			
Year2012	0.011(3.5)***	0.011(2.9)***			
Year2013	0.074(22)***	0.06(15.3)***			
Year2014	0.137(39.3)***	0.1(26.1)***			
Year2015	0.180(49.3)***	0.120(31.9)***			
Year2016	0.214(55.8)***	0.141(37.3)***			
Occupational variables	YES	YES			
Industrial variables	YES	YES			
State variables	YES	YES			
Field of study	YES	YES			
R Square	0.179	0.335			
Age of peak earnings	36.4	64			
Sample size	70,005	72,285			

- Data: SWS2010-2016 combined
- Lowest quartile: those with earning less than Q25 of the overall earning distribution.
- Top quartile: those with earning more than Q25 of the overall earning distribution.
- +ve coefficient for government among lowest quartile and –ve coefficient for highest quartile.