Demographics, Labour Force and Older People in Indonesia[1]

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Abstract

This paper documents and studies demographic and household survey data in Indonesia. The two key objectives are to provide (i) data for the calibration of the economic model that will be developed in this project; and (ii) stylized facts for the Indonesian household sector and economic behaviour of Indonesian households over their life cycle that will be closely captured by the economic model.

The focus of this report is on the demographic change, labour force and older people (and their resources) in Indonesia, using the United Nations demographic data (UN 2019) and the Indonesian Family Life Survey (IFLS) (documented by Strauss et al., 2016). In this report, "older people" can be thought of as those 50 and above.

We show that:

- Indonesia will undergo pronounced population ageing driven by a reduction in total fertility rate. For example, the aged dependency ratio (65+/15-64) is projected to increase from less than 10% (in 2020) to over 46% in 2100. This is also attributed to an increasing life expectancy, particularly at older ages. For those at age 65, life expectancy is projected to increase by almost 20 years in 2100 (which is almost double the expected lifespan in the middle of the 20th century). Indonesia's total population has also quadrupled to 273 million since 1950 and is projected to increase to 320 million in 2100. However, the annual population growth rate will become negative, reaching -0.3% in 2100 due to population ageing.
- Importantly, drawing on IFLS household survey data, this demographic transition is occurring in an economy where the majority of the labour force operates in informal employment not covered by a formal retirement income policy.
- At older ages, people continue to derive their income mainly from employment, along with private transfers from their adult children and these two income sources will be impacted by fewer adult children (to provide private transfers) and longer lifespans (affecting the labour supply of older people).

These findings indicate a pressing need for major social policy development over the next two decades to mitigate negative social and economic implications of this demographic shift and to avert large-scale poverty among older cohorts.

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1 Introduction

The Asian region is experiencing rapid population ageing, with the number of people in their 60s and older expected to more than double, from about 520 million today to about 1.2 billion in the next 30 years (United Nations (UN), 2019). For many populous Southeast Asian economies, this demographic transformation is occurring simultaneously with major shifts in labour markets, technology and formalisation, and against a backdrop of deficient social protection policies that do not cover a large proportion of older people (World Bank, 2016). Developing or reorienting policy to anticipate and mitigate the social and economic impacts of ageing will be crucial.

The focus country of this research is Indonesia, where major social policy development is urgent and will be required over the next two decades to avert large scale poverty and suffering among older cohorts[5], and ameliorate pressures leading to increasing inequality[6] and stalled development (the "middle income trap"). We review the evidence on demographic change, labour force, and older people in Indonesia, employing demographic and household survey data for Indonesia. We show that:

- Indonesia will undergo pronounced population ageing over the next 50 years, driven by a reduction in total fertility rate and increasing life expectancy. By 2100 the size of the population is projected to be declining.
- Importantly, drawing on Indonesian Family Life Survey (IFLS) data, this demographic transition is occurring in the economy where the majority of the labour force operates in informal employment with no coverage by a formal retirement income policy.
- At older age, people derive their income mainly from employment and private transfers from their adult children.

These findings emphasize a pressing need for major social policy development over the next two decades to mitigate negative social and economic implications of this demographic shift and to avert large-scale poverty among older cohorts.

This paper is structured as follows. In the next section, we introduce the data sources for Indonesia, briefly discussing the UN demographic data base and the IFLS as well as the National Labour Force and Socio-Economic Surveys. Section 3 documents the demographic change, presenting the past, current and future demographic developments in Indonesia. Section 4 focuses

[5] While Indonesia's official poverty rate was 9.2% in 2019, around 20% of the population remains vulnerable to becoming poor, measured by the vulnerability line equal to 1.5 times the national poverty line (World Bank 2020). In addition, official poverty rates among the elderly are much higher, with about 42% of the elderly aged 60 years and above being vulnerable and living just above the poverty line (Priebe and Howell 2014). Further note that based on an alternative "basic needs" poverty line measure developed by Allen (2017), Indonesia's poverty rate is already very high, at 46% (see Allen 2017).

[6] Inequality has risen strongly in Indonesia, with the Gini coefficient increasing from 0.3 in 2004 to 0.41 in 2014, one of the fastest increases in the Southeast Asian region (Organisation for Economic Co-operation and Development (OECD) 2019).

on the Indonesian labour force, reporting on formal-informal labour, skills and earnings. In Section 5, we study older people in Indonesia, documenting their characteristics, employment and income sources. Both Sections 4 and 5 use the IFLS. The final section provides interim conclusions, including a summary of the key stylized facts derived from the Indonesian population, its labour force and older people.

2 Demographic and Household Survey Data

In this section, we describe the following data sources: The United Nations World Population Prospects data (UN, 2019), the Indonesia Family Life Survey (IFLS), the National Labour Force Survey (SAKERNAS) and the National Socio-Economic Survey (SUSENAS). As discussed, in this report, we use the UN data to document the demographic change in Indonesia and the IFLS for the analysis of the Indonesian labour force, older people and private transfers.

In the first stage of the project (July 2020 - July 2021), together with the IFLS, we will also employ the two nationally representative household surveys, SAKERNAS and SUSENAS, when developing the database for the calibration of the economic model – and particularly of its household sector and life cycle behaviour – to Indonesia.

2.1 UN World Population Prospects

The 2019 Revision of World Population Prospects is the twenty-sixth round of official United Nations population estimates and projections for the world population, different regions and individual countries around the world.[7] It provides population estimates from 1950 to 2020 and projections up to 2100. Projections allow for several different variants, including different fertility rate assumptions.

In Section 3, we use UN data for Indonesia. In relation to demographic inputs, we focus on (the changes in) fertility and survival rates. For the demographic outcomes, we report on (the changes in) the total population as well as cohort shares from 1950 to 2020 and to 2100. We also provide key results for alternative projections, emphasizing the importance of past fertility trends and future fertility assumptions.

2.2 Indonesian Family Life Survey

The Indonesian Family Life Survey (IFLS) is an ongoing longitudinal survey in Indonesia, representative of about 83% of the Indonesian population and containing over 30,000 individuals living in 13 of the 27 provinces in the country (documented by Strauss et al., 2016).[8] It consists of five waves that were initiated in 1993, 1997, 2000, 2007, and 2014.

These surveys are rich-information socio-economic surveys which collect a wide range of data for studying life cycle behaviour and outcomes for the Indonesian population. Data on employment, labour force participation, education, health, income, expenditure, housing, fixed assets and durable goods are reported. Coverage of poverty alleviation programs, general

[7] Data can be downloaded at https://population.un.org/wpp/Download/Standard/Population/.

[8] Data and documentations can be accessed at https://www.rand.org/well-being/ social-and-behavioral-policy/data/FLS/IFLS.html.

economic conditions, agricultural production, local infrastructure and transportation are also reported, and in combination these allow us to construct a comprehensive panel data set.

In this report (and specifically in Sections 4 and 5), we document data on the labour force and older people, using mainly IFLS survey waves 3 to 5 for years 2000, 2007 and 2014.[9] These surveys and their procedures were reviewed and conducted by RAND corporation, and in Indonesia at the University of Gadjah Mada. Details on the variables used from this data source are provided in Section 4 (for the labour force) and Section 5 (for older people). Below, we provide our definition of informal labour used in the empirical investigation with the IFLS.

Definition of Informal Employment

According to the international statistical definition of informal employment by International Labour Organization (ILO, 2002, p.124), "employees are considered to have informal jobs if their employment relationship is not subject to national labour legislation, income taxation, social protection or entitlement to certain employment benefits".[10] Due to the wide diversity of social and economic situations in different countries, this broad guideline leaves the operational and specific criteria for establishing informality for individual countries, with specific definitions depending also on the actual data availability.

For Indonesia, informal workers are defined based on the legal status of enterprises, that is, whether enterprises are registered (UU Ketenagakerjaan No. 13 of 2003 by the Ministry of Manpower and Transmigration, discussed by Nasip and Pradipto, 2016). Furthermore, since 1993, the government has been requiring registered employers to provide health benefits to employees through the Employees' Social Security System. Under that regulation, formal workers are entitled to receive health benefits provided by their employers.

In this report, we use medical benefits from employers in the form of health insurance and any other medical expenditure as an indicator of formality. If a person reports that they have received either health insurance or medical expenditure from their employer, we code them as a formal worker.[11] However, if a person reports that they are self-employed, they will not be asked about medical benefits from employers. For those people, we code them as informal workers given the fact that most of them are working in agriculture as farmers.

This method of identifying informal workers has been utilized in many studies, such as Yamada (1996) for Peru, Maloney (1999) for Mexico, and McKee (2006) and Cuevas et al.

[9] In this report, we employ mainly the last three waves of the IFLS (2000-2007-2014), which provide the most updated information and necessary background (particularly) for the analysis of the labour force in Indonesia. In comparison with the earlier waves (1993-1997), those waves have more specific questions in relation to constructing the respondents' sectoral attainment (formal/informal labour), which is in accordance with the definition by the ILO. However, note that for certain specific issues, the 1993-1997 waves are also processed in this report in order to capture specific trends and supporting information.

[10] For further details on measuring informality, see, e.g., ILO (2013, 2018a).

[11] Most of the analysis in the labour force section (Section 4) deals with male workers only (due to the reasons discussed in that section). In Section 5 on older people and the appendix, we provide a comparison by gender.

(2009) for Indonesia. We use this definition of informal employment as a proxy for those operating outside of the retirement income policy in Indonesia. Capturing those operating in the informal sector, and also those in the formal sector but with no pension policy coverage, is important for our analysis of ageing and retirement income policy in Indonesia. Note that according to ILO (2018b), the proportion of Indonesians in informal employment operating in the formal sector (based on the registered enterprise definition given above) is small, 5.8% of all informal employment. Under the recent social security reforms implemented in 2014 and 2015, the objective is to gradually cover all formal sector workers by the national social security programs, including health, work-accident, old-age savings, pension and death benefits programs (for details, see Muliati and Wiener 2014).

