THE TRANSITION TO ADULTHOOD OF THE 1970-1985 BIRTH COHORT IN INDONESIA: COMPARISON OF THE TWO YOUNGEST BIRTH COHORTS COMPLETING THE TRANSITION TO ADULTHOOD, AND THE DEMOGRAPHIC AND THE SOCIOECONOMIC PREDICTORS OF THE TRANSITION TO ADULTHOOD

by

Ifta Choiriyyah, MSPH

A dissertation submitted to Johns Hopkins University in conformity with the

requirements for the degree of Doctor of Philosophy

Baltimore, Maryland

January 2019

ABSTRACT

Background

The transition to adulthood is critical for future wellbeing and in determining whether Indonesia will reap the demographic dividend. There are gaps in the description of Indonesian youth's transition to adulthood and the identification of factors that affect the transition.

Purpose

The aims of the study were to:

1) Analyze the occurrence, timing, and sequencing of the events marking the transition to adulthood by sex and birth cohort;

2) Examine the individual and family-level predictors of the probability of the events marking the transition to adulthood;

3) Analyze the occurrence of migration for education or work reason by sex and birth cohort, and examine the individual and family-level determinants of the probability of migration for education or work reason; and

4) Examine the interdependency of the events marking the transition to adulthood

Methods

The study analyzed 9,748 individuals born between 1970 and 1985 who participated in the Indonesian Family Life Survey that has been conducted five times between 1993 and 2015. The discrete-time logit model was specified to estimate the conditional probability of the event and examine the effect of individual and family-level predictors. The multivariate probit model for leaving school, starting a job, and getting married was specified to examine the interdependence of the three events and account for the possible endogeneity of educational attainment in the probability of employment and marriage.

Results

The 1980-1985 birth cohort stayed longer in school and started full-time employment earlier compared to the 1970-1979 birth cohort. Women of the 1980-1985 birth cohort stayed single longer by pushing their marriage into the early twenties. The 1980-1985 birth cohort had higher odds to migrate to pursue education or employment. The majority of young people in this study followed a trajectory that is considered normative in Indonesia, i.e. finishing school first, followed by employment and marriage. Father's education was significantly associated with the probability of leaving school and starting a job for both sexes and the probability of getting married and giving birth for women. The decisions to leave school and to start working, and to leave school and to marry are interdependent for women. For men, the transitions out of school and to employment are interdependent.

Conclusion

The lives of Indonesian youth are changing in terms of their school and work participation and their mobility to pursue education and employment. Family background, particularly father's education, matters in the transition to adulthood. While the gaps in education and employment between sexes narrow; men and women experienced the transition to adulthood differently. This study offers additional insights for future research and policies on the transition to adulthood in Indonesia.

Committee of Thesis Readers and Final Oral Examination

Committee Members:

Stan Becker, PhD
Professor
Department of Population, Family, and Reproductive Health

Robert W. Blum, MD, PhD
Professor
Department of Population, Family, and Reproductive Health)

Lawrence H. Moulton, PhD
Professor
Department of International Health

Brian S. Caffo, PhD
Professor
Department of Biostatistics

Alternate Committee Members:

Linnea A. Zimmerman, PhD
Assistant Professor
Department of Population, Family, and Reproductive Health

Lingxin Hao, PhD
Professor
Department of Sociology, Johns Hopkins Krieger School of Arts and Sciences

ACKNOWLEDGEMENTS

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CHAPTER 1: INTRODUCTION

1. Overview and Significance

The transition to adulthood is a process marked by interrelated events representing movement from economic dependence and participation in the family of origin to economic independence and establishment of a family of procreation (Marini, 1984; Modell, Furstenberg, & Hershberg, 1976). During this critical process, young people navigate through opportunities and challenges that have consequences over the life course (Hogan & Astone, 1986; Rindfuss, 1991; Shanahan, 2000) on outcomes such as income, health, and well-being (Assini-Meytin & Green, 2015; Chen & Kaplan, 2003; Dahl, 2010; Mouw, 2005; Wickrama & Baltimore, 2010). Most demographic studies on this theme analyze the occurrence, timing and sequencing of five major events marking the transition to adulthood, including the completion of full-time education, entry into paid employment, leaving the parental home, and entry into partnership and parenthood (Settersten, 2007); the effect of the occurrence of the event at a specific time or the sequence of the events on subsequent well-being; and the context in which the transition (Beegle & Poulin, 2013) take place that affects the transition (National Research Council and Institute of Medicine, 2005). For example, early parenthood, sometimes defined differently as parenthood before age 18, 19, or 20, is negatively associated with years of schooling (Hofferth, Reid, & Mott, 2001), high school and college graduation (Assini-Meytin & Green, 2015), and subsequently, employment and income (Assini-Meytin & Green, 2015; Dariotis, Pleck, Astone, & Sonenstein, 2011). In the United States and several European countries, numerous factors such as family structure (Astone & McLanahan, 1991; Raab, 2017; Woodward, Fergusson, & Horwood, 2001), family socioeconomic background (Mooyaart & Liefbroer, 2016; Oesterle, Hawkins, Hill, & Bailey, 2010; Sironi, Barban, & Impicciatore, 2015; Smith, Crosnoe, & Chao, 2016; South, 2001), and neighborhood context

(Ainsworth, 2002; Wickrama, Merten, & Elder, 2005; Wodtke, Elwert, & Harding, 2016) have been investigated for their associations with the achievement and timing of the events marking the transition to adulthood.

Much less is known about the heterogeneity and determinants of the transition to adulthood in developing countries where 89% of the total world youth population aged 10-24 live (Das Gupta et al., 2014). Socioeconomic, religious, cultural, and family systems, as well as social class and gender norms, generate distinct transition to adulthood from those experiences of youth in industrialized countries (Choe, Bumpass, Tsuya, & Rindfuss, 2014; Xenos et al., 2006). Increasing access to education and formal employment are regarded as some of the most important factors that affect young people's trajectories in developing countries, especially young women (Furstenberg, 2013; Lloyd & Mahmood, 2004; Mason & Lee, 2012; Nahar, Xenos, & Abalos, 2013; Yeung & Alipio, 2013); yet many young people experience poverty and lack family and state supports to secure quality education, health services, and fulfilling employment (Bayer, Gilman, Tsui, & Hindin, 2010; Viner et al., 2012).

Indonesia currently has 64 millions people aged 10-24 representing 28% of the total population (Statistics Indonesia (BPS), 2017a). Indonesia can reap the demographic dividend for social and economic gain in the coming decades if these young people have access to quality education, health services, and employment. Therefore, the transition of Indonesian youth to adulthood is important in individual developmental perspective and critical in shaping political and macroeconomic structure. However, educational expansion, urbanization, and changes in the sectoral composition of growth (from agriculture to industry and services) increase inequality and urban-rural disparity and may pose additional challenges to attainment of adulthood roles (Akita & Miyata, 2008; De Silva & Sumarto, 2014), particularly regarding school achievement and job obtainment. Inequity and a low quality of education system, high youth unemployment rates, and

high informal occupation rates in Indonesia (Allen, 2016; OECD, 2016) also put young people in unfavorable circumstances. For example, a study found that a third of young adults aged 20-34 in greater Jakarta who left school before age 16 had gone through a period of neither working nor studying. The average time spent neither studying nor working was not reported (Utomo, Reimondos, Utomo, McDonald, & Hull, 2014). Migration is a transformative event that potentially affects a person's life course by providing both new opportunities and challenges; and migration-- particularly rural-to-urban movement--, is an event experienced by an increasing number of young people; yet few studies have examined the relationship between migration and transitions to adulthood (McDonald, Utomo, Utomo, Reimondos, & Hull, 2013; Utomo, Reimondos, Utomo, McDonald, & Hull, 2013). In Indonesia, a context where the contribution of public institutions is limited, family is the central source of social and financial support. However, studies that examine the effect of family backgrounds on the transition to adulthood are limited. The events in the transition to adulthood are interdependent and mutually influence each other's occurrence and timing, but they have only been examined as independent events. Existing studies assessing precursors of the transition to adulthood focus only on a single event; the majority of them examine the effect of family factors on educational achievement (Lu, 2014; Maralani, 2008; Mare & Maralani, 2006). Of particular interest, research on individual and contextual factors that use longitudinal data to establish causality in Indonesia are few. Most studies focus on young people living in urban areas of Java, the most populous island that dominates Indonesia's economy; therefore excluding the experiences of their peers in other regions outside Java. Furthermore, the difference in the transition to adulthood between the two sexes and birth cohorts who reach adulthood under different socioeconomic context is underexplored.

This research aims to fill the gap in the description of young people making the transition to adulthood in Indonesia specifically, across their demographic and socioeconomic profile, and in the identification of individual, family, and community factors that may affect the occurrence and

the timing of the events that mark the transition to adulthood. Specifically, this research will focus on the effect of parent's education and a young person's education, as education is regarded as one of the most defining factors on young people's trajectories in developing countries. Schooling level completed is probably endogenous in the estimation of the probability to start working and get married. This research will simultaneously estimate the probability of leaving school, starting a job, and getting married to account for the possible interdependency of these events so as to obtain less biased estimates of the effect of education level on the probability of starting a job and getting married. Acknowledging the increasing significance of rural to urban migration to young people's lives, I will examine the effect of migration on the transition out of school and into employment, and the sociodemographic backgrounds that may predict migration for education or employment reasons.

2. Study Aims

The aims of the study are as follows:

Aim 1: Analyze the occurrence, timing, and sequencing of the events marking the transition to adulthood (i.e. graduating or leaving school, starting a job, getting married for the first time, and having the first birth) by sex and birth cohort

Hypotheses:

a. The percentage of persons who have had a first job, had been married for the first time, and had a first birth by age 30 are higher among the 1970-1979 birth cohort than the 1980-1985 birth cohort.

b. The percentage of persons who (1) have left school by age 15, (2) have started working by age 14, (3) have been married by age 18, and (4) have given birth by age 19 are higher among the 1970-1979 birth cohort than the 1980-1985 birth cohort.

c. The majority of persons have left school and had a job first before entering marriage and parenthood; therefore the most frequent sequence of transition to adulthood is leaving school - first employment - first marriage -first birth.

d. The percentage of persons who have achieved the four events by age 30 is higher among the 1970-1979 birth cohort than the 1980-1985 birth cohort.

e. The percentage of persons who (1) were employed before leaving school, (2) were married before leaving school, and (3) gave birth outside of marriage was higher among the 1970-1979 birth cohort than the 1980-1985 birth cohort.

Aim 2: Examine the individual and family-level predictors of the probability of the events marking the transition to adulthood

Hypotheses:

There is a difference in the probability of experiencing the events marking the transition to adulthood between the 1980-1985 birth cohort and the 1970-1979 birth cohort and between women and men. However, the difference between women and men become smaller among the 1980-1985 birth cohort. Specifically:

a. Comparing the 1980-1985 birth cohort and the 1970-1979 birth cohort, the odds of leaving school, starting a job, getting married, and giving the first birth are lower for the 1980-1985 birth cohort.

b. Comparing women and men, the odds of leaving school and getting married are higher for women, while the odds of starting a job is lower for women; but the differences between women and men are smaller among the 1980-1985 birth cohort.

Adjusting for other characteristics, an individual's education and parent's education are significant predictors of the probability of experiencing the events marking the transition to adulthood. Specifically:

c. Each additional year of schooling is associated with higher odds of starting a job, and lower odds of getting married and giving birth

d. Young people whose parents had less than a senior secondary education had higher odds of leaving school, getting married, and giving birth but had lower odds of starting a job, compared to those whose parents had a senior secondary education.

Aim 3: Analyze the occurrence of migration for education or work reason by sex and birth cohort, and examine the individual and family-level determinants of the probability of migration for education or work reason

Hypotheses:

a. The percent of persons who have migrated for educational or employment reason by a given age increases across birth cohorts and is higher among men than women.

b. Adjusting for other factors, higher economic status (represented by per-capita household expenditure) and higher parental or guardian education are associated with greater odds of having migrated for an education reason.

c. Adjusting for other factors, lower economic status (represented by per-capita household expenditure), lower parental or guardian education, and fewer years of respondent schooling are associated with higher odds of having migrated for work.

Aim 4: Examine the interdependency of the events marking the transition to adulthood

Hypotheses:

a. For women, the residuals of the following pairs of events that are estimated simultaneously are correlated: [leaving school – starting a job], [leaving school – getting married].

b. For men, the residuals of the following pairs of events that are estimated simultaneously are correlated: [leaving school – starting a job], [starting a job – getting married].

CHAPTER 2: BACKGROUND AND CONCEPTUAL FRAMEWORK

1. **Existing Studies on the Occurrence, Timing, and Sequencing of the Transition to Adulthood**

Hogan and Astone describe the transition to adulthood as a process that is multidimensional involving biological, psychological, and social transitions (Hogan & Astone, 1986). The young adult years between the ages of 18 and 30 have been characterized as demographically dense, that is, more demographic actions occur during these years than during any other stage in the life course (Rindfuss, 1991). The demographic actions include graduating or stop attending school, becoming economically productive, and establishing a family; which have become traditional markers of transition to adulthood in sociological and demographic studies, although other markers of transition to adulthood have been suggested in the field of psychology. For example, individualism, specifically accepting responsibility for the consequences of one's action, deciding on personal beliefs and values, establishing a relationship with parents as an equal adult, becoming financially independent – and norm compliance (e.g. avoid committing crimes) are considered as important markers of transition to adulthood more frequently than family capacities (such as capacity for caring for children), biological transitions, and role transitions (Arnett, 2001; Badger, Nelson, & Barry, 2006).

The majority of recent sociological and demographic studies focus on the occurrence, timing, and sequencing of role transitions for several reasons. First, profound economic and social changes in postindustrial economies result in the end of the adolescent period being protracted and transform early adulthood into a distinct stage of life. Institutional, social, economic, cultural factors (Furstenberg, 2013; Shanahan, 2000), and the interaction of macro- and micro-level determinants (Billari, 2004; Furstenberg, 2013; Settersten, Furstenberg, & Rumbaut, 2008) are

suggested to promote change and heterogeneity in transition to adulthood in Western societies. These factors include shifts in the economy and labor market which increase value of higher education, globalization of the economy, changing attitudes on sex, marriage, and childbearing, change in gendered division of labor (Furstenberg, 2013), and institutional arrangements of welfare state (Billari, 2004). While institutional arrangements such as compulsory school attendance and laws on legal age of work and marriage set boundaries that shape young people's transition to become more age-graded and standardized, events marking the transition to adulthood that occur after the completion of compulsory education can be greatly influenced by those socioeconomic and cultural changes, leading to diverse achievements.

Researchers use various approaches to describe the timing and sequencing of the events marking the transition to adulthood, including: simple descriptive statistics and event history analysis to analyze single events; latent class analysis that examines the combination of interrelated events to model the interdependency of roles across time to generate distinct pathways; sequence or entropy analysis that measures the magnitude of heterogeneity in transition to adulthood. Studies on transition to adulthood generally share the conclusions that (a) the timing and sequencing of role transitions have become less predictable, more prolonged, heterogeneous, and disordered (Settersten et al., 2008) within and between cohorts and countries (Elzinga & Liefbroer, 2007; Fussell, Gauthier, & Evans, 2007; Iacovou, 2002); and (b) there are separate pathways to adulthood distinguished by participation in postsecondary education and timing of family formation (Amato & Kane, 2011; Dariotis et al., 2011; Macmillan & Copher, 2005; Oesterle et al., 2010). Other studies identifying pathways to adulthood generally compare the dichotomy of experience, such as slow versus fast transition and transition of those with no or limited post-secondary education versus extended education (Amato & Kane, 2011; Macmillan & Copher, 2005; Oesterle et al., 2010). Gender, race/ethnicity, and social class have also been shown to distinguish the experience of transition (Fussell et al., 2007; Settersten et al., 2008).

Second, the timing, sequencing, and the context in which the events take place can substantially affect current and long-term well-being (National Research Council and Institute of Medicine, 2005), and these effects can accumulate over the life course (Dariotis et al., 2011). For example, increased years of schooling is positively associated with income (Duflo, 2000). Further, parenthood before age 18 is negatively associated with years of schooling (Hofferth et al., 2001), high school, and college graduation (Assini-Meytin & Green, 2015), and subsequent employment and income (Assini-Meytin & Green, 2015; Dariotis et al., 2011). The negative effects became weaker when selection bias --that is, confounding factors that influence both early parenthood and school attainment-- is addressed (Diaz & Fiel, 2016; Hoffman, Foster, & Furstenberg, 1993). Men who become fathers in their early 20's outside marriage and/or without full-time employment report significantly lower income, fewer years of education, and higher likelihood of incarceration than men whose fatherhood starts in late 20's and is preceded by full-time employment and marriage (Dariotis et al., 2011). Nontraditional family structure (co-residence with only one biological parent) (Raab, 2017; Woodward et al., 2001) or with stepparent (Astone & McLanahan, 1991), divorce of parents and mother migration (Lu, 2014; Mahaarcha & Kittisuksathit, 2009) is associated with high school dropout, non-enrollment in upper secondary school or college, and earlier home leaving and cohabitation. Advantageous family background, including parents' high level of education (Mooyaart & Liefbroer, 2016; Oesterle et al., 2010; Sironi et al., 2015; Smith et al., 2016) and higher family income (South, 2001), is associated with delayed transitioning out of school, into labor force, and into a union. Neighborhood factors such as proportion of households with income below the poverty level, proportion of working age adults who are unemployed, proportion of residents with college degree, proportion of residents with managerial or professional occupation have also been linked with educational outcomes (Ainsworth, 2002; Wodtke et al., 2016) and timing of transition to adulthood (Wickrama et al., 2005). This robust body of research in the United States and several European countries has shown the changes in

occurrence, timing, and sequencing of the transition; the consequences associated with timing and sequencing of the transition; and the family and community factors that significantly influence the transition to adulthood.

2. The Transition to Adulthood in non-Western Developing Countries Settings

The United Nations (UN) Population Division estimates that the global population of youth aged 10-24 has reached a historic 1.8 billion by 2015 in a total world population of 7.3 billion. The vast majority (89%) of them reside in developing regions of Latin America and the Caribbean, Asia, and Africa; the proportions of youth aged 15-24 in the three regions vary from 17.3%, 16.4%, and 19.4%, respectively (United Nations, 2015). This huge cohort of young people will soon leave their childhood behind to take on new roles and responsibilities. The transition to adulthood should be examined using a population perspective to grasp the complexity of such developmental processes, including its multidimensionality and the diverse social and institutional contexts in which the transition takes place (Hogan & Astone, 1986). The expansion of educational access and extended schooling as key sources of change in the transition to adulthood has already been underway; in part as a result of tremendous economic growth and increasing demand for skilled labor force (Choe et al., 2014). The difference in educational attainment and its consequences in later life are becoming more pronounced and may increase socioeconomic inequalities. The large number of youth who are navigating the globalized and industrialized economy has challenged the capacity of family, education, health, and labor market institutions in developing countries. Support from state institutions can be minimal and inaccessible to most people in low and middle-income countries (LMIC). As a consequence, many young adults struggle to attain economic independence in the face of poverty and inequality. Thus, delayed transition is more likely an involuntary choice due to adverse conditions; unlike in the post-industrial Western context where

delayed transitions have been positively interpreted as a voluntary choice for role experimentation and identity exploration (Arnett, 2000).

While some patterns are similar to the changes that occur in Western societies (Yeung & Alipio, 2013), different family, ideological and cultural values, and gender norms seem to characterize the distinct pattern of transition to adulthood in developing countries. For example, despite economic and technological advancement, Asian families have relatively strong affiliation to family, religious faith, and traditions. Cultural and religious stigma may explain the relative absence of cohabitation and non-marital childbearing despite the growing delay of marriage (Nahar et al., 2013; Yeung & Alipio, 2013) and changes in attitudes and behaviors associated with dating, sex, and marriage (Gipson, Gultiano, Avila, & Hindin, 2012). Patterns of home leaving are also different because in most Asian countries young adults are not expected to leave their home after high school graduation and multigenerational households are still quite common (Xenos et al., 2006; Yeung & Alipio, 2013).

2.1. School and Work

The expansion of education is seen as key predictor of the changes in transition to adulthood (National Research Council and Institute of Medicine, 2005). We have observed improvement in primary education enrollment, particularly among girls in low-income countries; although expansion of secondary education is more limited (UNESCO, 2007). Average grade attained has increased, particularly among girls (Grant & Furstenberg, 2007; UNESCO, 2015). Gender gaps in school enrollment are relatively small among 10-14 year olds but become larger among 15-19 and 20-24 year olds, though they have narrowed considerably over the years (Grant & Behrman, 2010). The educational requirement for formal global labor market incentivizes families to invest in their children's education. However, disparities in school enrollment rates by wealth and

residential status remain. School grade repetition and disruption due to part-time jobs complicate educational achievements of disadvantaged youths (UNESCO Institute for Statistics, 2012). Many young people severely lack access to secondary education that teaches foundational skills essential for career advancement (UNESCO, 2015). In addition, poor student academic performance raises concern about the quality of education. As a result, a significant number of young people are leaving school without adequate skills that match current labor market demands (ILO, 2013).

Increasing school enrollment and declines in poverty have delayed young people's entry into the labor force. Still, millions of youth in lower-income countries who are leaving school prematurely struggle to find decent employment in a labor market that increasingly demand high-skilled workers. The proportion of youth aged 15-24 in the labor market in LMIC who are unemployed has increased from 11.5% in 2007 to 13.1% in 2015 (ILO, 2015). The youth unemployment rates are highest in Middle East (28.2%) and North Africa (30.5%). In these scenarios, instead of securing stable and high-quality employment; young people are often forced to work low-paying, informal, part-time or temporary positions. In fact, 66% and 38% of youth aged 15-24 in low and middle-income countries are in a vulnerable employment group, which includes own-account workers (self-employed persons without paid employees) and unpaid family workers. As a consequence, 64% of employed youth are poor (living at less than US$2 per day) or near poor (living between US$2 and US$4 per day) (ILO, 2015). The school-to-work transition surveys that were conducted in 28 developing countries find that completion of tertiary education (e.g., university) is a guarantee towards securing more stable employment, further signifying the effect of access to education on equality (Spareboom & Staneva, 2014).

2.2. Marriage and Parenthood

Ages at first marriage and childbearing have dramatically increased for both sexes along with educational gains (Mensch, Singh, & Casterline, 2005; Xenos et al., 2006). School enrollment is suggested to be protective against early marriage and childbearing (Lloyd & Mensch, 2008) although there is still a considerable proportion of the effect that is not explained by increased education. Analysis of UN data from 74 developing countries in Asia, Africa, and Latin America found that the largest decline in marriage rates is among women aged 15-24 in Africa. Marriage is still universal; the majority of women reaching age 25 are married although a large proportion of men delay marriage until their 30s. The proportion of women aged 15-19 who are married is already low in the former Soviet Asia, Eastern Asia, and South America since 1970-1980s. Still, a quarter of women aged 20-24 reported having married before the age of 18 (Mensch et al., 2005; UNFPA, 2012) and disparities exist across socioeconomic groups. Young women who are poor, have low or no education, and live in rural areas are most likely to be married and to have at least one child by age 18 (Mensch et al., 2005; Rani & Lule, 2004; UNFPA, 2012), placing them at heightened risk compared to their wealthier, educated, urban counterparts. Some researchers suggest that declines in arranged marriages, changes in legal age of marriage, shifts in global norms about early marriage, increasing costs of dowries or establishing a household, and the lower availability of older men also contribute to the widely observed trend toward delayed marriage (Mensch et al., 2005). In many developing countries, women are expected to become pregnant immediately after marriage, therefore making timing of first marriage and first birth closely linked in these contexts. Globally, the median age at first birth is higher in urban than in rural areas and tends to increase with level of education (Westoff, 2003).

2.3. Relationship Between the Events Marking the Transition to Adulthood

Systematic analysis of the relationship between the events marking the transition to adulthood in developing countries is limited. In the context of universal education expansion, many studies have examined the association between education and timing of first marriage among women, demonstrating that higher educational attainment delays transition to first marriage in various settings (Abalos, 2014; Aryal, 2007; Borkotoky & Unisa, 2014; Gebel & Heyne, 2016; Gyimah, 2009; Ikamari, 2005). Mensch et al. (2005) suggested that change in educational attainment is not the dominant cause of change in age at first marriage due to the fact that trends in education and age of marriage are not always closely connected. For example, the largest increase in educational attainment among young people is observed in South and Southeast Asia while the largest decline in early marriage is in the Middle East. Moreover, years of schooling has increased in Latin America for the last few decades but age at marriage has not changed. Mensch et al.'s analysis compared the expected change in the probability of early marriage that would be generated by change in schooling to the observed change using the Demographic and Health Survey (DHS) data. In 16 of 39 countries the level of the decline in early marriage between cohorts is less than would be expected given the increase in educational attainment. For the rest of the countries, the observed decline exceeds the expected decline. Thus, Mensch et al. suggested that factors other than schooling might drive the change in the timing of first marriage (e.g. family system and urbanization). Bongaarts et al. (2017) performed a decomposition analysis using DHS data from 43 countries and found that the changing educational composition of population, rather than trends within education groups, is primarily responsible for the increasing age at first sex, first marriage, and first birth. Moreover, the relationship between years of education and timing of marriage is not always monotonic, as shown by Kroeger et al. who performed a survival analysis on Mexican Family Survey data for cohorts of women born in 1930-1949, 1950-1969, and 1970-1979. For women born in 1930-1969, those with lowest and highest level of education had the

earliest transition to first union. The pattern has changed for the most recent cohort, now only the most highly educated were significantly different from the least educated in terms of timing of first union (Kroeger, Frank, & Schmeer, 2015).

A smaller number of studies have investigated the gendered effects of employment on the timing of family formation that vary between countries. In Jordan, men who are employed – regardless of whether in public or informal sector – transition faster to first marriage than those who are unemployed and inactive. In contrast, women who are inactive have highest probability of transitioning into first marriage followed by women in public sector and in private informal sector (Gebel & Heyne, 2016). In Egypt, women's history of employment does not predict the likelihood of first marriage (Salem, 2016). In Iran, men wait on average over a year and women nearly three years to find their first job after finishing school. For men, years of work experience and whether the individual ever had an employment contract with unlimited duration (open-ended) are positively associated with probability of first marriage. Men who had ever been unemployed for 2 years have lower probability of first marriage than those who were employed immediately after school completion while for women the opposite is true, namely years of work experience is negatively associated with probability of first marriage (Egel & Salehi-Isfahani, 2010).

Two studies have described the combination and sequencing of major role transitions and the heterogeneity in the status/transition combinations across countries and cohorts. For example, among women from six DHS countries in Latin America and sub-Saharan Africa, being a single, childless, non-working student is the most common status combination at age 15 and 18; while being a working or non-working ever-married parent is the most common status combination at age 21 and 30 (Grant & Furstenberg, 2007). The magnitude of heterogeneity, the age in which heterogeneity of status combination peaks, and factors that contribute most to heterogeneity vary by sex, time, and countries. For example, the diversity of combination of events marking the

transition to adulthood peaks at age 18 in sub-Saharan African countries and at age 21 in Latin American countries. There is no substantial change in the heterogeneity in transition to adulthood across time (Grant & Furstenberg, 2007). In a study of five Southeast Asian countries using three decades (1970-2000) of census data on school enrollment, marriage, and labor force participation, heterogeneity of the status associated with these events peaks in the early 20's for women and in the late 20's for men (Nahar et al., 2013). The study using Mexican census data in 1970 and 2000 finds that apart from increased school attendance, particularly among women, little change has occurred in the prevalence and timing of other events (Fussell, 2005). However, in Southeast Asia, women's transition to adulthood becomes more diverse compared to men, with the highest difference observed in Indonesia. School attendance has strong age-graded effect on heterogeneity for both genders, while contribution of employment to heterogeneity is high for men (Nahar et al., 2013).

Only one study attempts to identify the pathways of transition to adulthood in developing country settings using latent class analysis. Goldberg (2013) derived six and five distinct pathways for women and men aged 15-22 respectively in Cape Town, South Africa, that are characterized by the timing of secondary school completion (i.e. on time, early departure, or protracted enrollment), whether the individual is employed or not, and the timing of parenthood (early or not).

Other studies focus on specific space and time context to show the influence of socioeconomic and political factors on the transition to adulthood. Yeung and Hu (2013) compared five Chinese birth cohorts (1936-1945, 1946-1955, 1956-1965, 1966-1975, 1976-1985) who experienced different economic and political environments using longitudinal Chinese General Social Survey. The birth cohort born in 1946-1955 were least likely to complete high school and attend college because the government limited enrollment to higher education during Cultural Revolution. On the other hand, those who were born after 1955 and experienced economic reform and its

subsequent economic growth during their young adulthood marry and have a child earlier than those who grew up during turbulent time. Similarly, a longitudinal study among Argentinian youth found that lower class individuals stayed in school during recession in 1999 when job opportunities were limited, but headed straight for job and surrendered further education as their upper and middle class counterparts continued investing in their education during labor market growth in 2011 (Bendit & Miranda, 2015). In Nairobi's informal settlement, sexual intercourse is the first event experienced by both men and women aged 12-22, followed by independent housing for men and marriage for women (Beguy, Kabiru, Zulu, & Ezeh, 2011). Space constraint in natal home in urban slum may drive men to quickly establish separate residence.

In developing countries settings, although a considerable number of studies have described the timing, heterogeneity, and historical trend of the transition to adulthood, few studies examined the effect of both family and community characteristics on the interdependent occurrence of each major event marking the transition to adulthood. The failure to account for interdependency or potential endogeneity of the other events can generate biased parameter estimates and lead to under- or overestimation of the effect of modifiable factors on the transition to adulthood.

3. The Transition to Adulthood in Indonesia

3.1 Demographic and Socioeconomic Context

Indonesia, the world's largest archipelago situated in Southeast Asia, is inhabited by 238 million people within 33 provinces and 497 districts in 2010. Fifty-three percent of the population live in cities and 56.8% in Java. The Capital Region of Jakarta has the highest population density at 14,500 population/km^2 in the country while Papua Barat --the easternmost province-- at 8 population/km^2 has the lowest. The population growth rate from 2010-2015 was 1.38 with a total fertility rate (TFR) at 2.60 births per woman (Statistics Indonesia (BPS), National Population and

Family Planning Board (BKKBN), Kementerian Kesehatan (MOH), & ICF International, 2012). Indonesia benefits from a low dependency ratio, i.e. the ratio of children aged 0-14 and older people aged over 65 to the working-age population aged 15-64, at 48.6 in 2015, which is projected to remain at below 50 through 2035. The population is young and growing; people aged 10-24 represent 26.7% of the total population (Statistics Indonesia (BPS), 2010).

School enrollment has improved dramatically at senior secondary (grades 10-12) and tertiary level (college or university), with net enrollment rate at 60% at senior secondary school and 18% at tertiary school in 2016. Net enrollment rate at junior secondary school is still at 78% although nine-year compulsory education has been enacted since 1994 (Statistics Indonesia (BPS), 2017a). Government vision for twelve-year compulsory education has been included in National Medium-term Development Plan 2015-2019, but it has not been supported by enactment of law or regulation. The current administration's *Program Indonesia Pintar* (Indonesia Smart) which was inaugurated in 2014 is stated as a path toward providing twelve-year compulsory education (Ministry of National Development Planning, 2014). The program provides cash transfer for education from primary to senior secondary level to low-income families, conditional upon enrollment. Regional differences remain significant, which is to be expected in a country as large and diverse as Indonesia. Another concern is the low quality of education, which may be due to limited teacher qualification, inadequate teacher compensation, low class-room quality, teacher's absence, and large class size. International assessment of students' academic performance shows that Indonesian students perform poorly in mathematics, science, and literacy with little improvement in their scores over time (OECD, 2016).

Since the 1990's Indonesia has experienced fast and sustained economic growth, only being interrupted for five years by a financial crisis in 1997-1998. The impacts of the financial crisis seem to vary across regions and socioeconomic groups. For example, within one year after the

crisis, the decrease in per capita expenditure was higher in urban households than in rural households. However, the economic recovery has tripled the GDP per capita from 1,065 USD in 2003 to 3,700 USD in 2012; accompanied by shift from agriculture into industry and service sector, which now account for 86.5% of GDP and 67% of employment (The World Bank, 2017). Economic growth has continued to concentrate in Java and Bali. The economic growth in Java and Bali accounts for 62% of national GDP with average annual growth rate of 6.0%, which is higher than the annual growth rate of the other Indonesia region (Henstridge, De , & Jakobsen, 2013). Income inequality has recently improved from 0.41 in 2014 to 0.39 in 2016. In 2016, 10.7% of the population lived below the poverty line (Statistics Indonesia (BPS), 2017a).

Indonesian youth aged 15-24 are three times more likely to be unemployed than adults, with an unemployment rate at 17.8% in 2015 (ILO, 2016), which is above regional average of 13.1% for Southeast Asia. Even 30% of recent senior secondary school graduates aged 20-24 are unemployed. Youth with senior secondary and tertiary education are less likely to be employed than those with lower level of education (The World Bank, 2010). The labor market situation is worsened by high proportion of informal employment and involuntary part-time jobs particularly among rural youth. Youth who are not in employment, education or training (NEET, idle, or economically inactive) have been a focal issue in industrialized countries (Scott et al., 2013), with several studies linking economic inactivity with negative outcomes such as mental disorder (Power et al., 2015) and subsequent unemployment (Ralston, Feng, Everington, & Dibben, 2016). In Indonesia, a third of youth aged 15-24 remain unemployed 12 months after leaving school (Allen, 2016). A study among young adults (ages 20-34) in Greater Jakarta found that those who left school before age 18, 30% were not in employment, education, or training for more than 1 year (Utomo et al., 2014). Given the magnitude of youth economic inactivity, there is no existing study that examines the effect of prolonged economic inactivity on transition to adulthood in the developing country context; where delayed transition to employment is likely due to unfavorable

situation – not due to voluntary role experimentation or identity exploration as may be the case in the developed country context– and social safety net for young people is very limited.

3.2. The Studies on the Transition to Adulthood in Indonesia

The cross-sectional Indonesia Demographic and Health Survey has shown that women are waiting longer to marry and give birth. The median age at first marriage has increased from 19.2 in 2002 to 20.4 in 2012, while the median age at first birth has increased from 21.0 in 2002 to 22.0 in 2012 (Statistics Indonesia (BPS) et al., 2012). There is no study that analyzes the timing at first marriage and parenthood among men, and the timing at graduation or leaving school and first employment among both men and women. We also don't know the proportion of men and women reaching the end of transition period (i.e. age 30) who have experienced each event marking the transition to adulthood.

Three studies on the transition to adulthood analyze the effect of dropping out of school by age 16 and migration on the transition to adulthood. All of these studies use the same data source i.e. the 2010 Greater Jakarta Transition to Adulthood study that interviewed individuals aged 20-34 in the Special Capital Region of Jakarta and the two contiguous cities of Tangerang and Bekasi (McDonald et al., 2013; Utomo et al., 2014; Utomo et al., 2013). A third of individuals who stopped attending school by age 16 spent some time neither studying nor working after leaving school. Nevertheless, individuals who left school early transitioned faster out of parental home and into marriage and parenthood. The proportions who have started work, left the parental home, married, and had a child by age 20 are higher among early school leavers than among individuals who left school between the ages of 17 to 19 (Utomo et al., 2014).

Migration is closely tied to transition to adulthood for young people in developing countries (Bernard, Bell, & Charles-Edwards, 2014), as their families strategize to find education and employment opportunities (Juárez et al., 2013). In communities where school beyond primary level is not always available, the growing value of education for upward social mobility drives young people to migrate for education. The diversity of situations of youth migration, the contexts in which they occur, and its relation with transition to adulthood mean that youth migration provides new opportunities, as well as novel risks, and may result in positive consequences for some and negative consequences for others. In Indonesia, young people are also the most mobile age group; about 30% of the entire migrant population belongs to this age group. Youths' decision to migrate can be motivated by and associated with transition to adulthood, such as enrolling in higher education, entering labor force, and getting married. Analysis of the Indonesian Intercensal Population Survey 2005 data found that 6% of youth aged 15-24 were recent migrants in the last 5 years, which was higher than the proportion among other age groups; and they were most likely to migrate at age 21-22 (Malamassam, 2016). Interestingly, the majority of young migrants came from small and large cities who chose to migrate to (other) large cities; only 24% come from towns. In addition, education was more likely to be cited as the reason for migration to large cities than employment.

Three studies have examined the relationship between youth migration and transition to adulthood in Indonesia. Resosudarmo and Suryadarma (2014) estimated the effect of rural-urban migration during childhood on educational attainment using the data from annual longitudinal household survey in four largest cities for migrant enclave in Indonesia between 2008 and 2011, national socioeconomic survey, intercensal survey, and the village censuses. Individuals who migrated before age 15 to the city have 2.9 more years of education than their counterparts who remained in the rural areas, after controlling for as many observable individual and district factors as possible that affect both decision to migrate and educational attainment. The individual factors

include gender, age, cohort, and height. The district factors include access to electricity and road, the number of senior secondary schools and the average educational attainment of adults, the average monthly per capita household expenditure, and the district propensity of migration represented as the proportion of residents who migrated to the city. Using data from the 2010 Greater Jakarta Transition to Adulthood Survey, McDonald et al. (2013) compared employment and wage of migrants and non-migrants aged 20-34. Those who migrated at age 10-17 years had the lowest level of education attainment compared to non-migrants and those who migrated at other ages. The qualitative study suggested that most of them had left school before migrated to Greater Jakarta. Further, the relationship between migration and employment and wage differed by sex. Men who migrated after age 10 were more likely to be employed and had a higher wage than non-migrants or men who migrated before age 10. For women, the relationship is the opposite. Women who migrated after age 10 were also overrepresented in primary occupations (e.g. as maids or cleaners) and underrepresented in administration. Utomo et al. (2013) focused their analysis on women using the same data and found that women who migrated after age 10 were more likely to have married and to have had a child. Thus, these migrant women were less likely to be employed because of the presence of a child.

