International Journal of Economics, Management and Accounting

ISSN: 2988-7615 | 2023(7)
Page **525-536**

Research Article

Dicky Randika Aji[1]*, Emi Maimunah, S.E., M.Si.[2], Dr. Dedy Yuliawan, S.E., M.Si.[3], Zulfa Emalia, S.E., M.Sc.[4]

Analysis of Economic and Social Demographic Factors That Influence the Dependency Ratio on the Island of Sumatra

*Corresponding Author: **Dicky Randika Aji:** University of Lampung, Indonesia; dickyrandika1113@gmail.com
Emi Maimunah, S.E., M.Si.: University of Lampung, Indonesia; emi_syam@yahoo.com
Dr. Dedy Yuliawan, S.E., M.Si.: University of Lampung, Indonesia; dedy.yuliawan@feb.unila.ac.id
Zulfa Emalia, S.E., M.Sc. : University of Lampung, Indonesia; emalia.zulfa@gmail.com

Received: November 18, 2023; **Accepted:** November 23, 2023; **Online:** December 11, 2023 | DOI: https://doi.org/10.47353/ijema.v1i7.83

Abstract: *This study aims to analyze the influence of education level, the proportion of married women who use birth control, life expectancy, per capita income, labor force on the dependency ratio. The method and analytical tools used in this research are panel data regression. The dependent variable used is the dependency ratio and the independent variables are education level, proportion of married women who use birth control, life expectancy, per capita income, labor force. The best model obtained is the Random Effect Model. The research results show that regardless of education level, the proportion of married women who use birth control, life expectancy, per capita income, labor force have a positive and significant effect on the dependency ratio on Sumatra Island.*

Keywords*: Dependency ratio, Education level, Proportion of married women who use contraception, Life expectancy, Per capita income, Labor force.*

Introduction

The demographic bonus is an economic benefit caused by a decrease in the dependency ratio as a result of a long-term fertility decline process. The demographic transition reduces the proportion of young people and increases the proportion of working age people, and this explains the relationship between population growth and economic growth. The decline in the proportion of the young population reduces the amount of investment to meet their needs, so that resources can be activated to stimulate economic growth and improve family welfare (BPS, 2020).

The demographic bonus can be seen using the dependency ratio parameter (dependency burden figure). The dependency ratio is the ratio between the number of people aged 0-14 years, plus the number of people aged 65 years and over (both of whom are called not in the labor force) compared to the number of people aged 15-64 years (the labor force). The demographic bonus can be seen from the dependency ratio which is quite low, namely below 50, this means that every 100 people of productive age (15-64 years) only support around 50 unproductive people. The peak of the demographic bonus occurs when the dependency ratio is at its lowest point. In this position, a country/region is referred to as a window of opportunity, namely a period where the dependency burden is very low. This period, if linked to the economy, will produce a demographic bonus, namely economic benefits caused by a decrease in the dependency ratio as a result of a long-term decline in births (Kost et al. 2003).

Table 1
Comparative Data on Dependency Ratio between Java Island and Sumatra Island (percent).

Year	Java Island	Sumatera island
2011	50.27	45.98
2012	49.97	45.71
2013	49.72	45.48

2014	49.49	45.32
2015	49.29	45.21
2016	49.04	45.06
2017	48.78	45.03
2018	48.55	45.02
2019	48.32	45.06
2020	48.08	45.12

Source: BPS 2015 Dependency Ratio (processed).

As is known based on data from the Central Statistics Agency, Java and Sumatra are the islands with the most dense populations in Indonesia. Table 1 shows the average dependency ratio for 2011-2020 on Java and Sumatra, with the highest average occurring in 2011 with an average of 50.27%, which means there are around 50-51 per 100 Non-productive age people in Indonesia depend on those of productive age. Meanwhile, in Sumatra Province, the highest average occurred in 2011, namely 45.98, and the lowest occurred in 2018, with an average of 45.02%, which means that there are around 45 per 100 people of non-productive age in Indonesia who are dependent on to those of productive age. The dependency ratio on Sumatra Island is lower than Java Island.