2.3 National Labour Force and Socioeconomic Surveys

The two main nationally representative household surveys in Indonesia are the National Labour Force Survey (SAKERNAS) and the National Socio-Economic Survey (SUSENAS). SAKERNAS was initiated in 1976 to cover national labour market characteristics of all working age individuals within sampled households. It has generally been conducted on an annual basis since 1976 and on a biannually basis since 2005 by Statistics Indonesia (BPS, Badan Pusat Statistik), drawing on either quarterly or annual observations. It covers around 220,000 individuals and 70,000 households across the nation.[12]

Another BPS survey, SUSENAS also provides information on the labour market. SUSENAS is a series of large-scale multi-purpose socioeconomic surveys initiated in 1963-1964 and fielded every year or two since then. Since 1993, SUSENAS surveys cover a nationally representative sample typically composed of 200,000 households. Each survey contains a core questionnaire which consists of a household roster listing the sex, age, marital status, and educational attainment of all household members, supplemented by modules covering about 60,000 households that are rotated over time to collection additional information such as health care and nutrition, household income and expenditure, and labour force experience.[13]

As part of developing the database for the calibration of the household sector in the model, in the first stage of the project, we will also use SAKERNAS and SUSENAS to complement the analysis of older people carried out with the IFLS, to establish the structure of the labour market, sectoral transitions, skills and labour supply, earnings of the working age population and family transfers between generations.

[12] Source: https://www.rand.org/well-being/social-and-behavioral-policy/data/bps/sakernas.html.

[13] Source: https://www.rand.org/well-being/social-and-behavioral-policy/data/bps/susenas.html.

3 Demographic Change

In this section, we document demographic changes in Indonesia, using the UN population data from 1950 to 2100 (UN, 2019). We first present past trends as well as projections for fertility and survival rates. We then provide estimates and projections for demographic outcomes, focusing on the size and age distribution of the Indonesian population.

In this report we employ the UN data for convenience (since this data source is publicly available) and for potential future international comparison. There are also official projections for Indonesian population produced by BPS-Statistics Indonesia and Bappenas, which we plan to utilise in calibrating the demographic structure of the economic model developed in this project. Note that the latest population projection for Indonesia was produced for the period of 2015-2045 and released in 2018. This official projection is based on population census in 2010 and the 2015 Indonesian population survey between censuses (SUPAS). For comparison of the UN population projections and the population projections based on population census data see McDonald (2014).

3.1 Fertility and Survival Rates

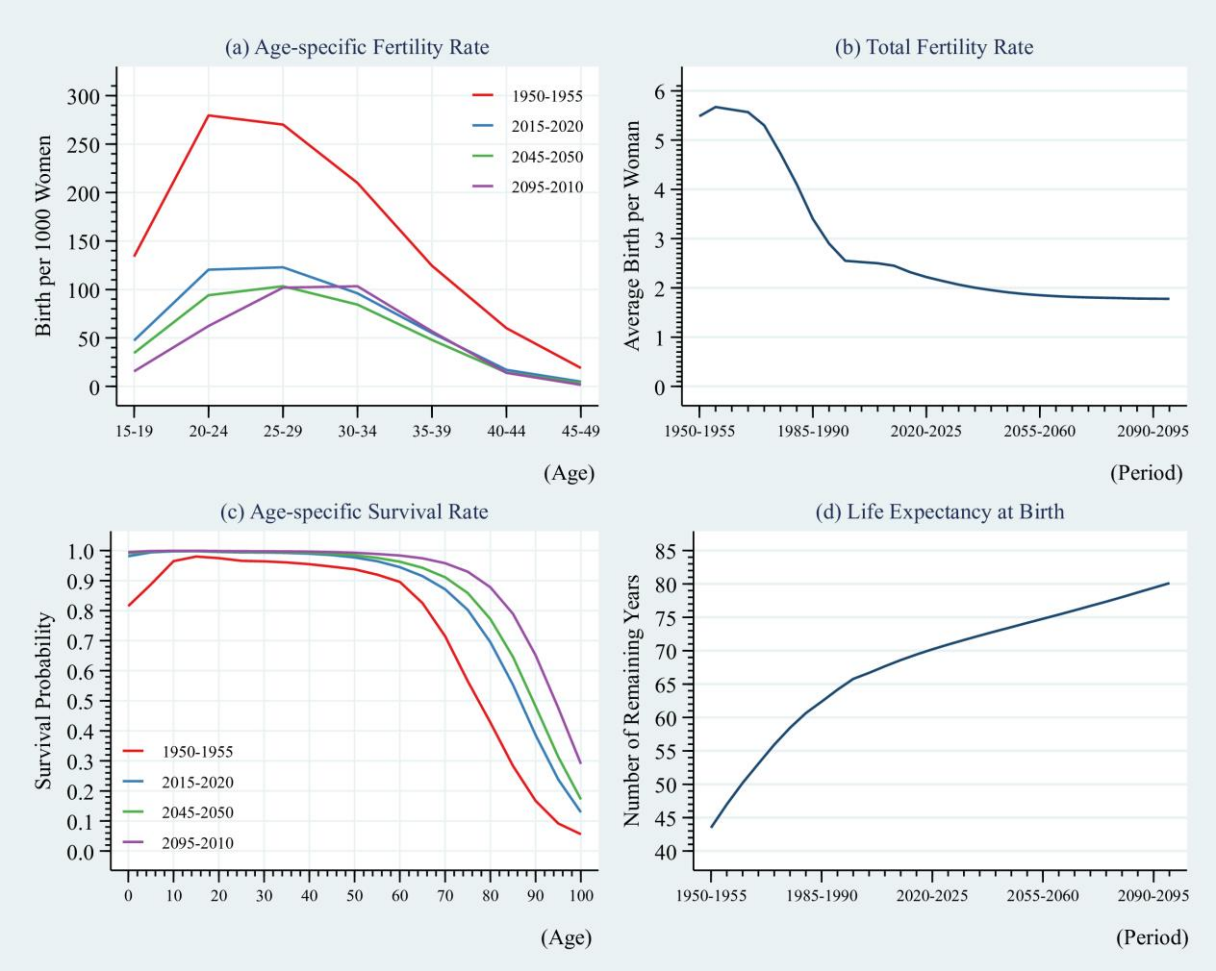
Changes in the size and age distribution of the Indonesian population have been and will be shaped by changes in fertility and survival rates. Figure 1 shows these two key demographic factors, with the changes in fertility and survival rates over the period of 1950-2100.[14]

Figure 1a shows the evolving change in age-specific fertility rates since the mid-20th century. It clearly indicates a substantial drop in the fertility rates among women aged 15-34 and also projects the shift of peak fertility toward the age group 30-34. Not surprisingly, this has resulted in a large decline in the total fertility rate (TFR) to just over 2 births per woman in 2020, from the peak TFR of over 5.5 births in the 1960s, as shown in Figure 1b.

The age-specific survival rates in Figure 1c has improved at young ages (compared to those in 1950-55) and particularly at older ages, with further improvements projected in the future. As a consequence, the life expectancy at birth is projected to almost double over the period of 1950-2100, reaching 80 years (average for both sexes) in 2100 (see Figure 1d).

[14] Projected rates (for 2020-2100) are based on the UN medium (most likely) population projection.

Figure 1: Fertility and Survival Rates



Source: United Nations (2019).

3.2 Demographic Estimates and Projections

The UN estimates and projections for key demographic variables in Indonesia are reported in Table 1. The projections are based on the medium fertility variant, with fertility and survival rates (and the implied life expectancy) depicted by Figure 1. We briefly discuss demographic outcomes for total population, population growth, cohort shares and dependency ratios in Indonesia below. As shown, the total population size has almost quadrupled, increasing to 273 million people in 2020, from 69.5 million people in 1950. However, it is projected that the annual population growth rate will become negative, with the total population declining at the annual rate of -0.3% projected for 2100.

Table 1 also reports significant changes in the age distribution of the Indonesian population. While in 1950 the population share of those aged 65 years and over was only 4%, that share is projected to increase to about 25% by 2050. The old-age dependency ratio (defined in Table 1 as those aged 65 years and over to the working age population aged 15 to 64) is projected to increase

to about 25% in 2050, and to 46% in 2100, while currently, this ratio is just over 9%. This increase is projected to drive up the total dependency ratio to 72% in 2100.

Table 1: Population Estimates and Projections

	Estimates			Projections[a]				
	1950	1980	2000	2020	2030	2050	2080	2100
Total population (in m)	69.54	147.45	211.51	273.52	299.2	330.9	334.74	320.78
Population growth (%)	1.88	2.39	1.39	1.07	0.78	0.27	-0.11	-0.29
Cohort shares (% of total population)								
Cohorts 0-14 (%)	39.17	52.02	41.22	34.46	31.2	26.12	21.9	20.25
Cohorts 15-64 (%)	56.87	44.42	54.08	59.28	59.63	58.01	55.39	52.85
Cohorts 65+ (%)	3.96	3.57	4.7	6.26	9.17	15.86	22.71	26.9
Dependency ratios (%)								
Youth (0-14/15-64)	68.88	74.26	47.51	38.25	34.18	30.02	26.55	25.75
Old-age (65+/15-64)	6.96	6.45	7.27	9.24	13.55	24.51	37.19	46.27
Total	75.84	80.71	54.78	47.49	47.73	54.53	63.74	72.02