3.3. Knowledge Gaps on the Transition to Adulthood in Indonesia

Expansion of educational access and recent rapid economic growth in the industry and service sectors increase the demand for school attainment and availability of employment opportunities for Indonesian youth. On the other hand, low quality of education, family poverty, and urban-rural disparity may prevent young people from obtaining the necessary knowledge and skills that match labor market's increasing demand for high-skilled workers. The short-term impacts of 1998 financial crisis have been examined, however, we do not know the later-life experiences of young people who were at critical transition during the time especially since young people's strategies

to respond adverse economic situation seem to vary across societies. For example, in Argentina, youth of lower socioeconomic status stayed in school during recession in 1999 when job opportunities were scarce while it appears that Indonesian youth may have left school early to enter the job market (Bendit & Miranda, 2015; Elizabeth Frankenberg, Duncan, & Beegle, 1999). It is not known whether, when, and in what sequence young people living outside the Greater Jakarta region experience the events marking the transition to adulthood. It is not known if there is any difference in the trajectories of the transition to adulthood across birth cohorts and sexes who went through rapid socioeconomic changes. Young people might want to achieve financial independence first or accumulate assets before assuming marriage and parenthood responsibilities, as is indicated by the delay in marriage and parenthood among youth in industrialized nations. Considering the high social value of family life and gender inequality in labor force participation and domestic relationship, we do not know to what extent it is true in Indonesia context and particularly for women as no empirical evidence has been generated. For example, are the risks for marriage and parenthood associated with employment status for women?

In addition, in the setting where family's support is central and state's assistance is limited or not equally distributed, the effects of family characteristics and socioeconomic resources on the transition to adulthood are underexplored. In recent years, the government of Indonesia has dramatically increased its investment in education programs to improve human resource quality so as to seize the demographic dividend. If educational achievement and advantages are transmitted from one generation to the next, an education program implemented today potentially would have lasting impacts for the following generation. Thus, for policy-making purposes, it is important to know if parents' education matters to the transition to adulthood. With unequal distribution of public facilities, it is unclear how the presence of public infrastructure and education facilities would affect the ability of youth to achieve their adulthood roles.

The occurrence and timing of an event most likely affect the occurrence and timing of the other events. Young people are constantly balancing between individual achievement (e.g. educational achievement) and freedom (e.g. to enjoy their leisure time, to decide their future) and the expectation and obligation set by their communities (i.e. becoming productive member of society through working and establishing their own family). Yet, existing studies on the transition to adulthood in Indonesia have not analyzed the events marking the transition to adulthood as interdependent. An outcome might be endogenous in the other outcome. For example, individuals who have more schooling might delay their marriage because they are able to find a job and early marriage would disadvantage their opportunity to earn income. On the other hand, individuals might delay their marriage precisely because they want to attain more schooling. In addition, various factors that may be unobserved can affect both educational attainment and marriage timing. Therefore, studies that do not consider this interdependency and the endogeneity of education level on the timing of the other events could generate biased estimates on the effect of education level on the transition to adulthood. Two studies have examined the effect of educational attainment on the timing of marriage and fertility behaviors among Indonesian women using exogenous sources of variation in education to address the bias caused by unobserved heterogeneity (Breierova & Duflo, 2004; Samarakoon & Parinduri, 2015). The study by Breierova and Duflo used a large-scale school construction program in the 1970s as the exogenous source of variation in school attainment, while the study by Samarakoon and Parinduri used a longer school year (six months longer) in Indonesia in 1978 caused by the change in the start of the academic year as the exogenous source of variation. Duflo (2000) also used an exogenous source of variation in education (also caused by a large-scale school construction program in the 1970s) as an instrumental variable to estimate the impact of education on men's income. However, no study has examined the interdependency of school attainment, labor force participation, and marriage among recent male and female populations in Indonesia. Finally, while

Indonesian youth's transition out of school, to employment, to marriage, to parenthood, and their migration have been described, these events have never been examined together for men and women in a study population.

4. Conceptual Framework

Based on the literature review, a conceptual framework is developed, which presents global, national, sub-national/local factors that affect young people's experience in assuming adulthood roles (**Figure 2.1**). As young people move from economic dependence and participation in the family of origin to economic independence and establishment of a family of procreation, their experience is shaped by the context in which the transition take place. Moving from distal to proximal: the most distal is global context, next is national context, and the most proximal is sub-national context where local community or neighborhood, families, and peers directly influence individuals. Individuals are embedded in their local context, and the proximal context is embedded in more distal context; and changes in the larger context will be transmitted to local context to affect individuals.

Figure 2.1. Conceptual framework of factors that affect the transition to adulthood
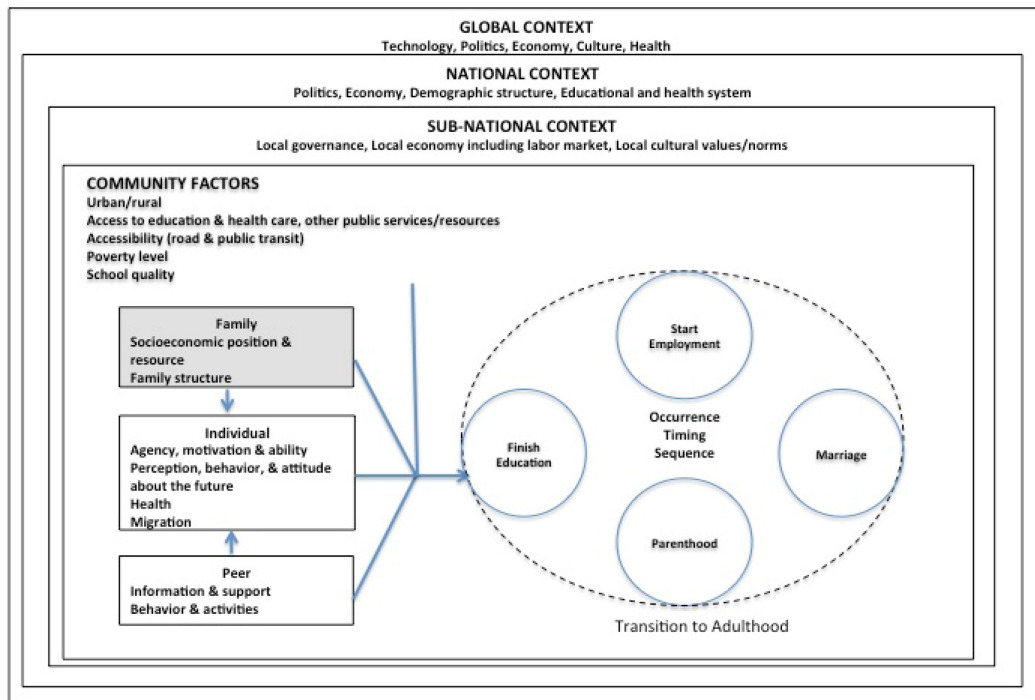
Community, family, and peer factors are interlinked to influence individuals' attitudes and behaviors. The specific factors included in each box are not exhaustive, but the community and family factors will be the focus of this research. Individuals acquire knowledge and skills through education, develop their agency and motivation, and gather resources from their family or other institutions to respond to changing opportunities and challenges. Finally, individual factors and their context determine the occurrence, timing, and sequencing of four major events marking the transition to adulthood; and each event is closely interlinked with the other events. Occurrence and timing of an event affect the occurrence and timing of other events. Although not explicitly included in the figure, other characteristics such as gender, race/ethnicity, and religion also shape young people's transition to adulthood experiences.

CHAPTER 3: METHODS

1. **Data Source: Indonesia Family Life Survey**

The data for this research come from the Indonesia Family Life Survey (IFLS), an ongoing longitudinal survey conducted five times since 1993 that collects individual and household-level behaviors and outcomes, including multiple indicators of economic well-being (consumption, income, and assets); education, migration, and labor market outcomes; marriage, fertility, and contraceptive use; health status, use of health care, and health insurance; relationships among co-resident and non-coresident family members; processes underlying household decision-making; transfers among family members and inter-generational mobility; and participation in community activities. In addition, IFLS collects information from the communities in which IFLS households are located and from the facilities that serve the residents of those communities, including factors related to the physical and social environment, infrastructure, employment opportunities, food prices, access to health and educational facilities, and the quality and prices of services available at those facilities. The study was reviewed and approved by the Institutional Review Boards of RAND in the United States and of the Universitas Indonesia for IFLS1 and IFLS2, and later of the Universitas Gadjah Mada for IFLS3, IFLS4, and IFLS5.

The IFLS data are well suited to study the transition to adulthood because the survey asks the occurrence and timing of the events marking the transition to adulthood that may happen between two surveys. For individuals joining in the later surveys as an adult, the occurrence and timing of each first event are asked retrospectively so that the experience of transition can be reconstructed chronologically. Individuals are asked about current and retrospective detail of each level of education that they have attended; their location at birth, at age 12, and each subsequent move that crossed the village boundary and lasted for 6 months or longer, and the reasons for the move;

current employment and employment information for each of the years in the last 5-10 years, history of first employment; first, current, and any other marriage that had begun since last interview; and for ever married women aged 15-49 information about all pregnancies. The information about household, family, and community characteristics collected during childhood (before or at age 12) will be used to examine childhood precursors of the transition to adulthood. Additionally, in IFLS5, retrospective socioeconomic circumstances when respondents were 12 years old were asked, which include whether respondent lived with their biological parents, marital status of biological parents, availability of electricity, the source of drinking water, the type of sanitation facility, and the occupation of the household's main breadwinner.

Figure 3.1. The provinces of the Indonesia Family Life Survey

IFLS is designed to be representative of about 83% of the Indonesia population who live in 13 of the 26 provinces in 1993. Provinces are selected to maximize representation, capture the cultural and socioeconomic diversity in Indonesia, and be cost-effective. **Figure 3.1** shows the provinces where IFLS is conducted. Most of the provinces that are not covered by IFLS are in the eastern and northern parts of Indonesia where population density is low. Within each of the 13 provinces, enumeration areas (EAs) - stratified on provinces and rural/urban location – were randomly selected from a nationally representative sampling frame prepared by regional Central Bureau of Statistics (BPS); and using the same sampling frame, within a selected EA, 20 households were randomly selected if the EA was urban, and 30 households were selected if the EA was rural. IFLS selected 321 EAs and oversampled urban EAs and EAs in smaller provinces to facilitate

urban-rural and Java–non-Java comparisons (E. Frankenberg & Karoly, 1995). In each EA, heads of village or township and community figures, and public and private outpatient health facilities and schools that were identified as available to the communities were listed for Community-Facility Survey.

The first wave of the survey (IFLS1) was conducted in 1993-94, followed by IFLS2 in 1997, IFLS2+ in 1998, IFLS3 in 2000, IFLS4 in 2007-08, and IFLS5 in 2014/15. For IFLS1 a total of 7,730 households were sampled to obtain the goal of 7,000 completed household interviews. In fact, the survey was able to conduct 7,224 household interviews; these households are called the *origin* or *dynasty households*. The IFLS1 conducted interviews with the following household members: the household head and spouse; two randomly selected children of the head and spouse aged 0-14; an individual aged 50 or older and spouse randomly selected from remaining members; and for randomly selected 25% of the households, an individual aged 15 to 49 and his/her spouse, randomly selected from remaining household members. The IFLS2 expanded the sample by (1) interviewing all current members of an IFLS1 household and (2) tracking and interviewing the *target respondent* – i.e. either an IFLS1 household member who had provided detailed individual level information in 1993 or who had been 26 or older in 1993 who split off into new households – as long as he or she still resides in any one of the origin 13 IFLS provinces, and his or her spouse and biological children. The criteria of *target respondent* for tracking were expanded in IFLS3, which included any person who had been member of an *origin* IFLS1 household. The same criteria applied in IFLS4 and IFLS5. The IFLS3, IFLS4, and IFLS5 survey attempted to interview (1) all current members of an IFLS1 household and (2) target respondent, their spouse and biological children, as long as they still reside in any one of the origin 13 IFLS provinces. The re-contact rate of *origin households* in IFLS2, IFLS3, IFLS4, and IFLS5 are 94.4%, 95.3%, 93.6%, and 92%, respectively; and 86.9% of *origin households* are interviewed in all 5 waves. The latest survey (IFLS5) conducted in 2015 interviewed 15,902 households and 50,148

individuals. The sample sizes of household and individual interviews in IFLS1-IFLS5 are presented in Appendix **Table A.3.1**.

The IFLS Questionnaires

The first four household questionnaires collect information at the household-level including household roster, household expenditures and knowledge of health facilities, and household economy. The other three questionnaires collect individual level information from adult respondents aged 15 years or older, ever-married female respondents aged 15-49, and children younger than 15 years old. The community history and characteristics questionnaire was asked to the head of the community in a group interview that ideally would include village or township head, several staff members, and members of advisory board. The questionnaire asks about available means of transportation, communications, sanitation infrastructure, agriculture and industry, history of the community, credit opportunities, community development activities, the availability of schools and health facilities, community welfare and economic changes. The community statistics book records data from the community's Statistical Monograph or from Village Potential Statistics.

2. Sample of the Study

This research will compare the two youngest birth cohorts who would have reached age 30 in 2015, the year of latest IFLS (IFLS5), to examine the current experience of youth transitioning to adulthood. Demographic studies often compare the population by the birth cohorts (5-year or 10-year age groups), as birth cohort can be thought of as a social context that affects individuals whom they are belong to (Bell & Jones, 2015). To determine the birth cohorts to compare, we can consider the demographic, social, economic and other changes that may affect the population behavior and thus their exposure to health and social risks over time. The first birth cohort includes

respondents who were born between January 1970 and December 1979 and the second birth cohort includes those who were born between January 1980 and September 1985. In addition, the two birth cohorts might be affected differently by financial crisis in 1998 due to their age and status at that time. The 1980-1985 birth cohort were 14-18 year olds in 1998, transitioning from junior to senior secondary school and from senior secondary school to tertiary education or employment; and might face increased risk of dropping out of school or unemployment. The 1970-1979 birth cohort were 19-28 year olds in 1998 and many of them would have left school and had a job, although some of them might have tried to pursue tertiary education or just started looking for a job. Therefore, this comparison can capture the effect of national socioeconomic context on the transition to adulthood in Indonesia. **Figure A.3.1** in the Appendix is the Lexis diagram of these birth cohorts, describing the relationship between chronological time and age.

2.1. *Sample size*

This analysis includes the members of an original IFLS1 household who were listed in the 1993 household roster; who were born between January 1970 and September 1985 and were interviewed in at least one of the following survey: IFLS 1, IFLS2, and IFLS3. **Figure 3.2** describes the selection of the study sample. A total of 18,498 individuals who were born between January 1970 and September 1985 participated in at least one wave of IFLS. Among them, 8,341 respondents were not listed in the 1993 household roster (as the members of the original IFLS1 household); as IFLS had started to interview all current members of an original household, including new members in 1997. This analysis will exclude them. Finally, 409 respondents were excluded because they only participated in IFLS4, IFLS5, or in both IFLS4 and IFLS5. Preliminary analysis (**Figure A.3.2**) showed that these late participants tend to report older age when they experienced a transition, compared to participants of the first three waves of IFLS. The positively skewed data may be due to recall error that increases with the length of the recall period.

Figure 3.2. The selection of the study sample
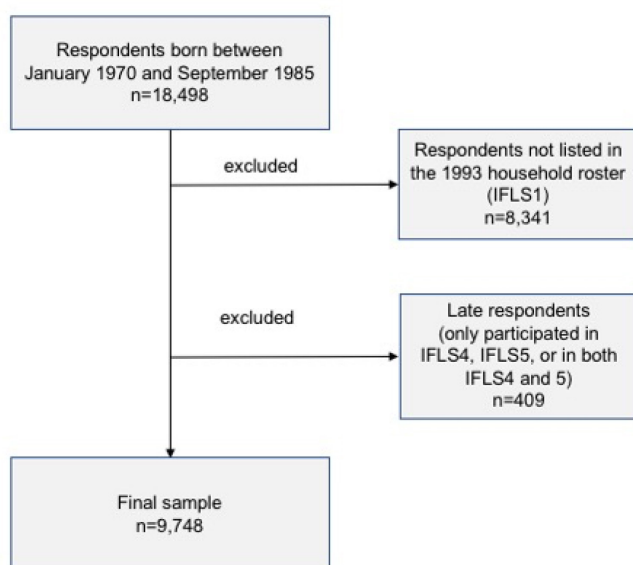
The final sample includes 9,748 respondents: 5,154 were born between 1970 and 1979 with 51.6% women, and 4,594 were born between 1980 and 1985 with 49.9% women (**Table 3.1**). Almost half of the respondents in each birth cohort participated in either the last four IFLS or all five IFLS (29.2% and 17.7% for 1970-1979 birth cohort, and 13.3% and 36.1% for 1980-1985 birth cohort, respectively). A significant percentage of the older birth cohort (10.3%) participated in the last three IFLS, and 8.1% of the younger birth cohort participated in the first four IFLS (**Table 3.2**). Almost 90% of the sample was followed-up until at least age 20, 81.7% were interviewed until at least age 25, and 74% were followed-up until at least age 30. The percentages followed-up until a specific age are lower for the younger birth cohort than for the older birth cohort.

Table 3.1. The distribution of analysis sample size by birth cohort and sex (unweighted)

Birth cohort (year of birth)	Men		Women		Both Sexes	
	N	%	n	%	n	%
1970-1979	2,497	48.4	2,657	51.6	5,154	100
1980-1985	2,303	50.1	2,291	49.9	4,594	100
Both birth cohorts	4,800	49.2	4,948	50.8	9,748	100

Table 3.2. Distribution of survey participation and whether the data include sample's first 20, 25, and 30 years of life, by birth cohort (unweighted)

| | Birth cohort | | | | | |
| | 1970-1979 | | 1980-1985 | | Both cohorts | |
	N	%	n	%	n	%
Interviewed in IFLS round:						
1	134	2.6	119	2.6	253	2.6
2	194	3.8	77	1.7	271	2.8
3	159	3.1	34	0.7	193	2.0
1, 2	64	1.2	114	2.5	178	1.8
1, 3	26	0.5	37	0.8	63	0.6
1, 4	20	0.4	9	0.2	29	0.3
1, 5	21	0.4	18	0.4	39	0.4
2, 3	237	4.6	158	3.4	395	4.0
2, 4	28	0.5	11	0.2	39	0.4
2, 5	60	1.2	18	0.4	78	0.8
3, 4	122	2.4	18	0.4	140	1.4
3, 5	58	1.1	15	0.3	73	0.7
1, 2, 3	134	2.6	307	6.7	441	4.5
1, 2, 4	11	0.2	22	0.5	33	0.3
1, 2, 5	35	0.7	56	1.2	91	0.9
1, 3, 4	23	0.4	33	0.7	56	0.6
1, 3, 5	13	0.2	30	0.6	43	0.4
1, 4, 5	30	0.5	37	0.8	67	0.7
2, 3, 4	278	5.4	165	3.6	443	4.5
2, 3, 5	94	1.8	73	1.6	167	1.7
2, 4, 5	81	1.6	35	0.8	116	1.2
3, 4, 5	533	10.3	75	1.6	608	6.2
1, 2, 3, 4	134	2.6	371	8.1	505	5.1
1, 2, 3, 5	70	1.4	260	5.7	330	3.4
1, 2, 4, 5	75	1.5	140	3.0	215	2.2
1, 3, 4, 5	102	2.0	90	2.0	192	2.0
2, 3, 4, 5	1,507	29.2	612	13.3	2,119	21.7
1, 2, 3, 4, 5	911	17.7	1660	36.1	2,571	26.4
Followed-up until at least age:						
20	4,950	96.0	3,802	82.8	8,752	89.8
25	4,501	87.3	3,461	75.3	7,962	81.7
30	4,094	79.4	3,117	67.9	7.211	74.0

2.2. Sample weight

The publicly available IFLS data include roster weights that are assigned to every individual listed in the 1993 household roster. The roster weights were calculated by stratifying the individuals by province, urban-rural sector, sex, and five-year age group, then by matching the proportions in each stratum to the population proportions estimated by 1993 SUSENAS. (SUSENAS or The National Socioeconomic Survey has been the primary source of nationally representative data on Indonesia's socioeconomic condition, which now covers about 300,000 households in their annual

survey). The weighted age and sex distribution of individuals in IFLS1 reflect the 1993 population age and sex distribution by urban and rural strata within the 13 provinces covered by the survey.

For this analysis, the roster weights are adjusted to account for the fact that not all individuals listed in 1993 household roster were interviewed, due to the 1993 sampling criteria that only selected some individuals and the rules for tracking individuals in subsequent waves of IFLS (although in 1997 IFLS started to interview all current members of the original household). The IFLS sampling scheme and criteria to track individuals who moved out of their IFLS households has been described in a working paper (John Strauss, Witoelar, Sikoki, & Wattie, 2009). For example, 10% of individuals born between 1968 and 1988 who were listed in the 1993 household roster never participated in IFLS. Logistic regression is performed to predict the probability of ever being interviewed in IFLS. The outcome (ever interviewed in IFLS) was coded as 1 "yes" or 0 "no". The predictors include the year of birth, household size, urban-rural sector, province, and quintile of per capita household expenditure. The percentage of individuals in 1993 household roster who were interviewed was found to vary by those variables (numbers not shown). The logistic regression model (**Figure A.3.3**) has pseudo-R^2 value of 0.1814, which can be considered as moderate fit. The roster weight is divided by the predicted probability to obtain the adjusted weight. The adjusted weight is then normalized to sum to the sample size.

3. Variables of Interests

3.1. *Outcome variables*

Using a series of questions asking current and retrospective detail of the event, the timing at school graduation or at school leaving, at first employment, at first marriage, and first birth will be constructed for the period beginning from age 6 to the censoring set at age 30. Individuals are at risk of an event if they haven't experienced the event. Individuals start to be at risk of leaving

school when they begin their education. Women start to be at risk of getting pregnant and giving birth as soon as they begin ovulating, with the average age at menarche at 12.5. Theoretically, individuals start to be at risk of employment and marriage after they reach the legal age to work and to consent for marriage. In Indonesia, the legal age to work is 18 and the legal age to consent for marriage is 19 for men and 16 for women. Many individuals have started working or are married at young age despite law; but I expect very few would experience any event before age 6. Therefore, the timeframe is selected to include the earliest age in which an Indonesian youth might begin their transition (e.g. those who dropped out of school very early) and the age in which they would typically complete their transition to adulthood. Based on initial data exploration, by the age of 30, more than 90% of individuals have transitioned out of school and into first job and more than 80% have transitioned into marriage and parenthood. For each first event which include 1) graduating or leaving school, 2) obtaining employment, 3) getting married, and 4) giving birth; the outcome variables are combination of:

a) dichotomous variable indicating whether the event is censored or not

b) the variable for duration i.e. number of 3-monthly period from age 6 to the experience of event or censoring

For the discrete-time survival model, these variables will be expanded, so that there is one observation for each period when a person is at risk of experiencing the event. The list of questions used to determine whether respondents have experienced the event and the timing at the event is summarized in **Table 3.3**.

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Table 3.3. The set of questions in Indonesia Family Life Survey used to determine the occurrence and timing (month and year or age) of the events marking the transition to adulthood

Event	Questions
Graduating or leaving school	Administered to respondents aged 15 years or older: (1) *"Have you ever attended/are you attending school?"*; (2) *"Are you currently attending school?"*; (3) *"When [year/month] did you graduate from or stop attending school?"*; (4) *"What age were you when you graduated from/stopped attending school?"*.
	Administered to respondents aged less than 15 years, in education the questions used are: (1) *"Has [child's name] ever been to school?"*; (2) *"Is [child's name] now in school?"*; (3) *"When did [child's name] graduate from or stop attending school?"*; (4) *"At what age did [child's name] graduate from or stop school?"*.
	Some cases had a gap year between high school and college. For these cases, if the gap was less than 2 years; the date of the first time leaving school would be the date of leaving college.
First job	Administered to respondents aged 15 years or older: *(1) "What was your primary activity during the past week?"*; (2) *"Did you work for pay for at least 1 hour during the past week? / Do you have a job/business, but were temporarily not working during the past week? / Did you work at a family-owned (farm or non-farm) business during the past week?"*; (3) *"Have you ever worked before?"*
	In IFLS1, IFLS2, and IFLS3, respondents were asked about their work history in the last 5 years; while in IFLS4 and IFLS5 work history was asked for the last 10 and 8 years, respectively with a series of questions that start with: (4) *"Did you work during […] year? / Did you work in this year […]?"* If respondents' first job is not covered within these periods, the last part of employment section asks: (5) *"When did you start working full-time for the first time?"*; (6) *"What was your age when starting to work full-time for the first time?"*
	Some respondents who were panel respondents (i.e., they had been interviewed in the previous survey) were not asked the question *"When did you start working full-time*

	for the first time?" ["The meaning of working full-time is that working is the primary activity"] because they had been asked about their work history in each year between the surveys. For these cases, the time of their first full-time employment would be the year when they indicated that they worked for 20 hours or more. I use the cut-off of 20 hours or more because I found that a substantial percentage of respondents who answered "*yes*" to the question *"When did you start working full-time for the first time?"* and answered "*working*" to the question *(1) "What was your primary activity during the past week?"* reported work hours less than 40 hours per week, a cut off that is usually used to define full-time work.
First marriage	Administered to respondents aged 15 years or older: (1) *Marital status* (asked to all household members in household roster section); (2) *"What (month/year) did you get married?"*; (3) *"How old were you when your […] marriage started?"* The questions were asked for all marriages starting from current/latest marriage.
First birth	History of birth was only asked to ever-married female respondents aged 15-49 years starting with: (1) *"Now I would like to ask you about all children that you have so far. Have you ever given birth?"*. Respondents were asked about the number of biological sons/daughters who are living with her, who are alive but not living with her, who were born alive but passed away later, the number of pregnancies that resulted in stillbirths, and the number of miscarriages. Each pregnancy regardless of the outcome was asked: (2) *"What date was […] born/you had a miscarriage?"*; (3) *"How old were you when […] was born/you had a miscarriage?"* Only first pregnancy that resulted in live birth is considered as first birth.

3.2. Independent variables

Several indicators of individual, family socioeconomic, and community characteristics are examined as predictor variables, which are treated as time-constant except for educational attainment and residence, to predict the transition to adulthood. The time-varying binary variables

for other interrelated events indicating whether the event has occurred, and a time-varying binary variable indicating whether migration has occurred are included for estimation of some events. These predictor variables are presented in **Table 3.4**.

Household socioeconomic position (SEP) is represented by two variables that describe various aspects of SEP: consumption expenditure, and parents' education. Consumption expenditure captures household's ability to meet material needs by purchasing goods and services. Consumption is often preferred over income as consumption is smoothed over anticipated long-term income, particularly in LMIC (Howe et al., 2012). Household wealth index as an asset-based measure is developed to measure household welfare in LMIC, mostly based around the DHS. Ownership of durable assets (e.g. television, car, refrigerator), housing characteristics (e.g. materials used for floor, wall, and roof), and access to services (e.g. electricity, drinking water, sanitation facilities) are used to represent the material aspect of living standards (Howe et al., 2012). Wealth index may be more stable measure of SEP than consumption expenditure and fluctuate less in response to income/expenditure changes and economic shocks. However, the questions used in the IFLS on household assets were too complicated for this study and might be more appropriate for an economic study. Educational achievement can be determined easily for most individuals and has been used widely as basic indicator of SES, because of its strong influence on future employment and income (Shavers, 2007). I use father's education because in Indonesia, men as the head of the household most often have the decision-making authority (Rammohan & Johar, 2009).

The community factors represent infrastructure and institutional resources that are often unequally distributed in Indonesia. The community level variables indicate the availability of road infrastructure, public transit services, and senior secondary schools for the community.

Table 3.4. Independent variables predicting the transition to adulthood
The covariates that were examined are:

Individual level	
Birth cohort:	as a binary variable indicating whether the person belongs to 1970-1979 or 1980-1985 birth cohort
Sex	as a binary variable indicating men or women
Education	as a time-varying numeric variable (in years) indicating the number of years of schooling enrolled. Education will be the predictor for the timing to first job, first marriage, and first birth.
Parent's or guardian's education	as a categorical variable indicating the father's education level, or mother's education level if father was not in the household, or the primary caretaker's education if both parents were not in the household 0 – no education 1 – primary 2 – junior secondary 3 – senior secondary or higher
Parent's co-residence	as a categorical variable indicating whether both parents were in the household 0 – both parents were co-resident with the child in the household 1 – only mother 2 – only father 3 – none of the parent Parent's co-residence is included in the model estimating the probability of leaving school and getting married.
Religion	as a categorical variable indicating respondent's religion: Islam, Protestant, Catholic, Hinduism, Buddhism, or other. Religion is only included in the model to estimate the probability of getting married
Household level	
Per capita household expenditure (PCE)	The sum of expenditures on 37 food items during the past week; non-food items (electricity, water, telephone, fuel, transportation, toiletries and other consumables, recreation and entertainment) during the past month; household supplies and furniture, clothing, charities and gifts, medical costs, taxes, and other expenditures such as purchase of livestock during the past year; combined to get a total expenditure in one month, divided by the number of household members, and adjusted for inflation.

	The monthly expenditure was divided into quintiles. The PCE quintile used was measured in the IFLS1 in 1993.
Community level	
Residence	a time-varying binary variable indicating residence during the time interval, obtained from the questions about the person's birth place, residence at age 12, and subsequent migration
Province	as a categorical variable indicating residence in the provinces in Sumatra, Java, Bali & Nusa Tenggara, Kalimantan, or Sulawesi region in 1993
Community facilities	For the estimation of leaving school, these variables on community-level facilities are examined: - a binary variable indicating whether there is an improved road (asphalt/cement/paved road) that can be traveled by motor vehicle - a binary variable indicating whether there is a public transit service - a binary variable indicating whether there are at least three senior secondary schools available for the community
Other time-varying variables indicating whether:	
- the person had migrated for education reason: included in the analysis of the timing of leaving school	
- the person had migrated for work reason: included in the analysis of the timing of first job	
- the person had started working: included in the analysis of the timing of leaving school, first marriage, and first birth	
Interactions between the following variables were also examined: - birth cohort and sex - residence and region - PCE and sex - residence and sex - whether has started working and sex for estimation of leaving school, first marriage, and first birth	

4. Statistical Analysis

4.1. Attrition before age 30 and the imputation of missing data

Any longitudinal study is prone to attrition, which can occur due to death of study participants, discontinued participation (refusal/withdrawal), or unsuccessful attempt in re-contacting

participants for a follow-up survey. Information on the magnitude, type of attrition, and the covariates associated with attrition is important to the interpretation of longitudinal analysis. In IFLS, the expansion of criteria for target respondents in subsequent surveys also created a significant percentage of participants who were interviewed in IFLS3, 4, and 5, but not in IFLS1 and 2. Here we discuss attrition from our study sample.

Table 3.5. The percentage of lost to follow-up before age 30 by demographic characteristics; among the study sample of individuals born in 1970-1985 who were members of original 1993 households of IFLS

Characteristic	Group (n)	% lost to follow-up
All persons		23.1
Sex*	Men (4,800)	25.9
	Women (4,948)	20.4
Birth cohort*	1970-1979 (5,154)	18.1
	1980-1985 (4,594)	29.8
Residence*	Urban (4,908)	29.6
	Rural (4,840)	19.3
Per capita	1st quintile (1,953)	22.7
household	2nd quintile (1,941)	20.7
expenditure*	3rd quintile (1,936)	18.5
	4th quintile (1,930)	21.9
	5th quintile (1,919)	33.9
Education+	No education (2,886)	19.2
	Junior secondary (2,072)	23.1
	Senior secondary (3,317)	22.4
	College (1,263)	32.4
	Other (210)	52.4

* measured in IFLS1 in 1993
+ education level at last interview

Overall, 23% (n=2,537) of the study sample was not followed-up until age 30. Men, individuals who were born in 1980-1985, who resided in urban areas, who were in the highest quintile of per capita household expenditure, and who had college education had a higher percentage of respondents dropping out of the survey before age 30 than their counterparts (**Table 3.5**). The analyses of migration (in the Results section) showed that the percentage of individuals who migrated was higher among the 1980-1985 birth cohort than the 1970-1979 birth cohort, resulting in the higher percentage of lost to follow-up among the 1980-1985 birth cohort. The reasons for

the subject loss before age 30 are presented in **Table A.3.2** (in the Appendix section). Almost a third of the subject loss (27% of 1970s birth cohort and 31% of 1980s birth cohort) were due to individuals moving out to find employment, 12% were due to marriage, and 3% were due to individuals moving out to continue their education. A significant percentage (14%) were lost to follow-up due to the household not found, moved to a non-IFLS province or an unknown location. Almost 10% refused to be interviewed, and 7% died.

At least 44% of the subject loss is related to the outcomes of interest (school enrollment, employment, and marriage), and the lost data can be assumed as missing not at random (MNAR). Under a missing not at random assumption, including only complete cases in the analysis can lead to bias; such as underestimation of the percentage of individuals who have ever worked by age 30. Therefore, for individuals who were lost to follow-up because they moved out to find a first job (n=311) or for first marriage (n=195), their date of the event was determined to be the same as their date of exit from the household, which was reported during household roster review. One might argue that some individuals would not find a job right away and thus their date of the first job would be later than the date of exit. However, to simplify the determination of the date of the first job; I would assume that these individuals started their job as soon as they moved out of the household. The date of the first migration was also determined to be the same as the date of exit (n=1,254) for individuals who moved out of the household or whose entire household moved to a non-IFLS province or an unknown location.

For individuals with the month of exit missing, the month of an event was imputed randomly based on the frequency distribution of the month of the event of the sample with complete date. For individuals with the year of exit missing, the year of an event was imputed as the middle year between the last interview and the survey when the subject was lost (n=26 for the year of first job, n=14 for the year of first marriage, and n=344 for the year of first migration).

Imputation of missing month and year of an event

Longitudinal surveys also commonly suffer from incomplete reporting of the date of an event due to the respondents forgetting the exact date. The most common problem is the respondents reported the year but not the month of the event, or the respondents reported their age when they experienced the event. Because the time of an event is central to this analysis, incomplete dates need to be imputed appropriately before being used for analysis. For this analysis, for observations with a missing date of the event, I need to impute: (1) the date of graduation or leaving school, (2) the date at first employment, (3) the date at first marriage, (4) the date at first live birth for women, and (5) the date at first migration after age 12.

The date most often incomplete is the month of the first job because the questionnaire only started asking the month of the first job in IFLS5. A substantial percentage of the month of the first migration (30%) and leaving school (15%) is also missing (**Table 3.6**). A minuscule percentage of the year of the event is missing; overall only 60 (0.6%) respondents have at least a year of an event missing. Therefore, these 60 respondents were excluded from this analysis.

Table 3.6. The percentage of missing values for the year/age and month of the transition events, among individuals who have experienced the event; by birth cohort

Event		Both birth cohorts		Birth cohort			
				1970-1979		1980-1985	
		n	%	n	%	n	%
Leaving school	Year/age	4	0.05	3	0.06	1	0.02
	Month	1342	15.2	705	14.6	637	15.9
First employment	Year/age	-	-	-	-	-	-
	Month	8026	96.9	4498	97.8	3528	95.7
First marriage	Year/age	16	0.2	8	0.2	8	0.3
	Month	453	6.3	229	5.6	224	7.3
First birth	Year/age	36	1.0	16	0.7	20	1.3
	Month	40	1.1	24	1.1	16	1.0
First migration since age 12	Year/age	6	0.3	12	0.4	7	0.3
	Month	996	28.5	676	29.9	320	25.9

The methods to impute the missing month

The analyses involve determining the sequence of the events, and the imputation of missing month creates a possibility of error if the events happened in the same year. Among the study sample who have experienced the pair of the events and the years of the events were not missing, [*left school - first job*] is the pair of events most commonly occurred in the same year (17%). Fortunately, the percentage of a pair of events occurred in the same year is less than 8% for [*first job - first marriage*] pair, and less than 5% for [*first job - first marriage*] and [*left school - first marriage*] pair (**Table A.3.3**).

The values for the missing month (1-12) were assigned randomly, based on the frequency distribution of the month of the event of the sample with complete dates. For example, 85% of the reported month of school-leaving are May, June, and July, which are the official months of school graduation. Therefore, 85% of the missing month of school-leaving was randomly assigned to 5, 6, or 7.

Below are the steps to assign a value to missing month:

1. By looking at the sample with a complete date, I found that the distribution of the month of some events can be different depending on whether that event occurred in the same year as another event. As an example, for those who finished school and started a job in the same year, the distribution of the month of the first job is as follows: the percentage is 8-16% for each month between June and December, which makes sense as school graduation is in May - July and these individuals seemed to start working soon after graduation. For those who finished school and started a job in different years, the distribution of the month of the first job is concentrated in the first seven months of the year instead.

2. Because [*left school - first job*] and *[first job - first migration]* pairs have a considerable percentage of cases that occur in the same year, the random assignment is done separately for the two groups i.e. whose pair of the events occurred (a) in the same year and (b) in the different year.

   Individuals who have left school and or have ever worked were categorized to the two groups: (a) "*in the same year*" if they left school and started working in the same year; (b) "*in different year*" if the events happened in different years, or if they have left school but never worked, or if they have worked but were still in school. Two groups were created similarly for individuals who have ever worked and or have had migrated after age 12.

3. Step 2 and Step 3 were done separately for each group. Initially, random numbers ranging from 0.0 to 1.0 were generated for all observations with missing month of leaving school in "*in different year*" group of [*left school - first job*]. Those observations with missing month were then sorted by the random numbers.

4. Tabulate to get the frequency distribution of the non-missing month of leaving school of those in "in different year" group of [*left school- first job*]. A value (1-12) were assigned to the sorted observations based on that frequency distribution.

   For example, 100 respondents have a missing value for the month of leaving school. Among respondents with a complete date, 1% and 2% reported that they left school in January and February, respectively. Therefore, respondent number 1 of the 100 respondents (who have been sorted by the random numbers) was assigned 1 (January) to replace the missing value, and respondents number 2-3 were assigned 2 (February).