Changes in the age structure of the populationand decreasing the burden of dependency provides an opportunity for what is called a demographic bonus. The demographic bonus is associated with the emergence of an opportunity called a window of opportunity which can be utilized to improve community welfare. The demographic bonus is often associated with an opportunity that will only occur once for all residents of a country, namely the window of opportunity. This must be utilized as well as possible by the government of a country if the country wants to improve the welfare of its population(Setyo Adioetomo 2005).

Table 2
Average Dependency Ratio on Sumatra Island 2011-2020

Province	Average Dependency Ratio 2011-2020 (percent)
Aceh	54.58
West Sumatra	55.67
North Sumatra	56.33
Riau	51.41
Jambi	32.10
South Sumatra	49.51
Bengkulu	47.91
Lampung	49.55
Bangka Belitung Islands	46.09
Riau islands	48.36

Source: Indonesian Central Statistics Agency 2015.

In table 2, it shows the average data on the 2011-2020 dependency ratio on the island of Sumatra. There are 3 provinces with the highest average, including North Sumatra Province with an average of 56.33%, followed by West Sumatra Province with an average of the average is 55.67% and Aceh is in 3rd place with an average of 54.58% while the lowest province is Jambi with an average of 32.10%, followed by Bangka Belitung Province with an average of 46.09% after that there is Bengkulu Province with an average of 47.91%.

Table 3
Average Years of Schooling on Sumatra Island 2011-2020

Province	Average Years of Schooling (Years)
Aceh	8,804
North Sumatra	9,078
West Sumatra	8,544
Riau	8,641
Jambi	8.03
South Sumatra	7,812
Bengkulu	8,362
Lampung	7,615
Bangka Belitung Islands	7,585
Riau islands	9,734

Source: Indonesian Central Statistics Agency 2022.

Table 3 shows data on the average length of school for 2011-2020 on the island of Sumatra, that there are 3 provinces with the highest average, including the Riau Islands with an average of 9.734%, followed by North Sumatra Province with an average of 9.078% and Aceh in second place. 3rd, the average length of schooling on the island of Sumatra is 8.804%, while for the lowest province there are 3 provinces, namely the Bangka Belitung Islands Province, which is 7.585%, followed by Lampung Province with an average of 7.615% and South Sumatra is the 3rd lowest with an average of 7.812%.

Table 4
Average of Women Aged 15-49 Years and Married Who Are Using/Using Birth Control Devices on Sumatra Island in 2011-2020

Province	Average Married Women Aged 15-49 Years Who Are Currently Using Birth Control (Percent)
Aceh	47.96
North Sumatra	47.79
West Sumatra	48.85
Riau	53.67
Jambi	63.60
South Sumatra	65.95
Bengkulu	67.02
Lampung	66.61
Bangka Belitung Islands	64.89

Riau islands	45.76

Source: Indonesian Central Statistics Agency 2022.

Table 4 shows the average data for married women aged 15-49 years who are currently using/wearing birth control devices for 2011-2020. On the island of Sumatra, there are 3 provinces with the highest average, including Bengkulu Province with an average of 67.02%. after that there is Lampung Province with an average of 66.61% and South Sumatra is in 3rd place with an average of 65.95%, while for the lowest province there are 3, namely the Riau Islands Province, which is 45.76, after that there is the Province North Sumatra with an average of 47.79%, followed by Aceh Province with an average of 47.96%.

Table 5
Average Life Expectancy for Men and Women on Sumatra Island 2011-2020 (percent)

Province	Man	Woman	Amount
Aceh	67.59	71.46	69.52
North Sumatra	66.43	70.19	68.31
West Sumatra	66.74	70.5	68.62
Riau	69.06	72.82	70.94
Jambi	68.68	72.5	70.59
South Sumatra	67.25	71.05	69.15
Bengkulu	66.67	70.47	68.57
Lampung	67.98	71.76	69.87
Bangka Belitung Islands	68.05	71.81	69.93
Riau islands	67.46	71.2	69.33

Source: Indonesian Central Statistics Agency 2022.