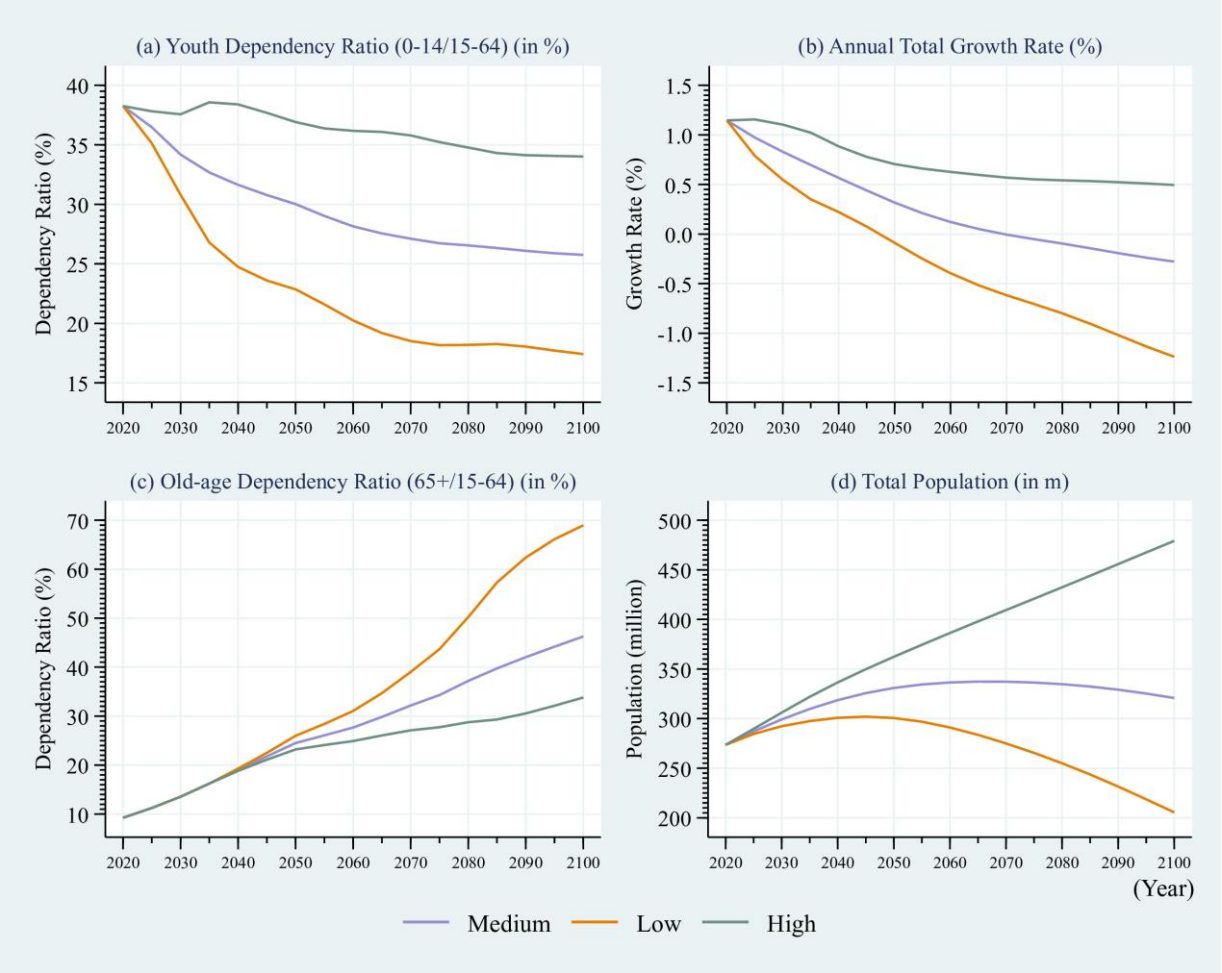
Notes : [a] Medium variant with medium assumption for TFR used in the projections.

Source : United Nations (2019) for Indonesia.

The alternative population projections compared to the medium (most likely) scenario (already discussed above) are presented in Figure 2. The figure plots two alternative and base-case projections for total population, population growth, old age dependency ratio and youth dependency ratio under different fertility assumptions. The base case or medium projections with medium assumptions for fertility and survival rates have already been discussed above and provided in Table 1. Figure 2 indicates that assumed fertility rates have significant impacts on the total population and population ageing, with low-high fertility assumptions generating the gap (in 2100) in the total population and in the old age dependency ratio by over 270 million and by over 35 percentage points, respectively. These alternatives also indicate that the declining TFR in the past will be driving the population ageing in Indonesia in years to come, whereas improvements in survival probabilities will cause the lifespan to extend, particularly at older age.

These demographic changes (i.e., fewer adult children supporting their parents and greater expected lifespans with survival improvement particularly at older ages) highlight the urgency of developing a formal social policy (that is fiscally sustainable) to avert large-scale poverty among older cohorts.

Figure 2: Alternative Demographic Projections



Source: United Nations (2019).

4 Labour Force

4.1 Introduction

This section is devoted to the labour force in Indonesia, using the IFLS. We first document employment rates and working hours over the life cycle. We then provide estimates for formal and informal employment and transitions. The next analysis deals with labour earnings over the working life cycle and the estimation of the earnings function. We conclude by summarizing the stylized facts related to the Indonesian work force and derived from the IFLS data.

Below we briefly discuss data selection, relevant to this section.

Data Selection

As discussed in Section 2 (in relation to the IFLS), we define "informal" workers (or employment) as those who do not receive any health insurance and medical benefits from their employers. We assume that this is a proxy for those who are not covered by formal retirement income policy. Note that this definition applies throughout this report.

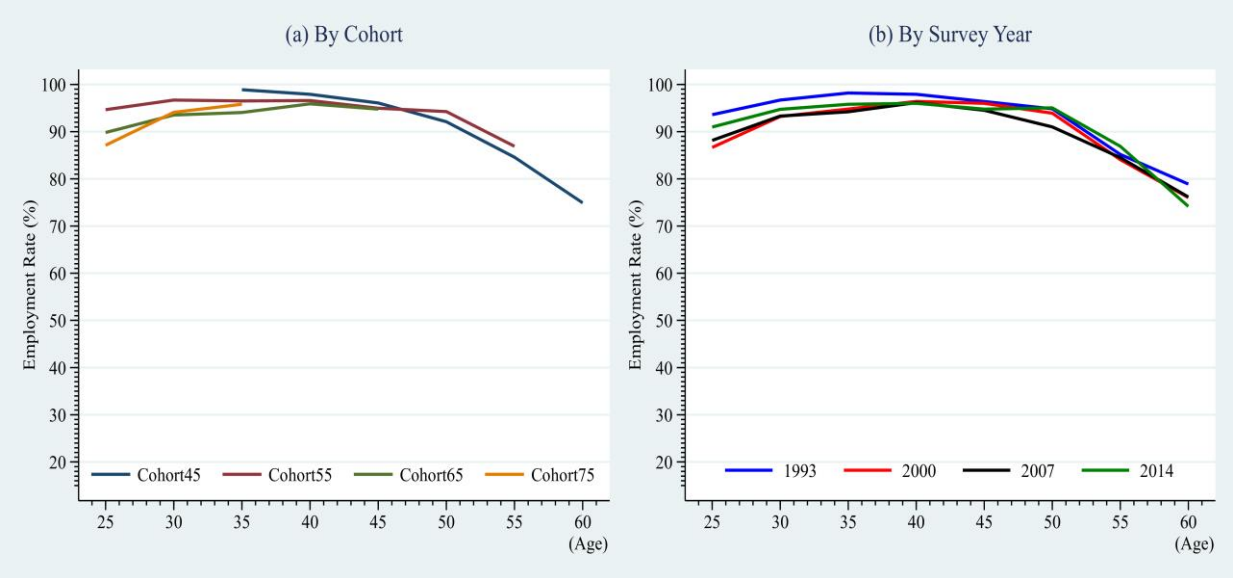
For the empirical analysis and estimation purpose in this section, specific restrictions for the output sampling are applied. These include the following:

- We use data for male workers only. The main reason for this restriction is the labour market participation in developing countries, where women are less likely to have a continuous job compared to men. Note that the data for Indonesia shows that the main reason for women never having worked or having suspended their work is marriage or taking care of their children. However, the female employment rate has increased significantly over the last two decades (see the appendix).
- We restrict the age of workers to be in the range from 25 to 60 years (as commonly used in the literature) and keep the below information at (i) the household level for consumption, earnings, assets and household business; and (ii) the individual level for age, education, marriage, fertility, health status, earnings and employment status variables.
- We keep farmers and the self-employed in the sample since they are very populous groups in developing countries.
- People with no jobs (around 16% of the total number of interviews across the three IFLS waves 2000, 2004 and 2014) and those who report themselves as "unpaid family workers" (around 5%) are excluded from the earnings function estimation.
- All observations with missing information are also removed from the constructed sample (for details, see the appendix and Table A1 with descriptive statistics for the earnings function estimation).

4.2 Employment Rates and Working Hours over the Life Cycle

The employment rates over working life are depicted by Figure 3.[15] The first graph shows the employment rate for four different cohorts (with the oldest born in 1945 and the youngest born in 1975) over the period of 1993-2014 (with seven years between each wave). Note that for the cohort born in 1975, we observe only 14 years in the labour force between the ages 25 to 39, corresponding to the period of 2000-2014, while for the oldest cohort, we do not have observations at younger ages (because the first survey was conducted in 1993). The second graph shows the age profiles of employment rates observed in different survey years.

Figure 3: Employment Rate by Cohort and Survey Year (Males)



Source: Authors' calculation from IFLS 1993–2014.

Both graphs indicate that the (average) employment rate over the working life exhibits a hump shape, i.e., increasing from early working ages, reaching a peak at ages 30 to 40, and then declining at older age. This age pattern is similar to those observed in developed countries, but the hump shape is not so pronounced and the employment rate (particularly at older age) is higher, compared to developed countries.[16] As shown in Figure 3a, when comparing across different cohorts of males, there is no significant difference, but younger cohorts of males seem to have lower employment compared to older cohorts at younger ages (also observed in developed countries). In addition, when comparing across different IFLS survey years in Figure 3b,

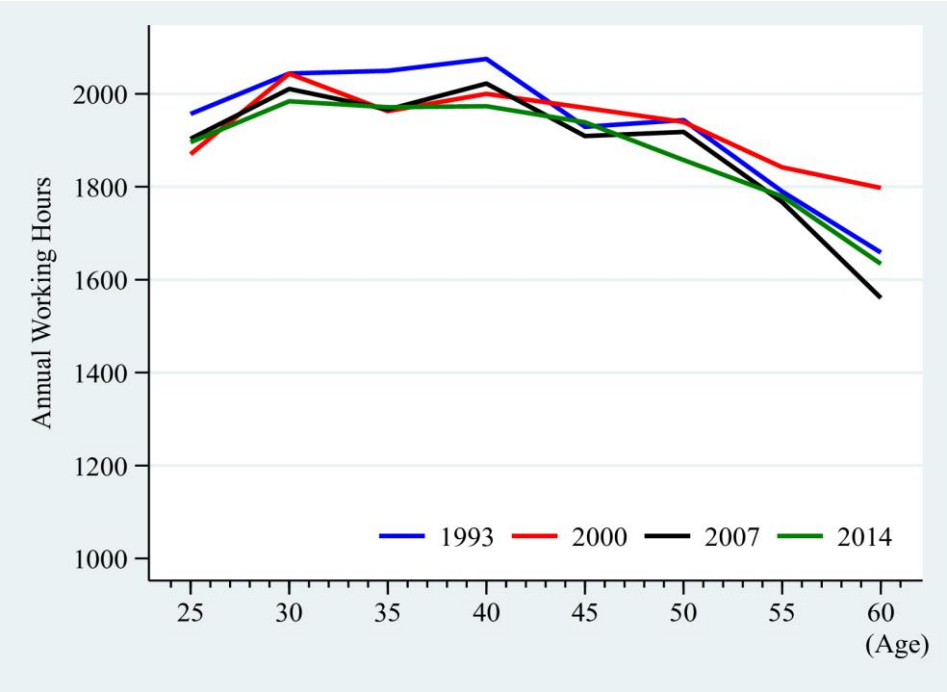
[15] The focus here is on males for the reasons outlined above. In brief, female employment rates are much lower than those for males. This is depicted in the appendix, where we provide life cycle profiles for employment rates and working hours for women. Additional details for gender comparison of employment of older people are provided in Section 5.