5. Repeat step 2 and 3 for the observations with a missing month of leaving school in "*in the same year*" group of [*left school- first job*]; for the observations with a missing month of first job in both groups of [*left school- first job*]; and for the observations with a missing month of first migration after age 12 in both groups of [*first job - first migration*].

6. Observations with a missing month of first marriage or first birth did not need to be categorized into similar groups since only a small percentage of first marriage or first birth occurred in the same year as another event. Step 2 and step 3 were done to replace all of the missing month of first marriage and first birth.

Figure 3.3 is a flowchart illustrating the steps to impute the missing month of starting a job. Similar steps were repeated to impute the missing month of migration.

Figure 3.3. The steps to impute the missing month of starting a job, for the sample who had started a job with the year or age of the event known but the month was missing
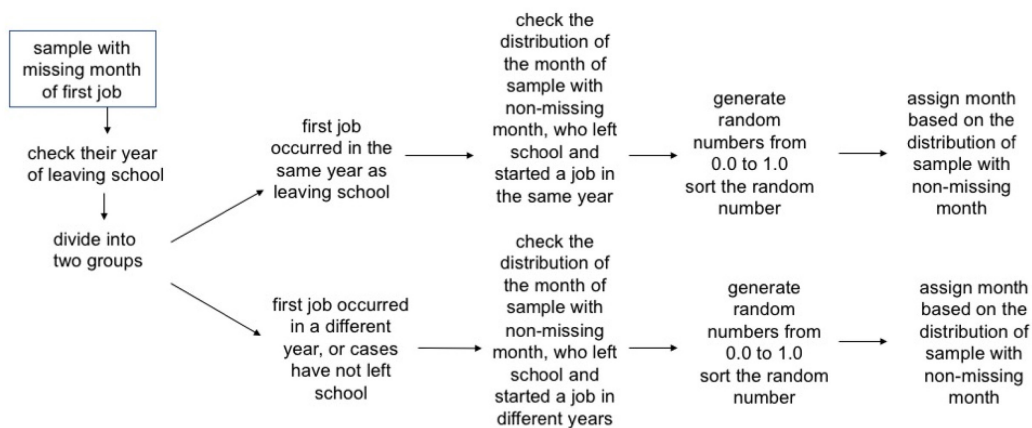
4.2. Methods for Aim 1

Data preparation and modeling will be conducted using Stata 14. Descriptive statistics such as the percentage ever experiencing the event marking the transition to adulthood by a specific age (12, 15, 18, 20, 25, 30); the percentage of individuals who ever migrate for education or employment and for other reason by age 15, 20, 25, and 30; and the percentage experiencing a given pattern of sequence of events, by sex and cohort, will be calculated. Specifically the most prevalent sequence of transition, the percentage of individuals who start working before leaving

school, and percentage of women who have a first child before first marriage by cohort will be determined. The weighted percentages will be presented using the adjusted roster weight that has been generated from the roster weight that is available in the public data, as has been described in the Sample section above, so that the weighted sample of individuals are representative of 1993 population (John Strauss, Witoelar, & Sikoki, 2016). To test whether two percentages are equal, chi-square statistics for weighted data will be calculated.

4.3. Methods for Aim 2 and 3

Discrete-time logit hazard model will be used to estimate the hazards and survival function, and to calculate the median time of each first event out of school, into employment, marriage, and parenthood. The analysis follows and measures the time between a starting point when all individuals have not yet experienced the event and thus are at risk of the event and the occurrence of the event or the end of observation. In this analysis, the starting point is set at age 6 and the end of observation is set at age 30. Individuals who have not experienced the event by the age of 30 or who dropped out of survey before age 30 are right censored. For this discrete-time survival analysis of single events, the covariates of primary interest are birth cohort and sex.

Data expansion for discrete-time logit model

The following are the steps to prepare the data for discrete-time logistic regression modeling:

1. Because the month and year of birth was known, and the month and year of the event of interest were reported or has been imputed (if month if missing); the time of the event can be calculated in months since birth. The time of the event was then binned in three-monthly intervals (or in quarters). Because very few (n=11) persons have experienced any of the four events before age 6, the origin is set to be at age 6. For example, a person was born in January 1980 and left school in January 2000. The time of leaving school is 240 months since birth. In the data, the time of leaving school is 56th quarters since age 6.

For persons who were followed up until at least age 30 and did not experience the event by age 30, the censoring time is age 30. For persons who were lost to follow-up before age 30 and have not experienced the event by the time they dropped out of the survey, the censoring time is the age at the last interview.

2. A binary censoring indicator was generated, indicating whether the event was observed or the response was censored.

3. I expanded the time of the event and the censoring indicator; so that each person was represented by a row of data for each quarter the person was at risk of experiencing the event. For example, if a person left school at age 12 - which is expressed to be at 24th quarter since age 6 -, there would be 24 rows of time-interval observations for the person. The expanded censoring indicator would take the value of 0 in row 1 to 23, and the value of 1 in row 24.

4. The occurrence of the other events was also included as time-varying covariates of the event of interest. A binary indicator was generated for each of the other events, indicating whether this other event has occurred before the time interval.

For example, in the discrete-time logit model for first marriage, I included the occurrence of first employment as time-varying covariates. A person was born in January 1980, married in January 2000, left school in January 1998, and got her first job in January 2002. There would be 56 rows of observation for the person; since she married at age 20, which was the 56th quarter since age 6. The expanded censoring indicator would take value of 0 in row 1 to 55, and the value of 1 in row 56. The time-varying indicator for leaving school would take value of 0 in row 1 to 47, and the value of 1 in row 48 to 56. The time-varying indicator for employment would take value of 0 in row 1 to 56 since employment occurred in 64th quarter since age 6.

The discrete-time logit regression model for the hazard of experiencing the event

Discrete-time survival model is specified in terms of the discrete-time hazard, defined as the conditional probability that the event g will occur at the time interval t_j, given that the event hasn't occurred earlier.

$$h^g(t_j) = h_j^g = \Pr(T^g = t_j | T^g > t_{j-1})$$

The discrete-time survival function is the probability of not experiencing the event g by the time interval t_j:

$$S^g(t_j) = \Pr(T^g > t_j) = \prod_{j=1}^{t} (1 - h_j^g)$$

The Stata's ltable command will provide the estimated survival function and hazard function.

The discrete time logit model to obtain the estimated baseline hazards for each time interval as predicted probabilities; where the covariates are dummy variables for each time interval:

$$logit(\Pr(Y_{ij}^g = 1 | D_{ij}) = \alpha_1 + \alpha_2\, d_{1ij} + \alpha_3\, d_{2ij} + \alpha_4\, d_{3ij} + \cdots + \alpha_{97}\, d_{96ij}$$

where: $Y_{ij}^g = 1$ if $j - 1 < T_i^g \leq j$
             $Y_{ij}^g = 0$ if $T_i^g > j$ or $T_i^g > C_i$

Y_{ij}^g is the indicator for event g occurring at time interval j for person i
D_{ij} is a vector containing all the dummy variables of the time interval for person i
$d_{1ij},\, d_{2ij}, d_{3ij}, \dots, d_{96ij}$ are dummy variables for (three-monthly) time interval 1 – 96
$\alpha_2,\, \alpha_3, \alpha_4, \dots, \alpha_{97}$ are the coefficients of the dummy variables for (three-monthly) time interval 1 – 96
T_i^g is time experiencing the event g for person i
C_i is censoring time for person i

The same model including the (time-constant) covariates:
$$logit(\Pr(Y_{ij}^g = 1 | D_{ij}, X_i) = \alpha_1 + \alpha_2\, d_{1ij} + \alpha_3\, d_{2ij} + \alpha_4\, d_{3ij} + \cdots + \alpha_{97}\, d_{96ij} + \beta_1 x_{1i} + \beta_2 x_{2i}$$
X_i is the vector of the time-constant covariates for person i

x_{1i}, x_{2i} are the time-constant covariates such as birth cohort, sex, per-capita expenditure, and region in 1993. They can be added as required.

β_1, β_2 are the coefficients of the time-constant covariates

The same model including the time-varying covariates:

$$logit(\Pr(\mathcal{Y}_{ij}^g = 1|D_{ij}, X_{ij}) = \alpha_1 + \alpha_2 d_{1ij} + \alpha_3 d_{2ij} + \alpha_4 d_{3ij} + \cdots + \alpha_{97} d_{96ij} + \beta_1 x_{1i} + \beta_2 x_{2i} +$$

$$Am_{ij} + Bn_{ij}$$

X_{ij} is the vector of the time-constant and time-varying covariates for person i

m_{ij}, n_{ij} are the time-varying covariates such as a variable indicating whether the person i has

migrated for education before the time interval j, for the model estimating the timing of leaving

school.

A, B are the coefficients of the time-varying covariates

Where for example, for the estimation of the probability of leaving school, which include whether

the person has migrated for education: m_{ij} = 1   if $T^m < j <$ T^g

$$m_{ij} = 0 \quad \text{if} \quad T^m > j$$

T^m is time experiencing the migration (m) for person i

The same model including the interaction:

$$logit(\Pr(\mathcal{Y}_{ij}^g = 1|D_{ij}, X_{ij}) = \alpha_1 + \alpha_2 d_{1ij} + \alpha_3 d_{2ij} + \alpha_4 d_{3ij} + \cdots + \alpha_{97} d_{96ij} + \beta_1 x_{1i} + \beta_2 x_{2i} +$$

$$Am_{ij} + Bn_{ij} + \beta_3 x_{1i} x_{2i}$$

$x_{1i} x_{2i}$ is the interaction of covariate x_{1i} and x_{2i}

β_3 is the coefficient of the interaction of x_{1i} and x_{2i}

I performed a simple analysis for each covariate to determine the significance of its effect before

adding the covariate in the model, using alpha level of 0.05 (shown in the Appendix). I also

checked the interaction effect of several pairs of covariates (as has been listed above). From this

work, the predictors used in the final model for the four events are detailed below in **Table 3.7.a**

and 3.7.b:

Table 3.7.a. The variables used in the multiple discrete-time logistic regression of the hazard of an event **to compare the 1970-1979 and the 1980-1985 birth cohorts**

Covariates	Event			
	Leaving /finishing school	Full-time employment	First marriage	First birth (women)
Birth cohort	X	X	X	X
Sex	X	X	X	X
Residence	X	X	X	X
Province	X	X	X	X
Number of years of schooling		X	X	X
Interaction of time and sex	X	X	X	
Interaction of time and birth cohort	X	X	X	X
Interaction of sex and birth cohort	X	X	X	
Interaction of residence and region	X			
Interaction of residence and sex	X	X	X	

Table 3.7.b. The variables used in the multiple discrete-time logistic regression of the hazard of an event among a subsample who were born in 1979-1985 (who were less than 14 years old in 1993)

Covariates	Event			
	Leaving /finishing school	Full-time employment	First marriage	First birth (women)
Number of years of schooling		X	X	X
Religion	X	X	X	X
Parent's education	X	X	X	X
Parent's coresidence in the HH	X		X	
HH PCE quintile measured in 1993	X	X	X	X
Whether had migrated for education before the time interval	X			
Whether had migrated for work before the time interval		X		
Whether had started working before the time interval	X		X	X
Duration of marriage (in year)				X
Residence	X	X	X	X
Province	X	X	X	X
Availability of senior high school (3 or more high schools)	X			
Availability of public transit	X			

The interaction of sex and time, sex and residence, and sex and whether has started working are significant. Therefore the analyses to examine the factors predicting the events marking the transition to adulthood are done separately for men and women.

4.4. Methods for Aim 4

Data with discrete-time logit model structure as described above cannot directly be estimated simultaneously using Stata. For aim 4, I change the data structure and the statistical model used to be able to estimate several events jointly. Multivariate probit model is used to estimate the events (as binary outcomes) that are thought to be interdependent. The following pairs of events will be estimated jointly: [leaving school – starting a job – getting married]. Seemingly unrelated multi-equation probit regression can be performed for models where the outcome variables may not depend on the same list of independent variables, but are still correlated (Bartus & Roodman, 2014; Hardin, 1996; Roodman, 2009).

Data preparation for the multivariate probit model

The age at experiencing the event of interest is expressed in months, and the data are expanded so that every individual has rows representing each month he/she is at risk of experiencing the event. The outcome variables have a value of 0 in the months when the event did not happen and have a value of 1 in the month the event occurred. To accommodate individual's education as a time-varying covariate, I also create spells of age 0-13 years, 14-16, 17-19, and 20-30. Next, the rows (representing person-month) when the event did not happen and the individual's education categories (i.e. 0-6 years, 7-9, 10-12, and >12 years of education) are the same (and thus identical) are collapsed, so that I have fewer rows of observation for each individual, which facilitates faster computation. **Figure 3.4** displays the data structure for the multivariate probit model.

Figure 3.4. The data structure for the multivariate probit model

	pidlink	age_censor	age_sc	age_wo	age_marr	sc	wo	mar	dur	period
107	003240005	30	23.58333	.	23.33333	0	0	0	156	0–13
108	003240005	30	23.58333	.	23.33333	0	0	0	36	14–16
109	003240005	30	23.58333	.	23.33333	0	0	0	36	17–19
110	003240005	30	23.58333	.	23.33333	0	0	0	51	20–30
111	003240005	30	23.58333	.	23.33333	0	0	1	1	20–30
112	003240005	30	23.58333	.	23.33333	0	0	0	2	20–30
113	003240005	30	23.58333	.	23.33333	1	0	0	1	20–30
114	003240005	30	23.58333	.	23.33333	0	0	0	77	20–30
115	004030005	24.33333	14.41667	17.75	.	0	0	0	156	0–13
116	004030005	24.33333	14.41667	17.75	.	0	0	0	16	14–16
117	004030005	24.33333	14.41667	17.75	.	1	0	0	1	14–16
118	004030005	24.33333	14.41667	17.75	.	0	0	0	19	14–16
119	004030005	24.33333	14.41667	17.75	.	0	0	0	20	17–19
120	004030005	24.33333	14.41667	17.75	.	0	1	0	1	17–19
121	004030005	24.33333	14.41667	17.75	.	0	0	0	15	17–19
122	004030005	24.33333	14.41667	17.75	.	0	0	0	64	20–30
123	004090006	17.91667	.	.	.	0	0	0	156	0–13
124	004090006	17.91667	.	.	.	0	0	0	36	14–16
125	004090006	17.91667	.	.	.	0	0	0	23	17–19

The variables are: pidlink (individual ID), age_sc (age when leaving school in years), age_wo (age when starting a job in years), age_marr (age when getting married in years), sc (binary variable indicating whether individual left school during the spell), wo (binary variable indicating whether individual started a job during the spell), mar (binary variable indicating whether individual married during the spell), dur (duration of the spells in months), period (indicating the period of the spells, at 0-13 years, 14-16, 17-19, or 20-30).

The basic of the equation system is as follows:

$$\mathcal{Y}_{i1}^* = X_{i1}\beta + \epsilon_{i1}$$

$$\mathcal{Y}_{i2}^* = X_{i2}\beta + \epsilon_{i2}$$

$$\begin{bmatrix} \epsilon_{i1} \\ \epsilon_{i2} \end{bmatrix} \sim \text{Simple normal distribution} \left(\begin{bmatrix} 0 \\ 0 \end{bmatrix}, \sigma^2 \begin{bmatrix} I & \rho I \\ \rho I & I \end{bmatrix} \right)$$

Where $\mathcal{Y}_{i1}^*$ and $\mathcal{Y}_{i2}^*$ are the underlying latent variables that manifest as discrete (binary) variables

Y_{i1} and Y_{i2} through a threshold specification

$$Y_{i1} = \begin{cases} 1 & \text{if } \mathcal{Y}_{i1}^* > 0, \\ 0 & \text{otherwise,} \end{cases}$$

$$Y_{i2} = \begin{cases} 1 & \text{if } \mathcal{Y}_{i2}^* > 0, \\ 0 & \text{otherwise,} \end{cases}$$

X_{i1} and X_{i2} are vectors of covariates, and $\begin{bmatrix} \epsilon_{i1} \\ \epsilon_{i2} \end{bmatrix}$ is a vector of residuals described by a simple normal distribution with correlation σ^2. For identification reasons, the variances of the residuals must equal 1.

The model for this analysis to simultaneously estimate the probability that an individual i leaves school (s), starts a job (w), or gets married (m):

$$Y_{is}^* = \beta_{1s}x_{1is} + \beta_{2s}x_{2is} + \cdots + \beta_{5s}x_{5ijs} + \beta_{6s}x_{6ijs} + \beta_{7s}x_{7ijs} + \beta_{8s}x_{7ijs} * x_{7ijs} + \epsilon_{is}$$

$$Y_{iw}^* = \beta_{1w}x_{1iw} + \beta_{2w}x_{2iw} + \cdots + \beta_{4w}x_{4ijw} + \beta_{5w}x_{5ijs} + \beta_{6w}x_{6ijw} + \beta_{7w}x_{6ijw} * x_{6ijw} + \epsilon_{iw}$$

$$Y_{im}^* = \beta_{1m}x_{1im} + \beta_{2m}x_{2im} + \cdots + \beta_{5m}x_{5ijm} + \beta_{6m}x_{6ijm} + \beta_{7m}x_{7ijm} + \beta_{8m}x_{7ijm} * x_{7ijm} + \epsilon_{im}$$

$$\begin{bmatrix} \epsilon_{is} \\ \epsilon_{iw} \\ \epsilon_{im} \end{bmatrix} \sim \text{Trivariate normal distribution with mean 0 } (0, \Sigma)$$

Where Y_{is}^*, Y_{iw}^*, and Y_{im}^* are the underlying latent variables that manifest as discrete (binary) variables Y_{is}, Y_{iw}, and Y_{im} through a threshold specification:

$$Y_{is} = \begin{cases} 1 & if\ Y_{is}^* > 0, \\ 0 & otherwise, \end{cases}$$

$$Y_{iw} = \begin{cases} 1 & if\ Y_{iw}^* > 0, \\ 0 & otherwise, \end{cases}$$

$$Y_{im} = \begin{cases} 1 & if\ Y_{im}^* > 0, \\ 0 & otherwise, \end{cases}$$

X_{is} , X_{iw} , X_{im} are the vector of the age-constant and age-varying covariates for person i

x_{1is} , x_{2is} ... are the age-constant covariates for the event of leaving school

x_{5ijs} , x_{6ijs} ... are the age-varying covariates for the event of leaving school

x_{1iw} , x_{2iw} ... are the age-constant covariates for the event of starting a job

x_{4ijw} , x_{5ijw} ... are the age-varying covariates for the event of starting a job

x_{1im} , x_{2im} ... are the age-constant covariates for the event of getting married

x_{5ijm} , x_{6ijm} ... are the age-varying covariates for the event of getting married

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x_{7ijs} , x_{6ijw} , x_{7ijm} are the age-varying age of respondents, for duration dependence

$\beta_1, \beta_2, ...$ are the coefficients of the covariates

ϵ_{is} , ϵ_{iw} , ϵ_{im} are the residuals

Σ is the variance – covariance matrix where the variances of the residuals must equal 1 for identification reasons (Roodman, 2009).

The predictors included in the multivariate probit model are as follows:

Table 3.8. The variables used in the multivariate probit model for the probability of the event among a subsample who were born in 1979-1985 (who were less than 14 years old in 1993)			
	Event		
Covariates	Leaving /finishing school	Full-time employment	First marriage
Individual's education		X	X
Individual's religion	X	X	X
Parent's education	X	X	X
Parent's coresidence in the HH in 1993	X		X
HH PCE quintile measured in 1993	X	X	X
Age	X	X	X
Residence	X	X	X
Province	X	X	X

The age of the individuals at each spell (the span of time during which an individual is at risk to experience the event) was also included in the model for duration dependence. The product of the duration variable (i.e. the number of months in the single spell) and the survey weight was used as weight[1], as the contribution of one individual to the log likelihood function is something multiplied by the survey weight, and the contribution of one spell to the individual level log likelihood is something multiplied by duration of the spell. The estimation also accounts for individual clustering.

The Stata module cmp (conditional mixed-process) written by Rodman fits Seemingly Unrelated Regression (SUR) models that combine several models (which can be linear regression, probit, ordered probit, multinomial probit, Tobit, interval regression, or truncated distribution regression

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[1] Personal consultation with Dr Tamas Bartus

models) into multi-equation systems in which the errors share a multivariate normal distribution using maximum likelihood estimation (Bartus & Roodman, 2014; Roodman, 2009). The command will give a correlation coefficient ("rho") between the residuals of the two probits. The "rho" that is significantly different from zero suggests that the timing of the two events are correlated and should be estimated simultaneously. The command will also provide the log-likelihood, pseudo-R squared for the single probit model, and the results of the chi-square test for the single and multivariate probit model.

The Stata commands used for the model are as follows:

global svar ib1.father_edu ib3.pce_quintile i.parentcoresidence i.religion ib2.urban ib5.prov c.age##c.age

global wvar i.own_edu ib1.father_edu ib3.pce_quintile i.religion ib2.urban ib5.prov c.age##c.age

global mvar i.own_edu ib1.father_edu ib3.pce_quintile i.parentcoresidence i.religion ib2.urban ib5.prov c.age##c.age

Multivariate probits of leaving school, starting a job, and getting married (wdur is the product of the sample weight and the duration of each spell in months):

cmp (sc = $svar) (wo = $wvar) (mar = $mvar) [iw=wdur], vce(cluster pidlink) ind(4 4 4)

CHAPTER 4: RESULTS

1. **Description of the Transition to Adulthood**

1.1.   Sociodemographic profile of the study sample

The study sample has been partially described in the Sample Size and Weight section. This study

analyzed the data from 9,688 persons born in 1970-1985 who were members of the original 1993

households of IFLS, and their sociodemographic profile is presented in **Table 4.1.a and Table

4.1.b**. All the percentages in this section are weighted unless noted otherwise noted.

Many persons had a primary school education even among the younger birth cohort. At age 19,

more than a third of the sample had a senior secondary school education and 5-8% had a college

education; the percentages were slightly higher for the 1980-1985 birth cohort. In 1993, the

majority still lived in a rural area and the provinces in Java island. The percentage of persons born

in the rural area was higher than the percentage of persons residing in the rural area in 1993,

indicating migration from rural to urban area that had occurred for some cases.

The majority of the subsample who were less than 14 years old in 1993 lived with both parents in

a male-headed household, 75% had a father with elementary school or no education. Ninety

percent of the subsample were Muslims, 5% were Protestant, and 2% were Hindu. The majority

lived in a community with access to three or more elementary and junior secondary schools, but

only half were living in a community with access to three or more senior secondary schools and

a third had access to a vocational school. Twenty percent did not have access to improved roads

that were passable by motor vehicle and 30% did not have access to public transit in 1993.

Table 4.1.a. The sociodemographic profile of the analysis sample i.e. persons born in 1970-1985 who were members of the original 1993 households of IFLS (n=9,688), by year of birth (weighted)

Characteristics		N of sample (unweighted)	Both birth cohorts %	Birth cohort 1970-1979 %	Birth cohort 1980-1985 %
Cohort	1970-1979	5,122	57.3		
	1980-1984	4,566	42.7		
Sex	Men	4,792	50.5	49.7	51.6
	Women	4,896	49.5	50.3	48.4
Education+*	No education or primary	2,284	30.5	35.7	22.7
	Junior secondary	1,913	23.8	22.0	26.6
	Senior secondary	3,953	39.2	37	42.4
	College	749	6.5	5.4	8.3
Per capita household expenditure^*					
	1st quintile	1.940	23.7	23.2	24.3
	2nd quintile	1,932	21.4	20.3	23.0
	3rd quintile	1,920	20.0	19.5	20.6
	4th quintile	1,921	18.4	18.6	18.1
	5th quintile	1,906	16.5	18.4	14.0
Residence^	Urban	4,884	37.4	39.7	34.4
	Rural	4,804	62.6	60.3	65.6
Province^	North Sumatra	817	7.6	7.3	8.0
	West Sumatra	56	2.7	2.7	2.7
	South Sumatra	520	4.5	4.5	4.5
	Lampung	434	4.5	4.5	4.5
	DKI Jakarta	1,081	6.2	6.9	5.3
	West Java	1,488	24.3	24.0	24.7
	Central Java	1,106	17.9	17.5	18.5
	DI Yogyakarta	468	1.7	1.8	1.5
	East Java	1,192	19.9	20.1	19.7
	Bali	431	1.7	1.9	1.5
	West Nusa Tenggara	570	2.3	2.3	2.4
	South Kalimantan	427	1.9	1.9	1.8
	South Sulawesi	598	4.8	4.5	4.8
Birth place	Urban	3645	29.2	29.5	28.7
	Rural	6043	70.8	70.5	71.3

* the difference between birth cohorts is statistically significant
+ the highest level of education ever enrolled, at age 19 among those who were followed up until age 19
^ in IFLS1 interview in 1993

Table 4.1.b. The household and community level profile during childhood (before age 14) and select individual profile of the study sample who were born in 1979-1985 who were members of the original 1993 households of IFLS and (who were less than 14 years old in 1993)

Characteristics		N of sample (unweighted)	%
Sex	Men	2,347	50.5
	Women	2,319	49.5
Education+	No education or primary	778	22.9
	Junior secondary	932	26.5
	Senior secondary	1,862	42.5
	College	416	8.2
Religion	Islam	8,413	90.6
	Protestant	490	4.8
	Catholic	177	1.3
	Hinduism	418	1.9
	Buddhism	90	0.6
	Other	87	0.8
Household or family level			
Parent's co-residency in the HH			
	Both	3,764	80.2
	Only mother	421	9.2
	Only father	116	2.6
	None of the parents	359	8.1
Parent's* education	Senior secondary or higher	845	14.8
	Junior secondary	601	10.7
	Primary	2580	58.7
	None	634	15.8
Sex of the head of the household	Men	4,196	89.6
	Women	464	10.4
Community level			
Living in a community with access to	≥3 elementary schools	4,082	86.7
	≥3 junior secondary	3,590	81.7
	≥3 senior secondary	2,429	53.9
	a vocational school	1,290	29.0
Living in a community with access to	Improved roads that are passable by motor vehicle	3,928	79.2
	A public transit	3,662	71.4

+ the highest level of education ever enrolled, at age 19 among those who were followed up until age 19

* father's education if father was co-resident in the HH, mother's education if father was absent and mother was co-resident, or education of individual's guardian if father and mother were both absent

1.2. The occurrence and sequence of the events marking the transition to adulthood

The occurrence of the events marking the transition to adulthood

The percentages of individuals who have experienced the events marking the transition to adulthood are presented in **Table 4.2**.

Left/completing school

By age 20, 88% of persons had left school, and all but 0.1% were not in school by age 30. Across sexes, for 1970-1979 birth cohort, a significantly higher percentage of women than men had left school by age 20 and 25; and for 1980-1985 birth cohort, a significantly higher percentage of women than men had left school by age 25. Across birth cohorts, for women, there was no difference in the percentage having left school at all three age cut-offs; and for men, a significantly higher percentage of 1980-1985 birth cohort had left school by age 20 than among the 1970-1979 birth cohort.

First job

By age 20, 61% of men and 50% of women had ever worked, and by age 25 the percentage increased dramatically for both sexes. By age 30, almost all men and 88% of women have had their first full-time job. Across sexes, for both birth cohorts, significantly more men had ever worked than women at all milestones. The largest difference between men and women was in the percentage ever worked by age 25 for the 1970-1979 birth cohort (i.e. 18%). Across birth cohorts, for women, the percentages having started a job were significantly higher for the 1980-1985 birth cohort than the 1970-1979 birth cohort at all age points. For men, a significantly higher percentage of 1980-1985 birth cohort had ever worked than the 1970-1979 birth cohort by age 20 and 25.

First marriage

The starkest difference between men's and women's transition to adulthood was the age at first marriage. By age 20, 44% of women but only 9% of men had been married although the percentage of men quadrupled by age 25. By age 30, 7% of women and 20% of men were still unmarried. Across birth cohorts, for women, a significantly lower percentage of 1980-1985 birth cohort had been married than of 1970-1979 birth cohort by age 20. But by age 30, a significantly

higher percentage of 1980-1985 birth cohort had been married than their older peers. For men, a

significantly lower percentage of 1980-1985 birth cohort had been married than the 1970-1979

birth cohort by age 25.

Table 4 2. The percentage of the study sample (i.e. persons born in 1970-1985 who were a member of the original 1993 households of IFLS) who have experienced an event marking the transition to adulthood by age 20, 25, and 30, by birth cohort and sex (weighted)[a,b]

Birth cohort and transition	Age cut off and sex								
	By age 20			By age 25			By age 30		
	Both sexes	Men	Women	Both sexes	Men	Women	Both sexes	Men	Women
Both birth cohorts									
Left school	87.7	86.4	88.9*	98.5	98.0	99.1*	99.9	99.9	99.9
First job	55.4	61.3	49.5*	85.0	92.9	76.9*	93.4	98.5	88.1*
First marriage	26.8	9.1	44.1*	61.3	43.1	78.5*	86.7	79.7	93.0*
First migration	29.6	28.5	30.6	48.0	50.5	45.5*	58.9	63.7	54.1*
First live birth			29.5			68.6			88.0
Birth cohort 1970-1979									
Left school	87.4	85.3	89.6*	98.3	97.6	99.0*	99.9	99.9	99.9
First job	49.9	55.3	44.6*	82.3	91.4	73.3*	92.7	98.5	86.9*
First marriage	29.3	9.9	48.1*	62.5	44.8	78.8*	85.7	78.9	91.8*
First migration	24.5	23.1	25.9	42.8	45.7	40.0*	53.0	58.3	47.8*
First live birth			33.2			69.8			86.9
Birth cohort 1980-1985									
Left school	88.0	88.0º	88.0	98.8º	98.4	99.2*º	99.9	99.9	100
First job	63.5º	69.6º	57.0*º	88.8º	94.8º	82.2*º	94.5º	98.5	90.0*º
First marriage	22.9º	8.0	37.9*º	59.5º	40.5º	78.0*	88.2º	80.9	94.9*º
First migration	37.0º	36.2º	37.8º	55.5º	57.3º	53.7*º	67.8º	71.4º	64.0*º
First live birth			23.8º			66.9			89.8º

ºstatistically significant difference between birth cohorts
* statistically significant difference between sexes
[a]excluding those who have at least the year of one event missing (n=73)
[b]to calculate the percentage, the denominator is (1) persons who were followed-up until the age of interest plus (2) persons who have experienced the event and were lost to follow-up before the age of interest; and the numerator is persons who have experienced the event before the age of interest. Therefore, the sample size for each cell is different and could not be included in the table

First birth

By age 20, 30% of women had ever given birth, a percent that more than doubled by age 25. By

age 30, only 12% of women had never given birth. Across birth cohorts, a significantly lower

percentage of 1980-1985 birth cohort have had a child than of 1970-1979 birth cohort by age 20.

By age 30, a significantly higher percentage of 1980-1985 birth cohort have had a child than of

1970-1979 birth cohort.

First migration after age 12

About a third had ever migrated by age 20 and more than half by age 30; the percentages ever migrated by age 25 and 30 were significantly higher for men than women. Across birth cohorts, at all age points, a significantly higher percentage of 1980-1985 birth cohort had migrated than of 1970-1979 birth cohort.

Figure 4.1 displays the distribution of age at the events marking the transition to adulthood. There were wide ranges of the ages at experiencing the event. The distributions of age at finishing/left school, first job, and first migration were somewhat similar for men and women. The main difference was that men marry at a later age than women; the distribution of the age at first marriage for men is skewed to the right, compared to a slightly normal distribution for women.

Comparing the two birth cohorts, the changes in the distribution of age at leaving school, first job, first marriage, and first birth were small. The more noticeable differences were between the age of 12 and 17. There was a decrease in the percentage of finishing school at age 12 for women while there was an increase in the percentage of finishing school at age 15 for both sexes. The percentage starting a job between age 14 and 16 also increased for both sexes. The distribution of age at first marriage and first birth among women shifted slightly to the right. We can observe a jump at age 15 and 16 in the distribution of age at first migration for both sexes; for women, there were two peaks at age 15 and 18. This study sample migrated at earlier age and it seems that they migrated after leaving junior secondary and senior secondary school, as age 15 and 18 are the typical age of junior secondary and senior secondary school graduation. **Table A.4.1** displays the mean and median ages at experiencing the events marking the transition to adulthood.

Figure 4.1. Distribution of the age at the events marking the transition to adulthood, for all study sample who have experienced the event before age 30; by birth cohort and sex
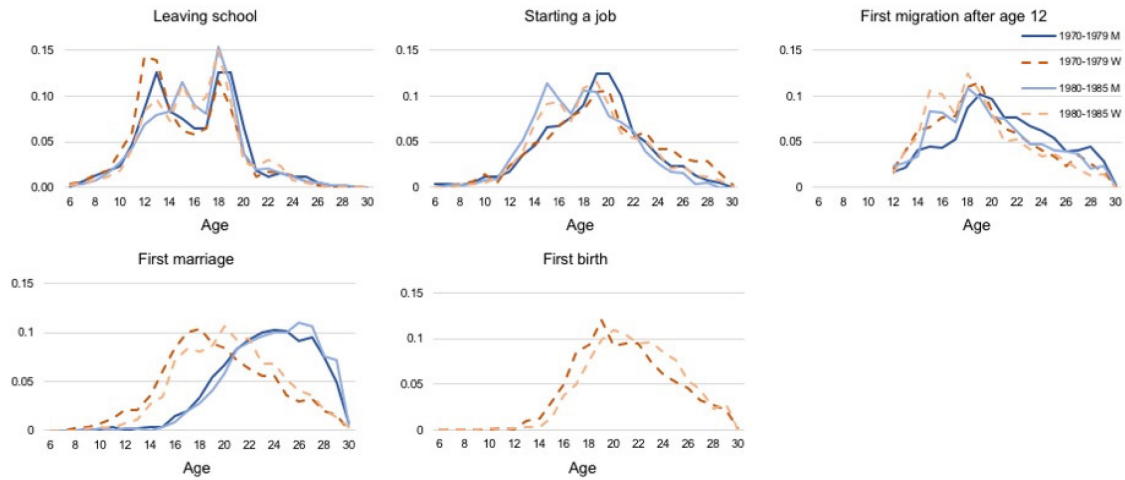
Table 4.3 displays the primary reason for the first migration after age 12. Employment (to get work at the destination or to search for new job opportunities) was the most cited reason in both cohorts, except for the 1970-1979 women whose most cited reason was marriage. For women, the percentage of first migration for work was significantly higher for the 1980-1985 birth cohort than the 1970-1979 birth cohort. The percentage of first migration for education was significantly higher for the 1980-1985 birth cohort than the 1970-1979 birth cohort for both sexes. Education was the third most common reason for the 1970-1979 birth cohort, but became the second most common reason for men of the 1980-1985 birth cohort at 22%. The percentage of first migration for education among women of the 1980-1985 birth cohort was comparable at 21%, but it was still ranked third after migration for marriage. These may explain the substantial increase in the first migration at younger ages, described above. Before, particularly for women, persons might finish school in their hometown and only moved after marriage. The younger cohorts migrated earlier to pursue employment or more education.

First migration for employment was significantly much higher among rural residents than urban residents, but there was no difference in the percentage of first migration for education by residence. Migration for employment was significantly highest among persons in the lowest tertile of per capita expenditure, while migration for education was significantly highest among persons in the top tertile.

Table 4 3. The percentage of the study sample (i.e. persons born in 1970-1985 who were a member of the original 1993 households of IFLS) who ever migrated by age 30, and the distribution of the reasons for the **first** migration after age 12, by birth cohort and sex, residence, and per capita expenditure.

	Birth cohort and sex						Residence		Per capita expenditure		
	1970-1979			1980-1985							
	Both sexes	Men	Women	Both sexes	Men	Women	Urban	Rural	Lowest	Middle	Highest
Ever migrated by age 30 for all reasons	53.0	58.3	47.7*	67.8º	71.4º	64.0*º	60.5	58.1*	58.1	56.5	63.2*
First migration by age 30 for a specific reason:											
Employment	40.8	50.6	28.9*	47.6	55.1	38.8*º	35.8	48.6*	53.7	42.6	32.6*
Continue education	15.1	15.5	14.6	21.5	21.7º	21.3º	19.6	17.2	12.0	17.0	27.2*
To be independent	3.9	3.6	4.2	3.5	2.9	4.2	5.2	2.8*	3.1	3.5	4.6
Marriage	28.6	20.1	38.8*	18.5	12.0º	26.1*º	25.6	23.0*	22.7	26.2	23.0
Family migration	8.4	7.7	9.3	7.4	7.4	7.4	11.1	6.1*	6.3	8.3	9.7*
Other	3.2	2.5	4.1*	1.5	1.0º	2.2*º	2.8	2.2	2.2	2.4	2.9
All reasons	100	100	100	100	100	100	100	100	100	100	100

ºstatistically significant difference between birth cohorts
* statistically significant difference between categories

The sequence of the events marking the transition to adulthood

There are 51 combinations of the sequence of leaving school, first job, first marriage, and first migration since age 12 (that had a percentage of at least 0.1% for any of the four birth cohort-sex groups) observed in both sexes; and 85 combinations of the sequence of leaving school, first job, first marriage, first birth, and first migration since age 12 observed in women. The list of all sequences (with a percentage of at least 0.1% for any of the four birth cohort-sex groups) observed and their frequencies are in **Table A.4.2** for both sexes and in **Table A.4.3** for women. **Figure 4.2** and **Figure 4.3** display the sequences (without migration, for a simpler display), ordered by the four summarizing categories: (1) first employment occurred before first marriage or first birth; (2) first marriage or first birth occurred before first employment; (3) first employment, not yet experiencing marriage or parenthood; and (4) first marriage or first birth, not yet experiencing first employment.

Table 4.4 summarizes those sequences to aid in reading and interpretation. Similarly, for men and women, by age 30, individuals most commonly gained employment first before entering a marriage; although the percentage was significantly higher for men than for women. However, the next most frequent sequence for men was "employment, no marriage or parenthood; and the majority of men (89% of 1970-1979 men and 94% of 1980-1985 men) were in "employment before marriage or parenthood" and "employment, no marriage or parenthood" by age 30. For women, the next most common sequences were "marriage or parenthood before employment" (32% of 1970-1979 women and 18% of 1980-1985 women) and "marriage or parenthood, no employment" (13% of women of both birth cohorts); while only a few men were in the two categories.