Table 5 shows data on the average male life expectancy in 2011-2020 on the island of Sumatra, there are 3 provinces with the highest average, namely Riau Province with an average of 69.06%, followed by Jambi Province with an average of the average is 68.68% and the Bangka Belitung Islands are in 3rd place with an average of 68.05%, while for the provinces with the lowest there are 3, namely South Sumatra Province with an average of 66.25% after that there is Sumatra Province North with an average of 66.43%, followed by Bengkulu Province with an average of 66.67%, while in table 1.5 we can see data on the average life expectancy for women in 2011-2020. On the island of Sumatra, there are 3 provinces with The highest average includes Riau Province with an average of 72.80%, followed by Jambi Province with an average of 72.50 and Bangka Belitung Islands which is in 3rd place with an average of 71.81%. while the lowest provinces were 3 provinces, namely North Sumatra Province at 70.19%, followed by Bengkulu Province with an average of 70.47%, after that there was West Sumatra Province at 70.50%.

Table 6
Average Gross Regional Domestic Product per capita on Sumatra Island 2011-2020

Province	Average Gross Regional Domestic Product per capita 2011-2020 (Thousand Rupiah)
Aceh	23,475.84
North Sumatra	32,186.97
West Sumatra	27,437.36
Riau	72,093.06
Jambi	37,027.14
South Sumatra	32,444.62
Bengkulu	20,617.11
Lampung	24,909.18
Bangka Belitung Islands	33,811.05
Riau islands	77,503.34

Source: Indonesian Central Statistics Agency 2020.

Table 6 shows the average GDP per capita data for 2011-2020 on the island of Sumatra, that there are 3 provinces with the highest average, including Riau Islands Province with an average of 77,503.34, followed by Riau Province with an average of 72,093.06. and Jambi is in 3rd place with an average of 37,027.14, while for the lowest provinces there are 3 provinces, namely Bengkulu Province with an average of 20,617.11, followed by Aceh Province with an average of 23,457.84 and Lampung is in 3rd place with the average is 24,909.18.

Table 7
Average Population Age 15 years and Over Included in the Labor Force on Sumatra Island 2011-2020

Province	Average population aged 15 years and over included in the labor force (millions)
Aceh	2,156,589
West Sumatra	6,315,841
North Sumatra	2,323,659
Riau	2,765,062
Jambi	1,598,371
South Sumatra	3,867,181
Bengkulu	925,485
Lampung	3,886,445
Bangka Belitung Islands	646.225
Riau islands	869,741

Source: Central Statistics Agency 2011-2020.

Table 7 shows data on the average population aged 15+ who are included in the 2011-2020 labor force on the island of Sumatra. There are 3 provinces with the highest average, including North Sumatra Province with an average of 6,315,841, followed by Lampung Province with The average is 3,886,445 and South Sumatra Province is in 3rd place with the highest average on Sumatra Island with an average of 3,867,181. Meanwhile, for the lowest provinces, there are 3 provinces, namely Bangka Belitung Islands Province with an average of 646,225, followed by Riau Islands Province with an average of 869,741 and Jambi Province is in 3rd place with an average of 1,598,371.

Method

Types of Research and Research Sources

This research is quantitative descriptive research. The data used in this research is secondary data, namely data obtained and published by the Central Statistics Agency (BPS) of the Republic of Indonesia. This research uses five independent variables, namely, average years of schooling, proportion of married women (15-49) who use birth control, life expectancy, per capita income, employment, and the dependent variable, namely the Dependency Ratio. The scope of this research covers 10 provinces on the island of Sumatra using 10 years of data, namely 2011-2020.