[16] Based on OECD (2020) labour force statistics, in 2014 the employment rate (i.e., employment-population ratio) for men averaged across all OECD countries peaked at 88.2% for ages 35-39, while the employment rate for men in the age group of 55-59 and of 60-64 was 75% and 55%, respectively.

employment rates over the working life for individuals observed in 2014 were higher than for those in 2007 but lower than for those in 1993.[17]

The hours worked by men between ages 25 and 60 in different survey years also exhibit a similar hump-shaped pattern, as shown in Figure 4. Overall, annual working hours increase at early working ages, reach the peak at age 35-40 and decrease at older ages. When comparing survey years, there is a slight trend of reduction in average annual working hours, which is observed over the entire working life.

Figure 4: Annual Working Hours by Age and Survey Year (Males)



Source: Authors' calculation from IFLS 1993–2014.

4.3 Formal-Informal Employment and Sectoral Transition

In this subsection, we first provide the descriptive statistics for formal and informal employment and then calculate the age-specific transitions between the formal and informal sector, using the IFLS data from Waves 3-5 (between 2000 and 2014) for men.

Share of Formal-Informal Employment

The descriptive statistics for formal and informal employment (by location, education and occupation) are summarized in Table 2. Overall, the share of the informal sector (defined in this

[17] In the appendix, we show that differences in employment rates for women across different cohorts and survey years are more pronounced, with (i) older cohorts of women having lower employment rates than younger cohorts at the same age, and (ii) that their employment rates over the working life in 2014 are much higher than in 1993.

report as the labour force with no health insurance nor any medical benefits from employers) is high, around 78%-82% of total employment in Indonesia.[18] A large proportion of formal employment is in the governmental sector in Indonesia. It is also noticeable that people in informal employment are likely to have lower education and are mostly located in rural areas. By occupation, self-employment and most agricultural employment (reported only in IFLS waves 2007 and 2014) are informal.

Table 2: Formal-Informal Employment Summary

Category	2000		2007		2014	
	Formal	Informal	Formal	Informal	Formal	Informal
Overall	18.02	81.98	17.77	82.23	21.16	78.84
By location						
Rural	10.33	89.67	10.32	89.68	12.9	87.1
Urban	25.58	74.42	23.8	76.2	26.49	73.51
By education						
Lower Education	8.23	91.77	7	93	9.02	90.98
Higher Education	39.81	60.19	33.63	66.37	34.96	65.04
By occupation						
Self-employed	0	100	0	100	0	100
Self-employed with unpaid family workers	0	100	0	100	0	100
Self-employed with employees	0	100	0	100	0	100
Government worker	74.35	25.65	66.81	33.19	66.38	33.62
Private worker	27.62	72.38	33.65	66.35	40.68	59.32
Casual worker in agriculture	-	-	1.2	98.8	2.77	97.23
Casual worker not in agriculture	-	-	4.05	95.95	6.96	93.04

Notes : Shares of formal/informal employment in %, Males only.

Source : IFLS 2000-2014, authors' calculation.

Sectoral Transition

We also calculate sectoral transitions for those between waves 2007 and 2014. Note that we keep only people who appear in the two consecutive survey years in each dataset. Table 3 reports the results for the aggregate sectoral transition matrix for those either in formal, informal or with no job in 2007 to any of these three categories in 2014. Only a small fraction of informal workers are moving to the formal sector, with only 11% of those in informal employment in 2007

[18] These figures are not that different from other studies, using different data sets. For example, the Asian Development Bank (2011) reported that 75.90% and 89.14% of the total employment (jobs) were informal in the Indonesian provinces of Banten and Yogyakarta, respectively, using Sakernas and the Informal Sector Survey (ISS) data. More recently, ILO (2018b) reported that 85.6% of Indonesians operate in informal employment, with 67.5% operating in the informal sector, 5.8% in the formal sector (based on the registered enterprise definition given above) and 12.2% in households (producing goods exclusively for own final use by their households).

switching to formal employment in 2014. However, the proportion of workers moving from the formal sector to the informal sector was higher (almost 30% as shown in Table 3).

Table 3: Aggregate Switches between Sectors (2007-2014)

Sector in 2014	Sector in 2007							
	Formal		Informal		No job		Total	
	(No.)	(%)	(No.)	(%)	(No.)	(%)	(No.)	(%)
Formal	804	66.3	529	10.2	31	13.7	1364	20.5
Informal	357	29.5	4518	86.9	164	72.2	5039	75.9
No job	51	4.2	153	2.9	32	14.1	236	3.6
Total	1212	100	5200	100	227	100	6639	100

Notes : Number and percentage of workers in each sector in 2007 and then in 2014, Males only.
Source : IFLS 2007-2014, authors' calculation.

In order to provide a more comprehensive picture of sectoral transitions and the motive for switching sector, we calculate age-specific transitions and also compare the average labour earnings of movers and stayers in each sector by age groups. The results are presented in Table 4. It shows that the probability of those in the informal sector in 2007 staying in that sector in 2014 is much higher than for the formal workers staying in the same sector. In fact, at older age (for the age group 60 and over in 2014), over 80% of those employed in formal employment in 2007 switched to informal employment in 2014. This result is driven by the mandatory retirement age for formal workers. Note that in the last wave (i.e., IFLS_2014), the retirement age (normal pension age) was 56 for employees in the private sector, while currently it is legislated to gradually increase to 65 by 2043 (OECD 2018). For public servants, the standard retirement age was 56, but they could retire at age 50 with a minimum of 20 years of service (Muliati and Wiener 2014).

The table also shows that the stayers (in the formal sector) have significantly higher earnings compared to the movers at every age, and that the gap between their earnings widens by age. However, the movers from the informal sector are shown to have higher earnings than the stayers. While the gap between earnings increases initially, it declines at older ages. The significantly higher earnings in the formal sector seem to support the ILO's view "that most people enter the informal economy not by choice, but as a consequence of a lack of opportunities in the formal economy and in the absence of other means of livelihood" in developing countries.[19]

[19] See page 1 (Preamble) of ILO Recommendation R204 (2015), available at: https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:R204

Table 4: Sectoral Switches and Earnings by Age Group (2007-2014)

Sector in 2007/ Age in 2014	Sector in 2014		Average labour income (p.a.) in 2014			Total workers
	Formal (%)	Informal (%)	Formal (1,000 rp)	Informal (1,000 rp)	Both (1,000 rp)	(No.)
Formal						
30-34	60.4	39.6	45,459	31,305	39,849	164
35-39	69.4	30.6	53,209	23,759	44,211	252
40-44	74.5	25.5	50,008	34,821	46,141	216
45-49	72.8	27.2	59,171	33,190	52,106	228
50-54	79.5	20.5	65,549	25,718	57,365	146
55-59	61.4	38.6	70,482	33,756	56,292	88
60+	18.2	81.8	61,995	7,532	17,435	11
All ages	70.0	30.0	55,911	29,591	48,003	1105
Informal						
30-34	18.3	81.7	34,688	22,458	24,697	612
35-39	14.4	85.6	32,963	20,397	22,205	1049
40-44	11.9	88.1	38,681	21,255	23,329	916
45-49	8.1	91.9	40,961	18,790	20,593	787
50-54	7.0	93.0	31,436	18,236	19,159	643
55-59	4.2	95.8	31,212	16,650	17,264	498
60+	1.3	98.7	15,260	13,838	13,857	78
All ages	11.0	89.0	35,359	19,656	21,379	4583
Both						
30-34	27.2	72.8	39,741	23,476	27,899	776
35-39	25.1	74.9	43,831	20,662	26,468	1301
40-44	23.9	76.1	45,435	22,121	27,682	1132
45-49	22.7	77.3	54,104	19,927	27,672	1015
50-54	20.4	79.6	56,014	18,593	26,229	789
55-59	12.8	87.2	59,486	17,788	23,125	586
60+	3.4	96.6	46,417	13,179	14,299	89
All ages	22.4	77.6	47,809	20,404	26,552	5688

Notes : Average annual labour earnings expressed in 1,000 Indonesian Rupiah, Males only.
Source : IFLS 2007-2014, authors' calculation.

4.4 Labour Earnings

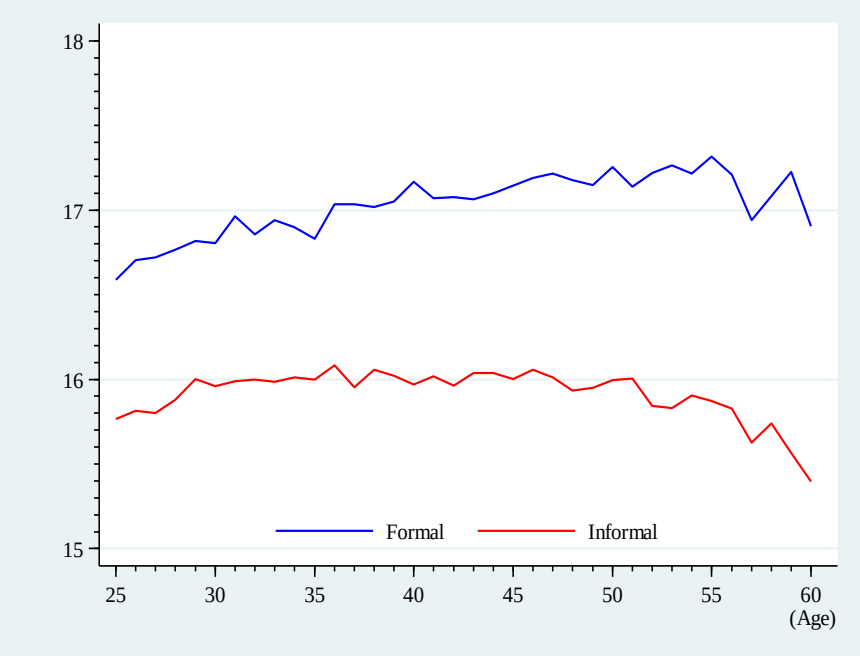
Definition

In the data section, we distinguished between formal and informal employment by defining informal workers as those without any health benefits from employers. We use this as a proxy for no coverage by the formal retirement income policy. The annual earnings of each individual are constructed as the total of salary (bonus included) from the main job and extra jobs (if any) and the net profit of business from their own farm or non-farm business. By nature, a formal worker is mainly a wage worker while an informal worker is usually self-employed. Therefore, for an informal worker, as they only report the net profit from their business or their household business, it is difficult to distinguish between labour earnings and capital earnings. However, we use the net profit in the calculations of their earnings in full. When pooling up data from different survey years, the Consumer Price Index (CPI) obtained from the International Financial Statistics (IFS) is used to construct real annual earnings.