Across birth cohorts, a lot more women of the 1980-1985 birth cohort were in "employment before marriage or parenthood" compared to women of 1970-1979 birth cohort (63% vs. 45%). The

increase in the same category was small for men although it was still significant. The change corresponds to the decrease in the percentage of individuals in "marriage and or parenthood before employment" for both sexes. The percentage in other categories changed a little. Only 1% of individuals had never started a job and a family in all four birth cohort-sex groups.

As summarized in **Table 4.4**, the majority of the four birth cohort-sex groups had completed the transition to adulthood by leaving school, starting work and getting married (and or having their first birth) by age 30. The majority had done so by working first before starting a family, although the percentage of those who were employed before getting married among the women of the 1970-1979 cohort was a lot smaller (at 45%) than the other groups. Most members of this group ("employment before marriage or parenthood") had finished school before starting a job, but increasingly for men of the 1980-1985 birth cohort, some had started working before finishing school. For example, among members of the "employment before marriage or parenthood", for 1970-1979 men, 15% had started working before finishing school. For 1980-1985 men, 21% of the members of the same group had started working before finishing school.

Less than 10% of women of both birth cohorts had not been married nor given birth by age 30. The percentage was significantly higher among the 1970-1979 birth cohort at 9%, compared to 6% among the 1980-1985 birth cohort. Contrastingly, 22% of men of both birth cohorts had not been married by age 30. Similar to those in "employed before marriage or parenthood" group, the men in the "employment, no marriage or parenthood" finished school first before starting a job. Again, increasingly for the 1980-1985 men, some begun working before leaving school. In the "employment, no marriage or parenthood" group, for 1970-1979 men, 13% had started working before finishing school. For 1980-1985 men, 22% of men in the group had started working before leaving school.

Figure 4.2. The distribution of the sequence of the events marking the transition to adulthood, among study sample who were observed until age 30, by birth cohort and sex
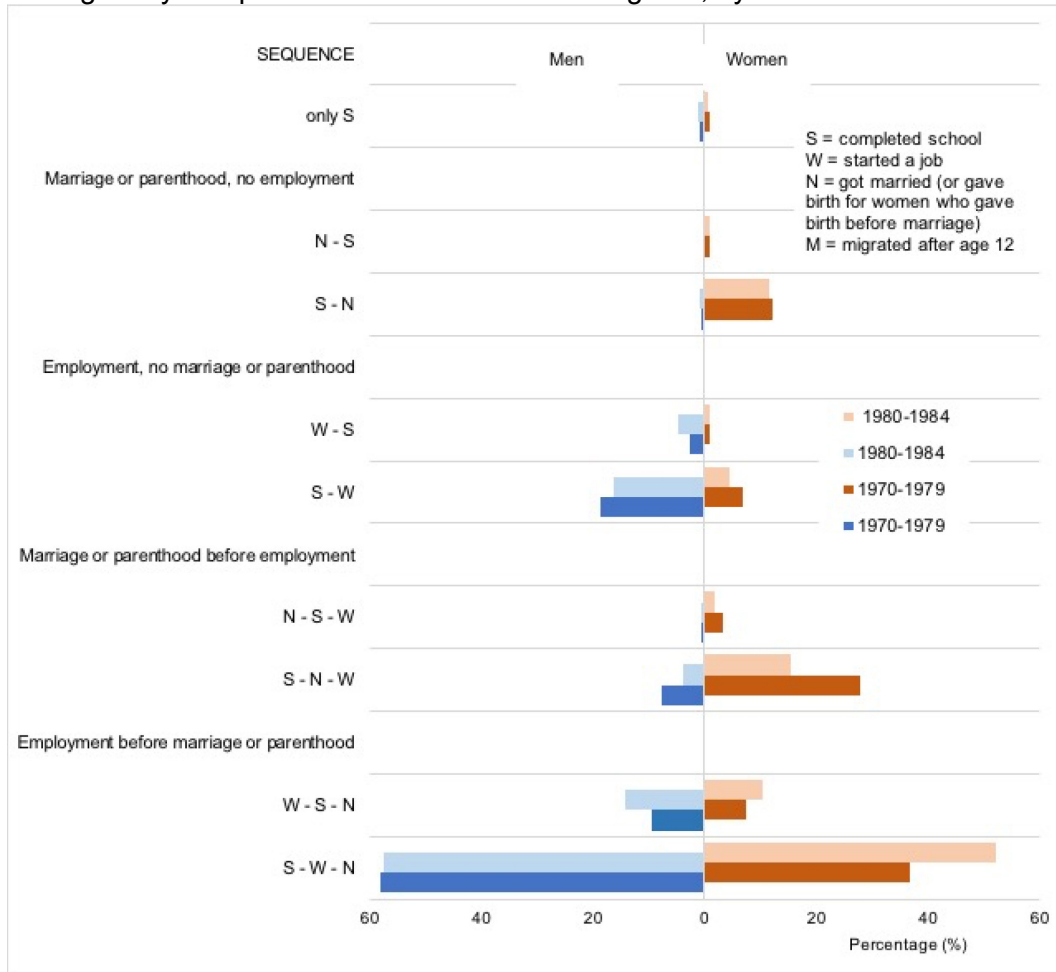
Figure 4.3 tells the same profile for women, only it includes first birth in the sequence. Comparing the two birth cohorts, there was a marked increase in the percentage of women experiencing [S – W – N – B] and [W – S – N – B] sequences; and as a result, a noticeable decrease in the percentage of women experiencing [S – N – B – W] and [S – N – W – B] sequences. There was also a significant decrease in the percentage of women experiencing [S – W] sequence. By age 30, almost all first marriage had been followed by a first birth.

Figure 4.3. The distribution of the sequence of the events marking the transition to adulthood, among female study sample who were observed until age 30, by birth cohort
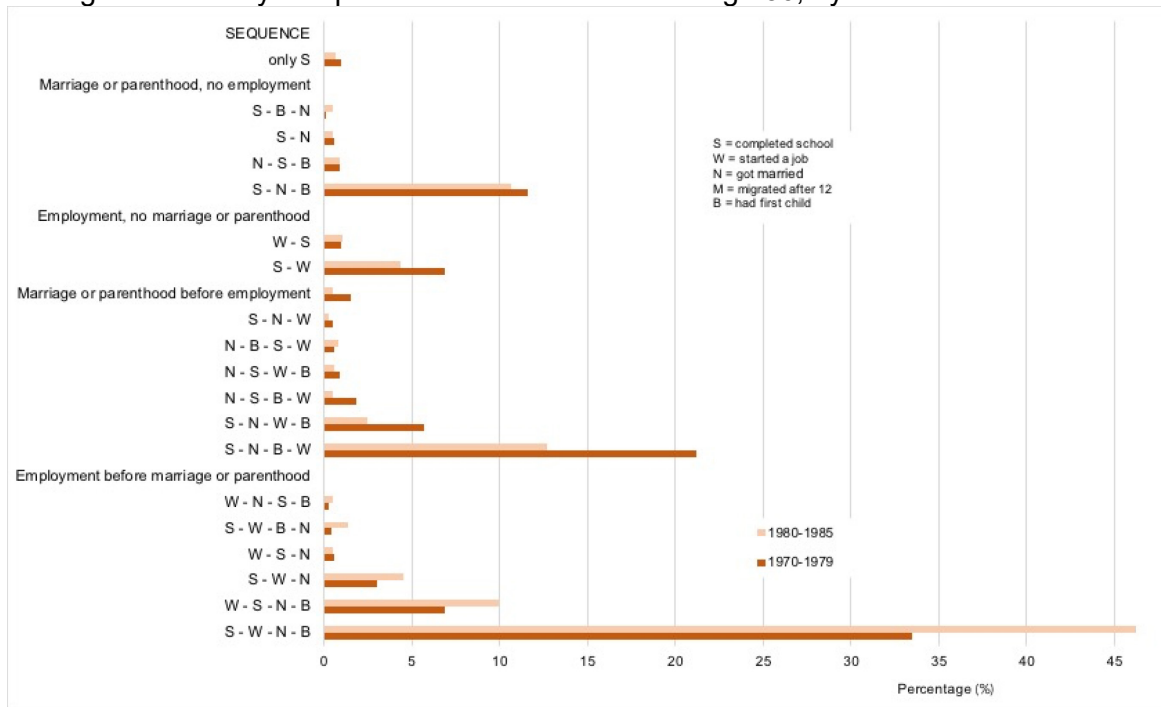
Table 4.4. Summary of the sequences of the events marking the transition to adulthood by age 30, among the study sample (i.e. persons born in 1970-1985 who were a member of the original 1993 households of IFLS) who were observed until age 30 (n=6861); by birth cohort, sex, residence, and per capita household expenditure

| | Birth cohort | | | | Residence | | Per capita expenditure | | |
| | 1970-1979 | | 1980-1985 | | | | | | |
	Men (n=1,923)	Women (n=2,143)	Men (n=1,354)	Women (n=1,441)	Urban (n=3,245)	Rural (n=3,616)	Lowest (n=2,369)	Middle (n=2,378)	Highest (n=2,074)
A. Sequence of the events									
Employment before marriage and or birth of a child	68.2	45.5*	72.4º	63.2*º	61.4	60.1	62.9	58.3	60.1
Marriage and or birth of a child before employment	8.6	31.8*	4.3º	17.9*º	12.4	19.7*	16.3	18.6	16.6
Employment, not yet experiencing marriage and or birth of a child	21.3	7.9*	21.1	5.5*º	18.4	11.6*	13.0	14.2	14.9
Marriage and or birth of a child, not yet experiencing employment	0.6	13.6*	0.8	12.6*	6.1	7.7	6.9	7.5	7.0
No employment and marriage, or birth of a child	1.2	1.2	1.3	0.9	1.7	0.9*	0.9	1.4	1.3
All persons	100	100	100	100	100	100	100	100	100
B. The percentage of non-frequent or uncommon sequences, among persons in the category:									
	Men (n=1,923)	Women (n=2,143)	Men (n=1,354)	Women (n=1,441)	Urban (n=3,245)	Rural (n=3,616)	Lowest (n=2,369)	Middle (n=2,378)	Highest (n=2,074)
Employment before leaving school	12.4	9.0*	19.3º	12.0*º	14.6	11.3*	11.7	12.0	14.3
Marriage before leaving school	1.2	4.9*	1.3	3.6*	2.9	2.9	1.9	3.8	3.1*
Birth of a child before marriage (but after employment)		0.5		1.4º	1.0	0.7	0.5	0.9	1.1
Birth of a child before marriage and employment		0.6		0.6	0.8	0.5	0.4	0.6	0.9

* statistically significant difference between categories
º statistically significant difference between birth cohorts

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Part B of **Table 4.4** displays the percentage of some sequences that were not frequently observed and may be considered as uncommon or disordered. Employment before school completion became quite common among men; 20% of 1980-1985 men had done so compared to 13% of 1970-1979 men. Only 1 in 10 women had worked full-time before leaving school in both birth cohorts. Marriage before school completion was rare and became slightly less common among women; only 4% of 1980-1985 women compared to 5% of 1970-1979 women did so. Parenthood before marriage was very uncommon among these women cohorts at 1% and 2%, although the increase was statistically significant. Employment before school completion was more common among urban residents than among rural residents. For the other non-frequent sequences (i.e. marriage before school completion and parenthood before marriage), there was no difference by residence and per capita expenditure.

Table A.4.4 displays the lag time between several pairs of events marking the transition to adulthood, and **Figure 4.4** displays the median age at experiencing events marking the transition to adulthood, by sex and birth cohort. For men, the median age at starting a job was younger for the 1980-1985 birth cohort than for the 1970-1979 birth cohort. For women, the median age at leaving school, at first marriage, and at first birth was older for the 1980-1985 birth cohort than for the 1970-1979 birth cohort while the median age at starting a job was younger for the 1980-1985 birth cohort than for the 1970-1979 birth cohort. The women of the 1970-1979 birth cohort married before starting a job while the women of the 1980-1985 birth cohort started a job before getting married.

Additionally, I described the median age at experiencing the events and the lag time between several pairs of events, among the study sample who were followed up until at least age 19 (n=8,850, 91% of the study sample), by their sex, birth cohort, the number of years of schooling completed by age 30, and their residence at age 12 in **Figure 4.5**.

Figure 4.4. The median age at experiencing the events marking the transition to adulthood, and the median lag time between the events, by sex and birth cohort
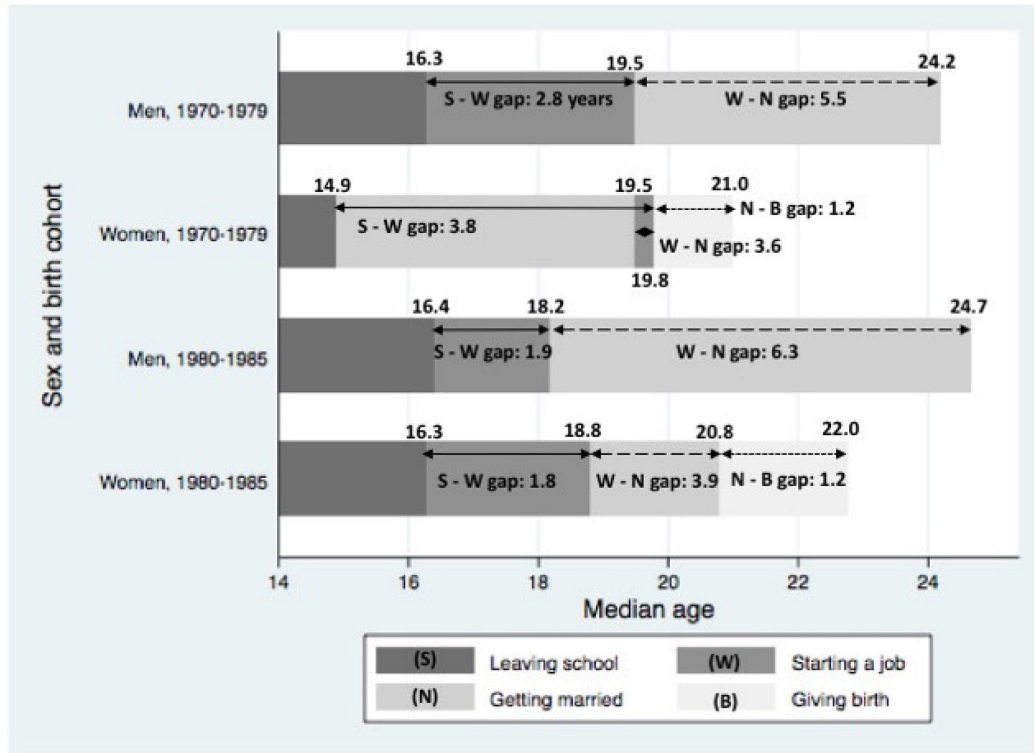
For men, comparing the two birth cohorts, the median age at leaving school among those who had nine years of schooling or less had increased. Particularly among men who had nine years of schooling or less, the median age at starting a job had decreased. Also for men who had nine years of schooling or less, the median age at first marriage was older for the younger birth cohort than for the 1970-1979 birth cohort; as a result, the gaps between starting a job and getting married became wider for the 1980-1985 birth cohort.

For women, there was also an increase in the median age at leaving school among those who had nine years of schooling or less and a decrease in the median age at starting a job. Among women who came from rural areas and had nine years of schooling or less, the median age at first marriage and first birth were older for the 1980-1985 birth cohort than for the 1970-1979 birth cohort.

Figure 4.4. The median age at experiencing the events marking the transition to adulthood, and the median lag time between the events, among those who were followed up until at least age 19, by sex and birth cohort, and by education level (at age 19) and residence (at age 12)
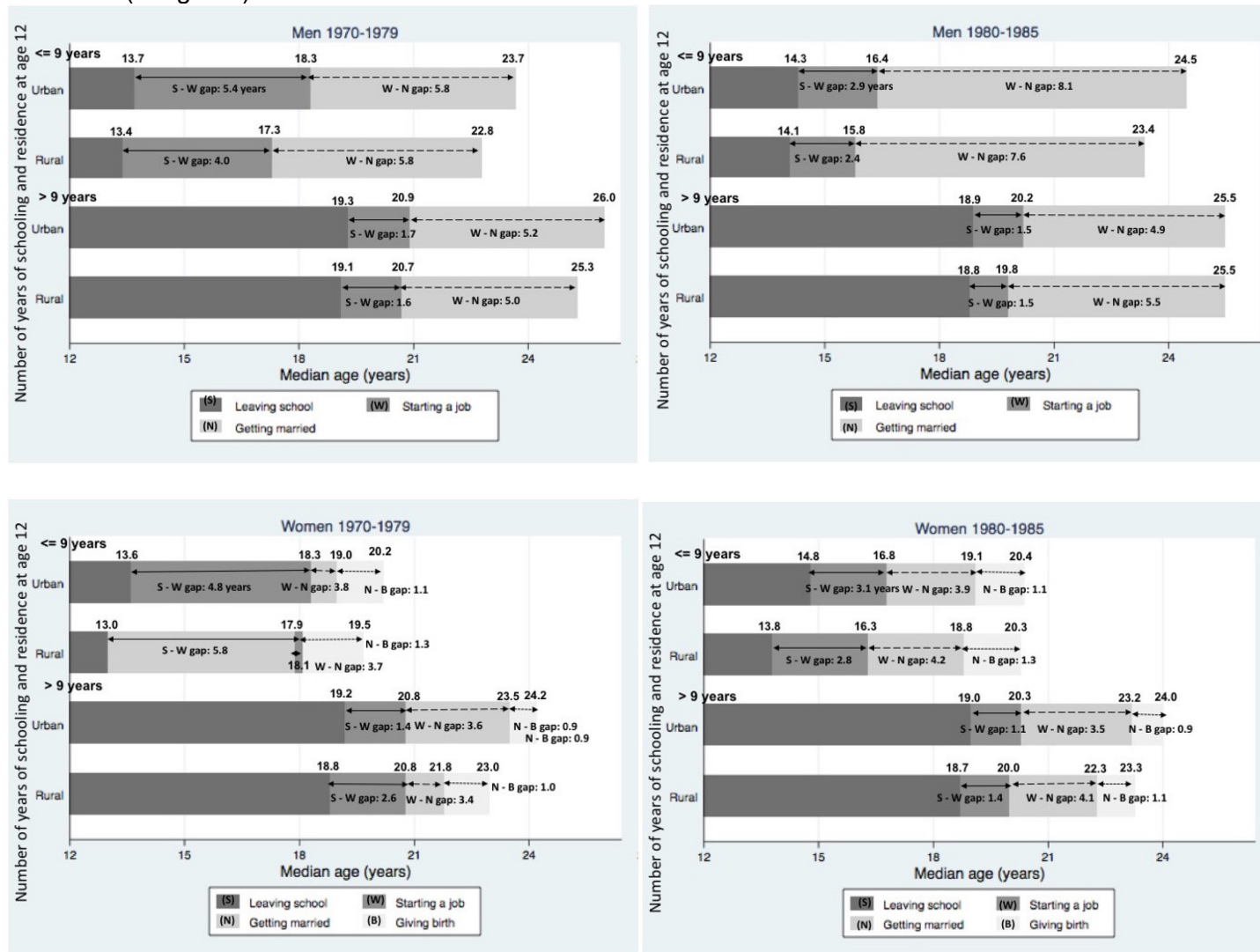
1.3. Other important indicators related to school, employment, marriage, and parenthood

Table 4.5 displays several indicators related to school, employment, marriage, and parenthood that are commonly used to describe adolescent health and development issues, such as early school-leaving, child labor, child marriage, and adolescent pregnancy. The age cut-offs used for employment here (12, 14, and 17) are used by ILO to define child labor (ILO, 2013).

The percentage having left school before age 12 was the highest (16%) among women of the 1970-1979 birth cohort; the percentage was significantly lower among their male peers at 12%, and among the 1980-1985 birth cohort at 10% for men and 9% for women. Again, women of the 1970-1979 birth cohort had left school before age 15 and age 18 at a higher percentage (51% and 69%, respectively) than the other birth cohort-sex groups. Forty percent of the men of the 1970-1979 birth cohort had left school by age 15; while about a third of both sexes of the 1980-1985 birth cohort had done so by age 15. By age 18, about two-thirds of the men of the 1970-1979 birth cohort and both sexes of the 1980-1985 birth cohort had left school. For the 1980-1985 birth cohort, the percentages having left school were comparable between men and women at all age cut-offs.

Only a small percentage of persons had started working before age 12 and 14. Among the four birth cohort-sex groups, women of the 1980-1985 cohort had the lowest percentage of having ever worked before age 12 and 14. By age 17, the percentages of having started a job increased markedly for all birth cohort-sex groups. The percentages ever worked before age 17 were higher for the 1980-1985 birth cohort than the 1970-1979 birth cohort; the highest

Table 4.5. The percentages of the study sample (i.e. persons born in 1970-1985 who were a member of the original 1993 households of IFLS) who experienced an event by a specific age[a], by birth cohort and sex, residence, and per capita household expenditure

Indicators	Birth cohort and sex						Residence in 1993		Per capita expenditure in 1993 (in tertiles)		
	1970-1979			1980-1985							
	Both sexes	Men	Women	Both sexes	Men	Women	Urban	Rural	Lowest	Middle	Highest
Left school											
before age 12	14.2	12.2	16.1*°	9.7	10.1	9.3	5.9	16.1*	18.8	10.9	5.0*
before age 15	45.8	40.3°	51.1*°	32.2	31.4	33.0	21.9	50.9*	56.5	38.6	19.4*
before age 18	64.6	60.1	69.0°*	61.8	60.6	62.9	44.2	74.7*	80.8	64.4	38.3*
First job[b]											
before age 12	3.0	3.4°	2.6	2.0	2.3	1.8	0.9	3.6*	4.1	2.0	1.3*
before age 14	8.0	8.5	7.5	8.4	9.8	6.8*	3.8	10.7*	12.4	6.9	3.7*
before age 17	23.6	25.7°	21.5*°	33.9	38.6	28.9*	17.3	34.0*	37.1	28.0	14.8*
Marriage before age 18[c]	16.6	3.3	29.6*°	11.6	2.4	21.2*	7.2	19.0*	16.7	15.9	10.2*
First birth before age 19[d]			22.6°			15	5.3	12.6*	10.7	11.5	6.9*

°statistically significant difference between birth cohorts
* statistically significant difference between categories
[a]The denominator and the numerator are defined similarly as in Table 6; [b]The age cut offs are used by the International Labour Organization to define child labor;
[c] The definition of child marriage; [d]The definition of adolescent pregnancy

percentage was among men of 1980-1985 birth cohort at 39%, and the lowest was among women of 1970-1979 birth cohort at 22%. For the 1970-1979 birth cohort, 30% had been married by age 18 and 23% had given birth before age 19. For the 1980-1985 birth cohort, 21% and 15% had done so, respectively.

More than twice as many rural residents as urban residents left school, started a job, married, and gave birth earlier than the ideal age suggested by experts and policy makers, i.e. older than 18 for marriage and older than 19 for first birth. For example, half of the rural residents had left school before age 15, compared to 22% of urban residents. Nineteen percent of rural residents had been married before age 18, compared to 7% of urban residents. There was a graded association between economic status and early progression to events marking the transition to adulthood. The strongest gradient was on the percentage leaving school before age 12 and age 15, and the percentage started working before age 12 and 14. The percentages among those in the lowest and middle tertile of per capita expenditure were three and two times higher than those in the highest tertile, respectively.

The disadvantages associated with premature exit from school might be mitigated if young people were not idle (e.g., working or in work training) during their time out of school. However, an increasing concern for young people is the extended time between the exit from school and entry into employment. I conducted additional analysis examining the time lag between leaving school and starting a job among the study sample.

The first part of this additional analysis examines the percentage of those who experienced the combined burden of (1) premature exit from school (before age 15), (2) more than two years of gap between exit from school and entry into employment, and (3) marriage before age 18.

Table 4.6.a display the percentages of those who had left school by age 15, who also experienced an extended period of idleness (not in school and not being employed); among study sample who were followed up at least until age 18. For the 1970-1979 birth cohort who left school before age 15, the majority of them also had to wait for two years or more to start working (including those who never worked by age 18). The percentages were substantial at 28% for men, and 39% for women which includes 19% of women who experienced all three disadvantages: left school before age 15, were not in school nor employed for two years or more, and were married before age 18.

For the 1980-1985 birth cohort, the percentages of those who left school before age 15 and waited for two years or more to start working were 18% and 22% for men and women, respectively; which were significantly lower than the 1970-1979 birth cohort. The percentage of women of the 1980-1985 birth cohort who left school before age 15, were not in school nor employed for two years or more, and were married before age 18 was half that of the 1970-1979 birth cohort, at 10%.

The extended gap between the premature exit from school and entry into employment was far more prevalent among rural residents than urban residents and those in the lowest three PCE quintiles than those in the 1st and 2nd quintile. Thirty-five percent of rural residents left school before age 15 and were not employed for two years or more after leaving school, compared to 16% of urban residents; the percentage (35%) includes 11% of rural residents who left school before age 15, were not employed for two years or more after leaving school, and had been married before age 18.

Table 4.6.a. The percentage of the study sample who left school before age 15, and/or were ever not in school nor employed for 2 years or more by age 18, and/or were married before age 18, among the study sample who were followed up until at least age 18 (n=9021); by birth cohort, sex, residence, and per capita household expenditure

| | Birth cohort and sex | | | | | |
| | 1970-1979 | | | 1980-1985 | | |
Transitions	Both sexes (n=5054)	Men (n=2455) ref	Women (n=2599)	Both sexes (n=3967)	Men (1964) ref	Women (n=2003)
Left school <15 only	7.3	9.6	5.0*	8.7	11.4º	5.9*
Left school <15, & NSE >=2 years	23.2	26.3	20.1*	14.6	16.8º	12.4º
Left school <15, & married <18	2.8	0.9	4.7*	2.2	1.1	3.3*º
Left school <15, NSE >=2 years, & married <18	10.3	1.7	18.7*	5.3	0.8	9.9*º
Left school >=15	56.5	61.6	51.5	69.2	69.9	68.5

| | Residence | | Per-capita HH expenditure | | | | |
Transitions	Rural (n=4503)	Urban* (n=4518) ref	Lowest (n=1786)	Lower (n=1805)	Middle (n=1830)	Higher (n=1817)	Highest (n=1718) ref
Left school <15 only	9.8*	4.4	11.2*	10.8*	7.4*	4.9*	3.0
Left school <15, & NSE >=2 years	24.2*	12.3	32.5*	22.8*	19.4*	11.9*	6.9
Left school <15, & married <18	3.5*	0.9	3.5*	3.1*	2.6*	2.0	1.1
Left school <15, NSE >=2 years, & married <18	11.2*	3.5	10.5*	9.1*	10.0*	6.1*	4.3
Left school >=15	51.3	78.9	42.4	54.1	60.6	75.1	84.6

NSE: not in school and not working full-time (full-time work means working for >=20 hours/week, or working is a main activity)
* significant difference with the reference
º significant difference between the two birth cohorts

The percentage of those who left school before age 15 and were not employed for two years or more after leaving school, among those in the lowest quintile and those in the 4th and 3rd quintile, were four times and three times that of those in the highest quintile, respectively. The percentages among the 5th, 4th, and 3rd quintile were 43%, 32%, and 29%, respectively; which includes about 10% who experienced the three disadvantages: left school before age 15, had two years or more gap between the exit from school and entry into employment, and had been married before age 18.

The analysis presented in **Table 4.6.a** suggested that the issue of young people spending an extended period of time out of school and not being employed was pervasive in Indonesia. Additional analysis was done to estimate the percentage of young people who were not employed for at least 20 hours/week within two years after leaving school among all study sample who had left school and were followed up until at least age 30, not just among those who had left school before age 15. **Table 4.6.b** displays the result of this analysis.

For the 1970-1979 birth cohort, more than half of the men and two-thirds of the women had not started working full-time within two years of leaving school. For the 1980-1985 birth cohort, the percentages were 40% and 49% for men and women, respectively. The median number of years spent not in school nor employed were 2.9 and 5.3 for men and women of the 1970-1979 birth cohort; and were 2.0 and 2.8 for men and women of the 1980-1985 birth cohort, respectively. The percentage of young people spending two years or more not being in school and not being employed full-time was higher among rural residents than urban residents, among those in the lower economic status than those in the highest economic status, and among those who had fewer years of schooling than those who had more than 12 years of schooling. However, although the percentage among those in the highest PCE quintile was the lowest, it was still pervasive at 44%. Also, although the problem was not as severe as observed among those with junior secondary education (7-9 years of education) or less, a fifth of young people who had a college education still experienced a long period of time not being in school nor being employed full-time.

People who had more than 12 years of schooling spent a median of 1.3 years waiting to be employed full-time after leaving school. The median time among those who had 10-12 years of schooling was 2.1 years, among those who had years 7-9 years of schooling was 3.4 years, and among those who had six years of schooling or less was 5.8 years.

Table 4.6.b. The percentage of the study sample who were ever not in school nor employed for 2 years or more by age 30 and the median number of years spent not in school nor employed, among the study sample who were followed up until at least age 30 and had left school before age 30 (n=6678); by birth cohort - sex, residence, per capita household expenditure, and number of years of schooling

Variables	Category	Percentage	Median (years)
Birth cohort - sex	1970-1979 men (n=1882)	54.3	2.9
	1970-1979 women (n=2072)	66.8	5.3
	1980-1985 men (n=1321)	39.8	2.0
	1980-1985 women (n=1403)	49.1	2.8
Residence	Rural (n=3509)	58.7	3.7
	Urban (n=3169)	47.5	2.4
PCE quintile	1st (n=1352)	60.1	3.8
	2nd (n=1387)	58.3	3.7
	3rd (n=1411)	56.3	3.1
	4th (n=1361)	50.6	2.8
	5th (n=1127)	44.0	2.2
Number of years of schooling	<= 6 years (n=1767)	76.7	5.8
	7-9 (n=1502)	57.1	3.4
	10-12 (n=2357)	44.5	2.1
	>12 years (n=1052)	21.1	1.3

2. The Predictors of the Probability of Transition to Adulthood

This section describes the results from the discrete-time logistic regression of the hazard of leaving school, starting a job, getting married, and giving birth; estimated **separately** for each event, to examine the effect of the independent variables on the probability of experiencing the event marking the transition to adulthood.

2.1. The Life Table

Table 4.7 summarizes the life table of the survival from the four events marking the transition to adulthood; presenting the time when the probability of survival from the event reached 0.75, 0.50, and 0.25. There is no difference in the median of survival from leaving school across birth cohort and sex; except for the 1970-1979 women for which the probability of not leaving school reached 0.75 by age 14.75. The 1980-1985 men were the fastest to obtain employment, while the 1970-1979 women were the slowest. For men, there was no difference in the age when the probability of not getting married reached 0.5 between the two birth cohorts. For women, the age when the probability of remaining single was 0.75 was younger among 1970-1979 women than 1980-1985 women, but the age when the probability of remaining single was 0.25 was younger among 1980-1985 women than 1970-1979 women. Similarly, the age when the probability of remaining childless reached 0.25 was younger among 1980-1985 women than 1970-1979 women.

2.2. The Baseline Hazard

Figure 4.6 displays the baseline discrete-time hazard of leaving/finishing school, first employment, first marriage, and first birth; given that the event has not yet occurred. The discrete-time logit model to estimate the baseline hazard includes the dummy variables for each time interval, the binary variables for birth cohort and sex, the interaction of birth cohort and the dummy variables for the time interval, and the interaction of sex and the dummy variables for the time interval to relax the assumption of proportional hazard. The discrete-time hazard (as the

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conditional probability of an event occurred, given that it has not yet occurred) of leaving school is similar across birth cohorts and sexes between the age of 6 and (around) 12. The discrete-time hazard of leaving school is higher for 1970-1979 women than for other birth cohort-sex groups from around age 12 to 14. The discrete-time hazard of leaving school peaks at around age 20 for all birth cohort-sex groups, before decreasing and increasing again for the rest of the analysis time.

Table 4.7. The age when the probability of survival reached 0.75, 0.50, and 0.25; for leaving school, starting a (full-time) employment, getting married, and giving birth; among all study sample (i.e. persons born in 1970-1985 who were a member of the original 1993 households of IFLS)

Probability by birth cohort and sex	Leaving/finishing school	Full-time employment	First marriage	First birth (women)
Probability of survival 0.75				
1970-1979 - men	15.75	18.75	24.00	
1980-1985 - men	16.00	17.00	24.00	
1970-1979 - women	14.75	19.50	19.50	21.00
1980-1985 - women	16.00	18.50	20.25	21.50
Probability of survival 0.5				
1970-1979 - men	18.75	20.75	27.25	
1980-1985 - men	18.50	19.75	27.50	
1970-1979 - women	18.25	23.00	23.25	24.75
1980-1985 - women	18.25	21.25	23.25	24.75
Probability of survival 0.25				
1970-1979 - men	20.25	23.50	>30.00	
1980-1985 - men	19.75	22.50	>30.00	
1970-1979 - women	20.00	28.75	27.75	29.75
1980-1985 - women	19.75	26.75	26.75	28.75

Within the same birth cohort, the discrete-time hazard of starting a job is lower for women than men at all time interval after (around) age 14. For both sexes, the discrete-time hazard of starting a job is slightly higher for 1980-1985 birth cohort than the 1970-1979 birth cohort.

The discrete-time hazard of getting married is distinctly higher for women than men between (around) age 14 and 26. For women, the discrete-time hazard of getting married is slightly lower for 1980-1985 birth cohort than the 1970-1979 birth cohort between age 14 and 19; while for men, there is no difference between the two birth cohorts. The discrete-time hazard of giving birth is

only slightly lower for 1980-1985 birth cohort than 1970-1979 birth cohort between (around) age

17 and 20.

Figure 4.5. The baseline discrete-time hazard (as a conditional probability of an event occurred, given that it has not yet occurred) of leaving school, starting a job, getting married, and giving birth between the age of 6 and 30, among all study sample (i.e. persons born in 1970-1985 who were a member of the original 1993 households of IFLS; by birth cohort and sex
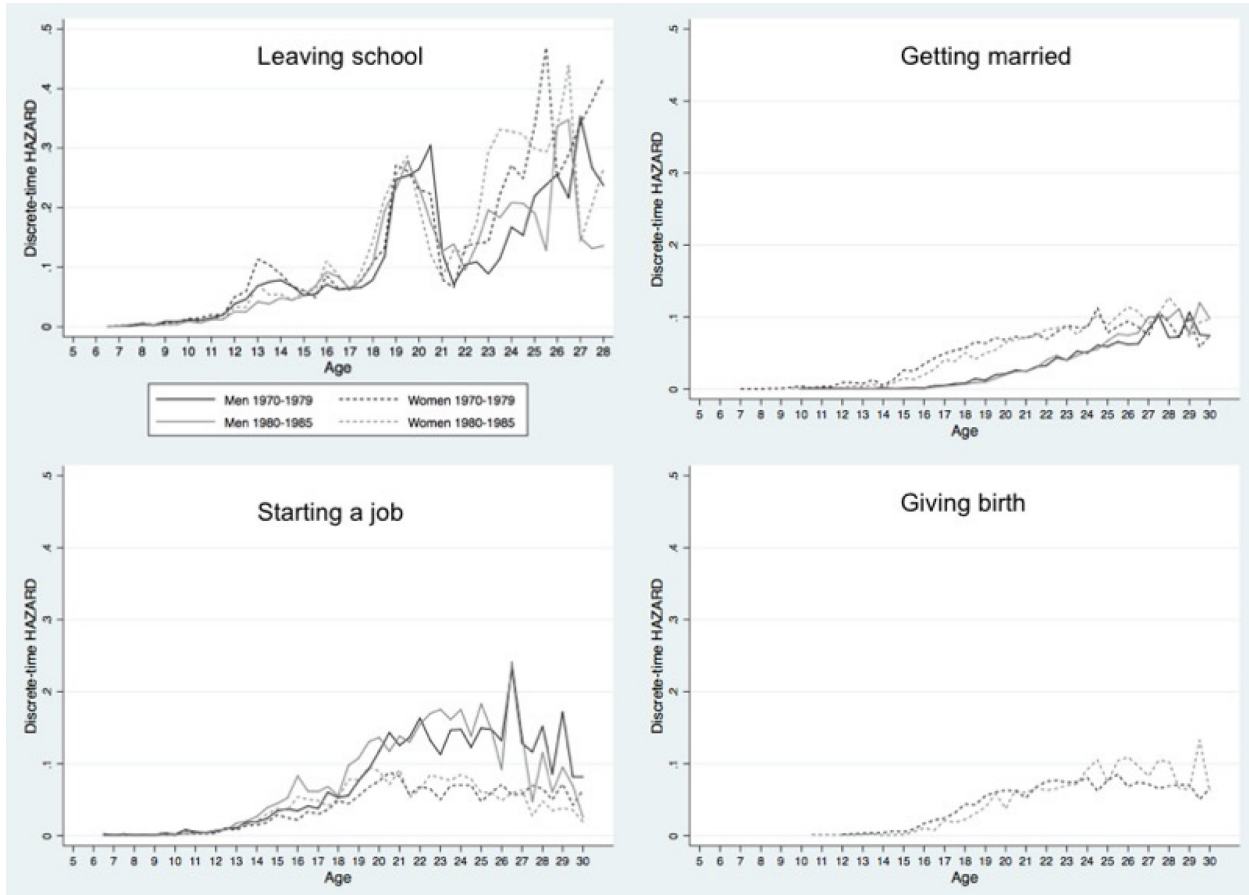
2.3. The Multiple discrete-Time Logistic Regression of the Hazard of the Events Marking the Transition to Adulthood

2.3.1. Comparison of the 1970-1979 and the 1980-1985 birth cohort

The odds ratios from the simple discrete-time logistic regression and the interaction of several pairs of variables can be found in **Table A.4.5** and **A4.6**. The results from the multiple discrete-time logistic regression further confirmed the findings from the life table and the graphs of the discrete-time hazard. The predictors included to compare the 1970-1979 and the 1980-1985 birth cohorts are: sex, number of years of schooling for the hazard of first employment, first marriage, and first birth, residence (urban/rural), region, interaction of birth cohort and the dummy variables for the time interval, interaction of sex and the dummy variables for the time interval, interaction of sex and cohort; interaction of residence and region for the hazard of leaving school; and interaction of sex and residence for the hazard of first employment and first marriage. Per capita expenditure (PCE) is not included as it would not be appropriate to use the PCE measured in 1993 survey to predict events for those who had different ages at that time.