Data analysis method

The analytical method used in this research is panel data regression. To prove the truth of the hypothesis, data analysis is needed. To determine the effect of one independent variable on the dependent variable, the following formulation can be made:

$$DRit = \beta o + \beta 1\ RLSit + \beta 2\ PWKit + \beta 3\ AHHit + \beta 4\ PP + \beta 5\ TKit\ \epsilon t$$

Information:

DRit = Dependency Ratio
RLSit = Average Years of Schooling
PWKit = Proportion of Married Women Who Use Birth Control
AHHit = Life Expectancy
Ppit = Per Capita Income
TKit = Labor
β1 β2 β3 β4 β5 = Coefficient
ϵt =*Term Error*

Results and Discussion

Data Description

This section presents statistical calculations and estimates of the equations used to answer how education level influences. proportion of married women (15-49) years who are currently using birth control. life expectancy. income per capita. and labor to dependency ratio on the island of Sumatra during the period 2011 – 2020. Estimate calculations using E-Views 12 software. Summary of descriptive statistics from research data:

Table 8
Descriptive Statistics of Research Variables

	DR	T.P	KB	AHH	PP	Kindergarten
Mean	49.1552	8.4205	60.4534	69.5234	38.15057	2.53546
Median	49.66	8.35	66,535	69,495	31.29986	2.27336
Maximum	57.64	10.12	68.78	71.65	85.01258	7.350057
Minimum	30.93	7.19	43.48	67,685	17.28227	0.143781
Std. Dev.	6.665855	0.71429	8.505203	0.920497	19.30465	1.742414
Skewness	-1.42966	0.31681	-0.55357	0.137132	1.260722	1.02031
Kurtosis	4.731933	2.352656	1.594847	2.333997	3.073656	3.45731
Jarque-Bera	46.56369	3.418868	13.33414	2.161585	26.51295	18.22193
Probability	0	0.180968	0.001272	0.339326	0.000002	0.00011
Sum	4915.52	842.05	6045.34	6952.34	3815.057	253,546
Sum Sq. Dev.	4398.929	50.51087	7161.51	83.88419	36894.28	300.5648
Observations	100	100	100	100	100	100

Based on Table 8, it can be seen that the number of data observations used was 100 observations sourced from 10 provinces on the island of Sumatra during the 2011-2020 period. From 100 data the average dependency ratio (Y) minimum value is 30.93%. the maximum value is 57.64%. from the 2011-2020 period it is known that the average is 49.15%. and the standard division value is 6.66%, which means the average value is greater than the standard value so that the data deviation that occurs in this study is low so the value distribution is even.

Education level (X1) from 100 observations shows a minimum value of 7.19%. the maximum value is 10.12%. from the 2011-2020 period it is known that the average is 8.35%. and the standard division value is 0.71%, which means the average value is greater than the standard value so that the data deviation that occurs in this study is low so the value distribution is even.

The minimum value of the proportion of married women aged 15-49 years who are currently using birth control (X2) is 30.93%. the maximum value is 57.64%. from the 2011-2020 period it is known that the average is 49.15%. and the standard division value is 6.66%, which means the average value is greater than the standard value so that the data deviation that occurs in this study is low so the value distribution is even.

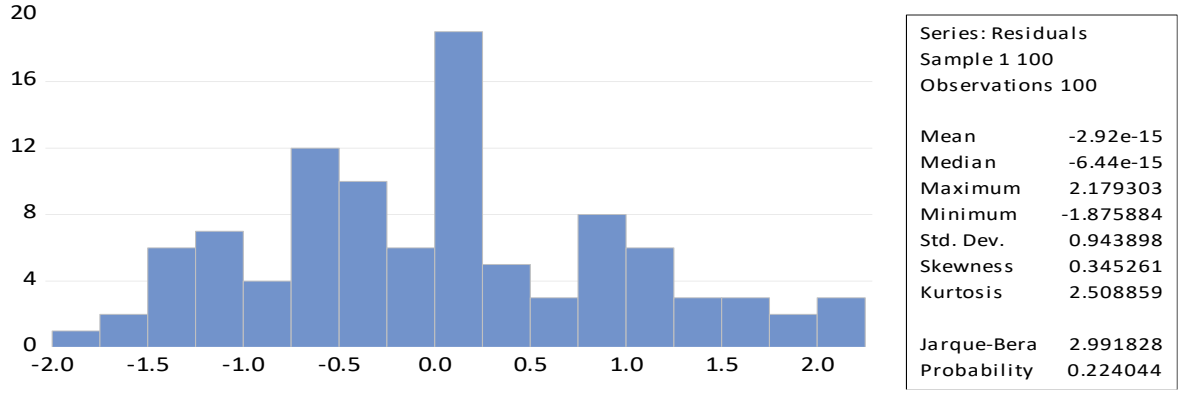
Life expectancy (X3) from 100 observations shows a minimum value of 67.68%. the maximum value is 71.65%. from the 2011-2020 period it is known that the average is 69.49%. and the standard division value is 0.92%, which means the average value is greater than the standard value so that the data deviation that occurs in this study is low so the value distribution is even.