Earnings over the Life Cycle

Figure 5 illustrates the earnings (i.e., log of annual labour earnings for males) over working life (25 to 60) by sector in Indonesia. As shown, individuals in the formal sector have significantly higher earnings compared to those operating in the informal sector. Moreover, the slope of the earnings profile for workers in the formal sector is steeper over early working years, increasing more significantly than for informal workers, but also more gradually than earnings of informal workers at older ages.

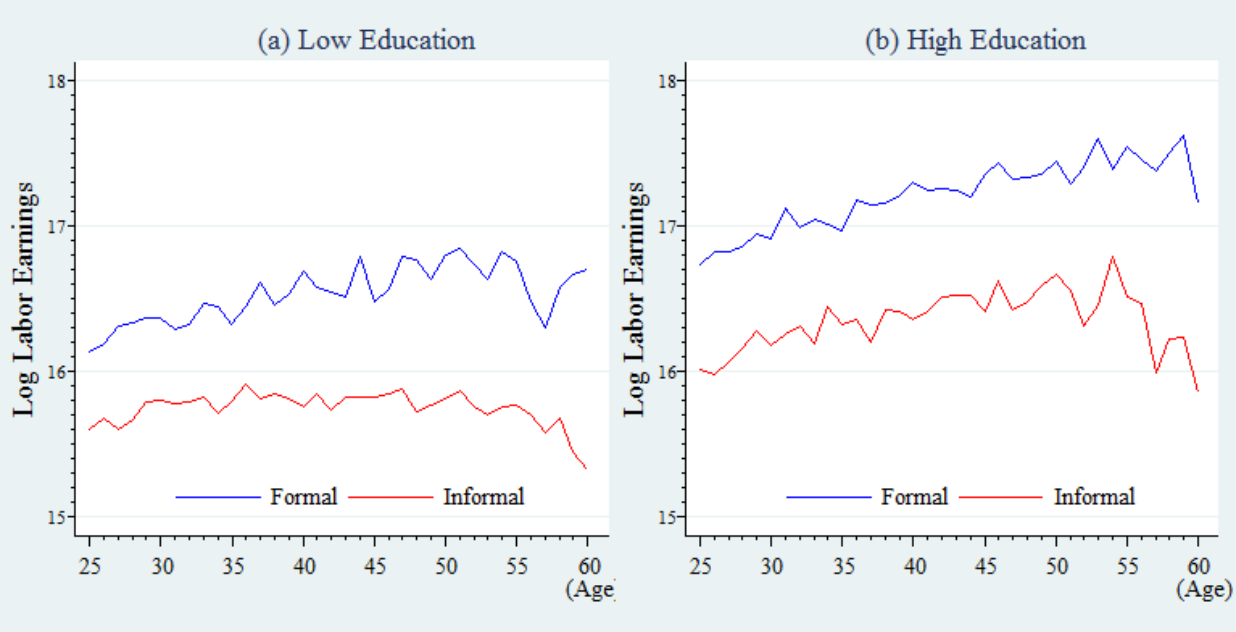
Figure 5: Log Earnings by Age and Sector (Raw Data)



Source: IFLS 2000–2014.

In Figure 6 we divided the sample into two educational groups and documented their earnings in the two sectors. It shows that given the same educational level, the formal sector offers higher earnings than the informal sector.[20] The other main observation from that figure is that those with higher education have a higher earnings growth for most of their working life than lower skilled individuals.

Figure 6: Log Earnings by Age and Sector and Educational Level (Raw Data)

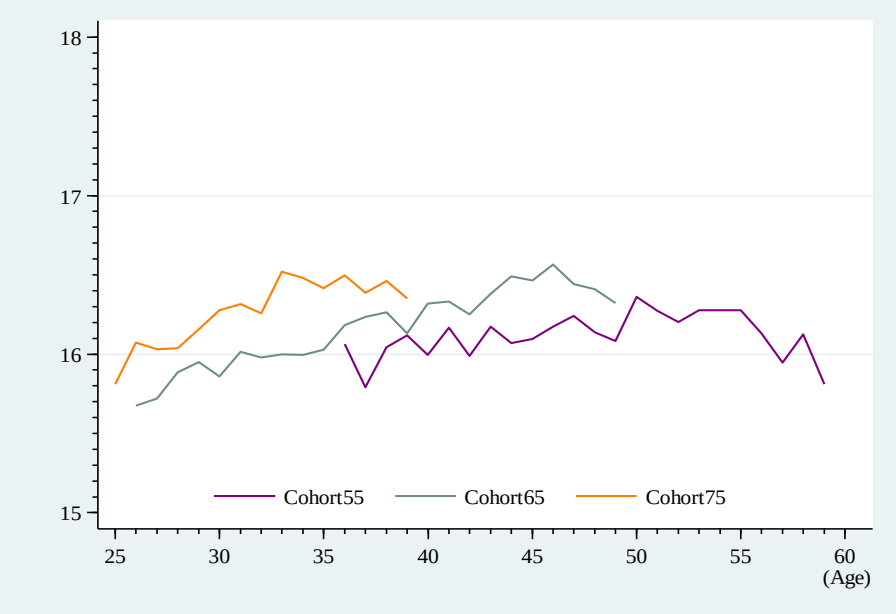


Source: IFLS 2000–2014.

The average life cycle earnings profiles for three different cohorts (born in 1955, 1965 and 1975) are depicted in Figure 7. The figure shows that the successive cohorts of workers (e.g. comparing the cohort born in 1975 to the cohort born in 1965) have higher labour earnings and higher growth in labour earnings over the life cycle.

[20] A higher educated person is defined as someone whose highest degree completion is senior high school and over.

Figure 7: Log Earnings by Age and Cohort (Raw Data)



Source: IFLS 2000–2014.

In the next section, we estimate earnings functions to determine whether the sectoral impacts identified above are statistically significant. We first briefly outline the econometric model for earnings function estimations and then discuss the results.

Econometric Specification

Our estimation tries to explain the different earnings profiles by sector and cohort. To capture the cohort effects, we follow the specification of Kambourov and Manovshii (2005). Furthermore, we also control for a sector dummy variable assumed to interact with age to explain the sector impacts. We allow for the difference in the level of earnings for people in the same age and different sectors, while the interaction of age with sector allows for different profile intercepts for the two sectors, as observed in the data. The earnings equation that we estimate can be expressed as:

$$\log(Y_{ict}^{s}) = \beta_0 + \beta_1 z_{ic} + \beta_2 z_{ic}^2 + \beta_3 z_{ic} * x_{it} + \beta_4 x_{\mathrm{it}} + \beta_5 x_{it}^2 + \beta_6 S_{it} + \beta_7 S_{it} * x_{it} + \gamma H_0 + y_{ict}^{s}, \quad (1)$$

where $\log(Y_{ict}^{s})$ is the log real annual earnings of an individual i in cohort c in sector s in period t, x_{it} is the age of an individual i in period t, z_{ic} is the birth year of cohort c; S_{it} is the dummy variable for the sector where an individual is working in period t, and H_0 is a vector of other characteristics of the individual such as his marital status, occupation, and educational level. y_{ict}^{s} is the residual of the log earnings of each individual.

It should be noted that to simultaneously identify cohort, time and age effects is difficult since any two of these variables imply the third one. Therefore, when controlling for the cohort effects, we do not attempt to identify the year effect. However, to better capture the macroeconomic

effects and as a sensitivity check, we estimate an additional version of the model given in Equation (1) and we control for the real GDP growth rate that captures the economic change in a specific survey year. The results of cohort effects are still robust, as shown in Table 5.

Empirical Results

The estimation results for the earnings equation given in (1) are provided in Table 5. As reported, the coefficient of the cohort term is significantly positive, which explains the difference in the earnings level by different cohorts. However, the coefficient on the interaction of the linear age and cohort terms is negative, indicating the flattening of the earnings profiles by cohort. The humped shaped earnings profiles are given by the estimated values for the age and age square variables that are shown to be positive for age and negative for age square.

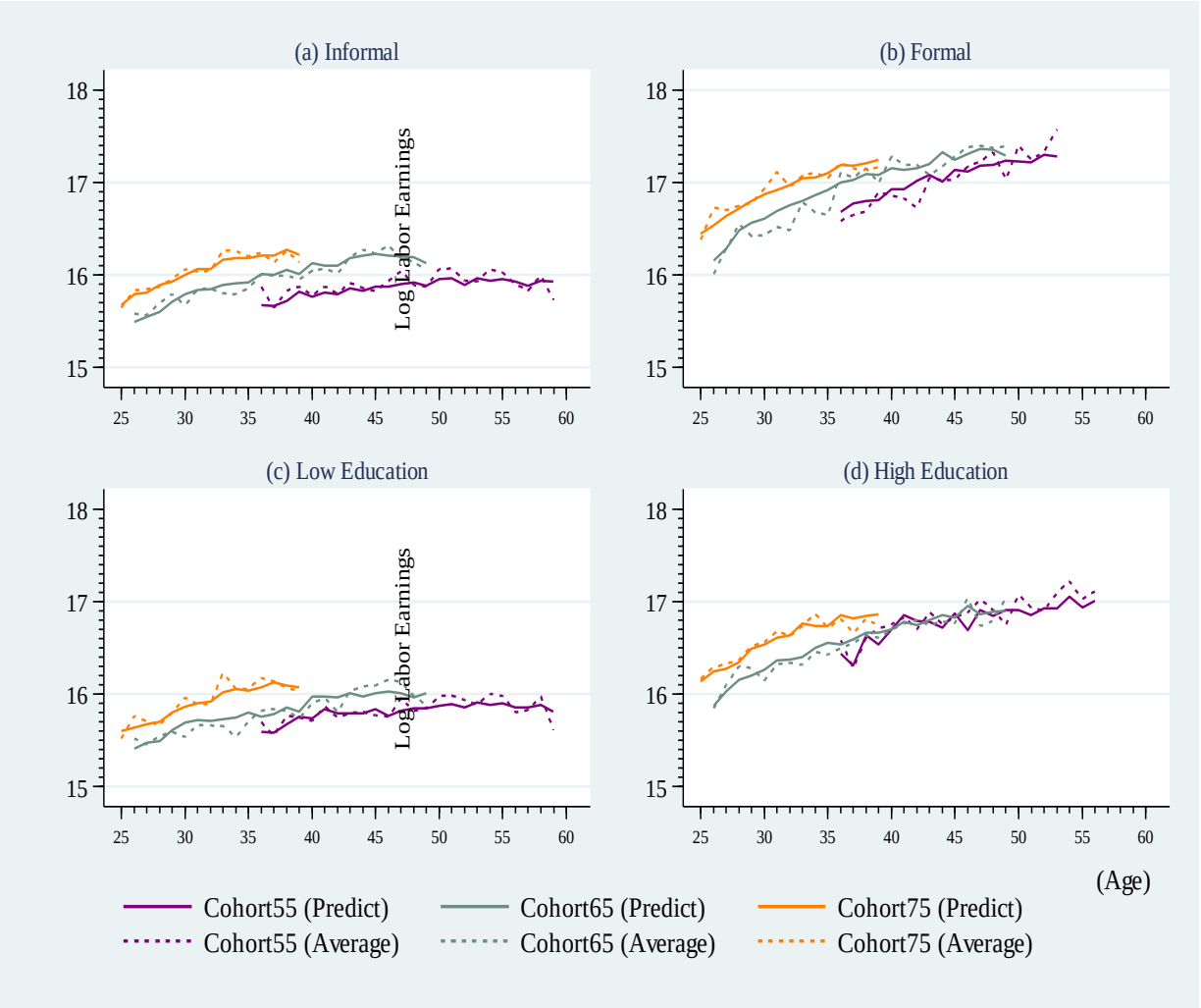
Table 5: Labour Earnings Estimation Results