The interaction of birth cohort and the dummy variables for the time interval is significant in the estimation of the hazard of leaving school, starting a job, and getting married; and not significant in the estimation of the hazard of giving birth. The interaction of sex and the dummy variables for the time interval is significant in the estimation of the hazard of leaving school, starting a job, and getting married. Therefore, the differences between the 1980-1985 and the 1970-1979 birth cohort and between women and men on their hazard of leaving school, starting a job, and getting married are not constant across time. **Table 4.8.a** displays those age-varying odds ratios at selected age points, while **Table 4.8.b** displays the age-constant odds ratios. **Figure 4.6** displays the age-varying coefficients for 1980-1985 birth cohort and women, for all ages between 6 and 30. At age 13, the 1980-1985 birth cohort had lower odds to leave school than the 1970-1979

birth cohort, but at age 16, the reverse is true; and at age 19, there was no difference between the two birth cohorts (**Table 4.8.a**). At age 13, 16, and 19, women had higher odds to leave school than men. There was no difference between the two birth cohorts and both sexes on the hazard of leaving school at age 22, 25, and 28. At age 13, 16, and 19, the 1980-1985 birth cohort had higher odds to have started a job than the 1970-1979 birth cohort. There was no difference between the two birth cohorts on the hazard of starting a job at age 22, 25, and 28. Women had lower odds to start a job than men at all age points, except at age 13 where there was no difference between the sexes. The 1980-1985 birth cohort had lower odds to marry than the 1970-1979 birth cohort at age 13, 16, and 19. There was no difference between the two birth cohorts on the hazard of getting married at age 22, 25, and 28. Women had higher odds to marry than men at all age points, except at age 28 where there was no difference between the sexes. The differences between women and men on the hazard of getting married became smaller at older age points. At all age points, there was no difference on the hazard of giving birth between birth cohorts.

Each additional year of education increases the odds of getting a job and decreases the odds of getting married and giving birth (**Table 4.8.b**). Except for those who resided Yogyakarta and West Sumatra, individuals who lived elsewhere had higher odds of leaving school than those who lived in Jakarta. Individuals in North Sumatra had lower odds of starting a job than those in Jakarta, while those in Lampung, West Java, Central Java, East Java, Bali, West Nusa Tenggara, and South Kalimantan had higher odds of starting a job. Except for residents of North and West Sumatra, Yogyakarta, and South Sulawesi, individuals who lived elsewhere had higher odds of getting married than those who lived in Jakarta. Individuals who lived in North Sumatra had lower odds of giving birth than those who lived in Jakarta, while residents of South Sumatra, Lampung, West and East Java had higher odds of giving birth.

The interaction of sex and birth cohort was significant in the estimation of the hazard of leaving school and getting married; the difference between women and men in the odds of leaving school and getting married varies by birth cohort. The interaction of residence and province was significant in the estimation of the hazard of leaving school. Thus, the effect of residence on the hazard of leaving school varies by province. For example, the difference between urban and rural residents in their hazard of leaving school was smaller in West Sumatra, but larger in West Java. The interaction of residence and sex was significant in the estimation of hazard of leaving school, starting a job and getting married; the effect of residence on the probability of leaving school, starting a job and getting married depends on the sex. As an example, for men, urban residents' odds were 0.8 times that of rural residents to start working and marry. However, for women, urban residents' odds were 1.3 times (from multiplying 0.82 by 1.53) and 0.6 times (from multiplying 0.78 by 0.84) that of rural residents to start working and to marry, respectively. It can also be said that the difference between women and men in their hazard of leaving school, starting a job and getting married was smaller in the urban areas than in rural areas.

Table 4.8.a. The age-varying odds ratios (and 95% CI) of the hazard of leaving school, starting an employment, getting married, and giving birth between 1980-1985 and 1970-1979 birth cohorts and between women and men at selected age points; among all study sample (i.e. persons born in 1970-1985 who were a member of the original 1993 households of IFLS), weighted

Transition	Age					
	13	16	19	22	25	28
Leaving school						
1980-1985 (ref: 1970-1979)	0.64** (0.51 – 0.81)	1.36* (1.08 – 1.73)	0.95 (0.77 – 1.16)	0.96 (0.57 – 1.61)	0.86 (0.41 – 1.78)	0.55 (0.07 – 3.98)
Women (ref: men)	2.00** (1.60 – 2.51)	1.50* (1.18 – 1.90)	1.46* (1.18 – 1.81)	1.68 (0.98– 2.88)	2.03 (0.99 – 4.12)	2.55 (0.41 – 15.64)
Starting a job						
1980-1985	1.64* (1.02 – 2.63)	2.56** (1.93 – 3.39)	1.43* (1.13 – 1.81)	0.91 (0.67 – 1.22)	1.23 (0.79 – 1.92)	0.72 (0.36 – 1.44)
Women	0.66 (0.41 – 1.07)	0.55** (0.41 – 0.73)	0.60** (0.47 – 0.76)	0.32** (0.24 – 0.43)	0.24** (0.16 – 0.38)	0.33* (0.16 – 0.68)
Getting married						
1980-1985	0.33* (0.11 – 0.96)	0.45* (0.27 – 0.74)	0.66* (0.47 -0.92)	1.11 (0.82 – 1.50)	1.07 (0.79 – 1.44)	1.36 (0.93 – 1.98)
Women	15.27** (3.12 – 74.86)	26.13** (9.10 – 75.08)	5.72** (3.89 – 8.39)	2.36** (1.73 – 3.22)	1.45* (1.05 – 2.00)	1.38 (0.91 – 2.09)
Giving birth						
1980-1985	0.97 (0.42 – 2.25)	0.65 (0.32 – 1.31)	0.74 (0.51 – 1.07)	0.87 (0.60 – 1.26)	1.03 (0.66 – 1.60)	1.67 (0.96 – 2.90)

* p-value<0.05
** p-value<0.001

Table 4.8.b. The odds ratios (and 95% CI) of the multiple discrete-time logistic regression[1] of the hazard of leaving school, starting an employment, getting married, and giving birth; among all study sample (i.e. persons born in 1970-1985 who were a member of the original 1993 households of IFLS)

Covariates	Category	Event			
		Leaving /finishing school	First job	First marriage	First birth (women)
Number of years of schooling		--	1.01* (1.00 – 1.03)	0.95** (0.95 – 0.97)	0.94** (0.93 – 0.95)
Residence (ref: rural)	urban	0.75** (0.62 – 0.90)	0.82** (0.75 – 0.89)	0.78** (0.71 – 0.86)	0.73** (0.66 – 0.80)
Province (ref: Jakarta)	North Sumatra	1.26* (1.02 -1.56)	0.83* (0.75 – 0.93)	0.97 (0.85 – 1.11)	0.75* (0.62 – 0.90)
	West Sumatra	0.85 (0.69 – 1.05)	0.95 (0.85 – 1.06)	0.92 (0.80 – 1.04)	0.93 (0.78 – 1.11)
	South Sumatra	1.65** (1.32 – 2.07)	0.97 (0.86 – 1.10)	1.29** (1.12 – 1.49)	1.24* (1.02 – 1.49)
	Lampung	1.95** (1.59 – 2.39)	1.26* (1.10 – 1.44)	1.42** (1.23 – 1.65)	1.44** (1.19 – 1.75)
	West Java	2.07** (1.72 – 2.50)	1.07 (0.98 – 1.17)	1.54** (1.39 – 1.71)	1.42** (1.23 – 1.65)
	Central Java	1.74** (1.44 – 2.11)	1.42** (1.28 – 1.57)	1.15* (1.02 – 1.28)	1.12 (0.96 – 1.31)
	DI Yogyakarta	0.73* (0.60 – 0.89)	1.03 (0.92 – 1.16)	0.86* (0.75 – 0.98)	0.89 (0.74 – 1.07)
	East Java	1.66** (1.38 – 2.00)	1.19** (1.08 – 1.31)	1.31** (1.17 – 1.46)	1.30* (1.11 – 1.51)
	Bali	1.34* (1.09 – 1.65)	1.30** (1.15 – 1.47)	1.21* (1.04 – 1.41)	1.02 (0.83 – 1.27)
	West Nusa Tenggara	1.69** (1.37 – 2.09)	1.52** (1.33 – 1.74)	1.17* (1.01 – 1.35)	0.91 (0.75 – 1.10)
	South Kalimantan	2.02** (1.60 – 2.56)	1.29** (1.12 – 1.49)	1.45** (1.23 – 1.72)	1.24 (0.98 – 1.56)
	South Sulawesi	1.78** (1.43 – 2.20)	0.91 (0.80 – 1.03)	1.03 (0.88 – 1.20)	0.82 (0.67 – 1.01)
Interactions					
Sex and birth cohort	women#1980-1985	0.82* (0.73 – 0.91)	0.97 (0.87 – 1.09)	1.29* (1.12 – 1.48)	--
Residence and sex	urban#women	0.83* (0.74 – 0.93)	1.53** (1.36 – 1.71)	0.84** (0.74 – 0.96)	--
Residence and region	urban#N. Sumatra	0.95 (0.73 – 1.22)	--	--	--
	urban#W. Sumatra	1.31* (1.02 – 1.69)	--	--	--
	urban#S. Sumatra	0.66* (0.50 – 0.88)	--	--	--
	urban#Lampung	0.92 (0.66 – 1.27)	--	--	--
	urban#W. Java	0.57** (0.46 – 0.71)	--	--	--
	urban#C. Java	0.73* (0.58 – 0.93)	--	--	--

urban#DI Yogyakarta	0.88 (0.66 – 1.17)	--	--	--
urban#E. Java	0.79 (0.63 – 1.00)	--	--	--
urban#Bali	1.02 (0.77 – 1.34)	--	--	--
urban#W. Nusa Tenggara	0.92 (0.69 – 1.23)	--	--	--
urban# S. Kalimantan	0.64* (0.48 – 0.87)	--	--	--
urban#S. Sulawesi	0.86 (0.66 – 1.13)	--	--	--

[1] assuming constant hazard ratio in each time interval
** p-value<0.001
* p-value<0.05

Figure 4.6. The coefficients of the odds ratios of women (reference: men) and the 1980-1985 birth cohort (reference: 1970-1979 birth cohort) on their hazard of experiencing the events marking the transition to adulthood, from age 6 to 30
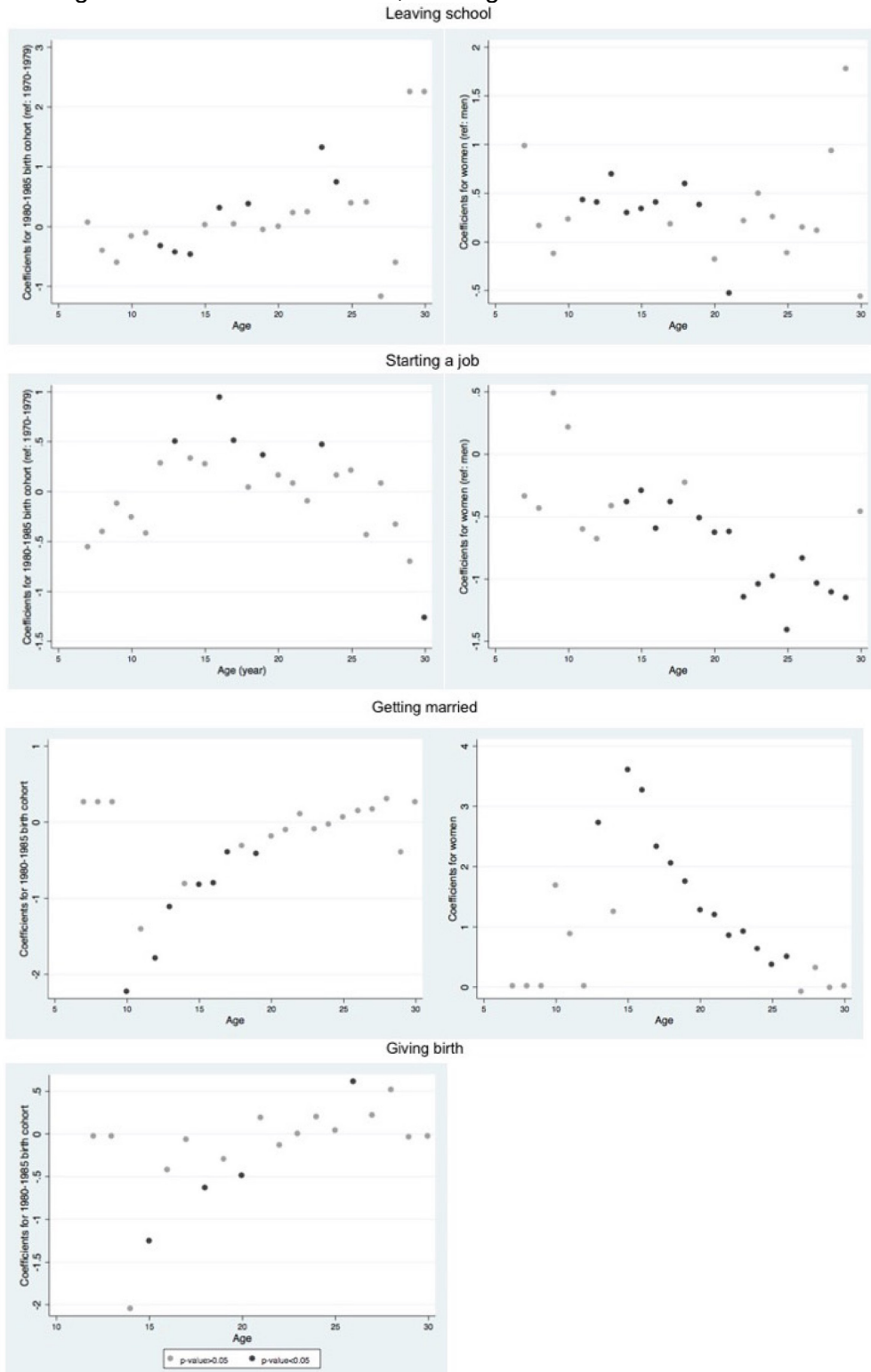
2.3.2. The predictors of the probability to experience the events marking the transition to adulthood

Event: Leaving or finishing school

The odds ratios of the simple logistic regression on the hazard of leaving school are presented in **Table A.4.7**; the odds ratios of the multiple logistic regression are displayed in **Table 4.9**. Father's education was a strong predictor of the hazard of leaving school for both sexes. For both men and women, the odds to leave school of those who had a father without schooling were three times that of those whose father had a senior secondary education. The odds ratio for men whose father had a primary school education and for men whose father had a junior secondary education were 1.8 and 1.4, respectively. For women, the odds to leave school of those whose father had primary school education were 2.3 times and of those whose father had a junior secondary education were 1.4 times that of those whose father had a senior secondary education. The absence of mother was associated with higher odds of leaving school for men, while the absence of father was associated with higher odds of leaving school for women.

There was a gradient relationship between the hazard of leaving school and PCE quintile for both sexes. For men, the only non-significant difference in the hazard of leaving school was between the 2nd and the 3rd quintile. However, for women, there was no difference in the hazard of leaving school between the four lowest PCE quintiles while women in the highest PCE quintile had lower odds of leaving school than women in the 3rd quintile.

Having migrated for education was associated with lower odds of leaving school, and having started working was associated with higher odds of leaving school. However, we would not know whether the person who had started a job before finishing school already had a higher propensity to leave school (and that was why they took a job), or that their job interfered with

Table 4.9. The odds ratios (and the 95% CI) of the multiple discrete-time logistic regression of the hazard of **leaving school**; among the study sample who were born in 1979-1985 who were a member of the original 1993 households of IFLS (who were less than 14 years old in 1993)

Covariates	Category	Sex	
		Men	Women
Father's education (ref: senior secondary school)	college/university	0.83 (0.59 – 1.16)	0.91 (0.73 – 1.14)
	junior secondary	1.41** (1.16 – 1.72)	1.41** (1.15 – 1.72)
	primary	1.83** (1.53 – 2.20)	2.30** (1.92 – 2.74)
	no education	3.10** (2.38 – 4.06)	3.24** (2.42 – 4.35)
Parent's coresidence in the HH (ref: both parents were in the HH)	only mother	1.10 (0.90 – 1.35)	1.34** (1.08 – 1.68)
	only father	1.62* (1.21 – 2.15)	1.13 (0.76 – 1.67)
	none of the parents	0.96 (0.74 – 1.24)	0.89 (0.63 – 1.24)
PCE (ref: 3rd quintile)	1st	1.25* (1.03 – 1.52)	1.22 (0.99 – 1.51)
	2nd	0.95 (0.80 – 1.13)	1.04 (0.87 – 1.23)
	4th	0.70** (0.59 – 0.84)	0.87 (0.73 – 1.03)
	5th	0.60** (0.50 – 0.73)	0.73* (0.60 – 0.88)
Had migrated for education (ref: no)	Yes	0.72* (0.57 – 0.90)	0.66* (0.54 – 0.79)
Had worked (ref: no)	Yes	2.30** (1.94 – 2.73)	2.78** (2.30 – 3.36)
Religion (ref: Islam)	Protestant	0.82 (0.66 – 1.03)	0.64** (0.51 – 0.80)
	Catholic	1.06 (0.73 – 1.53)	0.75 (0.52 –1.07)
	Hinduism	1.19 (0.57 – 2.51)	0.74 (0.44 – 1.24)
	Buddhism	0.94 (0.51 – 1.75)	0.49 (0.24 – 1.01)
	Other	1.33 (0.65 – 2.72)	0.66 (0.33 – 1.35)
Residence (ref: rural)	Urban	0.82* (0.71 – 0.95)	0.72** (0.63 – 0.83)
Province (ref: Jakarta)	North Sumatra	0.93 (0.73 -1.18)	1.33 (0.99 – 1.78)
	West Sumatra	0.58* (0.40 – 0.83)	0.53** (0.38 – 0.76)
	South Sumatra	0.95 (0.75 – 1.21)	1.52* (1.13 – 2.05)
	Lampung	0.59* (0.41 – 0.85)	1.23 (0.92 – 1.64)
	West Java	1.11 (0.90 – 1.36)	1.47* (1.14 – 1.89)
	Central Java	0.88 (0.69 – 1.12)	1.11 (0.86 – 1.44)
	DI Yogyakarta	0.45** (0.33 – 0.61)	0.85 (0.64 – 1.13)
	East Java	0.81 (0.65 – 1.03)	1.12 (0.85 – 1.47)
	Bali	0.75 (0.37 – 1.53)	1.44 (0.83 – 2.49)
	West Nusa Tenggara	0.91 (0.67 – 1.24)	1.03 (0.74 – 1.44)
	South Kalimantan	1.11 (0.84 – 1.47)	1.03 (0.66 – 1.60)
	South Sulawesi	0.85 (0.63 – 1.16)	1.51* (1.07 – 2.15)
Whether there were at least 3 senior secondary schools for the community (ref: no)	Yes	0.76** (0.64 – 0.89)	0.83* (0.71 – 0.98)
Whether there is a public transit service (ref: no)	Yes	0.84* (0.72 – 0.98)	0.76* (0.65 – 0.89)

* p-value<0.05
** p-value<0.001

their education, or it was because they were simply older and at the end of their education when they started a job.

Religion was not a significant predictor of the probability of leaving school for men while women who were Protestant had lower odds of leaving school than Muslim women. Urban residents had lower odds of leaving school than rural residents. The confidence intervals of the odds ratios comparing other provinces and Jakarta were wide due to the limited sample size in each province, thus the estimated effects of province were not precise. West Sumatran and male residents of Lampung and Yogyakarta had lower odds of leaving school than those in Jakarta, while women in South Sumatra and West Java had higher odds of leaving school.

In the simple logistic regression, I examined the effect of the availability of senior secondary schools, vocational senior secondary schools, and public transit service in the community, and community access to improved roads that could be passed by motor vehicles on the hazard of leaving school. All of these community services were significant predictors of the hazard of leaving school. However, after adjusting for residence (urban/rural), only the availability of senior secondary schools and public transit service remain significant. Therefore, only these two variables were included in the final model. For both sexes, living in a community where there were at least three senior secondary schools or public transit service was associated with lower odds of leaving school.

Event: Starting a job

The odds ratios of the simple logistic regression on the hazard of starting a job can be found in **Table A.4.8**; the odds ratios of the multiple logistic regression are presented in **Table 4.10**. After adjustment, residence (urban/rural) was no longer a significant predictor of the hazard of starting

a job for men and women, and PCE quintile was no longer a significant predictor of the hazard of

starting a job for women.

Table 4.10. The odds ratios (and the 95% CI) of the multiple discrete-time logistic regression of the hazard of **starting a job**; among the study sample who were born in 1979-1985 who were a member of the original 1993 households of IFLS (who were less than 14 years old in 1993)

Covariates	Category	Sex	
		Men	Women
Father's education (ref: senior secondary or higher)	junior secondary	1.11 (0.90 – 1.38)	1.29* (1.06 – 1.56)
	primary	1.50** (1.26 – 1.78)	1.65** (1.39 – 1.96)
	no education	1.71** (1.34 – 2.19)	2.09** (1.62 – 2.68)
Number of years of schooling		1.02 (0.98 – 1.05)	1.06** (1.03 – 1.09)
PCE (ref: 3rd quintile)	1st	1.10 (0.92 – 1.32)	1.16 (0.94 – 1.43)
	2nd	0.87 (0.73 – 1.03)	1.09 (0.91 – 1.31)
	4th	0.83* (0.70 – 0.98)	1.02 (0.85 – 1.21)
	5th	0.68** (0.57 – 0.83)	0.91 (0.75 – 1.11)
Had migrated for work (ref: no)	Yes	5.00* (3.78 – 6.62)	7.83** (5.71 – 10.74)
Had been married (ref: no)	Yes	1.98** (1.37 – 2.86)	0.52* (0.41 – 0.65)
Religion (ref: Islam)			
	Protestant	0.51** (0.36 – 0.71)	0.84 (0.65 – 1.09)
	Catholic	0.72 (0.44 – 1.18)	1.14 (0.85 –1.53)
	Hinduism	2.05* (1.09 – 3.84)	0.98 (0.53 – 1.82)
	Buddhism	0.74 (0.30 – 1.84)	0.56 (0.25 – 1.25)
	Other	1.40 (0.55 – 3.54)	0.35* (0.16 – 0.73)
Residence (ref: rural)	Urban	0.89 (0.78 – 1.01)	0.93 (0.82 – 1.05)
Province (ref: Jakarta)	North Sumatra	0.84 (0.64 – 1.10)	0.59** (0.46 – 0.77)
	West Sumatra	0.87 (0.68 – 1.13)	0.63** (0.49 – 0.81)
	South Sumatra	0.75 (0.54 – 1.04)	0.69* (0.50 – 0.93)
	Lampung	1.11 (0.84 – 1.48)	0.75 (0.55 – 1.02)
	West Java	0.91 (0.76 – 1.10)	0.89 (0.73 – 1.09)
	Central Java	0.82 (0.66 – 1.03)	0.87 (0.69 – 1.10)
	DI Yogyakarta	0.94 (0.75 – 1.19)	0.60* (0.40 – 0.90)
	East Java	0.90 (0.74 – 1.11)	0.69* (0.54 – 0.87)
	Bali	0.39* (0.19 – 1.80)	1.13 (0.62 – 2.09)
	West Nusa Tenggara	1.37* (1.02 – 1.86)	1.15 (0.88 – 1.49)
	South Kalimantan	1.15 (0.91 – 1.46)	1.13 (0.79 – 1.61)
	South Sulawesi	1.01 (0.76 – 1.35)	0.72* (0.54 – 0.95)

* p-value<0.05
** p-value<0.001

For both sexes, having a father with no schooling or only primary education was associated with higher odds of starting a job. The odds of starting a job of men whose father had no schooling and primary education were 1.7 times and 1.5 times that of men whose father had senior secondary education or higher; the odds ratio for women were 2.1 and 1.7, respectively (**Table 4.10**). There was no difference in the odds of starting a job between men whose father had junior secondary education and men whose father had senior secondary or higher education, while the odds to start a job of women who had a father with junior secondary education was 1.3 times that of women whose father had senior secondary or higher. While for men the number of years of schooling did not significantly affect the hazard of starting a job; for women, each additional year of schooling was significantly associated with higher odds of starting a job. Contrastingly, for women, PCE quintile was not a significant predictor of the hazard of starting a job; while for men, those in the 4th and 5th quintile had lower odds to start a job than those in the middle quintile.

Having migrated for work was strongly associated with higher odds of starting a job for both sexes. However, this analysis did not distinguish whether a person migrated after being offered or confirmed a job, or they migrated to find a job (that was not already promised to them). The analysis in the previous section already showed that very few men married before starting a job. The odds to start working of men who had been married were two times that of men who had never been married, but the confidence interval of the estimated OR was wide due to small number of men who were married before making work as their primary activity. Contrastingly for women, the odds of starting a job of those who had been married was 0.5 times that of those who were not yet married.

Men who were Protestant had lower odds of starting a job than Muslim men. The results also suggested that Hindu men had higher odds of starting a job while the simple logistic regression (presented in Table A.4.8) showed that there was no difference in the odds of starting a job

between Muslim and Hindu men. As Bali is a Hindu-majority province, religion and province are collinear. In the multiple logistic regression model that did not include province as a predictor, there was no difference in the odds of starting a job between Muslim and Hindu men. Men in West Nusa Tenggara had higher odds of starting a job than men in Jakarta. Women in North, West, and South Sumatra, Yogyakarta, East Java, and Sulawesi had lower odds of starting a job than women in Jakarta.

Event: Getting married

The odds ratios of the simple logistic regression on the hazard of getting married can be found in **Table A.4.9**; the odds ratios of the multiple logistic regression are in **Table 4.11**. After adjustment, PCE quintile was no longer a significant predictor of the hazard of getting married for women, while the effect of father's and an individual's education remain significant.

For men, father's education was not a significant predictor of the hazard of getting married while for women, having a father with less than senior secondary education was associated with higher odds of getting married. Each additional year of schooling decreased the odds of getting married for women. The absence of a father was associated with lower odds of getting married for men, while the absence of both parents was associated with higher odds of getting married for women.

For women, there was no difference in the odds of getting married across PCE quintiles. For men, the odds of getting married of those in the highest quintile was 1.3 times that of those in the middle quintile. Having started working was associated with higher odds of getting married for both men and women; the effect of working status seemed to be stronger for men than for women.

Table 4.11. The odds ratios (and the 95% CI) of the multiple discrete-time logistic regression of the hazard of **getting married**; among the study sample who were born in 1979-1985 who were a member of the original 1993 households of IFLS (who were less than 14 years old in 1993)

Covariates	Category	Sex	
		Men	Women
Father's education (ref: senior secondary or higher)	junior secondary	1.12 (0.89 – 1.42)	1.26* (1.04 – 1.53)
	primary	1.26 (1.02 – 1.55)	1.54** (1.31 – 1.80)
	no education	1.24 (0.93 – 1.64)	1.70** (1.31 – 2.19)
Number of years of schooling		0.98 (0.95 – 1.00)	0.96** (0.94 – 0.99)
Parent's coresidence in the HH (ref: both parents were in the HH)	only mother	0.73* (0.56 – 0.95)	1.08 (0.84 – 1.39)
	only father	0.76 (0.53 – 1.10)	0.74 (0.57 – 0.96)
	none of the parents	1.12 (0.85– 1.46)	1.30* (1.03 – 1.63)
PCE (ref: 3rd quintile)	1st	1.04 (0.86 – 1.27)	0.89 (0.73 – 1.10)
	2nd	0.87 (0.71 – 1.08)	0.96 (0.79 – 1.17)
	4th	1.09 (0.89 – 1.34)	1.01 (0.83 – 1.23)
	5th	1.33* (1.06 – 1.68)	0.99 (0.80 – 1.24)
Religion (ref: Islam)	Protestant	0.88 (0.66 – 1.17)	0.64** (0.48 – 0.86)
	Catholic	0.72 (0.35 – 1.46)	0.69 (0.37 – 1.31)
	Hinduism	0.47 (0.21 – 1.07)	0.50* (0.30 – 0.84)
	Buddhism	0.63 (0.26 – 1.50)	0.29 (0.07 – 1.19)
	Other	0.59 (0.22 – 1.59)	1.02 (0.57 – 1.81)
Had started working (ref: no)	Yes	3.58** (2.68 – 4.78)	1.60** (1.39 – 1.85)
Residence (ref: rural)	Urban	0.80* (0.69 – 0.93)	0.70** (0.60 – 0.80)
Province (ref: Jakarta)	North Sumatra	1.98** (1.45 – 2.71)	1.17 (0.92 – 1.50)
	West Sumatra	0.98 (0.64 – 1.49)	0.93 (0.71 – 1.21)
	South Sumatra	1.52* (1.07 – 2.16)	1.28 (0.98 – 1.68)
	Lampung	1.37 (0.92 – 2.05)	1.38* (1.07 – 1.79)
	West Java	1.55* (1.16 – 2.07)	1.42* (1.14 – 1.77)
	Central Java	1.08 (0.80 – 1.46)	1.07 (0.86 – 1.33)
	DI Yogyakarta	1.14 (0.76 – 1.70)	0.91 (0.68 – 1.22)
	East Java	1.26 (0.93 – 1.71)	1.37* (1.08 – 1.74)
	Bali	2.62* (1.15 – 5.98)	1.76* (1.06 – 2.93)
	West Nusa Tenggara	1.45 (0.99 – 2.14)	0.93 (0.71 – 1.21)
	South Kalimantan	1.28 (0.87 – 1.89)	1.07 (0.74 – 1.57)
	South Sulawesi	1.42 (0.94 – 2.14)	0.98 (0.70 – 1.36)

* p-value<0.05
** p-value<0.001

As 90% of the study sample were Muslims, the sample size of other religions were small and the

odds ratios comparing different religions were very wide. We need a larger sample size to obtain

precise estimates of the effect of religion. However, it is interesting that for men, there was no difference in the odds of getting married by religion; while for women, Protestant and Hindus women had lower odds of getting married than Muslim women.

For both sexes, urban residence had a strong protective effect against getting married. The odds to marry of women who were urban residents were 0.7 times that of women who were rural residents; the odds to marry of men who were urban residents were 0.8 times that of men who were rural residents. Men in North Sumatra, South Sumatra, and West Java, as well as women in Lampung, West Java and East Java had higher odds of getting married than those in Jakarta. The results showed that those in Bali had higher odds of getting married than those in Jakarta. On the other hand, most of Balinese were Hindus and Hindus were shown to have lower odds of getting married. In the model that doesn't include religion as a covariate (not shown), there was no difference between residents of Bali and Jakarta in their odds of getting married.

Event: Giving birth

The odds ratios of the simple logistic regression on the hazard of getting married are presented in **Table A.4.10**; the odds ratios of the multiple logistic regression are in **Table 4.12**. Similar to the results on the hazard of getting married, after adjustment, PCE quintile was no longer a significant predictor of the hazard of giving birth, while the effect of father's and an individual's education remain significant.

Women whose father had junior secondary or lower education had higher odds to give birth than those whose father had senior secondary education or higher. Each additional year of schooling was associated with lower odds of giving birth, while each additional year of marriage was associated with higher odds of giving birth. Interestingly, women in the lowest PCE quintile had lower odds of giving birth than those in the 3rd quintile.

Table 4.12. The odds ratios (and the 95% CI) of the multiple discrete-time logistic regression of the hazard of **giving birth**; among female study sample who were born in 1979-1985 who were a member of the original 1993 households of IFLS (who were less than 14 years old in 1993)

Covariates	Category	Women
Father's education (ref: senior secondary or higher)	junior secondary	1.25* (1.01 – 1.56)
	Primary	1.49** (1.25 – 1.78)
	no education	1.37* (1.03 – 1.84)
Number of years of schooling		0.97* (0.95 – 0.99)
Duration of marriage (in year)		1.17** (1.09 – 1.26)
PCE (ref: 3th quintile)	1st	0.81* (0.66 – 0.99)
	2nd	0.82 (0.68 – 1.01)
	4th	0.87 (0.69 – 1.08)
	5th	0.94 (0.77 – 1.16)
Had started working (ref: no)	Yes	1.27* (1.07 – 1.52)
Religion (ref: Islam)	Protestant	0.77 (0.58 – 1.03)
	Catholic	0.67 (0.36 – 1.23)
	Hinduism	0.59 (0.34 – 1.02)
	Buddhism	0.40 (0.1 – 1.66)
	Other	0.79 (0.34 – 1.83)
Residence (ref: rural)	Urban	0.76* (0.66 – 0.88)
Province (ref: Jakarta)	North Sumatra	1.09 (0.84 – 1.43)
	West Sumatra	0.89 (0.66 – 1.19)
	South Sumatra	1.36* (1.03 – 1.79)
	Lampung	1.44* (1.10 – 1.90)
	West Java	1.16 (0.92 – 1.47)
	Central Java	1.12 (0.89 – 1.41)
	DI Yogyakarta	0.96 (0.70 – 1.31)
	East Java	1.20 (0.93 – 1.56)
	Bali	1.43 (0.80 – 2.56)
	West Nusa Tenggara	0.94 (0.71 – 1.25)
	South Kalimantan	1.03 (0.72 – 1.49)
	South Sulawesi	0.87 (0.62 – 1.23)

* p-value<0.05
** p-value<0.001

Having started a job was associated with higher odds of giving birth. The odds of giving birth of urban residents was 0.8 times that of rural residents. Religion is not a significant predictor of the probability of giving birth. There was no difference in the odds of giving birth by province, except

for those who lived in South Sumatra and Lampung, who had higher odds of giving birth than those who lived in Jakarta.

2.4. *The predictors of the probability to migrate for education and or for work*

The multiple discrete-time logistic regression for the hazard of leaving school and starting a job showed that having migrated for education and for work were significant predictors. In this section, I examined the percentage of the sample who had ever migrated for education and work reason (not just as a first migration since age 12, but migration for education or work reason at any time between age 12 and 30 or the last interview), and the predictors of migration for education and for work, among all study sample and among the subsample who were born in 1979-1985 (who were less than 14 years old in 1993).

Among those who have migrated for education, the median age at first migration for that reason was 17.9 and 17.0 for men and women in the 1970-1979 birth cohort, respectively (**Table 4.13**). The 1980-1985 birth cohort migrated earlier at the median age of 16.6 years for men and 16.4 years for women. The 1980-1985 birth cohort also migrated for work earlier than the 1970-1979 cohort. The median age at first migration for work reason was 21.0 for men born in 1970-1979 and 20.3 for men born in 1980-1985. Women migrated for work reason earlier than men, the median ages for 1970-1979 cohort and for 1980-1985 cohort were 20.0 and 19.4, respectively.

By age 15, only 2-3% of young people have migrated for education or work reason (**Table 4.14**). By age 20, for the 1970-1979 birth cohort, 8.4% of men and 6.8% of women have migrated for education reason and 13.7% of men and 9.2% of women have migrated for work reason. For the 1980-1984 birth cohort, by age 20, 15.3% of men and 13.5% of women have migrated for education reason and 22.5% of men and 19.3% of women have migrated for work reason. At all age points of interest after age 15, the percentage of persons who have migrated for education

and work reason is higher among men than women and is higher among 1980-1985 birth cohort than the 1970-1979 birth cohort. Particularly for women, the percentage of persons who have migrated for education reason by age 20, 25, and 30 has doubled for the younger birth cohort. By age 30, for the 1980-1984 birth cohort, 21.5% of men and 17.6% of women have migrated for education reason.

The simple logistic regressions of the hazard of migration for education and for work reason are in **Table A.14.11**. The interaction of birth cohort and the dummy variables for the time interval and sex and the dummy variables for the time interval were not significant in the estimation of the hazard of migration for education and migration for work (not shown). The difference between the 1980-1985 and 1970-1979 birth cohorts and between women and men in the hazard of migration for education and migration for work were therefore treated as constant over time.