Per capita income (X4) from 100 observations shows a minimum value of 17.28%. the maximum value is 85.01%. from the 2011-2020 period it is known that the average is 31.29%. and the standard division value is 19.30%, which means the average value is greater than the standard value so that the data deviation that occurs in this study is low so the value distribution is even.

Labor Force (X5) from 100 observations shows a minimum value of 0.14%. the maximum value is 7.35%. from the 2011-2020 period it is known that the average is 2.27%. and the standard division value is 1.74%, which means the average value is greater than the standard value so that the data deviation that occurs in this study is low so the value distribution is even.

Classic assumption test

Figure 1. Normality test



Source: Research Results, 2023

Based on the normality test results seen in the image above. that the Jarque-Bera P-value is 0.2991828 which is greater than (α) 5 percent (0.05). So it can be concluded that in this research model the data is normally distributed.

Multicollinearity Test

Table 9
Multicollinearity Test

	T.P	KB	AHH	PP	Kindergarten
T.P	1,000000	-0.448602	-0.079871	0.544899	0.096453
KB	-0.448602	1,000000	0.161169	0.078101	-0.427832
AHH	-0.079871	0.161169	1,000000	0.452175	-0.170533
PP	0.544899	0.078101	0.452175	1,000000	-0.156093
Kindergarten	0.096453	-0.427832	-0.170533	-0.156093	1,000000

Based on the estimation results above, it can be seen that there is no value for each independent variable that exceeds 0.8. So it can be concluded that all independent variables do not have multicollinearity problems.

Hetoscedasticity Test

Table 10
Heteroscedasticity Test

Variables	Prob.
C	0.2043
T.P	0.9114
KB	0.6234
AHH	0.2347
PP	0.2551
Kindergarten	0.8255

Source: Research Results, 2023

Based on the estimation results from the heteroscedasticity test. using the Park method. The results show that the probability value for each independent variable exceeds α = 5% (0.05). so it can be concluded that the model used in the research is free from heteroscedasticity problems.

Panel Data Regression Results

Table 11
Significance Test Results

Test	Cross section-stat	Prob.
Test Chow	411.959512	0.0000
Hausman test	7.098510	0.2134

Source: Research Results, 2023

The results of the Chow test show that the P-value of 0.0000 is smaller than the real level (α) value of 5 percent (0.05), so H0 is rejected so it can be concluded that the Fixed Effect Model is more appropriate than the Common Effect Model.

The Hausman test results show that the P-value is 0.2134. Because the P-value is greater than the real level (α) value of 5 percent (0.05), H0 is rejected so it can be concluded that the Random Effect Model is more appropriate than the Fixed Effect model for analyzing this research.