	Model 1: No GDP		Model 2: GDP	
Age	0.141***	[5.52]	0.187***	[6.21]
Age square	-0.001***	[-6.06]	-0.001***	[-6.70]
Age*Cohort	-0.008**	[-2.65]	-0.014***	[-3.80]
Cohort	0.818***	[3.55]	1.282***	[4.56]
Cohort square	-0.034**	[-2.36]	-0.064***	[-3.59]
Sector (Formal= 1)	0.395***	[5.65]	0.392***	[5.62]
Sector*Age	0.008***	[4.21]	0.008***	[4.23]
Education (Higher edu= 1)	0.117**	[2.00]	0.120**	[2.04]
Education*Age	0.008***	[5.08]	0.008***	[5.04]
Location (Urban=1)	0.257***	[19.50]	0.257***	[19.51]
Marital status (Married= 1)	0.315***	[15.30]	0.315***	[15.30]
Occupation				
Self-employed	-	[.]	-	[.]
Self-employed with unpaid family workers	0.111***	[5.85]	0.113***	[5.93]
Self-employed with employees	0.927***	[22.81]	0.928***	[22.82]
Government worker	0.341***	[11.88]	0.342***	[11.92]
Private worker	0.057**	[3.11]	0.056**	[3.08]
Casual workers in agriculture	-0.499***	[-12.08]	-0.493***	[-11.93]
Casual worker not in agriculture	-0.227***	[-8.60]	-0.223***	[-8.45]
Real GDP growth rate	-	-	-0.033**	[-2.87]
Intercept	10.150***	[10.94]	8.569***	[7.94]
Number of observations	25092		25092	

Source : IFLS 2000-2014, Authors' calculation (Males).

The results for the earnings profiles for the different cohorts between the ages 25 to 60 are plotted in Figure 8. The figure indicates that the earlier the cohorts enter the labour market, the higher the earnings growth. Note that younger cohorts have higher earnings levels overall but face slower growth rates in earnings over their working life. This pattern is statistically significant, even when we control for the aggregate macro effect.

Figure 8: Fitted Model for Average Log Earnings by Sector and Educational Level



Source: IFLS 2000–2014.

The overall effect of the cohorts is positive, indicating higher earnings but lower growth in earnings through the life cycle for the successive cohorts. Furthermore, the relationship between earnings and potential experience is also positive and significant, which is analogous to the findings by Lagakos et al. (2018). We also explore the sector effects on earnings growth and find that working in the formal sector offer a higher return. The interaction term of sector and age is significantly positive, which reveals a widening gap in earnings between formal and informal workers over the working age. Importantly, the overall effect of the sector compared to the returns from potential experience is much higher.

Similarly, people with higher education earn more. The positive interaction term between high education and age implies higher earnings growth for high educated labour. We have also examined other specifications with the interaction between education and sector, but the results show no statistical significance.

4.5 Summary

The key findings of this section (derived from the IFLS) are that:

- Informal employment in Indonesia is large, ranging between 78% and 82% of the labour force in years 2000 and 2014.
- Although both formal and informal workers exhibit humped shaped earnings, those working in the formal sector have significantly higher labour earnings and growth in earnings at early working ages.
- Related to the cohort effects, we document clear evidence of the flattening of the earnings of the successive cohorts, which is similar to developed countries.

5 Older People

5.1 Introduction

This section documents living arrangements, employment rates and labour supply, and income sources of older people, with the results presented for those aged 50 years and over.

5.2 Marital Status and Living Arrangements

The marital status of older people, which has important implications for their living arrangements, is documented in Table 6. While most older men are married (over 86% in the 65-69 age group in 2014), the share of widowed women is significantly higher (55% in the 65-69 age group in 2014) and it increases with age (almost 80% in the 75+ age group in 2014). These observations reveal that older women might be more vulnerable in terms of not having informal support from their spouse, compared to older men.

Table 6: Older People and Marital Status

Year	Age range	Female					Male				
		Unmarried (%)	Seperated (%)	Divorced (%)	Widowed (%)	Married (%)	Unmarried (%)	Seperated (%)	Divorced (%)	Widowed (%)	Married (%)
2000	50-54	1.77	0.63	3.8	16.58	77.22	1.15	0.26	1.15	2.3	95.15
	55-59	1.2	0.96	4.32	31.53	61.99	1.13	0.28	0.7	3.94	93.95
	60-64	0.98	1.13	5.06	39.24	53.59	0.17	0.35	1.21	5.72	92.55
	65-69	0.75	1.32	4.51	53.57	39.85	0.24	0.48	1.92	8.65	88.7
	70-74	0.24	0	5.74	63.4	30.62	0	0.28	1.65	12.4	85.67
	75+	1.18	0.98	3.14	79.02	15.69	0.77	0	1.53	26.09	71.61
2007	50-54	3.03	1.18	4.63	19.55	71.61	1.23	0.28	1.7	2.17	94.62
	55-59	1.84	0.65	4.11	28.46	64.94	0.7	0.12	0.93	4.54	93.71
	60-64	1.67	0.7	5.43	43.04	49.16	0.82	0.16	0.98	6.69	91.35
	65-69	1.43	0.72	3.16	51.65	43.04	0.71	0	1.24	10.42	87.63
	70-74	1.4	0.7	2.56	67.13	28.21	0.29	0.86	2.3	16.09	80.46
	75+	1.12	0.64	2.71	80.06	15.47	0.22	0.88	1.53	30.42	66.96
2014	50-54	2.22	1.17	4.9	15.14	76.57	1.72	0.6	1.72	3.67	92.28
	55-59	2.5	0.97	5.08	25.42	66.02	1.71	0.19	1.9	4.75	91.45
	60-64	1.75	0.21	4.53	40.58	52.94	0.89	0.22	2.35	6.94	89.6
	65-69	1.43	0.16	4.75	55.31	38.35	0.86	0.35	1.73	11.05	86.01
	70-74	0.84	0.51	3.21	65.54	29.9	0.46	0	1.61	19.08	78.85
	75+	0.57	0.28	4.67	79.89	14.59	0.2	0	2.57	33	64.23

Source: IFLS 2000-2014, Authors' calculation.

Table 7: Older People and Living Arrangements

Year	Gender	Age range	No. of obs.	Living arrangement (%)				
				With spouse and child	With spouse and no child	No Spouse but with child	No spouse and no child	
							Alone	With others
2000	Female	50-54	790	48.86	25.82	14.3	2.78	8.23
		55-59	834	32.73	27.22	20.38	3.72	15.95
		60-64	711	20.96	30.66	21.1	5.77	21.52
		65-69	532	13.35	25.75	22.37	11.28	27.26
		70-74	418	11.24	17.94	28.95	8.85	33.01
		75+	510	3.33	10.98	39.41	10.78	35.49
	Male	50-54	783	78.03	15.33	2.55	1.4	2.68
		55-59	711	74.4	18.42	3.94	1.13	2.11
		60-64	577	64.82	26.69	4.51	1.04	2.95
		65-69	416	51.68	35.34	4.57	3.37	5.05
		70-74	363	51.52	33.61	7.44	1.65	5.79
		75+	391	34.02	35.81	15.09	5.37	9.72
2007	Female	50-54	1187	49.2	20.3	18.7	4.04	7.75
		55-59	924	36.15	27.16	21.1	6.06	9.52
		60-64	718	22.14	26.18	26.6	9.47	15.6
		65-69	697	16.21	25.68	28.98	10.47	18.65
		70-74	429	11.19	15.62	32.87	15.85	24.48
		75+	627	4.94	10.05	41.63	14.83	28.55
	Male	50-54	1060	75.94	16.89	2.74	2.08	2.36
		55-59	859	67.52	23.86	4.07	2.1	2.44
		60-64	613	61.66	27.41	5.71	2.12	3.1
		65-69	566	52.65	33.57	7.6	2.65	3.53
		70-74	348	43.1	37.07	8.33	4.6	6.9
		75+	457	35.67	29.76	20.79	4.81	8.97
2014	Female	50-54	1532	55.68	18.47	15.6	3.72	6.53
		55-59	1239	39.79	24.7	22.11	5.25	8.15
		60-64	971	28.42	23.07	27.39	8.03	13.08
		65-69	631	15.21	22.82	35.5	10.78	15.69
		70-74	592	10.47	18.75	31.59	15.37	23.82
		75+	706	4.39	10.2	36.12	13.6	35.69
	Male	50-54	1335	71.39	17.98	3.97	2.77	3.9
		55-59	1053	63.53	26.31	4.56	2.18	3.42
		60-64	894	56.6	30.54	6.71	3.24	2.91
		65-69	579	46.63	36.79	9.67	3.45	3.45
		70-74	435	39.08	38.62	10.34	5.06	6.9
		75+	506	28.46	34.98	19.17	5.14	12.25

Source : IFLS 2000-2014, Authors' calculation.