Table 4.13. The mean and median age at first migration for education and work reason, among study sample (i.e. persons born in 1970-1985 who were a member of the original 1993 households of IFLS) who have migrated for that reason by age 30, by birth cohort and sex

| | | Birth cohort and sex | | | |
| | | 1970-1979 | | 1980-1985 | |
Reason for migration	Indicator	Men	Women	Men	Women
For education	Mean	17.6	16.9*	16.8	16.7
	Median	17.9	17.0*	16.6	16.4
For work	Mean	21.4	20.4*	20.8	19.4*°
	Median	21.0	20.0*	20.3	19.0*°

* statistically significant difference between categories
° statistically significant difference between birth cohorts

Table 4.14. The percentage of the study sample (i.e. persons born in 1970-1985 who were a member of the original 1993 households of IFLS) who have migrated for education or work reason, by age 15, 20, 25, and 30; by birth cohort and sex

| Cohort and transition | Age point/cut off and sex | | | | | | | | | | | |
| | By age 15 | | | By age 20 | | | By age 25 | | | By age 30 | | |
	Both sexes	Men	Women	Both sexes	Men	Women	Both sexes	Men	Women	Both sexes	Men	Women
Both birth cohorts												
Have migrated for school	2.6	2.8	2.3	10.3	11.2	9.4*	12.1	13.5	10.7*	13.6	15.4	11.9*
Have migrated for work	2.2	2.0	2.4	15.3	17.3	13.2*	28.5	35.5	21.4*	36.1	45.5	26.3*
Birth cohort 1970-1979												
Have migrated for school	2.2	2.5	2.0	7.6	8.4	6.8*	9.2	10.6	7.8*	10.1	11.7	8.5*
Have migrated for work	1.8	1.9	1.6	11.5	13.7	9.2*	23.7	31.4	16.2*	30.0	39.9	20.1*
Birth cohort 1980-1985												
Have migrated for school	3.1°	3.3	2.8	14.5°	15.3°	13.5*°	16.6°	17.9°	15.2*°	19.5°	21.5°	17.6*°
Have migrated for work	2.7°	2.0	3.4*°	20.9°	22.5°	19.3*°	35.5°	41.3°	29.4*°	45.6°	53.9°	36.5*°

* statistically significant difference between sexes (p-values <0.05)
° statistically significant difference between birth cohorts (p-values <0.05)

Table 4.15. The odds ratios (and 95% CI) of the multiple discrete-time logistic regression of the hazard of migration for education reason and migration for work reason; among all study sample (i.e. persons born in 1970-1985 who were a member of the original 1993 households

| Covariates | Category | Outcome | |
		Migration for education	Migration for work
Birth cohort (ref: 1970-1979)	**1980 – 1985**	**1.36** (1.18 – 1.57)**	**1.29** (1.16– 1.44)**
Sex (ref: men)	Women	0.84* (0.73 – 0.97)	0.47** (0.41 – 0.54)
Number of years of schooling		1.80** (1.69– 1.91)	1.08** (1.07 – 1.10)
Residence (ref: rural)	Urban	0.80* (0.69 – 0.92)	0.74** (0.67 – 0.81)
Province (ref: Jakarta)	North Sumatra	2.62** (1.91 – 3.60)	2.36** (1.91 – 2.92)
	West Sumatra	3.15** (2.26 – 4.43)	2.27** (1.81 – 2.86)
	South Sumatra	3.32** (2.34 – 4.70)	1.58** (1.23 – 2.04)
	Lampung	1.68* (1.07 – 2.65)	2.55** (2.01 – 3.24)
	West Java	1.69* (1.24 – 2.31)	1.55** (1.26 – 1.89)
	Central Java	2.56** (1.89 – 3.47)	2.76** (2.26 – 3.37)
	DI Yogyakarta	2.66** (1.90 – 3.72)	2.08** (1.64 – 2.64)
	East Java	2.09** (1.53 – 2.85)	2.09** (1.70 – 2.56)
	Bali	2.86** (1.99 – 4.10)	2.04** (1.59 – 2.64)
	West Nusa Tenggara	2.72** (1.89 – 3.91)	2.04** (1.62 – 2.57)
	South Kalimantan	3.91** (2.73 – 5.60)	1.72** (1.33 – 2.24)
	South Sulawesi	2.42* (1.68 – 3.50)	1.80** (1.42 – 2.28)
Interactions			
Sex and birth cohort	women#1980-1985	--	1.31* (1.09 – 1.57)
* p-value<0.05 ** p-value<0.001			

The difference between the two birth cohorts on the probability of migration for education and work was substantial; the odds of the 1980-1985 birth cohort to migrate for education was 1.4 times that of the 1970-1979 birth cohort, and 1.3 times that of the 1970-1979 birth cohort to migrate for work (**Table 4.15**). Women had lower odds to migrate for education or for work than men. The difference between women and men in the odds of migrating for work was smaller among the 1980-1985 birth cohort, as shown by the significant positive interaction of sex and birth cohort. Obviously, those who did not live in the capital (Jakarta) had higher odds to migrate for work or education than those who lived in Jakarta.

For the subsample of persons who were born in 1979-1985 (and were less than 14 years old in 1993), we could observe that the significant predictors of migration were different by the reason

of migration (**Table 4.16 and Table 4.17**). Father's education is a significant predictor of migration for education but not a significant predictor of migration for work except for men whose father had no schooling. Economic status seemed to be the more important predictor of migrating for work as there was no difference in the odds of migrating for work by parent's education level. The simple logistic regression on the hazard of migrating for education and for work for this subsample can be found in **Table A.4.12** and **A.4.13**.

Predictors of migration for education reason

For both sexes, each additional year of schooling was associated with higher odds to migrate for education (**Table 4.16**). This suggests that individuals who migrated for education reason might do so seeking higher rather than lower level of education (e.g. senior secondary school or college). For men, the odds of migrating for education of those whose father had no schooling and had primary education were 0.5 and 0.6 times the odds of those whose father had a senior secondary education. Similarly, for women, having a father with primary education or less was associated with lower odds of migrating for education.

For both sexes, urban residence was associated with lower odds of migration for education. Those in North, West, and South Sumatra, Central and East Java, Bali, and South Kalimantan had higher odds than those in Jakarta to migrate for education. Women in West Java and West Nusa Tenggara also had higher odds to migrate for education than women who lived in Jakarta

Table 4.16. The odds ratios (and 95% CI) of the multiple discrete-time logistic regression of the hazard of **migration for education reason**; among all the subsample who were born in 1979 - 1985 (who were less than 14 years old in 1993)

Covariates	Category	Sex	
		Men	Women
Number of years of schooling		1.52** (1.35 – 1.72)	1.68** (1.53 – 1.84)
Father's education (ref: senior secondary or higher)	junior secondary	0.99 (0.69 – 1.43)	0.69 (0.46 – 1.02)
	Primary	0.61* (0.43 – 0.88)	0.58** (0.42 – 0.80)
	no education	0.49* (0.24 – 0.83)	0.46** (0.25 – 0.82)
PCE quintile (ref: 3rd quintile)	1st	0.90 (0.56 – 1.46)	0.96 (0.60 – 1.51)
	2nd	1.23 (0.81 - 1.88)	0.79 (0.51 – 1.20)
	4th	1.18 (0.78 – 1.77)	0.86 (0.57 – 1.29)
	5th	1.49 (0.98 – 2.26)	0.99 (0.65 – 1.49)
Residence (ref: rural)	Urban	0.70* (0.53 – 0.92)	0.59* (0.44 – 0.78)
Province (ref: Jakarta)	North Sumatra	2.24* (1.28 – 3.90)	5.60** (2.80 – 11.23)
	West Sumatra	2.25* (1.18 – 4.28)	4.11** (1.95 – 8.65)
	South Sumatra	1.96* (1.05 – 3.67)	3.86* (1.76 – 8.50)
	Lampung	1.60 (0.75 – 3.44)	1.66 (0.60 – 4.53)
	West Java	1.66 (0.98 – 2.80)	2.18* (1.05 – 4.84)
	Central Java	2.78** (1.65 – 4.68)	2.72* (1.34 – 5.51)
	DI Yogyakarta	0.92 (0.44 – 1.92)	1.97 (0.87 – 4.48)
	East Java	1.89* (1.09 – 3.27)	3.31* (1.63 – 6.74)
	Bali	2.07* (1.09 – 3.93)	3.54* (1.59 – 7.90)
	West Nusa Tenggara	1.80 (0.89 – 3.61)	4.02** (1.91 – 8.44)
	South Kalimantan	3.16** (1.68 – 5.93)	7.42** (3.36 – 16.36)
	South Sulawesi	1.45 (0.68 – 3.09)	3.84* (1.72 – 8.56)

* p-value<0.05
** p-value<0.001

Predictors of migration for work reason

There was no difference in the odds of migrating for work by father's education, except that the odds to migrate for work of men who had a father without schooling were 1.4 times that of men who had a father with senior secondary education (**Table 4.17**). Each additional year of schooling was associated with higher odds of migrating for work for both sexes. For men, those in the lowest two quintiles had higher odds to migrate for work than those in the 3rd quintile. For women, those in the lowest quintile had higher odds to migrate for work but those in the highest quintile had lower odds to do so than those in the middle quintile. For women, those who had migrated for

education also had higher odds to migrate for work. For women, urban residence was associated

with lower odds of migration for work.

Table 4.17. The odds ratios (and 95% CI) of the multiple discrete-time logistic regression of the hazard of **migration for work reason**; among all the subsample who were born in 1979 - 1985 (who were less than 14 years old in 1993)

Covariates	Category	Sex	
		Men	Women
Number of years of schooling		1.06** (1.03 – 1.10)	1.14** (1.09 – 1.19)
Father's education (ref: senior secondary or higher)	junior secondary	0.97 (0.73 – 1.30)	1.20 (0.84 – 1.71)
	primary	1.02 (0.82 – 1.28)	1.19 (0.88 – 1.60)
	no education	1.42* (1.05 – 1.92)	1.35 (0.91 – 1.99)
PCE quintile (ref: 3rd quintile)	1st	1.32* (1.04 – 1.66)	1.65* (1.24 – 2.20)
	2nd	1.30* (1.03 – 1.63)	1.29 (0.97 – 1.71)
	4th	1.07 (0.84 – 1.37)	0.93 (0.68 – 1.27)
	5th	1.02 (0.78 – 1.33)	0.57* (0.39 – 0.82)
Has migrated for education (ref: no)	yes	0.91 (0.71 – 1.16)	1.54** (1.17 – 2.02)
Residence (ref: rural)	urban	0.89 (0.75 – 1.06)	0.66** (0.54 – 0.81)
Province (ref: Jakarta)	North Sumatra	5.70** (3.38 – 9.62)	5.22** (2.45 – 11.10)
	West Sumatra	7.27** (4.16 – 12.72)	3.00* (1.33 – 6.73)
	South Sumatra	3.89** (2.19 – 6.94)	2.71* (1.14 – 6.41)
	Lampung	5.91** (3.32 – 10.52)	5.48** (2.49 – 12.07)
	West Java	3.49** (2.09 – 5.84)	3.73* (1.75 – 7.93)
	Central Java	6.57** (3.945 – 10.94)	6.39** (3.05 – 13.40)
	DI Yogyakarta	4.96** (2.77 – 8.88)	6.42** (2.94 – 13.98)
	East Java	4.48** (2.67 – 7.54)	4.07** (1.92 – 8.60)
	Bali	4.20** (2.31 – 7.63)	6.62** (2.96 – 14.79)
	West Nusa Tenggara	6.43** (3.72 – 11.11)	2.46* (1.10 – 5.50)
	South Kalimantan	4.65** (2.61 – 8.31)	2.98* (1.20 – 7.37)
	South Sulawesi	5.12** (2.93 – 8.97)	2.70* (1.18 – 6.17)

* p-value<0.05
** p-value<0.001

3. The Correlations of the Probability of Experiencing the Events Marking the Transition to Adulthood

The multivariate probit model allows the errors of the equations that are being estimated to be correlated. The simultaneous estimation of the probability of leaving school, starting a job, and getting married also allows the examination of the effect of education level on the probability of starting a job or getting married while accounting for the possible endogeneity of educational attainment. **Table 4.18** and **Table 4.19** display the coefficients from the single and multivariate probit model for the subsample of males and females who were less than 14 years old in 1993. A positive coefficient increases the probability of the outcome, and a negative coefficient decreases the probability of the outcome. The sign and the significance of the coefficients from the multivariate probit model are generally consistent with the coefficients from the univariate probit model. However, for men and women, in the multivariate probit model, the positive coefficients of the effect of individual's education on the probability of starting a job changed compared to the coefficients in the single probit model. For women, in the multivariate probit model, the negative coefficients of the effect of individual's education on the probability of getting married also changed some compared to the coefficients in the single probit model.

For men, in the multivariate probit model simultaneously estimating the probability of leaving school, starting a job and getting married, the correlation between the residuals of the equations estimating `leaving school' and `starting a job' was significantly different from zero while the correlation between the residuals of the equations estimating `starting a job' and `getting married' and the correlation between the residuals of the equations estimating `leaving school' and getting married' were not significantly different from zero.

Table 4.18. The coefficients from the single and multivariate probit model, for the subsample of men who were born in 1979 - 1985 (who were less than 14 years old in 1993)

Variable	Category	Probit Model	
		Single	Multivariate
LEAVING SCHOOL			
Father's education	junior secondary	.023	.023
(ref: senior secondary	primary	.043	.042
or higher)	no education	.075*	.074*
Parent's co-residence	only mother	-.001	-.000
(ref: both parents)	only father	.032	.030
	none of the parents	.012	.011
PCE quintiles	1st	.015	.016
(ref: 3rd)	2nd	-.010	-.010
	4th	-.030	-.030
	5th	-.055	-.054
Religion	Protestan	-.067	-.066
(ref: Islam)	Catholic	-.012	-.011
	Hinduism	.086	.087
	Buddhism	-.010	-.112
	Other	.067	.068
Residence			
(ref: rural)	Urban	-.010	-.010
Province	North Sumatra	.029	.029
(ref: Jakarta)	West Sumatra	.004	.005
	South Sumatra	.016	.017
	Lampung	.006	.007
	West Java	.025	.025
	Central Java	.015	.015
	DI Yogyakarta	-.015	-.016
	East Java	.011	.011
	Bali	-.049	-.049
	West Nusa Tenggara	.049	.050
	South Kalimantan	.028	.027
	South Sulawesi	.029	.029
Age		.268**	.268**
Square of age		-.011**	-.011**
	Log likelihood	-12555.807	
	Pseudo-R^2	0.0414	
STARTING A JOB			
Father's education	junior secondary	.041	.040
(ref: senior secondary	primary	.122**	.120**
or higher)	no education	.170**	.167**
PCE quintiles	1st	.042	.042
(ref: 3rd)	2nd	-.006	-.007
	4th	-.048	-.049
	5th	-.097*	-.095*
Individual's education	7-9 years	.062*	.058*
(ref: 0-6 years)	10-12	.231**	.220**
	>12	.438**	.422**
Religion	Protestan	-.082	-.082
(ref: Islam)	Catholic	.010	.012
	Hinduism	.093	.095
	Buddhism	-.135	-.151
	Other	.165	.166
Residence			
(ref: rural)	Urban	-.030	-.030
Province	North Sumatra	.027	-.026
(ref: Jakarta)	West Sumatra	.002	.003
	South Sumatra	.002	.004
	Lampung	.014	.014
	West Java	.041	.040
	Central Java	.028	.027
	DI Yogyakarta	-.048	-.049

	East Java	.007	.008
	Bali	-.051	-.053
	West Nusa Tenggara	.102	.102
	South Kalimantan	.035	.034
	South Sulawesi	.019	.020
Age		.185**	.185**
Square of age		-.014**	-.014**
	Log-likelihood	-11406.671	
	Pseudo-R^2	0.0901	
GETTING MARRIED			
Father's education (ref: senior secondary or higher)	junior secondary	.038	.037
	Primary	.065	.064
	no education	.079	.078
Parent's co-residence (ref: both parents)	only mother	-.077	-.077
	only father	-.021	-.020
	none of the parents	.008	.007
PCE quintiles (ref: 3rd)	1st	-.025	-.025
	2nd	-.027	-.027
	4th	.016	.016
	5th	.042	.042
Individual's education (ref: 0-6 years)	7-9 years	-.091*	-.090*
	10-12	-.135**	-.133**
	>12	-.207**	-.202**
Religion (ref: Islam)	Protestant	-.049	-.049
	Catholic	-.109	-.109
	Hinduism	-.122	-.121
	Buddhism	-.184	-.184
	Other	.001	.000
Residence (ref: rural)	Urban	-.042	-.042
Province (ref: Jakarta)	North Sumatra	.182*	.182*
	West Sumatra	.009	.008
	South Sumatra	.128	.127
	Lampung	.175*	.175*
	West Java	.085	.085
	Central Java	.074	.075
	DI Yogyakarta	.122	.122
	East Java	.092	.093
	Bali	.270	.271
	West Nusa Tenggara	.181	.181
	South Kalimantan	.092	.093
	South Sulawesi	.095	.095
Age		.171**	.169**
Square of age		-.011**	-.011**
	Log-likelihood	-7160.6914	
	Pseudo-R^2	0.1951	
Correlation between residuals			
		correlation coefficient (95% CI)	p-value
Leaving school – starting a job		.190 (.141 - .238)	<0.01
Leaving school - getting married		-.156 (-.323 - .021)	0.083
Start working – getting married		-.110 (-.226 - .009)	0.069

For women, in the multivariate probit model simultaneously estimating the probability of leaving school, starting a job and getting married, the correlation between the residuals of the equations estimating `leaving school' and `starting a job' and the correlation between the

Table 4.19. The coefficients from the single and multivariate probit model, for the subsample of women who were born in 1979 - 1985 (who were less than 14 years old in 1993)

| Variable | Category | Probit Model | |
		Single	Multivariate
LEAVING SCHOOL			
Father's education	junior secondary	.011	.012
(ref: senior secondary	Primary	.058	.058
or higher)	no education	.098	.097
Parent's co-residence	only mother	.033	.034
(ref: both parents)	only father	.012	.014
	none of the parents	.011	.012
PCE quintiles	1st	.018	.019
(ref: 3rd)	2nd	-.009	-.009
	4th	-.016	-.016
	5th	-.021	-.021
Religion	Protestan	-.048	-.048
(ref: Islam)	Catholic	-.027	-.026
	Hinduism	-.033	-.031
	Buddhism	-.278	-.278
	Other	-.040	-.040
Residence			
(ref: rural)	Urban	-.032	-.032
Province	North Sumatra	-.021	-.022
(ref: Jakarta)	West Sumatra	-.018	-.017
	South Sumatra	.036	.037
	Lampung	.014	.016
	West Java	.045	.045
	Central Java	.006	.006
	DI Yogyakarta	-.003	-.003
	East Java	.016	.017
	Bali	.042	.041
	West Nusa Tenggara	.045	.046
	South Kalimantan	.067	.067
	South Sulawesi	.034	.033
Age		.273**	.273**
Square of age		-.011**	-.011**
	Log likelihood	-11981.032	
	Pseudo-R^2	0.0386	
STARTING A JOB			
Father's education	junior secondary	.043	.039
(ref: senior secondary	Primary	.114**	.111**
or higher)	no education	.165**	. 162**
PCE quintiles	1st	.045	.047
(ref: 3rd)	2nd	.020	.020
	4th	-.010	-.010
	5th	-.046	-.046
Individual's education	7-9 years	.036	.032
(ref: 0-6 years)	10-12	.094*	.084*
	>12	.250**	.232**
Religion	Protestan	-.041	-.041
(ref: Islam)	Catholic	-.010	-.006
	Hinduism	-.036	-.035
	Buddhism	-.252	-.251
	Other	-.106	-.107
Residence			
(ref: rural)	urban	-.047*	-.047*
Province	North Sumatra	-.037	-.052
(ref: Jakarta)	West Sumatra	-.076	-.072
	South Sumatra	-.020	-.018
	Lampung	-.009	-.005
	West Java	.029	.031
	Central Java	.007	.009
	DI Yogyakarta	-.040	-.038

	East Java	-.024	-.022
	Bali	.049	.019
	West Nusa Tenggara	.048	.050
	South Kalimantan	.062	.065
	South Sulawesi	-.013	-.026
Age		.088**	.091**
Square of age		-.007**	-.008**
	Log-likelihood	-9763.3841	
	Pseudo-R²	0.0939	
GETTING MARRIED			
Father's education (ref: senior secondary or higher)	junior secondary	.075	.075
	primary	.140**	.139**
	no education	.171**	.170**
Parent's co-residence (ref: both parents)	only mother	.022	.022
	only father	-.082	-.082
	none of the parents	.011	.011
PCE quintiles (ref: 3rd)	1st	-.021	-.021
	2nd	-.025	-.025
	4th	.000	-.000
	5th	-.016	-.017
Individual's education (ref: 0-6 years)	7-9 years	-.073*	-.076*
	10-12	-.134**	-.140**
	>12	-.131**	-.141**
Religion (ref: Islam)	Protestan	-.072	-.072
	Catholic	-.114	-.112
	Hinduism	-.107	-.107
	Buddhism	-.465	-.465
	Other	-.050	-.050
Residence (ref: rural)	urban	-.069*	-.069*
Province (ref: Jakarta)	North Sumatra	.047	.048
	West Sumatra	-.013	-.012
	South Sumatra	.036	.036
	Lampung	.096	.096
	West Java	.086	.086
	Central Java	.057	.056
	DI Yogyakarta	.046	.046
	East Java	.086	.086
	Bali	.120	.119
	West Nusa Tenggara	.048	.048
	South Kalimantan	.114	.113
	South Sulawesi	.061	.060
Age		.298**	.299**
Square of age		-.016**	-.016**
	Log-likelihood	-9310.0574	
	Pseudo-R²	0.1412	
Correlation between residuals			
		correlation coefficient (95% CI)	p-value
Leaving school – starting a job		.176 (.123 - .228)	<0.01
Leaving school – getting married		.151 (.086 - .215)	<0.01
Start working – getting married		-.062 (-.149 - .025)	0.164

residuals of the equations estimating `leaving school' and getting married' were all significantly different from zero; while the correlation between the residuals of the equations estimating `starting a job' and `getting married' were not significantly different from zero.

For men, there is something in common that is not represented by the predictors in the model that influences their probability to leave school and start a job. For women, there is a shared unexplained predictor that is not represented by the predictors in the model that influences their probability to leave school and to start working, and to leave school and to marry. Therefore, for men, `leaving school - starting a job' are interdependent events while `starting a job - getting married' and `leaving school – getting married' are independent events. For women, `leaving school - starting a job' and `leaving school – getting married' are interdependent.

The results from the discrete-time logistic and the multivariate probit model cannot be compared as the models use a different data structures, a different set of predictors, and a different type of variable for individual's education (numeric variable in the discrete-time logit model and categorical variable in the probit model). However, the effects of father's education, an individual's education, and PCE quintile were generally consistent between the two models, i.e., a category that has a positive coefficient in the probit model has higher odds in the discrete-time logit model, and a category that has a negative coefficient in the probit model has lower odds in the discrete-time logit model; but differences in the significance of a category exist.

In the multivariate probit model, the differences in the probability of leaving school between men whose father had primary or junior secondary education and men whose father had senior secondary education were not significant; but in the discrete-time logit model, the differences were significant. In the multivariate probit model, there was no significant difference in men's probability of leaving school across PCE quintile; but in the discrete-time logit model, there was a significant difference between men in the 5th, 2nd or 1st quintile and men in the 3rd quintile. In the multivariate probit model, there was no significant difference in men's probability of getting married between PCE quintiles and parent's co-residence status;

but in the discrete-time logit model, men whose father was absent had lower odds of getting married and men in the highest quintile had higher odds of getting married. In the multivariate probit model, there was no difference in men's probability of leaving school or starting a job between provinces; but in the discrete-time logit model, there were some differences by province.

In the multivariate probit model, the difference in the probability of leaving school between women whose father had a junior secondary education and women whose father had a senior secondary education was significant; but in the discrete-time logit model, the difference was significant. In the multivariate probit model, there was no difference in women's probability of leaving school between PCE quintiles; but in the discrete-time logit model, women in the highest quintile had lower odds of leaving school than women in the 3rd quintile. In the multivariate probit model, there was no difference in the probability of leaving school, starting a job, or getting married by religion for both sexes. In the discrete-time logit model, for women, religion is a significant predictor in the probability of leaving school and getting married while for men, religion is a significant predictor in the probability of starting a job. In the multivariate probit model, there was no difference in women's probability of starting a job or getting married between provinces; but in the discrete-time logit model, there were some differences by province.

CHAPTER 5: DISCUSSION

Table 5.1 and **Table 5.2** display the hypothesis, analysis findings, and the significant covariates from the discrete-time logistic regression of the probability of the events.

The 1980-1985 birth cohort stayed longer in school by enrolling in secondary schools and made working as their primary activity at an earlier age. Women of the 1980-1985 birth cohort stayed single for a longer time by pushing their marriage into the early twenties. By age 30, the majority of individuals had completed their transition to adulthood.

The first aim of this study is to describe the occurrence, timing, and sequencing of the events marking the transition to adulthood by sex and birth cohort in Indonesia. The central question is, did the younger birth cohort delay their transition to adulthood? And if they did, did the delay change the sequence of the events marking the transition to adulthood? The descriptive statistics show that compared to the 1970-1979 birth cohort, the 1980-1989 birth cohort stayed in school longer, married and gave birth later, but started working as their primary activity earlier. However, the majority of the events still occurred within the third decade of life. For men, the percentages of persons who had started a first full-time job and had ever been married by age 30 did not differ between the two birth cohorts. Interestingly for women, the percentages of those who had started a first full-time job, who had ever been married, and who had given birth by age 30 were higher for the 1980-1985 birth cohort than for the 1970-1979 birth cohort. Women delayed their marriage and parenthood for about a year, so these events were shifted into the third decade of life. However, between the ages of 25 and 30, the women in the 1980-1985 birth cohort who had not experienced marriage and parenthood caught up with their older peers; as suggested by the lower percentages of those who had ever been married and who had given birth by age 20 but the higher percentages of those who had done so by age 30 among the 1980-1985 birth cohort.

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Table 5.1. Comparison of the study hypotheses and the findings

Aim 1: Analyze the occurrence, timing, and sequencing of the events marking the transition to adulthood (i.e. graduating or leaving school, starting a job, getting married for the first time, and having the first birth) by sex and birth cohort		
Hypothesis	Conclusion	Note
a. The percentage of persons who have had a first job, had been married for the first time, and had a first birth by age 30 are higher among the 1970-1979 birth cohort than the 1980-1985 birth cohort	Rejected	For women: the percentages were higher among the 1980-1985 birth cohort than the 1970-1979 birth cohort. For men: The percentages were not different between the two birth cohorts.
b. The percentage of persons who (1) have left school by age 15, (2) have started working by age 14, (3) have been married by age 18, and (4) have given birth by age 19 are higher among the 1970-1979 birth cohort than the 1980-1985 birth cohort	Fail to reject, except for hypothesis b(2)	The percentage of persons have started working by age 14 were not different between the two birth cohorts
c. The majority of persons have left school and had a job first before entering marriage and parenthood; therefore the most frequent sequence of transition to adulthood is leaving school - first employment - first marriage -first birth	Fail to reject	
d. The percentage of persons who have achieved the four events by age 30 is higher among the 1970-1979 birth cohort than the 1980-1985 birth cohort	Rejected	For women: the percentage of persons who have achieved the four events by age 30 was higher among the 1980-1985 than the 1970-1979 birth cohort. For men: The percentages were not different between the two birth cohorts
e. The percentage of persons who (1) were employed before leaving school, (2) were married before leaving school, and (3) gave birth outside of marriage was higher among the 1970-1979 birth cohort than the 1980-1985 birth cohort	Rejected	For both sexes: the percentage of persons who (1) were employed before before leaving school and (3) gave birth outside of marriage was higher among the 1980-1985 birth cohort than the 1970-1979 birth cohort. The percentage of persons who were married before leaving school was not different between the two birth cohorts.
Aim 2: Examine the individual and family-level predictors of the probability of the events marking the transition to adulthood		
a. Comparing the 1980-1985 birth cohort and the 1970-1979 birth cohort, the odds of leaving school, starting a job, getting married, and giving the first birth are lower for the 1980-1985 birth cohort	Rejected	The difference between the two birth cohorts on their odds of leaving school, starting a job, getting married, and giving birth were not constant across ages.
Hypothesis	Conclusion	Note
b. Comparing women and men, the odds of leaving school and getting married are higher for women, while the odds of	The odds ratios between	The difference between women and men were not constant across ages; but most of the time, the

starting a job is lower for women; but the differences between women and men are smaller among the 1980-1985 birth cohort	women and men vary by age/time	odds of leaving school and getting married were higher for women, and the odds of starting a job was lower for women. The difference between women and men in their odds of leaving school was smaller among the 1980-1985 birth cohort than the 1970-1979 birth cohort. The difference between women and men in their odds of starting a job didn't change across the two birth cohorts. The difference between women and men in their odds of getting married was larger among the 1980-1985 birth cohort than the 1970-1979 birth cohort.
c. each additional year of schooling is associated with higher odds of starting a job, and lower odds of getting married and giving birth	The effect of each additional year of schooling varies by sex	For men: each additional year of schooling did not increase the odds of starting a job and did not decrease the odds of getting married. For women: each additional year of schooling was associated with higher odds of starting a job and lower odds of getting married and giving birth
d. compared to those whose parents had a senior secondary education, persons whose parents had less than a senior secondary education had higher odds of leaving school, getting married, and giving birth but had lower odds of starting a job	The effect of parent's education varies by sex	For men: compared to those whose parents had a senior secondary education, persons whose parents had less than senior secondary education had higher odds of leaving school. Persons whose parents had less than junior secondary education had higher odds of starting a job. There was no difference in the odds of getting married across parent's education level. For women: compared to those whose parents had a senior secondary education, persons whose parents had less than senior secondary education had higher odds of leaving school, starting a job, and getting married.
Aim 3: Analyze the occurrence of migration for education and work reason by sex and birth cohort, and examine the individual and family-level determinants of the probability of migration for education and work reason			
Hypothesis	Conclusion	Note

a. The percentage of persons who have migrated for educational or employment reason by a given age increases across birth cohorts and is higher among men than women	Fail to reject	
b. Adjusting for other factors, a higher economic status (represented by per-capita household expenditure) and a higher level of parent's or guardian's education are associated with higher odds of having migrated for education reason	Controlling for other factors, PCE is not associated with the odds of migration for education	For both sexes: compared to those whose parents had senior secondary education, those whose parents had less than junior secondary education had lower odds of migrating for education. Per-capita household expenditure was not a significant predictor of migration for education
c. Adjusting for other factors, a lower economic status (represented by per-capita household expenditure), a lower level of parent's or guardian's education, and a lower level of respondent's education are associated with higher odds of having migrated for work reason	The effects of PCE and parent's education vary by sex	For men: compared to those whose parents had senior secondary education, those whose parents had no schooling had lower odds of migrating for work. Compared to those who were in the middle PCE quintile, those who were in the lowest PCE quintile had higher odds of migrating for work. For women: there was no difference in the odds of migrating for work across parent's education level. Compared to those who were in the middle PCE quintile, those who were in the lowest PCE quintile had higher odds of migrating for work, and those who were in the highest PCE quintile had lower odds of migrating for work
Aim 4: Examine the interdependency of the events marking the transition to adulthood		
a. For women, the residuals of the following pairs of events that are estimated simultaneously are correlated: [leaving school – starting a job], [leaving school – getting married]	Fail to reject	
b. For men, the residuals of the following pairs of events that are estimated simultaneously are correlated: [leaving school – starting a job], [starting a job – getting married]		Only the residuals of [leaving school – starting a job] were correlated

Table 5.2. Summary of the findings from the discrete-time logistic regression models on the probability of leaving school, starting a job, getting married, giving birth, by sex

Sex	Event	Significant covariates
Men	Leaving school	- *Father's education*: lower education was associated with higher odds - *Parent's co-residence*: the absence of mother was associated with higher odds - *PCE quintile*: being in 1st quintile was associated with higher odds, being in 4th and 5th quintile were associated with lower odds - *Residence*: urban residence was associated with lower odds - *Had migrated for education*: lower odds - *Had started working*: higher odds
	Starting a job	- *Father's education*: parent's education less than junior secondary was associated with higher odds - *PCE quintile*: being in 4th and 5th quintile were associated with lower odds - *Religion*: Protestant men had higher odds than Muslim men - *Had migrated for work*: higher odds - *Had been married*: higher odds
	Getting married	- *Parent's co-residence*: the absence of father was associated with lower odds - *PCE quintile*: being in 5th quintile was associated with higher odds - *Had started working*: higher odds - *Residence*: urban residence was associated with lower odds
Women	Leaving school	- *Father's education*: higher education was associated with lower odds - *Parent's co-residence*: the absence of father was associated with higher odds - *PCE quintile*: being in 5th quintile was associated with lower odds - *Religion*: Protestant women had lower odds than Muslim women - *Residence*: urban residence was associated with lower odds - *Had migrated for education*: lower odds - *Had started working*: higher odds
	Starting a job	- *Father's education*: lower education was associated with higher odds - *Had migrated for work*: higher odds - *Had been married*: lower odds - *Number of years of schooling*: higher odds
	Getting married	- *Father's education*: lower education was associated with higher odds - *Parent's co-residence*: the absence of both parents was associated with higher odds - *Religion*: Protestant and Hinduism were associated with lower odds - *Had started working*: higher odds - *Residence*: urban residence was associated with lower odds - *Number of years of schooling*: lower odds
	Giving birth	- *Father's education*: lower education was associated with higher odds - *PCE quintile*: being in 1st quintile was associated with lower odds - *Had started working*: higher odds - *Residence*: urban residence was associated with lower odds - *Number of years of schooling*: lower odds

Enrollment in junior secondary, senior secondary, and college education was higher among the younger birth cohort than the 1970-1979 birth cohort. The nine-year compulsory education program that was enacted in 1994 would affect those who were born between 1982 and 1985, but the initial rollout of the program might not have been able to reach all children. Therefore, among the 1980-1985 birth cohort, a fifth still did not have a junior secondary education. The gaps between women and men in primary and secondary education had closed, as shown by no difference in the percentages of those who had left school by age 12, 15, and 18 among the 1980-1985 birth cohort, although the gaps in tertiary education still existed. The 2010 population census data show that the increasing enrollment in secondary education has continued and the gaps between women and men have closed in all levels of education. In 2010, 84% of people aged 13-15, 53% of people aged 16-18, and 15% of people aged 19-24 were currently in school (Statistics Indonesia (BPS), 2011); with the gender parity index of 1.02 for junior secondary, 0.98 for senior secondary, and 0.96 for tertiary education. However, the increase in the enrollment in senior secondary school was not as large as in junior secondary school.

Studies across the developing regions in Asia, Africa, and South America have also shown the universal pattern of increased length of time spent in school and increased age when entering marriage and parenthood, particularly for women (Lloyd & Mensch, 2008; Mensch et al., 2005; UNESCO, 2015; Xenos et al., 2006). Far fewer studies compare the age at first job among youth in developing regions (Xenos et al., 2006); the available data are mostly on the cross-sectional percentage of persons aged 15-24 who are employed, which are also collected by the Indonesian government during biannual labor force survey. The ILOSTAT database estimated that unemployment for Indonesians between the ages of 15-24 continuously increased from 7% to 24% between 1991 and 2005, then started to decrease in 2006 reaching 15% in 2017 (ILO, 2018). Statistics Indonesia estimated the percentages of persons aged 15-24 not in employment, education or training to be 25%, 23%, and 21% in the year of 2015 through 2017, respectively (Statistics Indonesia (BPS), 2017b). Both patterns

are consistent with these finding of decreased youth unemployment, although the exact percentages are not comparable due to the different definitions, numerators, and denominators.

Adjusting for residence, province, and the number of years of schooling, I compared the hazard (as the conditional probability of an event occurred, given that it has not yet occurred) of leaving school, starting a job, getting married, and giving birth between the two birth cohorts and both sexes. The differences between the two birth cohorts vary by age and sex in their hazard of leaving school and first marriage and vary by age in their hazard of starting a job. The differences between women and men vary by age and birth cohorts in their hazard of leaving school and first marriage and vary by age in their hazard of starting a job. The differences between urban and rural residents in their hazard of leaving school vary by province.

The main difference between the two birth cohorts in their transition out of school is the higher enrollment of the 1980-1985 birth cohort in the junior secondary school particularly for women, as suggested by the lower odds of the 1980-1985 birth cohort at age 13 but the higher odds at age 16 of leaving school, and the significant interaction of birth cohort and sex indicating the difference between the two birth cohorts among women was more substantial at age 13. The younger birth cohort was able to stay longer in school until at least junior secondary school, but the ability to remain in school beyond junior secondary level did not differ between the two birth cohorts. The 1980-1985 birth cohort shifted their marriage into the third decade of life, as suggested by the lower odds of the 1980-1985 birth cohort at ages below 20 but similar odds after age 20. The younger birth cohort delayed their transition to marriage, but marriage still occurred within the period deemed appropriate by social norms as often defined by ethnicity-based laws and customs (Buttenheim & Nobles, 2009). The two birth cohorts had the same odds of giving birth at all selected age points.

The 1980-1985 birth cohort was prominently different from the 1970-1979 birth cohort in their hazard of starting to work as their primary activity. The difference between the two birth cohorts in their transition to employment did not vary by sex, both women and men of the 1980-1985 birth cohort started a job earlier than the 1970-1979 birth cohort did. For example, at age 16, the odds of the 1980-1985 birth cohort to start working was more than two times that of the 1970-1979 birth cohort. The younger birth cohort stayed longer in school, but they were able to obtain employment sooner than the 1970-1979 birth cohort once they left school. Considering the median age at leaving school was 16.4, some of the 1980-1985 birth cohort would start searching for jobs before the 1997-1998 financial crisis, but some others would start job searching during and after the crisis. Individuals might have more difficulties finding jobs in 1997-1998, especially those who never worked before. A comprehensive analysis of the effects of the 1997-1998 financial crisis using the National Labour Force Surveys data by Feridhanusetyawan (1999) indeed found that the majority of unemployed individuals were new entrants in the labor market. His analysis also found that contrary to what was expected, the increase in unemployment and underemployment rates were relatively small. The unemployment rate had only increased from 4.7% to 5.5%. Instead, the labor market adjusted by shifting back to the informal and agricultural sectors or to self-employment and family work and decreasing the real wages dramatically (Feridhanusetyawan, 1999; Manning, 2000). The impact of the crisis was heterogeneous across sex, income groups, region, and sectors of the industry. For example, the construction and manufacturing industries were hit by the financial crisis but the export-oriented manufacturing, agriculture and forestry, and mining industries benefited from the crisis. Female labor force participation had actually increased during the 1997-1998 crisis, from 1.8% annually before the crisis, to 4.2% in 1997-1998. The 1997-1998 financial crisis might indeed have increased women's employment opportunity in the sectors benefiting from the crisis; on the other hand, it might suggest that the crisis had forced women to participate in income-generating activities. The unemployment rate in 1997-1998 actually decreased among those with education level less than senior secondary while it increased among senior secondary school graduates. My analysis did not determine the sector and type

of the 1980-1985 birth cohort's first job. However, it's probable that the majority of the 1980-1985 birth cohort who entered the labor market during the crisis could not afford to be unemployed and thus followed the market adjustment, i.e., they found employment in the informal sectors or in sectors that were not affected by the crisis and worked for much lower wages.