Random Effect Model (REM) Equation

Table 12. REM Equation

Variables	Coefficient	Std. Error	t-Statistics	Prob.
C	203.5647	28.18685	7.221974	0.0000
T.P	-1.786979	0.586354	-3.047609	0.0030
KB	-0.133906	0.036944	-3.624568	0.0005
AHH	-1.994093	0.464661	-4.291503	0.0000
PP	0.202174	0.037986	5.322302	0.0000
Kindergarten	-0.135697	0.173812	-0.780712	0.4369

Source: Research Results, 2023

Hypothesis testing

T-Statistics Test

Table 13
T-Statistics Test

Variable	T-stat	T-table	Prob	Conclusion	information
T.P	-3.047609	1.66105	0.0030	H0 is rejected	Significant
PWKB	-3.624568	1.66105	0.0005	H0 is rejected	Significant
AHH	-4.291503	1.66105	0.0000	H0 is rejected	Significant
PP	5.322302	1.66105	0.0000	H0 is rejected	Significant
TG	-0.780712	1.66105	0.4369	H0 is accepted	Not significant

Source: Research Results, 2023

The t-table result is 1.66105. The t-stat value (-3,047) > t-table (1.661) so H0 is rejected. So it can be concluded that the education level variable has a significantly negative effect on the Dependency Ratio.

The t-table result is 1.66105. The t-stat value (-3,624) > t-table (1.66105) so H0 is rejected. So it can be concluded that the variable proportion of married women (15-49) years old who are using birth control methods has a significantly negative effect on the Dependency Ratio.

The t-table result is 1.66105. The t-stat value (-4,291) > t-table (1.66105) so H0 is rejected. So it can be concluded that the variable Life Expectancy has a significantly negative effect on the Dependency Ratio.

The t-table result is 1.66105. The t-stat value (5,322) > t-table (1.66105) so H0 is accepted. So it can be concluded that the per capita income variable has a significantly positive effect on the Dependency Ratio.

The t-table result is 1.66105. The t-stat value (-0.780) > t-table (1.66105) so H0 is accepted. So it can be concluded that the Labor variable has a significantly positive effect on the Dependency Ratio.

F test

Table 14
F test

DF1	DF2	a	F-table	F-stat	Prob	Information
4	94	0.05	2.46	35.04127	0,000	H0 is rejected

Source: Research Results, 2023

Testing was carried out using n of 100,α = 0.05, df1 = 4, df 94, so the f-table value is 2.46. Based on the results, it can be concluded that the independent variables have a simultaneous (together) effect on the dependency ratio, because the f-stat value is 35.04127 > f-table 2.46. These results show that the independent variable has a significant effect on the dependency ratio.

Coefficient of Determination (R2)

The coefficient of determination (R2) is used to measure the model's ability to explain the dependent variable. From the results of the data processing above, the coefficient of determination (R2) is 0.632252 or 63 percent. The coefficient of determination is seen from the coefficient value starting from 0

to 1. If the coefficient value is closer to 1, the more the independent variable can explain the dependent variable.

Discussion of Research Results

1. Based on the estimation results, it was found that the level of education had a negative and significant effect on the dependency ratio in 10 provinces on the island of Sumatra. with a regression coefficient of -1.786979 at the 95% confidence level. This means that if the level of education is higher, the dependency ratio will decrease by 1.78%. ceteris paribus.
2. Based on the estimation results, it was found that the proportion of married women (15-49) years old who were using family planning had a negative and significant effect on the dependency ratio in 10 provinces in Sumatra. with a regression coefficient of -0.133906 at the 95% confidence level. This means that the proportion of married women (15-49) years who are currently using birth control methods increases by 1%, so the dependency ratio will experience an increase of 0.13%. ceteris paribus.
3. Based on the calculation results, it shows that life expectancy has a negative and significant effect on the dependency ratio on the island of Sumatra 2011-2020 with a regression coefficient of -1.994093 at a 95% confidence level. This means that if life expectancy increases by 1%, the dependency ratio will increase by 1.99%. ceteris paribus.
4. Based on the calculation results, it shows that per capita income has a negative and significant effect on the dependency ratio on the island of Sumatra 2011-2020 with a regression coefficient of 0.202174 at a 95% confidence level. This means that if per capita income increases by 1%, the dependency ratio will decrease by 0.21%. ceteris paribus.
5. Based on the calculation results, it shows that labor has a positive and insignificant effect on the dependency ratio on the island of Sumatra in 2011-2020 with a regression coefficient of -0.135697 at a 95% confidence level. This means. if the workforce increases by 1%, the dependency ratio will decrease by 0.13%. ceteris paribus.