Table 7 reports living arrangements of older women and men in Indonesia, and changes in these arrangements between 2000 and 2014. It confirms the importance of the family for old-age

support. Most older people live with their children, especially women.[21] While only a small fraction of older people live alone, the proportion with no spouse and no child is large and has been increasing, particularly in the case of older women. However, the probability of co-residing with children decreases with the age of the older adults as well as over time, as reported in Table 8. For example, older women aged 75+ shared the residence on average with 1.17 children and 2.61 grandchildren in the 1993 wave, but only with 0.98 children and 1.31 grandchildren in the 2014 wave (due probably to regional migration).

Table 8: Older People and Average Number of Co-residing Children

Year	Age range	Average number of co-residing children			
		Female		Male	
		Children	Grandchildren	Children	Grandchildren
2000	50-54	2.15	0.98	2.47	0.78
	55-59	1.76	1.14	2.25	0.88
	60-64	1.43	1.47	1.76	0.85
	65-69	1.17	1.69	1.54	1.06
	70-74	1.12	1.89	1.36	1.26
	75+	1.13	1.95	1.22	1.69
2007	50-54	1.64	0.83	2.07	0.64
	55-59	1.36	0.96	1.6	0.65
	60-64	1.18	1.03	1.45	0.85
	65-69	1.04	1.29	1.15	0.91
	70-74	1.07	1.36	0.95	0.91
	75+	1	1.39	1.03	1.1
2014	50-54	1.43	0.8	1.72	0.72
	55-59	1.19	1.05	1.47	0.81
	60-64	1.04	1.11	1.24	0.88
	65-69	0.98	1.21	0.94	0.94
	70-74	0.92	1.24	0.88	0.84
	75+	0.98	1.31	0.91	1.12

Source : IFLS 2000-2014, Authors' calculation.

5.3 Trends in Employment amongst Older People

This section focuses on employment of older people, reporting on their employment rates, types of jobs (part-time or full-time) and working hours at older ages.

Figure 9 compares the changes in employment rates in different survey years for different age groups of older people. We define employment as workers who report working in a paid job. As

[21] According to Frankenberg et al. (2002), in a survey of experts in "adat" (traditional law) conducted in some 250 communities as part of the IFLS, 99% of respondents reported that traditional law required children to care for older parents.

shown, the employment increase was large particularly for women aged 50-64 after 2007. Increasing labour supply at older ages for women is similar to the observations in developed countries, but the level of male employment and the gap between male and female employment rates are both much higher than in developed countries. Note that similar findings are reported by Cameron and Cobb-Clarke (2002), showing that many Indonesians continue to work well into old age, using the 1993 IFLS data. As already discussed, we focus on the more recent IFLS surveys.

Figure 9: Employment Rate at Older Age (by Age Group)

Source: Authors' calculation from IFLS 2000–2014.

Figure 10 shows the employment rates of working men and women at older ages (5-year age groups) in different survey years. As expected, the rate declines over the remaining life cycle. As mentioned at the time of IFLS wave 5 (2014), the retirement age in Indonesia (for both employees in the private sector and public servants) was 56 (Muliati and Wiener 2014). This (formal retirement age) effect is depicted by the decline in the employment rate for the age group 55-59. The figure reveals that male workers' employment rate decreases after the retirement age.

Figure 10 also shows significant increases in the employment rate for older females in more recent survey years. Except for the decrease in 2007, due to the global financial crisis, the female employment rate is significantly higher for all age groups in more recent years, and particularly in 2014, as depicted by the green line in Figure 10 for females.

Figure 10: Employment Rate at Older Age (by Survey Year)

Source: Authors' calculation from IFLS 1993–2014.

The labour force data also reveals interesting patterns in the part-time and full-time work types, depicted by Figure 11 showing the proportion of part-time workers by age and gender in different survey years. A part-time worker is defined as one who works less than 30 hours per week in their main job. It should be noted that in developing countries, the proportion of informal workers is large, and they often work more than one job in the same period or work more intensively in some seasons. Therefore, using the main job to define part-time workers might underestimate the total number of working hours per week. We therefore use a different definition focusing on annual total working hours. Following Blundell et al. (2016), we consider part-time workers as those who work less than 1500 hours per year (which is equivalent to working no more than 30 hours per week, assuming 50 weeks per year).

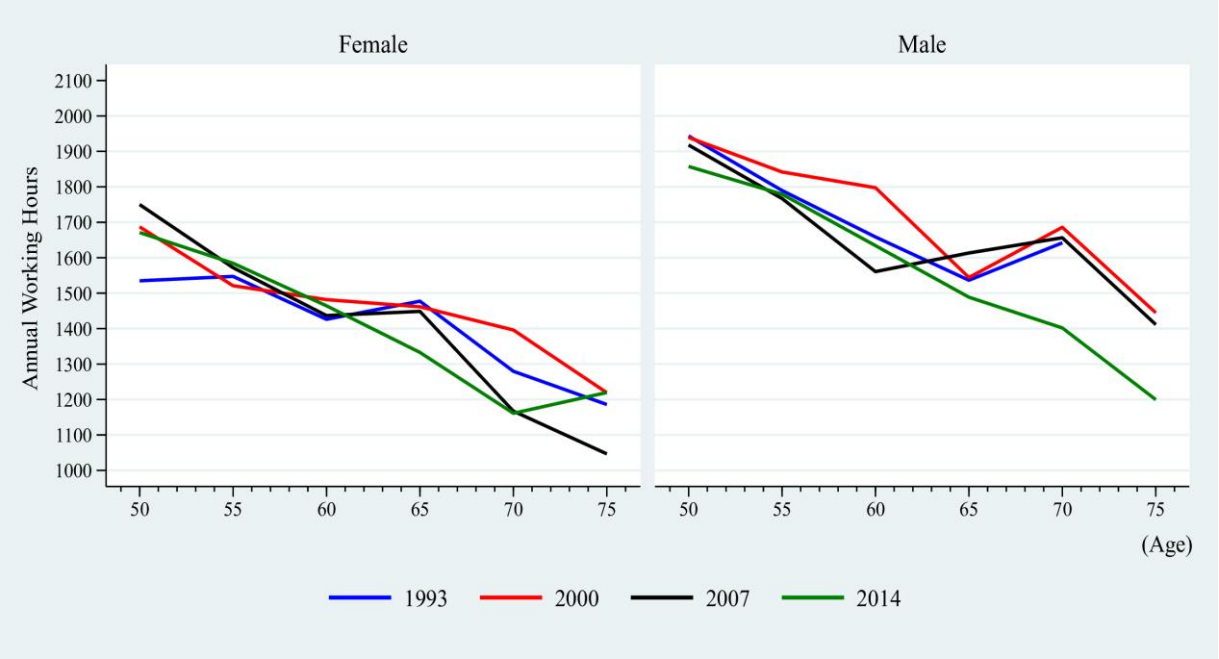
Figure 11: Percentage of Working Part-time at Older Age

Source: Authors' calculation from IFLS 1993–2014.

Overall, Figure 11 shows that part-time employment increases with age and is more prevalent in women. When comparing the employment rates between 2000 and 2014, the rate was higher in 2014 for all age groups of both women and men. There was no clear trend in 2007 compared to other survey years, most likely due to the global financial crisis during which the labour market fluctuated dramatically.

Finally, we show annual hours worked by men and women at older ages depicted by Figure 12. As shown, not only the employment rate but also working hours are high at older ages, particularly for men. For example, most working men aged 60 to 64 are working over 1,500 hours per year and those 65+ over 1200 per year. Compared to early survey years, the labour supply has decreased (in particular at very older ages) in more recent surveys but the hours are much higher than those observed in developed countries.

Figure 12: Annual Working Hours at Older Age



Source: Authors' calculation from IFLS 1993–2014.

5.4 Income Sources

The key results for the income sources of older people (those aged 50 years and over) are provided in Tables 9 and 10. The four main sources of income that we distinguish are labour income (including farm and non-farm income), non-labour income (including pension, insurance money, and lottery), assets income (including income from savings, and rent), and private transfers from children. Specifically, Table 9 reports whether older households at different age groups (in different survey years) receive income from labour, non-labour (defined above) and assets (i.e. percentage of those who answered either yes or no for each income category) and net transfers from their children (i.e. percentage of those who received either negative or zero or positive transfers from their children). Table 10 shows the percentage of each income source in their total income.

Table 9: Income Sources of Older People by Age Groups

Year	Age range	No. of obs.	Income sources (%) (Household head only) [a]						Net transfer from children [b]		
			Labor income		Non-labor income		Assets income				
			Yes	No	Yes	No	Yes	No	(-)	0	(+)
2000	50-59	808	61.88	38.12	16.09	83.91	7.43	92.57	19.43	33.66	46.91
	60-69	396	49.24	50.76	15.4	84.6	6.57	93.43	9.6	31.31	59.09
	70+	164	36.59	63.41	11.59	88.41	6.71	93.29	5.49	34.76	59.76
	All (50+)	1368	55.19	44.81	15.35	84.65	7.09	92.91	14.91	33.11	51.97
2007	50-59	922	59	41	0.43	99.57	4.77	95.23	13.88	29.83	56.29
	60-69	416	44.23	55.77	1.44	98.56	4.33	95.67	9.86	18.99	71.15
	70+	129	35.66	64.34	0	100	3.1	96.9	1.55	24.03	74.42
	All (50+)	1467	52.76	47.24	0.68	99.32	4.5	95.5	11.66	26.24	62.1
2014	50-59	1136	68.57	31.43	5.02	94.98	10.04	89.96	20.77	24.91	54.31
	60-69	442	52.94	47.06	9.05	90.95	10.41	89.59	14.03	16.97	69
	70+	134	35.82	64.18	4.48	95.52	7.46	92.54	6.72	18.66	74.63
	All (50+)	1712	61.97	38.03	6.02	93.98	9.93	90.07	17.93	22.37	59.7

Notes : [a] % receiving/not-receiving given income; [b] % receving negative, zero or positive net tranfer from their children.
Source : IFLS 2000-2014, Authors' calculation.

Table 10: Distribution of Income Sources of Older People by Age Group

Year	Age range	No. of obs.	Income sources (%) (Household head only)			
			Labor income	Non-labour income	Asset Income	Children net transfer
2000	50-59	808	66.26	10.29	4.53	18.92
	60-69	396	51.59	9.55	4.02	34.84
	70+	164	35.18	8.22	4.15	52.46
	All (50+)	1368	58.51	9.84	4.34	27.3
2007	50-59	922	63.64	0.04	4.38	31.93
	60-69	416	44.37	0.59	1.96	53.08
	70+	129	31.34	0	2.17	66.49
	All (50+)	1467	55.44	0.2	3.5	40.86
2014	50-59	1136	82.63	2.12	3.54	11.7
	60-69	442	55.13	12.56	5.28	27.03
	70+	134	36.27	4.44	5.19	54.09
	All (50+)	1712	71.99	5.01	4.12	18.88

Source : IFLS 2000-2014, Authors' calculation.