The differences between the two birth cohorts in their transition to adulthood vary by sex, it also can be said that the difference between women and men depends on the birth cohort. At ages below 20, women were more likely to leave school than men, but the difference between women and men was smaller for urban residents and the 1980-1985 birth cohort. Likewise, women married earlier than men, but the difference between both sexes was smaller for urban residents and the 1980-1985 birth cohort. The difference between women and men in their transition to employment was also smaller for urban residents and the 1980-1985 birth cohort. The greater access to education and employment and modernization in urban settings might provide more flexibility for women in their transition to adulthood, narrowing the gaps between women's and men's experience. Education and employment provide an alternative to early marriage, although these opportunities are not yet sufficient to push marriage age further into the third decade of women's lives. Gender norms might continue to be a strong factor to encourage women to assume marriage and parenthood regardless of education and employment achievement or opportunities.

The majority of young people in this study followed a trajectory to adulthood that can be considered normative in Indonesia, i.e. finishing school, followed by employment, and subsequently marriage. The share of individuals who had started working before their marriage has increased, mainly due to increased female labor participation.

Social, cultural, and religious norms can strongly influence the pathways to adulthood by suggesting the appropriate ages at and sequences of the events marking the transition to

adulthood. Some studies on the sequences of transition to adulthood in Western industrialized countries were motivated by the suggestion that the pathways to adulthood have become "disordered" compared to the normative sequence of events; as individuals require an extended period to secure stable employment, postpone marriage and cohabitate instead, delay parenthood or become a parent outside marriage (Mouw, 2005; Salmela-Aro, Kiuru, Nurmi, & Eerola, 2011). These studies also examined whether sequence matters by examining the effect of the different pathways on adult wealth and wellbeing. Developing countries such as Indonesia might not yet share the same issues, as the family system and social norms prevail to influence young people's behavior during their transition to adulthood. Young people might still follow the normative and predictable trajectories. However, this assumption has not been examined in many developing country settings.

In fact, the majority of individuals in this study followed a sequence of transition that can be considered normative in Indonesia (Naafs, 2013), i.e. leaving school first, followed by starting a full-time job, getting married, and having a child. The percentages of those who followed that trajectory were higher for the 1980-1985 birth cohort than for the 1979-1979 birth cohort, and the difference in the percentage was large among women (18%). Men's priority of being employed first before forming a family and their later progression to marriage than women define the different frequencies of the various sequences of the events marking the transition to adulthood. Indonesian's trajectory to adulthood might become more ordered and uniform as more individuals, particularly women, start a job first before entering family life. Increased employment differentiates the distribution of women's sequences to adulthood between the two birth cohorts. More than 70% of individuals had experienced the four events marking the transition to adulthood by age 30. For men, there was no difference in the percentage of those who had experienced the four events by age 30; for women, the percentage was higher for the 1980-1985 than for the 1970-1979 birth cohort. The majority of the two birth cohorts completed their transition to adulthood by the end of their third decade of life. Only 1% of individuals had not started a job and had not been married by age 30.

Social, cultural and religious expectations coupled with familial responsibilities might encourage individuals to achieve adult roles within a period that is considered appropriate. A study by Buttenheim and Nobles (2009) found that cultural norms strongly predict age at marriage for both women and men in Indonesia, and their effects remain significant even among the younger birth cohorts and after adjusting for educational attainment, which may explain the persistent low age at marriage in Indonesia, relative to other countries with similar educational expansion and economic development (Xenos et al., 2006). The persistent effect of cultural norms in the form of gender roles may also explain the different distribution of sequences of events marking the transition to adulthood between women and men. By age 30, a fifth of men in both birth cohorts had never been married, and few married before starting a job. Almost 75% of men who married before started working were rural residents (not shown). Men in rural settings were able to marry before establishing work as their primary activity probably because most of the economic activities were based on agriculture, where intergenerational households cooperated in managing production and a young married couple did not have to establish a separate household immediately (Malhotra, 1997). Contrastingly, only 9% of women in the 1970-1979 birth cohort and 6% of women in the 1980-1985 birth cohort had never been married by age 30; and 45% of women in the 1970-1979 birth cohort and 30% of women in the 1980-1985 birth cohort married before or without ever starting a job.

In Indonesia, obtaining a job is an essential event for men to assume adult status and a necessity to achieve financial independence before they can enter a marriage, but men seem to have more flexibility to decide their timing of first marriage. Men might be less penalized than women when they push their marriage into the fourth decade of life. Instead, due to urbanization, industrialization, and exposure to new consumption norms, the society might demand men to secure a stable income and accumulate the necessary resources to establish an independent household before they can marry. Therefore, we saw a small yet significant increase in the percentage of men who started a job first before getting married.

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On the other hand, marriage before age 30 seems to be an essential event for women due to social expectations; and women are not expected to secure a job before entering marriage although Indonesian women also have always been relatively free to contribute to household income, as long as it does not interfere with family responsibilities. This traditional gender roles ideal is still prevalent event among university educated students at least in two major cities in Indonesia (Utomo, 2012). However, new employment opportunities available for women in the 1980-1985 birth cohort seem to influence women's marital decisions but still within the socially acceptable period.

Changing aspirations and attitudes toward education and employment, in addition to changing economic opportunities, might explain the changes in the distribution of the sequence of transition to adulthood; unfortunately, the IFLS does not ask about aspirations. Two other studies examined urban Indonesian youth's aspirations for education and employment while rural youth's aspirations have never been described. Nilan et al. surveyed senior secondary school and college students in nine cities that were considered as representative to a range of youth experiences across Indonesia in 2006-2008 (Nilan, Parker, Bennett, & Robinson, 2011). The study found both sexes had high education and career aspirations and female respondents actually wanted professional jobs more than their male peers. Very few women wanted to be stay-at-home mothers. However, many respondents in the lower social classes also perceived that limited financial resources to afford high quality upper level education (that is also severely limited in availability) was the main obstacle to their aspirations. Naafs conducted ethnographic fieldwork in 2008-2010 using participant observation and in-depth interviews of young people aged 18-30 from lower-middle-class background in an industrial town in Java, to understand how they navigate the economic changes amid the emergence of global Muslim youth culture and to analyze their aspirations for work and education (Naafs, 2013). Both men and women in her study considered education as well as personal connections to be important to secure a stable employment and felt the obligation and

necessity to use their education to find jobs. As their parents had spent a considerable amount of money to fund their education, these young people wanted to pay their due and help caring for their younger siblings. In addition, many had anticipated that a household needs dual earners to maintain the current middle-class lifestyle and thus expected to keep working after marriage. Naafs's fieldwork also illustrated how some young men were able to take some leisure time before committing to find a good job and thinking about marriage preparation while young women were not able to have comparable leisure time and felt more pressure to prepare for marriage.

An ethnographic study conducted in 1999 and in several months during 2001, 2002, and 2003 among university-educated Javanese youth in Yogyakarta – a city well-known as the `city of students' as it hosts numerous colleges and universities - found that education has become a marker of individual and family pride and prestige among both urban and rural middle class in Java as it is linked to employment and economic security (Smith-Hefner, 2005). Parents had recognized that both men and women need higher education to thrive in the changing world; and thus, they allowed their children to pursue higher education as long as the parents were able to afford it. Parents also had allowed greater autonomy of their daughters to delay marriage and use their education to get a job. However, many young women also felt conflicted about how to take advantage of the new opportunities and freedom while at the same time protect their chastity and family's reputation, a societal and familial responsibility that is largely placed on women and is constantly reminded of by their families and the society. This study also observed a resurgence of Islamic piety among urban communities that appeals for modest clothing, pre-marital chastity, and early marriage as a solution to problematic contemporary youth behaviors.

These other studies offer a backdrop to my findings despite differences in study samples. Women in this analysis increasingly started to work probably due to both their personal aspirations and economic necessities to support their families. The increased enrollment to

secondary and tertiary education and the associated expenses borne by the parents might generate expectation about the return to investment in education. Indonesian government's policies and programs emphasizing the value of education and globalization might also instill increased aspirations for a higher level of education. The increased availability of job opportunities in the trade and service sectors particularly facilitates the recruitment of young women into employment. Global youth culture and a new norm about middle-class lifestyle, which are often defined by achievement and consumption, further aspire young people to work in order to participate in this culture. However, strong social norms and the resurgent Islamic piety (Smith-Hefner, 2005; Utomo & McDonald, 2009) - that consider the freedom accompanying greater schooling and employment to be dangerous - might keep young people from further delaying their transition to marriage.

This analysis also looked at the occurrence of sequences that might be considered as disordered, i.e., employment before leaving school, marriage before leaving school, and the birth of a child before marriage among women. The percentages of persons who started a job before leaving school and women who had a child before marriage were higher for the 1980-1985 birth cohort than the 1970-1979 birth cohort, but there was no difference in the percentage of those who married before leaving school. Only 1% of the women in 1980-1985 birth cohort gave birth before marriage, although the percentage might be underestimated due to social desirability bias. Premarital sexual activities and childbearing are discouraged in Indonesia although there is increased openness among urban youth (Holzner & Oetomo, 2004); therefore we do not expect to see a high percentage of atypical pathways to adulthood soon among Indonesian youth. The IFLS data do not have the questions exploring why individuals started a job before leaving school i.e., due to a financial constraint that also threatened their ability to stay in school or whether individuals had started a job before leaving school because a good job opportunity was available. The first scenario might be an unfavorable situation, and working might be associated negatively with the length of time spent in school. In the second case, however, working before leaving school is not necessarily a

"disordered" sequence. Rather, working while still in school might help young people preparing for their adult roles and paying their school expenses. The median age at leaving school of those who started a job before leaving school was 18.3, which was higher than for those who did not start a job before leaving school (median age was 15.7, not shown). Therefore, the second case might be true for the majority of individuals who started a job before leaving school. The increased percentage of young people who had made working their primary activity before leaving school might be beneficial for the transition to adulthood. Unfortunately, no study has examined the effect of certain sequences of the transition to adulthood on adult outcomes in Indonesia, or in other countries in Southeast Asia region that share similar sociocultural settings to Indonesia.

There is an intergenerational effect of parents' education on the transition to adulthood. The effect of an individual's education on the transition to adulthood varies by sex and the event.

The second aim of this study is to examine the individual and family or household level predictors of the transition to adulthood. Education is suggested to be the key factor for the changes associated with the transition to adulthood. I examined the significance of education to affect the transition to adulthood of Indonesian youth, and whether there is also an intergenerational effect of education by examining the effect of father's education.

The data suggest an intergenerational effect of parent's education on the transition to adulthood, and more so for women. For both men and women, there is a strong gradient relationship between father's education and the length of time spent in school. Also, individuals who migrated for education spent a longer time in school than those who didn't migrate for education. Each additional year in school only increased their odds to migrate for education, suggesting those who migrated for education were individuals who already achieved a considerable amount of education and they migrated to pursue higher education such as senior secondary or tertiary education. Families have to spend significant resources to send

their child away to pursue higher education, as they would need to pay tuition, boarding room, meals, and transportation. If a child migrates to pursue college education, often they have to go to a different city or even a different island. The data showed that migration for education has increased among the 1980-1985 birth cohort. While the costs associated with migration for education might be high, PCE quintile was actually not a significant predictor of migration for education. Father's education is a more important predictor of youth migration for education. Children whose fathers had a higher education stayed longer in school in part because their families were willing to finance their education away from home.

Parent's education, one of the two socioeconomic status indices used in these analyses, is a distinguished and important predictor of the transition to adulthood. In the estimation of transition to marriage and parenthood for women, father's education remains a significant predictor while PCE quintile, the other socioeconomic status index, is not a significant predictor. Studies from other countries (mostly in Europe) consistently show that individuals with a higher level of education have children who likewise achieve a higher level of education (Chevalier, Denny, & McMahon; Dubow, Boxer, & Huesmann, 2009), although the correlations between parent's and child's education vary across countries depending on national economic and educational policies (Hertz et al., 2007). Several mechanisms have been offered to explain the intergenerational effect of education (Dubow et al., 2009). As a result of their education, parents with more education might provide a more supportive environment for their children's academic achievement. Parents with a higher level of education might provide a model of learning and achievement for their children through behaviors and activities (e.g., showing how their advanced degree has helped them to gain other life's achievements, providing educational materials, doing educational activities outside of school, encouraging their children to do their school assignments). As a result of their education, parents with more education might gain insights into the potential returns on investment in education and these insights affect their preferences and expectations towards their children's education. By communicating their aspirations and expectations to their children, parents might encourage

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their children to develop a high expectation of their own, which in turn will motivate them to achieve a higher level of education. Parent's higher level of education improves families' income and a higher income might be important to cover the expenses associated with children's education, especially in settings where government assistance is limited and thus the private contribution of families is essential. Finally, characteristics that make parents achieve a higher level of education, e.g. behavioral characteristics, innate traits, or other unobserved characteristics, might also affect their abilities to raise children who will also achieve a higher level of education.

The data show that each additional year of schooling delays the transition to marriage and parenthood and increases their odds of transitioning to employment for women. For men, each additional year of schooling did not affect the odds of transitioning to employment or marriage. In general, men marry later than women and this was seen among the older as well as younger birth cohort (the median age at marriage was 24.2 for the 1970-1979 and 24.7 for the 1980-1984 birth cohort). Studies in various settings have also shown that women's increasing educational attainment leads to later entry into marriage and parenthood, but few studies have examined the effect of education on men's transition to marriage. Mensch et al. argued that while increased schooling and urbanization have had some impact on marriage age, a considerable fraction of the change in marriage age is not explained by the change in education (Lloyd, Behrman, Stromquist, & Cohen, 2006). They reviewed other factors such as changes in legal age of marriage, the change in global norms about the desirability of early marriage for women, and the decline in arranged marriage. They also suggested that for men, the increasing cost of establishing a household might cause men to delay marriage. Indeed, among my study sample of men who were less than 14 years old in 1993, men in the highest PCE quintile were the only group who were more likely to marry than men in the middle quintile. Men who came from a high socioeconomic class might be assisted by their family to afford marriage.

I also looked at the effect of family structure and the transition to adulthood. Studies that were mostly done in the United States suggest that single-parenthood and step-families were associated with child's lower educational achievement and poorer behavioral and mental outcomes (Astone & McLanahan, 1991; Hofferth & Goldscheider, 2010; McLanahan & Percheski, 2008). However, studies in developing countries suggest the lack of the effect of single parenthood on a child's educational outcome (Cid, Wilcox, Lippman, & Whitney, 2009) and the mitigating effect of extended families with grandparents presence during parent's absence (Mahaarcha & Kittisuksathit, 2009). Among my study sample, the effect of single-parenthood was significant on the transition out of school and to marriage for both sexes. Unfortunately, the IFLS does not have a variable indicating whether the absence of a parent was due to divorce, migration, or death. Children whose father or mother was absent might lack financial resources and parenting input that help them succeed in school. Among my sample, the absence of mother was associated with son's earlier transition out of school while the absence of the father was associated with daughter's earlier transition out of school. It's unclear what kind of mother's input for son and father's input for daughter is important for this population's educational achievement. In Indonesia, social class, which is typically determined by father, might be more important to daughter's ability to stay in school, while mother's involvement and nurturing role might be more important to son's school achievement. In terms of transition to marriage, men whose father was absent had lower odds of getting married, while women with both parents absent had higher odds. These men might delay marriage because they took the family's responsibility to provide for their mothers and siblings first. This further confirms that men's decision to marry very much depends on their economic circumstances. The strong extended family networks typically observed in Indonesia might buffer against other disadvantages associated with single parenthood or orphanhood.

The differences across provinces in Indonesia regarding the odds of experiencing the events marking the transition to adulthood might reflect the effect of diverse sociocultural norms and economic development. However, the limited sample size does not allow precise estimation

of regional differences. Considering both previous research and the level of socioeconomic development of these provinces, some findings were predictable. For example, men in Yogyakarta had lower odds of leaving school than men in Jakarta. Indonesia DHS data show that alongside Jakarta residents, Yogyakarta residents have the highest median number of years of education completed (Statistics Indonesia (BPS) et al., 2012), and it is known as `city of students' as it houses dozens of universities. Women in West and East Java had higher odds of getting married than women in Jakarta. Sundanese of West Java and Madurese of East Java have been identified as the earliest marrying groups in Indonesia (Jones, 2001; Jones & Gubhaju, 2008). However, some findings could not be readily explained and need future investigation. For example, it's unclear why men in North Sumatra had lower odds of starting a job but higher odds of getting married than men in Jakarta.

Starting a full-time job facilitated entrance to marriage for both men and women, and to parenthood for women

Marriage is still the norm in Indonesia and marriage is often a prerequisite for being recognized as a fully-fledged adult (Situmorang, 2007). Marriage and childbearing are viewed as an expected progression after finishing school and obtaining a job. The effect of employment status on marriage is particularly strong for men, as men are required to show their ability to support a family before they can marry (Smith-Hefner, 2005). Employment is also associated with higher odds of transition to marriage and childbearing among women; the positive association between employment and family formation is also observed in other settings (Kim, 2017; Sweeney, 2002). Indonesian women who had been employed might enter marriage because it was the natural progression suggested by the social norms. On the other hand, it's suggested that women's socioeconomic status and labor market prospects become an increasingly important determinant of marriage due to changing economic structure (Oppenheimer, 1997). Given the rising standard of living and increased job insecurity, more

households adopt a dual-earner strategy to maintain financial security, which is also increasingly preferred among Indonesian young couple (Smith-Hefner, 2005; Utomo, 2012).

The decisions to leave school and to make working as the primary activity, and to leave school and to marry are interdependent for women in this study.

In the equations simultaneously estimating the probability of leaving school, starting a job, and getting married, for women, the unexplained variations from the two pairs of events (leaving school – starting a job and leaving school - getting married) are significantly correlated. For men, the unexplained variation from the two events, i.e. leaving school and starting a job, are significantly correlated while the unexplained variations from the other pairs of events (i.e. starting a job - getting married and leaving school - getting married) are not correlated. For men, there are unobserved common factors that influence the probability of leaving school and starting a job. For women, there are unobserved common factors, that are not represented by the predictors in the model, that influence the probability of leaving school and starting a job and the probability of leaving school and getting married.

For men, the decisions to stop attending school and start working are interdependent, but not the decisions to start working and marry and the decisions to leave school and marry. For women, the decisions to stop attending school and start working are interdependent, so are the decisions to leave school and marry. Many young people in Indonesia have limited resources and are constrained by social expectations and familial obligations and might not be able to fully decide for themselves their personal goals during the transition to adulthood. For example, when deciding about whether to stay in school, some individuals might also consider whether their family needs them to get a job instead. The social expectation might pressure women and their families to always consider the timing of their marriage when they make a decision about their schooling or employment, as the social stigma toward delayed marriage persists (Himawan, 2018; Situmorang, 2007). In fact, the result from the discrete-

time logistic regression showed that women who were married had lower odds of starting a job. The correlation of the unobserved factors influencing women's schooling-employment and schooling-marriage might be caused in part by women's attempt to reconcile the pairs of events. On the other hand, men enjoy more freedom to decide their marriage timing and they don't have to reconcile marriage plan with decisions about their schooling and first employment. **Table 5.3** summarizes the social norms regarding employment, marriage, and fertility in Indonesia, based on several qualitative studies.

For both men and women, the direction and the significance of the effect of educational level on the probability of starting a job do not change after accounting for the endogeneity of education level while for women, the direction and the significance of the effect of education level on the probability of getting married do not change. The magnitude of the effect of educational level after accounting for its endogeneity in the probability of starting a job or getting married changes a little.

The simultaneous estimation of the probability of leaving school, starting a job, and getting married also allows us to account for the possible endogeneity of educational attainment in the probability of starting a job and getting married. After accounting for its endogeneity, the effect of higher levels of education on the probability of starting a job remains positive and significant for both men and women; the magnitude of the effect of higher levels of education is only slightly attenuated. Likewise, after accounting for endogeneity, the effect of higher levels of education on the probability of marriage remains negative and significant for women. Interestingly, the magnitude of the effect of higher levels of education on women's probability of getting married is slightly strengthened.

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Table 5.3. The social norms regarding education, employment, marriage, and fertility in Indonesia, based on several recent qualitative studies

Issue	Sex	Social norms
Education	Both sexes	The government promotes education to improve the quality of Indonesia's human resource and to advance the nation's development. There is no legal or cultural restriction against educating women in Indonesia (Smith-Hefner, 2005). Many Indonesian families hope that education will improve their social status and assist their upward mobility. In Indonesia where social security system is limited, children are sometimes seen as a safety net to contribute to family's income and to support them in their old age (Naafs, 2013; Smith-Hefner, 2005).
Employment	Men	Men are expected to be the one responsible to earn income for the family; and even if their wives were working, men still have to give some of their income to their wives. Men face a much higher pressure about finding a job than women (Naafs, 2013).
	Women	Dual earner arrangement is increasingly preferred among middle-class families. Educated women are increasingly expected to continue working after marriage, but are still obliged to make family as their first priority. Women can be a secondary earner and have a career, as long as it doesn't interfere with their primary roles as wives and mothers. Women perceive there will be conflict between their career and their role as mothers; and they expect and are expected to work less hours, or work from home, or stop working after having children (Utomo, 2012) There are regional variations in the extent to which young women are supported or discouraged from migrating to get a job (Naafs, 2013).
Marriage	Both sexes	The universality of marriage is still the norm; marriage and childbearing are viewed as natural and expected progressions following schooling and employment. There is a cultural belief, reinforced by religious interpretations and state ideologies, that men and women have different '*kodrat*', i.e. inherent nature and natural roles. Men have a '*kodrat*' to protect and be responsible for their families while women should fulfill their reproductive roles and be devoted to their husband and children. The 1974 Marriage Law stipulates that the husband is the head of the household and the provider of the family (Naafs, 2013; Smith-Hefner, 2005; Utomo, 2012).
	Men	Ideally, men should have a job, social experience, and personal maturity to support a family before they can marry (Smith-Hefner, 2005). Sometime between their 20s or mid 30s, men are expected to fulfill their duties of becoming a responsible husband (Naafs, 2013).
	Women	The Javanese upper-class values were institutionalized to become the norm in all of Indonesia particularly among middle-class families, where women have a noble role as daughters, wives and mothers (Utomo, 2012). Women from middle-class families are expected to conform to their noble

		role, that is to marry and have children (Buttenheim & Nobles, 2009; Nobles & Buttenheim, 2008; Utomo, 2012). Women should be married by age 30 (Nilan, 2008).
Fertility	Women	The purpose of marriage is to have children, and it's expected that pregnancy would follow soon after marriage. Contraception is seldom used before the birth of the first child. Women who get married in their late twenties and thirties might be very concerned about their fertility and want to have children right away. While some women might want to enjoy their marriage before starting a pregnancy, many defer to the social expectation and become pregnant soon after marriage (Spagnoletti, Bennett, Kermode, & Wilopo, 2018).

A substantive percentage of the study sample spent two years or more neither studying nor working. However, the share of young people who were neither studying nor working for two years or more has decreased among the younger birth cohort, as they stay longer in school by enrolling in secondary school and started a job faster after leaving school, compared to the 1970-1979 birth cohort.

While the majority of the study sample completed their transition to adulthood by age 30, a high percentage also underwent an extended period of neither studying nor working; the percentage was higher among rural than urban residents and those in the lower socioeconomic levels than those in the highest. The share of young people who were neither studying nor working for two years or more decreased dramatically among the younger birth cohort, particularly among women. The 1980-1985 birth cohort was able to stay longer in school by enrolling in secondary school and transitioned to employment faster after leaving school than the 1970-1979 birth cohort; a higher percentage of women of the 1980-1985 birth cohort participated in the labor force than women of the 1970-1979 birth cohort. Individuals who only have six years of schooling or less spent a median of 5.8 years neither studying nor working. Premature exit from school is a complex problem that can be caused by a variety of reasons, most commonly cited reason is cost (Suryadarma, Suryahadi, & Sumarto, 2006); but the majority of these people left school probably not due to a conflict between study and work. Therefore, improved socioeconomic conditions that allow continuous increase in enrollment

in secondary school in Indonesia will likely decrease the number of young people neither studying nor working for an extended period. However, based on 2010 census data, the nine-year compulsory education program that has been implemented for almost 25 years has not been able to achieve 100% enrollment rate in junior secondary school (Statistics Indonesia (BPS), 2011).

My analysis only described the percentages and the median time spent neither studying nor working. While some studies in industrialized countries suggested that going through an extended period of neither studying nor working is associated with unfavorable adulthood outcomes (Bäckman & Nilsson, 2016; Bynner & Parsons, 2002), we don't know yet whether the same effect applies to Indonesian youth. Future studies are needed to examine the effect of an extended period of neither working nor studying on adulthood outcomes. A qualitative study by Naafs (2013) that has been described above illustrated that even among those who have the same age and social background, young men's behaviors during their transition from school to work are diverse. Some described that they did not have leisure time and immediately started looking for work or for ways to enroll in college, while others actually took time after studying to enjoy leisure time. Some described their or their peers' work-searching activities as "waiting for a job", "waiting for work, without really looking for it", "looking for money" (i.e., getting by without having to become a salaried worker, but from various strings of temporary or informal economic activities). The analysis by the World Bank suggested that senior secondary school graduates actually have more difficulties to obtain a job than those with lower levels of education, due to the limited growth of employment in manufacturing and service sectors, which has not kept up with the increased numbers of educated job-searchers (The World Bank, 2010). This probably explains why some people spent an extended period not working while no longer in school, as they have not been able to find a good quality job that matches their qualifications and aspirations. My analysis used a stricter definition of starting a job for the transition to adulthood, i.e., working as the primary activity or working for 20 hours or more. Therefore, many who had started a part-time job were categorized as not

started working until they increased their work hours to 20 hours or indicated that their primary activity was working. Some had other activities such as housekeeping, caring for other family members, or being married and raising a child (particularly among women) which can be meaningful and fulfilling although not necessarily economically productive.

The younger birth cohort increasingly migrated during their transition to adulthood to continue their education or find an employment. The socioeconomic indices that significantly predict these two types of migration differ. Migration for education was done by young people who come from more educated families as well, while the lowest economic status (represented by per-capita expenditure in the study) was associated with higher odds to migrate for education.

The percentage of individuals who had migrated for education or work reason had almost doubled among the 1980-1985 birth cohort. Father's education is a significant predictor of migration for education, although there is no difference in the odds of migration for education between those whose father had a junior secondary education and those whose father had senior secondary education. Only 25% of the analysis sample had a father with junior secondary education or higher, therefore among their father's generation that is homogeneous in term of educational achievement, a junior secondary education was probably considered advanced to be able to provide socioeconomic advantages and high aspirations for education. While the percentage of those who migrated for education has doubled, only 20% of the 1980-1985 birth cohort had migrated for education by age 30. The costs associated with sending a child away for school is probably prohibitive for many families in Indonesia, although many students might actually feel the need to migrate due to limited numbers or even unavailability of schools in their community or low quality of schools that do not match their expectation and needs, a prevalent problem in Indonesia. If families who already have socioeconomic advantages are the only ones who are able to send their children away to pursue higher education, the gaps in educational achievement across socioeconomic class will continue to widen.

My analysis found that the availability of senior secondary schools and public transit were associated with lower odds of leaving school, although the indicator for the availability of senior secondary schools is crude and does not account for the population size as it was not available from the data. Providing enough schools closer to the community and establishing public transit might benefit those who otherwise would quit because they do not have the resources to migrate or arrange for private transportation. The study by Duflo (2000) used the variations in schooling generated by a mass construction of 61,000 primary schools throughout Indonesia between 1973 and 1978 as an instrumental variable to determine its impact on education and income. Her study found that school constructions increased the number of years of primary education completed, which subsequently translated into an increase in wages.

Migration to obtain jobs can also be costly especially if there is uncertainty whether individuals would be able to find a job as soon as they arrive. However, those in the lowest PCE quintile actually had higher odds of migration for work. These individuals probably could not afford to be unemployed and were willing to take the risk of uncertainty as they were not able to find a good job in their place of origin. Rapid urbanization will continue and by 2025 68% of Indonesia population will live in cities (United Nations Department of Economic and Social Affairs Population Division, 2014), placing the burden on services and infrastructure that are already stretched in cities (Lewis, 2014). Among this study sample, migration for work was associated with higher odds of starting a job, and those who migrated for first work waited a median time of 1.4 years to be fully employed (not shown). If young migrants from low socioeconomic class had to spend even longer time to find work, they might not have financial reserve to draw on and thus need outside assistance. Rural to urban migration has also been associated with higher rates of stress and poorer mental health, due to negative stereotypes attached to rural migrants (Li, Stanton, Fang, & Lin, 2006), poor living and working conditions, loss of social support, or pressure to send large remittance (Lu, 2010). Youth migrants might benefit from

health or social programs that address their needs to cope with the loss of social support, the poor living or working condition, or the heightened psychological stress.

It is interesting that migration seems to have a stronger effect on employment gain among women than men (the odds of starting a job of men and women who migrated for work were 4.8 and 7.5 times that of those who didn't migrate for work). A number of qualitative studies described that Indonesian young women had to negotiate with their parents to be allowed to migrate to cities; as parents were concerned about their daughters' reputation, about losing control of their daughters, or about daughters' autonomy that might lead them to abandon their traditional obligations (Elmhirst, 2002; Koning, 2005; Williams, 2005). However, the existence of the informal kinship-peer network of female migrants through which young women are often recruited reassured parents that their daughters would be assisted and monitored by the extension of their own community in the destination place. Young, unmarried women might be more likely to be allowed to migrate if there is some assurance from this network of friends that job is indeed available.

Study Limitations

This study has several limitations regarding the data and the statistical models being used. First, I will describe the data limitation. While the year or age at starting a job was not missing for the entire study sample who had started a job by age 30, for 97% of these individuals, I had to impute the month of starting the first job because IFLS only started to ask the month of the first job in wave 5. A substantial percentage of the month of migration and the month of leaving school was also missing and had to be imputed. Time is the central outcome of this study and the imputation of such a high percentage of outcome variable is a serious threat to study's validity and can generate misleading estimates. However, the transition to employment is a very significant event during the transition to adulthood and is often the main concern among young people, and increasingly so for women in developing country settings. The

transition to employment is rarely examined in the studies about young people's health and wellbeing due to limited data availability. Excluding the transition to employment will make the description of the transition to adulthood incomplete. The imputation of the month of leaving school is less problematic because other variables exist to help determine whether the respondent finished the grade level (85% did), and the official month of the end of the school year could be assigned. Partial reporting of the date of key events is a common problem in population surveys and I have adopted the standard approaches used by the Demographic and Health Surveys to impute the missing months (Croft, 2018). I considered the interrelationship of the events, used the observations with complete reporting as the basis of any assumptions and assignments, and randomly imputed the missing months. Fortunately, IFLS had started to ask the month of the first job in wave 5. While future research will benefit from better data collection and interviewing techniques to minimize incomplete response, the recall error associated with retrospective reporting of past events might always exist. Rare and important events such as marriage, divorce, and the birth of a child are more accurately reported based on autobiographical memory. However, recalling a frequent, irregular, or complex event can be difficult and thus more prone to error (Schwarz, 2007). A study analyzing the accuracy of retrospective reporting on first substantial employment among women in the US suggested that it's not easy to recall the date of such events. The accuracy of recall was related to the length of the recall period, the salience (part-time or full-time) and the complexity (e.g. multiple jobs) of the employment histories itself, and the presence or absence of time-anchoring biographical events to assist recall (Shattuck & Rendall, 2017).

My study faced a problem of informative censoring, as almost half of the respondents lost to follow-up was due to reasons related to the outcomes (e.g. left the household to find a job or marry) which can cause biased inference. To address this, I used the exit date from the household as the date of the event according to the reason of exit. Also, the coefficients from the estimations that included this information and the estimations that treated those cases as censored are similar. My study also benefited from the low attrition rate of such a large-scale

and long-term survey (John Strauss et al., 2016). However, in the future when survey response rates will likely fall, a more sophisticated imputation technique might be preferred to yield less biased estimates.

In this study, I defined full-time employment as 20 hours of work per week for some panel respondents who were not asked the question "When did you start working full-time for the first time?" (details are on page 46 of Chapter 3) because I found a high percentage of respondents who indicated that they had started working full-time actually reported less than 40 hours of first full-time job per week. The IFLS provided an explanation "the meaning of working full-time is that working is the primary activity" to help respondents answering the question. Therefore, for those who were asked the question about first full-time job, it's up to respondents to determine when they perceive their work activity as the primary activity. As a result, risk of miscategorization exists if respondents that I categorized as "starting a job" using "20 hours/week" definition actually didn't perceive his work activity as a primary activity. Also, comparison with other studies that might use a different definition of employment to mark the transition to adulthood will not be straightforward. One might argue that a quantitative standard is needed to define "full-time employment" in the studies on the transition to adulthood so that results across studies can be comparable. The definition of full-time employment for the study on the transition to adulthood might need to be less restrictive (e.g. more than 20 hours/week), since many young people probably start full-time job (i.e., working is their primary activity) at less than 40 hours/week. Also, I would recommend the IFLS to not skip the questions about first full-time job when asking panel respondents, so that researchers interested in the timing of first full-time job can use a consistent definition.

In addition, I only described the transition to employment in terms of the occurrence and timing of first full-time job. However, there are many other variables that can be used to comprehensively capture the complexity of today's youth employment and can be more important than just the timing of first employment (Alisjahbana & Manning, 2006). For

example, young people can go back and forth between full-time and part-time work or between informal and formal employment; types and quality of employment can be categorized based on number of work hours, wages, productivity, and conditions of work, etc. Many economic studies have described Indonesian youth employment, although not in relation to other youth outcomes (Manning & Junankar, 1998; Manning & Pratomo, 2013; Naidoo, Packard, & Awwalin, 2015; The World Bank, 2010).

My findings suggest an underlying gender role ideology shaping the gendered pattern of the transition to adulthood in Indonesia. Parent's and individual's own expectations about education and career - which can also be shaped by gender norms - probably influence the transition to adulthood. I was not able to examine these other important predictors of the transition to adulthood because they were not collected in the IFLS. However, several studies in various settings have shown the significant effect of gender role attitudes on the transition to adulthood (Cunningham, 2008; Gadallah, Roushdy, & Sieverding, 2017) and female labor force participation (Stickney & Konrad, 2007). A number of qualitative studies in Indonesia explored the gender norms related to employment, marriage, and fertility (Naafs, 2013; Nilan, 2008; Spagnoletti et al., 2018; Utomo, 2012), but no study has linked these norms with young adult outcomes.

Also, I only compared the two youngest birth cohorts who reached age 30 by 2015 because I wanted to focus on the experience of contemporary youth. Future research that includes the younger birth cohorts (e.g. those who were born in 1986-1995) can be conducted to examine whether the changes continue across successive birth cohorts, whether there is any change in the effect of the predictors and in the interdependencies of the events marking the transition to adulthood.

While I included the time-varying variable of residence (urban-rural) based on the migration history, the variable for the province is time-constant which did not accurately represent the

study population, as some households moved to other provinces between the surveys. By 2015 (the 5th wave of IFLS), 10% of the IFLS households have moved to other IFLS provinces. However, several provinces were expanded and have changed names since 1999, thus complicated the tracking of the inter-provincial move. I also only included the status of parents' co-residence and the value of PCE quintile measured in 1993, as I focused on the effect of childhood socioeconomic status on the transition to adulthood of individuals who were born between 1979 and 1985. However, PCE that is measured more proximate in time to the events might have more predictive power.

I used two different models i.e., the discrete-time logit model and the multivariate probit model because the discrete-time logit model cannot be used to simultaneously estimate several events that are thought to be interdependent. The results from the discrete-time logit model and the multivariate probit model cannot be compared as the models use a different data structure, a different set of predictors, and a different type of variable (numeric variable of individual own's education in the discrete-time logit model and categorical variable in the probit model). However, when I compared the coefficients from the two models, the direction of the coefficients was consistent although there were differences in the significance of some categories. While the discrete-time logit model cannot be used to simultaneously estimate several events, it was easier to include time-varying covariates that change every year (such as the number of years of schooling) in the discrete-time logit model. Therefore, I was able to estimate the effect of each additional year of schooling on the transition to employment, marriage, and parenthood, and the effect of each additional year of marriage duration on the transition to parenthood.

Conclusion

This study provides a more comprehensive understanding of the Indonesian youth's transition to adulthood as I examined employment and migration, the two issues that are often excluded from public health studies on youth. Indonesian youth is undergoing some changes in their

participation in school and in the labor force and in their mobility to pursue education and employment. While the gaps between men and women become smaller, there is a clear gendered pattern of the transition to adulthood in Indonesia. The main contribution of this study is that my findings suggest the interdependency of school enrollment and workforce participation, and school enrollment and marriage for women. A number of qualitative studies have described how Indonesian women have to reconcile their aspirations for education and a career with the social expectation of establishing a family. This study provides some quantitative evidence from a study population that is representative of 80% of the Indonesian population. For men, school enrollment and workforce participation are interdependent processes, but are less interdependent with marriage.

Family background matters in the transition to adulthood; father' education is an important predictor of school enrollment and workforce participation for both men and women, and of marriage for women. After accounting for the possible endogeneity of individual own's educational level in the probability of employment and marriage, the effect of individual own's education does not change much.

There are questions that are key to understanding the transition of Indonesian youth that I am still unable to answer in this study. While the majority of individuals have completed their transition to adulthood by age 30, it's not known whether their experience matched their aspirations for education, career, or marriage; that is, whether Indonesian youth feel that their timing of school leaving, starting (or not starting) a job or marriage was the right time, or that it should be sooner or later. My findings show a pervasiveness of young people spending an extended period of neither studying nor working; it's not yet known whether this situation would be disadvantageous for adult's health and wellbeing, as it would be in industrialized countries. Future research examining the match between young people's aspirations for and realization of education, career, and marriage or examining the effect of an extended period of non-productivity on adulthood outcomes will be an illuminating complement to my study.