Conclusion

Based on testing the hypotheses in this research. then it can be concluded that:

1. The education level variable has a negative and significant effect on the dependency ratio. This proves that the first hypothesis states that the education variable has a significant negative effect on the dependency ratio.
2. The variable proportion of married women (15-49) years who are currently using birth control methods has a negative and significant effect on the dependency ratio. This proves that the first hypothesis states that the education variable has a significant negative effect on the dependency ratio.
3. The life expectancy variable has a negative and significant effect on the dependency ratio. This proves that the first hypothesis states that the life expectancy variable has a significant negative effect on the dependency ratio.
4. The per capita income variable has a negative and significant effect on the dependency ratio. This proves that the first hypothesis states that the per capita income variable has a significant positive effect on the dependency ratio.
5. The labor variable has a positive and insignificant effect on the dependency ratio. This proves that the first hypothesis states that the labor variable has a significant negative effect on the dependency ratio.

References

Behrendt, Christina, and Quynh Anh Nguyen. 2018. "Innovative Approaches for Ensuring Universal Social Protection for the Future of Work", ILO Future of Work Research Paper Series 1. Geneva: International Labour Organization. https://www.ilo.org/global/topics/future-of-work/publications/WCMS_629864/lang--en/index.html

Bussolo, Maurizio, Johannes Koettl, and Emily Sinnott. 2015. Golden Aging: Prospects for Healthy, Active, and

Prosperous Aging in Europe and Central Asia. The World Bank. https://doi.org/10.1596/978-1-4648-0353-6

Clark, Robert L., and Richard. Anker. 1990. "Labour Force Participation Rates of Older Persons: An International Comparison", Population and Labour Policies Programme Working Paper No. 171, ILOWEP 2-21 (171). https://www.ilo.org/public/libdoc/ilo/1990/90B09_25_engl.pdf

Elder, Sara, and Sriani Kring. 2016. "Young and Female – a Double Strike? Gender Analysis of School-toWork Transition Surveys in 32 Developing Countries", Work4Youth Publication Series, No. 32.

Eurofound. 2012. Income from Work after Retirement in the EU. EF, 12/59 EN. Luxembourg: Publications Office of the European Union [u.a.].

International Labour Organization (ILO). 2012. Understanding Deficits of Productive Employment and Setting Targets: A Methodological Guide. Geneva: ILO. https://www.ilo.org/wcmsp5/groups/public/---ed_emp/documents/publication/wcms_177149.pdf

———. 2016a. Women at Work: Trends 2016. Geneva: International Labour Office.

———. 2016b. "Non-Standard Employment around the World: Understanding Challenges, Shaping Prospects." Report. Geneva: International Labour Office. http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_534326.pdf

———. 2017a. "Labour Force Estimates and Projections: 1990–2050 (2017 Edition). Methodological Description." Geneva.

———. 2017b. World Social Protection Report 2017–19: Universal Social Protection to Achieve the Sustainable Development Goals. Geneva: ILO. https://labordoc.ilo.org/view/delivery/41ILO_INST/1251629030002676

———. 2018a. "Care Work and Care Jobs for the Future of Decent Work." Geneva: International Labour Office. https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_633135.pdf

Kost, Gerald J. et al. 2003. "Demographic Trends, Health Economics, and Rapid Response in Southeast Asia." Point of Care: The Journal of Near-Patient Testing & Technology.

Setyo Adioetomo, Sri Moertiningsih. 2005. "Bonus Demografi: Menjelaskan Hubungan Antara Pertumbuhan Penduduk Dengan Pertumbuhan Ekonomi." Pidato Pengukuhan Guru Besar Tetap dalam Bidang Ekonomi Kependudukan (April).