Results are reported for the three latest waves of IFLS over the period 2000-2014. They show that labour income is the most important source of income for older people, while non-labour income (i.e., pension, insurance and lottery income) and assets income account for only a small fraction of their total income. For example, over 55% of people aged 50+ reported receiving labour income in 2000 and this proportion increased to almost 62% in 2014. In contrast, only 6 to 7% of older people had assets income in 2000 and while those numbers increased slightly in

2014, they were still less than 10% (9.93% for people aged 50+ in 2014). This fact is consistent with the observation that a large proportion of older people are still working at older age.

In addition to labour income, private transfers from children also play an important role as an income source for older people. Table 10 reports the shares of each income source and for people aged 50-59, private transfers account for less than 20% of the total income in 2000 and 2014. However, this within-family financial support becomes more crucial for people at a higher age, with those aged 70+ deriving more than 50% of their income from private.

In contrast to developed countries where transfers typically flow from parents to their children via bequests, in developing countries, transfers from children play an important role for sustaining consumption of older people. As shown, in Indonesia, a majority of the old-age population does not receive a public pension as a result of a large informal economy. However, more than 70% of those aged 70+ receive positive net money transfers from their children (see Table 9).[22]

5.5 Summary

Our analysis reveals the following features:

- Most older people in Indonesia share residence with their children and the share of older adults co-residing with their children increases with age and is particularly high for older women.
- While employment rates for men and women decrease after the mandatory retirement age (56 in 2014), many older people continue to work, with both employment rates and hours worked remaining high, in particular for males.
- Older people are, however, more likely to work part-time and decrease their working hours as they age.
- The most important source of income for older people is labour income.
- Private (within-family) transfers become a more important source of income as people age, representing the majority of the income for people aged 70 and over.

[22] There is a large literature studying intergenerational family transfers and the motives for family transfers (i.e. pure altruism, impure altruism with exchange motive, and explicit reciprocity) in the context of developing countries. For example, Lillard and Willis (1997) find strong evidence of the parental repayment hypothesis in Malaysia, showing that both the probability and the amount of transfers to elderly parents increase with higher educational attainment of their adult children. The consistent exchange motive has been noted by Secondi (1997) for China and Hoddinott (1992) for Kenya, while Cai et al (2005) find evidence of an altruistic motive for private transfers at very low level of household income in urban China. Ravallion and Dearden (1988) show that the inter-generational transfers on the Indonesian island of Java are generally aimed at individuals suffering from an illness. Other motives for transfers such as pure loan contract and self-enforcing reciprocity are studied by Raut and Tran (2005), using the IFLS. Also using the IFLS data, Cameron and Cobb-Clark (2008) examines the labour supply of elderly Indonesians and find little evidence on the relation between the reduction of parents' labour supply and support from their children – either through coresidence or financial transfers. Using Vietnamese data, Nguyen et al. (2012) show that transfers from children help older people cope with risks related to old-age and illness.

6 Concluding Remarks

In this report, we have documented demographic changes toward pronounced population ageing in Indonesia, and this demographic transition is occurring in an economy that faces many other challenges. Drawing on the IFLS, we have found that:

- A large majority of the labour force is in informal employment not covered by the government retirement income policy.
- Individuals working in the formal sector have much higher labour earnings than those in the informal sector.
- While employment rates for men and women decrease after the mandatory retirement age (currently 57, gradually increasing to 65 by 2043), many people continue to work after that age, with a large transition to informal employment.
- Older people are more likely to work part-time and decrease their working hours as they age.
- Older people mainly rely on labour income and many also rely on private transfers from their children (particularly at very old age).

Note that one of the objectives of this project will be to extend the analysis undertaken in this report (focusing on the IFLS data) to also examine the National Labour Force and Socio-Economic Surveys (SAKERNAS and SUSENAS). This work will be carried out in stage 1 of the project devoted to developing the database for the calibration of the economic model.

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Appendix

Data Summary for Earnings Estimation

Table A1 describes the statistical summary for relevant variables that we have constructed from the IFLS (i.e., the last three waves in 2000, 2007 and 2014) and used for our labour earnings function estimation.

Table A1: IFLS Data Summary for Earnings Function Estimation

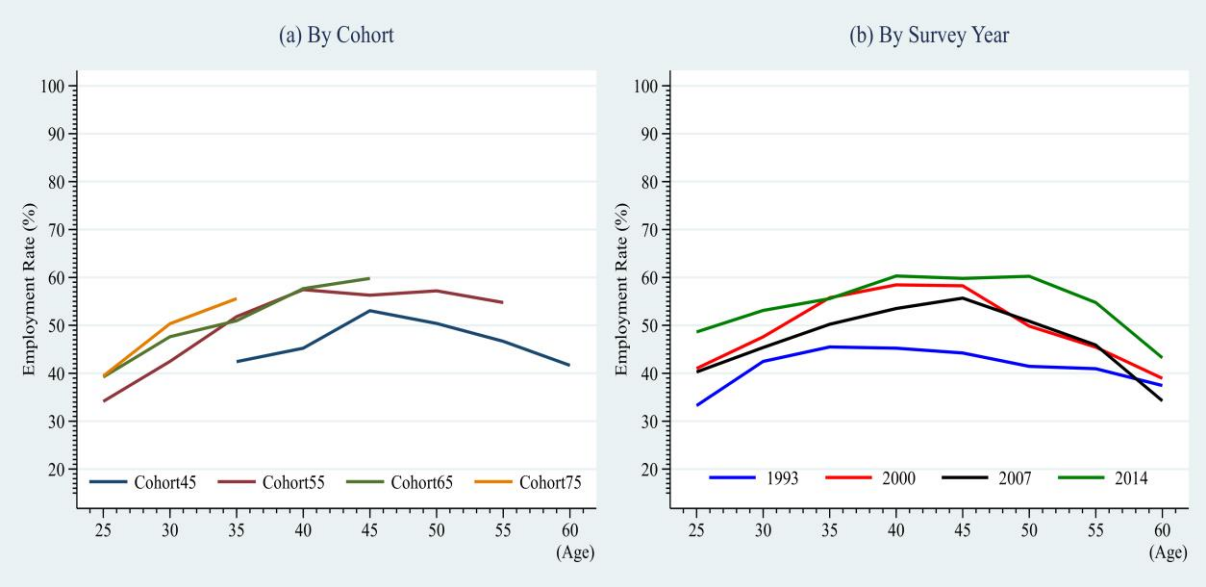
(Number of observations: 25092)	Mean	SD	Min	Max
Labour earnings (p.a) (in rp)	1.79E+07	2.06E+07	185484	3.02E+08
Age	38.911	9.464	25	60
Cohort	3.967	1.139	1	6
Number of household members	4.441	1.897	1	22
Education				
Lower education	0.569	0.495	0	1
Higher education	0.431	0.495	0	1
Marital status (share)				
Single	0.104	0.306	0	1
Married	0.896	0.306	0	1
Job sector (share)				
Informal	0.782	0.413	0	1
Formal	0.218	0.413	0	1
Occupation (share)				
Self-employed	0.205	0.404	0	1
Self-employed with unpaid family	0.204	0.403	0	1
Self-employed with employees	0.025	0.156	0	1
Government worker	0.091	0.288	0	1
Private worker	0.378	0.485	0	1
Casual worker in agriculture	0.024	0.154	0	1
Casual worker not in agriculture	0.072	0.259	0	1
Location (share)				
Rural	0.451	0.498	0	1
Urban	0.549	0.498	0	1
Real GDP growth rate (p.a) (%)	5.427	0.646	4.92	6.35

Source: IFLS 2000-2014, Authors' calculation (Males).

Female Employment Rates and Labour Supply

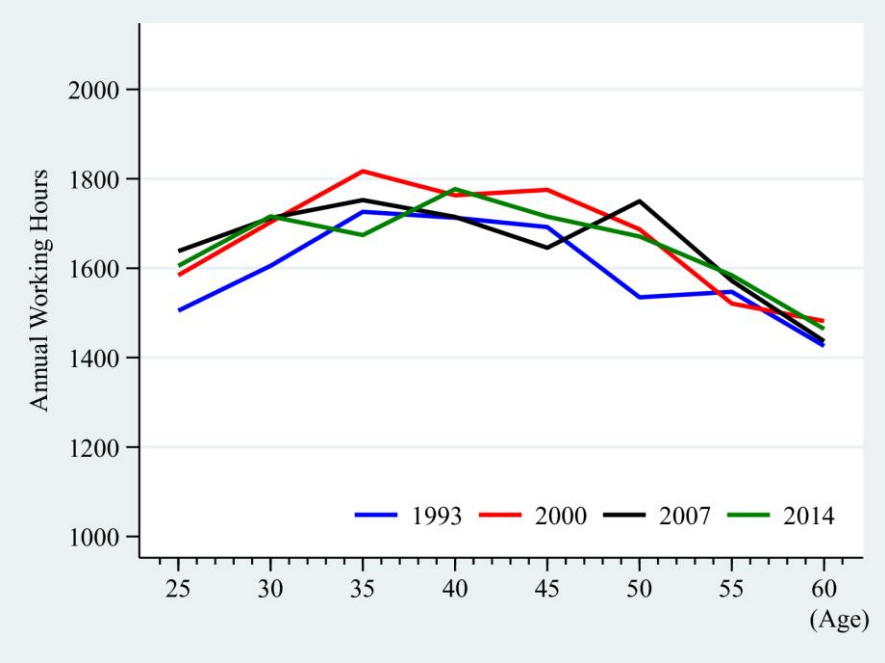
Figures A1 and A2 show the female employment rates over the working life by cohort and survey year and annual hours worked by survey year, respectively.

Figure A1: Employment Rate by Cohort and Year (Females)



Source: IFLS 1993–2014.

Figure A2: Annual Working Hours by Age and Year (Females)



Source: IFLS 1993 – 2014.

When comparing the employment rates and working hours by gender, overall, the female employment rate and labour supply are far lower than for males. However, the gaps, especially between the employment rates, have narrowed over years. For example, in 2000, 50% of women aged 50-54 were in paid work, compared with 94% of men, while in 2014, the rates for women and men were 60% and 95%, respectively. The employment rate for females has increased in all age groups, but most significantly for those aged 35-55.