My analysis has at least three policy implications. First, as female workforce participation will continue to increase in the coming years, conflicts between work and family responsibilities for men and women will likely increase too. Women, in particular, would see that new opportunities for pursuing education and career are now open to them, yet at the same time, patriarchal value and gender discriminations in school and work spaces might make it difficult for them to combine school-work participation with marriage-childbearing. The government and policymakers in Indonesia will need to recognize this issue and develop school and workforce policies to promote gender equity. Indonesia will be more likely to enjoy the demographic dividend if everyone is allowed to participate.

Second, as the events marking the transition to adulthood are interdependent, the government agencies that deal with education, labor, and reproductive health and family policies should together develop an integrated youth policy that recognizes this interdependency and is inclusive to the diverse youth backgrounds and life orientations. While Indonesia has several agencies that are primarily responsible for youth, there is no recognized comprehensive cross-sectoral national youth policy (Ramadhan, 2013).

Third, the findings affirm that family background matters and there is a strong intergenerational effect of education in the transition to adulthood. The government should attempt to reduce the inequality of opportunity caused by this uneven playing field, by sustaining the policies that assist families with low socioeconomic status. In the last twenty years, the Indonesian government has rapidly expanded the social protection programs for families and child's education, such as the conditional cash transfer program for low-income families and in 2008, cash assistance for students from low-income families covering primary and secondary school enrollment. A study evaluating the effect of the conditional cash transfer program on children's school enrollment and labor participation found that the effect of the program is only significant

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if the coverage period is expanded to cover children's primary and secondary schooling period

(Lee & Hwang, 2016).

List of Appendix Tables and Figures

Table A.3.1. The number of households and individuals interviewed in IFLS1, IFLS2, IFLS3, IFLS4, and IFLS5

Survey	Households interviewed	Individuals interviewed	Response rate (%)	
			HH interview	Individual interview
IFLS1 1993	7,224	22,347 panel respondents	99.0	--
IFLS2 1997[a]	7,698 (6,820 origin IFLS1 HH and 878 split-off HH)	31,953 (20,821 target respondents, 5,716 other IFLS1 HH member, 5,416 new respondents)	94.0	91.0
IFLS3 2000[b]	1,0435 (6,758 origin IFLS1 HH and 3,677 split-off HH since 1993)	38433 (29,847 in origin IFLS1 HH, 8,586 in split-off HH)	95.0	95.7
IFLS4 2007 [b]	13,536 (6,429 origin IFLS1 HH and 7,107 split-off HH since 1993)	44,103 (25,351 in origin IFLS1 HH, 18,752 in split-off HH)	90.0	94.0
IFLS5 2014 [b]	15,902 (6,021 origin IFLS1 HH and 9,881 split-off HH since 1993)	50,148 (22,090 in origin IFLS1 HH, 28,058 in split-off HH)	90.0	90.1

Panel respondents: IFLS1 household members who provided detailed individual-level data in 1993

Target respondents will be tracked if they move out of an IFLS household.

Criteria for target respondents:

- IFLS2 1997: IFLS1 household members who provided detailed individual-level information in 1993 or those who were born before 1968

- IFLS3 2000: IFLS1 household members who provided detailed individual-level information in 1993 or those who were born before 1968, individuals born since 1993 in origin 1993 households, individuals born after 1988 if they were resident in an origin household in 1993, IFLS1 household members who were born between 1968 and 1988 if they were interviewed in 1997, 20% random sample of IFLS1 household members who were born between 1968 and 1988 if they were not interviewed in 1997

- IFLS4 2007: IFLS1 household members who provided detailed individual-level information in 1993 or those who were born before 1968, individuals born since 1993 in origin 1993 households also in split-off households if they are children of origin IFLS1 household members, individuals born after 1988 if they were resident in an origin household in 1993, IFLS1 household members who were born between 1968 and 1988 if they were interviewed

in 2000, 20% random sample of IFLS1 household members who were born between 1968

and 1988 if they were not interviewed in 2000

- IFLS5 2014: IFLS1 household members who provided detailed individual-level information in

    1993 or those who were born before 1968, individuals born since 1993 in origin 1993

    households also in split-off households if they are children of origin IFLS1 household

    members, individuals born after 1988 if they were resident in an origin household in 1993,

    IFLS1 household members who were born between 1968 and 1988 if they were interviewed

    in 2007, 20% random sample of IFLS1 household members who were born between 1968

    and 1988 if they were not interviewed in 2007

[a] The goal of IFLS2 is to interview all members of origin IFLS1 HH and target respondent, spouse,

and minor children of split-off HH.

[b] The goal of IFLS3, IFLS4, and IFLS5 is to interview all current members of origin IFLS1 HH and all

IFLS1 household members, their spouse, and biological children of split-off HH.

Table A.3.2.The percentage of reasons for lost to follow-up before age 30 (i.e. respondent not followed-up until age 30) among the study sample, by birth cohort

		Birth cohort	
Reasons	Both cohorts (n=2,537)	1970-1979 (n=1,060)	1980-1985 (n= 1,477)
All reasons	100	100	100
House not found, HH moved to non-IFLS province or to unknown location	14.4	17.6	12.2
R followed their family	10.5	9.2	11.4
R not at home	1.4	1.1	1.6
HH/R refused to be interviewed	9.1	7.3	10.4
R moved out to find a job	29.1	26.9	30.6
R moved out due to marriage	12.0	13.3	11.0
R moved out to continue their education	3.0	2.2	3.7
R died	7.3	8.3	6.5
Proxy interview was conducted	2.8	2.9	2.7
Don't know / other	9.5	11.3	8.3

HH=household, R=respondent

Table A.3.3. The percentage of individuals with pairs of events occurred in the same year, among the study sample who have experienced the pair of events and the years of the events were not missing

Sample	Pair of events			
	S – W % (n)	W – M % (n)	W – N % (n)	S – N % (n)
All study sample	17.2 (8,865)	7.6 (8,528)	4.6 (8,655)	4.0 (8,796)
Sample with …				
month of leaving school missing	12.2 (1,323)	na	na	2.2 (1,323)
month of first employment missing	18.6 (7,897)	7.8 (7,885)	4.8 (7,972)	na
month of first migration missing	na	23.5 (808)	na	na

S = left school; W = first job; M = first migration since age 12; N = first marriage; na = not applicable

Table A.4.1. The mean and median age at experiencing the events marking the transition to adulthood, among all study sample who had experienced the event, by birth cohort and sex

Transition	Measure	Birth cohort and sex					
		1970-1979			1980-1985		
		Both sexes	Men	Women	Both sexes	Men	Women
Leaving school	median	15.7	16.3	14.9*	16.4	16.4	16.3
	mean	15.9	16.3	15.6*	16.5	16.5	16.4
Starting a job	median	19.6	19.5	19.8	18.5	18.2	18.8*
	mean	19.5	19.2	19.9*	18.6	18.3	19.0*
Getting married	median	21.8	24.2	19.5*	22.5	24.7	20.8*
	mean	21.6	23.9	19.9*	22.4	24.4	20.9*
Giving birth	median			21.0			22.0
	mean			21.3			22.1
Number of years of schooling	median	9.0	9.1	8.9	9.1	9.25	9.1
	mean	9.1	9.4	8.8*	9.8	9.8	9.8

Table A.4.2. The percentage of the sequences of the events marking the transition to adulthood, among all study sample who were observed until age 30*, by birth cohort and sex

Sequence	Birth cohort					
	1970-1979			1980-1985		
	Both sexes (n=4,060)	Men (n=1,919)	Women (n=2,141)	Both sexes (n=2,789)	Men (n=1,353)	Women (n=1,436)
S = left or finished school, W = started a job, M = migrated, N = married, B = gave birth						
Employment before marriage/parenthood						
S – W – N	22.3	26.1	18.8	20.3	20.1	20.4
S - W – N – M	9.7	12.7	7.0	9.6	9.9	9.3
S - W – M – N	7.3	10.1	4.7	11.1	12.8	9.4
S - M – W – N	4.7	6.0	3.4	7.8	7.7	7.9
W - S - N	4.1	4.2	4.0	4.2	4.3	4.0
M - S – W – N	2.9	3.2	2.6	5.9	6.8	5.1
W – S – N – M	1.8	1.8	1.9	2.6	2.9	2.3
W – S – M – N	1.3	1.8	0.8	3.3	4.4	2.2
M – W – S – N	0.9	1.1	0.7	1.9	2.3	1.5
W – N	0.4	0.3	0.4	<0.1	0.1	<0.1
W – M – S – N	0.3	0.5	0.1	0.4	0.3	0.4
W – N – S	0.2	<0.1	0.3	0.2	0.1	0.3
W – N – S – M	<0.1	<0.1	<0.1	<0.1	0.0	<0.1
W – N – M	<0.1	0.0	0.1	0.0	0.0	0.0
W – M – N – S	<0.1	<0.1	<0.1	<0.1	0.2	0.0
W – N – M – S	<0.1	<0.1	<0.1	0.1	<0.1	0.1
M – W – N – S	<0.1	<0.1	0.0	0.2	0.3	0.1
Marriage and or parenthood before employment						
S – N – W	10.6	3.7	16.9	5.2	1.7	8.6
S - N – M – W	4.2	1.4	6.9	2.1	0.7	3.6
S - M – N – W	1.3	0.9	1.6	0.5	0.3	0.7
S – N – W – M	1.3	1.1	1.5	0.7	0.2	1.2
N – S – W	0.9	0.2	1.5	0.5	0.2	0.8
M – S – N – W	0.8	0.6	1.0	1.1	0.8	1.4
N – S – M – W	0.5	0.1	0.7	0.2	<0.1	0.4
N – S – W – M	0.5	0.2	0.7	0.2	0.1	0.2
N - W	0.3	0.2	0.4	<0.1	<0.1	<0.1
M – N – S – W	0.2	<0.1	0.2	0.3	0.2	0.5
N – M – S – W	0.1	<0.1	0.2	0.1	0.0	0.2
N – W – S	0.1	0.2	<0.1	0.0	0.0	0.0
Employment, not yet experiencing marriage and or parenthood						
S – W	7.9	11.4	4.7	5.5	8.5	2.5
S – W – M	2.2	3.8	0.6	2.4	4.2	0.5
S – M – W	1.3	1.6	1.0	1.6	2.6	0.6
M – S – W	1.1	1.6	0.7	0.9	1.1	0.7
W – S	1.0	1.2	0.8	1.6	2.6	0.7
W – S – M	0.6	1.2	<0.1	0.6	1.0	0.1
M – W – S	0.2	0.3	0.2	0.4	0.7	0.2
M - W	0.0	0.0	0.0	<0.1	<0.1	0.0
W – M – S	<0.1	<0.1	0.0	0.2	0.4	0.0
Marriage and or parenthood, not yet experiencing employment						
S – N	4.0	0.1	7.6	3.7	0.4	6.9
S – N – M	1.5	0.2	2.7	1.4	0.0	2.9
M – S – N	0.6	0.1	0.9	0.5	0.2	0.8
S – M – N	0.6	<0.1	1.0	0.7	0.2	1.1
N - S	0.3	0.0	0.6	0.3	0.0	0.7
N	0.2	0.0	0.4	0.0	0.0	0.0
N – S – M	<0.1	0.0	0.2	0.0	0.0	0.0
M – N – S	<0.1	0.0	<0.1	0.1	0.0	0.2
N – M – S	<0.1	0.0	0.1	0.0	0.0	0.0
No employment, marriage, or parenthood						
S	0.8	0.8	0.8	0.7	0.7	0.7
none	0.2	0.3	0.2	0.3	0.3	0.3
S - M	0.1	<0.1	0.1	<0.1	0.2	0.0
M – S	<0.1	<0.1	<0.1	<0.1	0.1	0.0

Other sequences that are <0.1%	0.7	0.9	0.9	0.6	0.5	0.4
* only sequences with percentage >= 0.1% were displayed						

[S - W - N] was the most frequent sequence observed in the four birth cohort-sex groups

(**Table A.4.2**); about one-fifth of the study sample experienced that sequence, but the

percentage was higher among the 1970-1979 men at 26%. The second rank was [S - W - N

- M] for 1970-1979 men; [S - W - M - N] for 1980-1985 men; and [S - N - W] for 1970-1979

women. For 1980-1985 women, [S - W - N - M], [S - W - M - N], and [S - N - W] were tied for

second at 9%. The third rank was [S - W] for 1970-1979 men, [S - W - N - M] for 1980-1985

men, [S - N] for 1970-1979 women, and [S - M - W - N] for 1980-1985 women. Ranked

fourth for 1970-1979 men was [S - W - M - N]; for 1980-1985 men was [S - W]; and for 1980-

1985 women was [S - N]. For 1970-1979 women, [S - W - N - M] and [S - N - M - W] were

tied for fourth at 7%.

Comparing the 1970-1979 and 1980-1985 men, the apparent increase in the percentage

experiencing the sequence was for [S - W - M - N] and [M - S - W - N]. If we compare the

1970-1979 and 1980-1985 women, the noticeable increase was for [S - W - M - N], [S - M -

W - N], and [M - S - W - N]; corresponds to the dramatic decrease for [S - N - W]. A higher

percentage of women of the 1980-1985 birth cohort were employed before getting married

and ever migrated.

Table A.4.3. The percentage of the sequences of the events marking the transition to adulthood, among all female study sample who were observed until age 30*, by birth cohort

Sequence	Birth cohort	
	1970-1979 (n=2,142)	1980-1985 (n=1,441)
S = left or finished school, W = started a job, M = migrated, N = married, B = gave birth		
Employment before marriage/parenthood		
S – W – N - B	16.9	18.5
S – W – N – M – B	4.6	5.7
S – W – M – N – B	4.3	7.8
W – S – N - B	3.6	3.9
S – M – W – N – B	3.2	6.9
M – S – W – N – B	2.3	3.9
S – W – N – B – M	1.9	3.1
S – W – N	1.7	1.2
W – S – N – M – B	1.4	1.7
W – S – M – N – B	0.7	2.1
M – W – S – N – B	0.6	1.4
S – W – N – M	0.5	0.4
W – S – N	0.4	0.2
S – W – M – N	0.4	1.2
W – S – N – B – M	0.4	0.5
M – S – W - N	0.3	1.0
W – N – S - B	0.2	0.2
S – W – B – M	0.2	0.6
W – N - B	0.2	<0.1
W – M – S – N – B	0.1	0.4
W – N – B - S	0.1	<0.1
W – N	0.1	0.0
S – M – W - N	<0.1	0.6
M – W – N – S	<0.1	0.3
S – M – W – B – N	<0.1	0.3
S – W – M – B – N	<0.1	0.3
N – M – B – S – W	<0.1	0.2
W – N – M – S – B	0.0	0.2
M – S – W – B – N	<0.1	0.1
M – W – S – N	<0.1	0.1
Marriage and or parenthood before employment		
S – N – B – W	13.0	7.2
S – N – W - B	3.2	1.2
S – N – M – B – W	3.1	2.2
S – N – B – M – W	2.0	0.7
S – N – M – W – B	1.6	0.1
S – M – N – B – W	1.5	0.5
N – S – B - W	0.8	0.2
M – S – N – B – W	0.8	1.1
S – N – B – W – M	0.7	1.0
N – S – W - B	0.5	0.2
S – N – W – M – B	0.4	0.0
S – N – W – B – M	0.4	0.2
S – B – N - W	0.4	<0.1
N – S – B – W – M	0.3	0.0
N – S – W – M – B	0.3	0.0
S – N - W	0.3	0.2
N – S – M – B – W	0.3	0.1
N – B – S - W	0.2	0.4
S – M – N – W – B	0.2	0.2

S – N – M – W	0.2	0.0
N – S – B – M – W	0.2	0.2
M – N – S – B – W	0.2	0.1
M – S – N – W – B	0.1	0.3
N – B - W	0.1	0.0
N – W - B	0.1	0.0
N – B – S – M - W	0.1	0.0
M – N – S – W – B	0.0	0.2
M – N – B – S – W	<0.1	0.1
S – M – N - W	0.0	0.1
N – S – W – B – M	0.0	0.1
Employment, not yet experiencing marriage and or parenthood		
S - W	4.6	2.5
S – M – W	1.0	0.6
W - S	0.8	0.7
M – S – W	0.7	0.7
S – W - M	0.6	0.5
M – W - S	0.1	0.2
W – S - M	<0.1	0.1
Marriage and or parenthood, not yet experiencing employment		
S – N - B	7.2	6.2
S – N – M - B	2.0	2.1
S – M – N – B	1.0	1.0
M – S – N – B	0.9	0.7
N – S - B	0.6	0.7
S – N – B - M	0.5	0.5
S - N	0.4	0.5
N - B	0.3	0.0
S – N – M	0.1	<0.1
N – M – S – B	0.1	0.0
N – S – M – B	0.1	0.7
M – N – S – B	<0.1	0.2
N – S – B – M	0.0	0.1
S – B - N	0.0	0.1
S – B – N – M	<0.1	0.1
No employment, marriage, or parenthood		
S	0.8	0.7
none	0.2	0.3
S – M	0.1	0.0
Other sequences that were <0.1%	2.8	1.4
* only sequences with percentage >= 0.1% were displayed		

Among the sequences with a percentage of 1% or above, [S - W - M - N] and [M - S - W - N] were the only sequences that didn't include a first birth, that were higher among 1980-1985 women than 1970-1979 women at 1.2% vs. 0.4%, and 1% vs. 0.3%, respectively.

Table A.4.4. The median lag time (in years) between the events, among all sample who had experienced the pair of events by age 30, by birth cohort and sex

	Birth cohort and sex			
Pair of events	1970-1979		1980-1985	
	Men	Women	Men	Women
Leaving school and start working	2.8	3.8	1.9	1.8
Start working and getting married	5.5	3.6	6.3	3.9
Leaving school and getting married	7.8	4.4	7.7	4.5
Getting married and giving birth		1.2		1.2

Table A.4.5. The odds ratios (and 95% CI) of the **simple** discrete-time logistic regression on the hazard of leaving school, starting an employment, getting married, and giving birth; among all study sample (i.e. persons born in 1970-1985 who were a member of the original 1993 households of IFLS)

Covariates	Category	Event			
		Leaving /finishing school	Full-time employment	First marriage	First birth (women)
Birth cohort (ref: 1970-1979)	1980 - 1985	0.90 (0.86 – 0.94)	1.24** (1.17 – 1.31)	0.94* (0.89 – 0.99)	0.92* (0.85 – 0.99)
Sex (ref: men)	women	1.17** (1.11 – 1.23)	0.61** (0.58 – 0.64)	2.52** (2.37 – 2.67)	--
Number of years of schooling		--	1.03** (1.02 – 1.04)	0.95** (0.94 – 0.96)	0.92** (0.91 – 0.94)
Residence (ref: rural)	urban	0.50** (0.48 – 0.53)	1.04 (0.98 – 1.09)	0.69** (0.65 – 0.73)	0.62* (0.57 – 0.67)
Province (ref: Jakarta)	North Sumatra	1.38** (1.25 – 1.51)	0.83** (0.75 -0.92)	1.21* (1.08 – 1.37)	0.97 (0.82 – 1.16)
	West Sumatra	1.13* (1.02 – 1.25)	0.89 (0.80 – 0.99)	1.17* (1.02 – 1.33)	1.13 (0.96 – 1.33)
	South Sumatra	1.64** (1.46 – 1.84)	0.94 (0.84 – 1.06)	1.60** (1.40 – 1.82)	1.59** (1.33 – 1.90)
	Lampung	2.28** (2.03 – 2.56)	1.18* (1.03 – 1.34)	1.82** (1.59 – 2.09)	2.01** (1.68 – 2.41)
	West Java	1.87** (1.72 – 2.04)	1.02 (0.94 – 1.11)	1.79** (1.61 – 1.98)	1.89** (1.64 – 2.17)
	Central Java	1.83** (1.67 – 2.00)	1.41** (1.28 – 1.55)	1.42** (1.27 – 1.59)	1.51** (1.30 – 1.75)
	DI Yogyakarta	0.84* (0.75 – 0.93)	1.06 (0.95 – 1.18)	0.97 (0.85 – 1.11)	0.99 (0.83 – 1.19)
	East Java	1.81** (1.66 – 1.97)	1.12* (1.02 – 1.22)	1.60** (1.43 – 1.78)	1.78** (1.54 – 2.06)
	Bali	1.59** (1.43 – 1.77)	1.25** (1.11 – 1.40)	1.51** (1.31 – 1.74)	1.38* (1.14 – 1.67)
	West Nusa Tenggara	1.99** (1.77 – 2.23)	1.38** (1.21 – 1.58)	1.66** (1.46 – 1.90)	1.34* (1.12 – 1.59)
	South Kalimantan	1.96** (1.73 – 2.23)	1.21* (1.06 – 1.40)	1.81** (1.55 – 2.11)	1.69** (1.37 – 2.09)
	South Sulawesi	1.94** (1.73 – 2.17)	0.84* (0.75 – 0.94)	1.39** (1.20 – 1.60)	1.18 (0.98 – 1.42)

** p-value< 0.001
*   p-value<0.05

Table A.4.6. The odds ratios (and 95% CI) of the discrete-time logistic regression with **significant interaction** on the hazard of leaving school, starting an employment, getting married, and giving birth; among all study sample (i.e. persons born in 1970-1985 who were a member of the original 1993 households of IFLS)

Covariates	Category	Event Leaving /finishing school	Full-time employment	First marriage	First birth (women)
Interaction of cohort and sex[a]					
Birth cohort (ref: 1970-1979)	1980 - 1985	0.98 (0.91 – 1.05)	1.25** (1.17 – 1.34)	0.95 (0.88 – 1.03)	--
Sex (ref: men)	women	1.27** (1.18 – 1.36)	0.62** (0.58 – 0.66)	2.53** (2.33 – 2.75)	--
Interaction	1980 – 1985#women	0.83* (0.76 – 0.92)	0.97 (0.87 – 1.08)	0.99 (0.88 – 1.11)	--
Interaction of sex and residence[a]					
Sex (ref: men)	women	1.29** (1.21 – 1.38)	0.52** (0.48 – 0.56)	2.97** (2.71 – 3.25)	--
Residence (ref: rural)	urban	0.54** (0.50 – 0.58)	0.84** (0.78 – 0.90)	0.76** (0.70 – 0.83)	--
Interaction	women#urban	0.85** (0.77 – 0.94)	1.49** (1.33 -1.67)	0.72** (0.63 – 0.81)	--
Interaction of residence and region[a]					
Residence (ref: rural)	Urban	0.69** (0.56 – 0.84)	0.98 (0.82 – 1.17)	0.88 (0.69 – 1.13)	0.72 (0.51 – 1.03)
Province (ref: Jakarta)	North Sumatra	1.26* (1.01 – 1.57)	0.80* (0.65 – 0.99)	1.17 (0.91 – 1.52)	0.70 (0.47 – 1.03)
	West Sumatra	0.87 (0.70 – 1.09)	0.80* (0.64 – 0.99)	1.10 (0.83 – 1.45)	0.88 (0.60 – 1.28)
	South Sumatra	1.66** (1.31 – 2.10)	0.98 (0.79 – 1.21)	1.58* (1.21 – 2.07)	1.53* (1.04 – 2.24)

Interaction	Lampung	1.91** (1.53 – 2.38)	1.12 (0.90 – 1.38)	1.64** (1.26 – 2.14)	1.72* (1.18 – 2.50)
	West Java	2.04** (1.67 – 2.49)	1.00 (0.83 – 1.20)	1.99** (1.56 – 2.53)	1.77* (1.25 – 2.51)
	Central Java	1.72** (1.40 – 2.12)	1.37* (1.12 – 1.66)	1.45* (1.13 – 1.89)	1.45* (1.02 – 2.07)
	DI Yogyakarta	0.74* (0.59 – 0.91)	1.00 (0.81 – 1.22)	0.97 (0.74 – 1.29)	0.94 (0.63 – 1.40)
	East Java	1.66** (1.36 – 2.03)	1.03 (0.85 – 1.25)	1.69** (1.32 – 2.15)	1.70* (1.19 – 2.42)
	Bali	1.35* (1.08 – 1.69)	1.21 (0.98 – 1.49)	1.51* (1.15 – 2.00)	1.20 (0.80 – 1.79)
	West Nusa Tenggara	1.73** (1.38 – 2.15)	1.37* (1.10 – 1.70)	1.66** (1.23 – 2.15)	1.04 (0.72 – 1.49)
	South Kalimantan	2.01** (1.58 – 2.56)	1.35* (1.07 – 1.72)	1.86** (1.39 – 2.48)	1.58* (1.04 – 2.39)
	South Sulawesi	1.78** (1.42 – 2.24)	0.78* (0.63 – 0.97)	1.36* (1.03 – 1.80)	0.90 (0.61 – 1.33)
	Urban#N. Sumatra	0.94 (0.72 – 1.23)	1.06 (0.82 – 1.37)	0.96 (0.71 – 1.31)	1.52 (0.96 – 2.40)
	Urban#W. Sumatra	1.28 (0.99 – 1.67)	1.25 (0.95 – 1.62)	1.04 (0.74 – 1.47)	1.29 (0.82 – 2.02)
	Urban#S. Sumatra	0.66* (0.50 – 0.88)	0.88 (0.67 – 1.15)	0.90 (0.64 – 1.25)	0.77 (0.48 – 1.22)
	Urban#Lampung	0.95 (0.68 – 1.33)	1.21 (0.86 – 1.69)	1.13 (0.79 – 1.62)	0.97 (0.60 – 1.56)
	Urban#W. Java	0.58** (0.46 – 0.73)	1.05 (0.84 – 1.30)	0.67* (0.51 – 0.89)	0.81 (0.54 – 1.21)
	Urban#C. Java	0.75* (0.59 – 0.96)	1.06 (0.84 – 1.34)	0.83 (0.62 – 1.11)	0.75 (0.50 – 1.14)
	Urban#DI Yogyakarta	0.89 (0.67 – 1.20)	1.14 (0.86 – 1.51)	0.88 (0.62 – 1.25)	0.83 (0.50 – 1.39)

Urban#E. Java	0.80 (0.63 – 1.01)	1.23 (0.98 – 1.54)	0.75 (0.56 – 1.01)	0.76 (0.51 – 1.15)
Urban#Bali	1.00 (0.75 – 1.34)	1.08 (0.82 – 1.42)	0.88 (0.62 – 1.25)	1.01 (0.62 – 1.65)
Urban#W. Nusa Tenggara	0.89 (0.66 – 1.20)	1.00 (0.73 – 1.35)	0.75 (0.56 – 1.01)	1.23 (0.76 – 1.99)
Urban#S. Kalimantan	0.67* (0.49 – 0.90)	0.74 (0.54 – 1.00)	0.88 (0.63 – 1.24)	0.83 (0.50 – 1.39)
Urban#S. Sulawesi	0.88 (0.66 – 1.16)	1.17 (0.88 – 1.54)	0.83 (0.59 – 1.17)	1.33 (0.83 – 2.12)

** p-value< 0.001
* p-value<0.05
-- not examined or not significant
[a] only the two variables and their interaction were in the model

Table A.4.7. The odds ratios (and 95% CI) of the **simple** discrete-time logistic regression on the hazard of **leaving school**; among a subsample who were born in 1979-1985 (who were less than 14 years old in 1993), by sex

| Covariates | Category | Sex | |
		Men	Women
Parent's education (ref: senior secondary)	college/university	0.78 (0.58 – 1.04)	0.80* (0.67 – 0.96)
	junior secondary	1.45** (1.21 – 1.74)	1.61** (1.27 – 1.79)
	primary	2.54** (2.18 – 2.97)	2.85** (2.45 – 3.32)
	no education	4.27** (3.34 – 5.46)	5.00** (3.86 – 6.48)
Parent's coresidence in the HH (ref: both parents were in the HH)	only mother	1.29 (1.09 – 1.53)	1.40* (1.15 – 1.71)
	only father	1.50* (1.17 – 1.94)	1.10 (0.74 – 1.64)
	none of the parents	1.13 (0.89 – 1.42)	1.16 (0.94 – 1.45)
PCE (ref: 3rd quintile)	1st	1.58** (1.32 – 1.89)	1.45* (1.22 – 1.73)
	2nd	1.05 (0.89 – 1.24)	1.14 (0.98 – 1.32)
	4th	0.68** (0.57 – 0.80)	0.74** (0.64 – 0.85)
	5th	0.47** (0.40 – 0.56)	0.48** (0.41 – 0.56)
Had migrated for education (ref: no)	yes	0.59** (0.50 – 0.70)	0.54** (0.47 – 0.63)
Had worked (ref: no)	yes	2.68** (2.28 – 3.14)	2.92** (2.45 – 3.49)
Religion	Protestant	0.67** (0.57 – 0.78)	0.55** (0.46 – 0.65)
	Catholic	0.55** (0.38 – 0.81)	0.49** (0.36 – 0.67)
	Hinduism	1.06 (0.84 – 1.34)	0.97 (0.80 – 1.17)
	Buddhism	0.48* (0.26 – 0.90)	0.26** (0.13 – 0.55)
	Other	1.69 (0.95 – 3.02)	0.91 (0.48 – 1.71)
Residence (ref: rural)	urban	0.58** (0.52 – 0.65)	0.51*** (0.46 – 0.57)
Province (ref: Jakarta)	North Sumatra	1.23* (1.03 – 1.47)	1.27* (1.05 – 1.52)
	West Sumatra	1.06 (0.83 – 1.35)	0.94 (0.76 – 1.16)
	South Sumatra	1.37* (1.10 – 1.71)	1.79** (1.38 – 2.32)
	Lampung	1.60* (1.22 – 2.09)	2.32** (1.90 – 2.82)
	West Java	1.55** (1.30 – 1.85)	1.93** (1.62 – 2.30)
	Central Java	1.48** (1.23 – 1.78)	1.73** (1.45 – 2.06)
	DI Yogyakarta	0.73* (0.57 – 0.92)	1.08 (0.89 – 1.31)
	East Java	1.43** (1.19 – 1.71)	1.64** (1.38 – 1.95)
	Bali	1.33* (1.55 – 2.55)	1.58** (1.28 – 1.96)
	West Nusa Tenggara	1.99** (1.55 – 2.55)	1.65** (1.29 – 2.12)
	South Kalimantan	1.69** (1.35 – 2.11)	1.90** (1.44 – 2.51)
	South Sulawesi	1.82** (1.41 – 2.34)	1.88** (1.45 – 2.43)
Whether there were at least 3 senior secondary schools for the community (ref: no)	yes	0.69** (0.61 – 0.79)	0.80* (0.71 – 0.91)
Whether there was at least one vocational senior secondary school in the community (ref: no)	yes	0.89* (0.80 – 0.99)	0.86* (0.78 – 0.96)
Whether the roads in the community were an improved road that were passable by motor vehicles (ref: no)	yes	0.77* (0.67 – 0.89)	0.71** (0.62 – 0.82)
Whether there is a public transit service (ref: no)	yes	0.65** (0.57 – 0.74)	0.66** (0.58 – 0.74)

Table A.4.8. The odds ratios (and 95% CI) of the **simple** discrete-time logistic regression on the hazard of **starting a job**; among a subsample who were born in 1979-1985 (who were less than 14 years old in 1993), by sex

| Covariates | Category | Sex | |
		Men	Women
Parent's education (ref: senior secondary or higher)	junior secondary	1.07 (0.89 – 1.27)	1.07 (0.90 – 1.26)
	Primary	1.80** (1.59 – 2.03)	1.35** (1.20 – 1.52)
	no education	2.29** (1.89 – 2.77)	1.53** (1.24 – 1.88)
Number of years of schooling		0.96* (0.93 – 0.99)	1.06** (1.04 – 1.08)
PCE (ref: 3rd quintile)	1st	1.27* (1.07 – 1.52)	1.32* (1.09 – 1.58)
	2nd	0.92 (0.78 – 1.09)	1.20* (1.00 – 1.44)
	4th	0.82* (0.70 – 0.96)	1.02 (0.85 – 1.21)
	5th	0.59** (0.50 – 0.69)	0.86 (0.73 – 1.03)
Had migrated for work (ref: no)	Yes	4.60** (3.52 – 6.01)	8.32** (6.14 – 11.29)
Had been married (ref: no)	Yes	2.00 (1.41 – 2.81)	0.45** (0.37 – 0.54)
Religion	Protestant	0.61** (0.51 – 0.74)	0.89 (0.73 – 1.08)
	Catholic	0.70* (0.53 – 0.92)	0.95 (0.73 – 1.23)
	Hinduism	1.18 (0.91 – 1.52)	1.22 (0.92 – 1.62)
	Buddhism	0.45 (0.18 – 1.13)	0.41* (0.20 – 0.84)
	Other	1.07 (0.34 – 3.33)	0.52* (0.28 – 0.97)
Residence (ref: rural)	Urban	0.85* (0.76 – 0.96)	1.18* (1.05 – 1.32)
Region (ref: Java)	North Sumatra	1.04 (0.84 – 1.28)	0.79* (0.65 – 0.96)
	West Sumatra	1.30* (1.02 – 1.65)	0.82 (0.67 – 1.02)
	South Sumatra	1.16 (0.92 – 1.46)	0.84 (0.64 – 1.10)
	Lampung	1.86** (1.41 – 2.45)	1.08 (0.83 – 1.41)
	West Java	1.22* (1.02 – 1.46)	0.97 (0.81 – 1.18)
	Central Java	1.29* (1.05 – 1.59)	1.25* (1.02 – 1.52)
	DI Yogyakarta	1.15 (0.93 – 1.42)	1.03 (0.81 – 1.31)
	East Java	1.36* (1.13 – 1.63)	0.86 (0.71 – 1.05)
	Bali	1.37* (1.06 – 1.78)	1.30 (0.99 – 1.71)
	West Nusa Tenggara	2.07** (1.55 – 2.77)	1.30 (0.99 – 1.71)
	South Kalimantan	1.62** (1.30 – 2.02)	1.35* (1.07 – 1.72)
	South Sulawesi	1.46* (1.12 – 1.90)	1.25 (0.88 – 1.78)

Table A.4.9. The odds ratios (and 95% CI) of the **simple** discrete-time logistic regression on the hazard of **getting married**; among a subsample who were born in 1979-1985 (who were less than 14 years old in 1993), by sex

Covariates	Category	Sex	
		Men	Women
Parent's education (ref: senior secondary or higher)	junior secondary	1.05 (0.84 – 1.31)	1.32* (1.11 – 1.58)
	primary	1.32* (1.12 – 1.57)	1.96** (1.71 – 2.25)
	no education	1.36* (1.07 – 1.73)	2.36** (1.91 – 2.91)
Number of years of schooling		0.96** (0.94 – 0.98)	0.93** (0.91 – 0.95)
Parent's coresidence in the HH (ref: both parents were in the HH)	only mother	0.82 (0.64 – 1.05)	1.17 (0.95 – 1.45)
	only father	0.70* (0.50 – 0.99)	0.81 (0.61 – 1.08)
	none of the parents	1.03 (0.80 – 1.34)	1.27* (1.02 – 1.59)
PCE (ref: 3rd quintile)	1st	1.18 (0.97 – 1.42)	1.08 (0.90 – 1.28)
	2nd	0.87 (0.71 – 1.07)	1.04 (0.87 – 1.23)
	4th	0.97 (0.80 – 1.19)	0.89 (0.76 – 1.06)
	5th	1.05 (0.86 – 1.28)	0.66** (0.55 – 0.80)
Religion (ref: Islam)	Protestan	0.97 (0.77 – 1.21)	0.54** (0.43 – 0.68)
	Catholic	0.56 (0.29 – 1.07)	0.50* (0.27 – 0.92)
	Hinduism	0.86 (0.59 – 1.25)	0.67* (0.49 – 0.91)
	Buddhism	0.51 (1.9 – 1.37)	0.18* (0.04 – 0.73)
	Other	0.62 (0.23 – 1.68)	0.99 (0.58 – 1.72)
Had started working (ref: no)	yes	3.72** (2.79 – 4.96)	1.79** (1.57 – 2.04)
Residence (ref: rural)	urban	0.74 (0.65 – 0.85)	0.62** (0.55 – 0.71)
Province (ref: Jakarta)	North Sumatra	1.86** (1.39 – 2.49)	1.18 (0.95 – 1.47)
	West Sumatra	1.01 (0.68 – 1.50)	1.18 (0.94 – 1.49)
	South Sumatra	1.67* (1.20 – 2.32)	1.56* (1.20 – 2.01)
	Lampung	1.70* (1.18 – 2.45)	2.00** (1.59 – 2.51)
	West Java	1.73** (1.31 – 2.28)	1.94** (1.57 – 2.40)
	Central Java	1.18 (0.89 – 1.58)	1.52** (1.24 – 1.86)
	DI Yogyakarta	1.12 (0.78 – 1.61)	1.13 (0.88 – 1.45)
	East Java	1.41* (1.05 – 1.88)	1.80** (1.46 – 2.23)
	Bali	1.55* (1.05 – 2.27)	1.44* (1.11 – 1.88)
	West Nusa Tenggara	1.66* (1.16 – 2.39)	1.39* (1.09 – 1.76)
	South Kalimantan	1.50* (1.04 – 2.17)	1.64* (1.18 – 2.29)
	South Sulawesi	1.40 (0.94 – 2.07)	1.20 (0.89 – 1.62)

Table A.4.10. The odds ratios (and 95% CI) of the **simple** discrete-time logistic regression on the hazard of **giving birth**; among a subsample of women who were born in 1979-1985 (who were less than 14 years old in 1993)

Covariates	Category	Odds ratios (95% CI)
Parent's education (ref: senior secondary or higher)	junior secondary	1.33* (1.09 – 1.62)
	primary	1.91** (1.65 – 2.21)
	no education	2.03** (1.63 – 2.53)
Number of years of schooling		0.92** (0.91 – 0.94)
Duration of marriage (in year)		1.21** (1.12 – 1.30)
PCE (ref: 3th quintile)	1st	0.99 (0.83 – 1.18)
	2nd	0.97 (0.81 – 1.15)
	4th	0.84* (0.70 – 0.99)
	5th	0.66** (0.55 – 0.81)
Had started working (ref: no)	yes	1.26* (1.10 – 1.44)
Religion (ref: Islam)	Protestant	0.58** (0.46 – 0.75)
	Catholic	0.45* (0.24 – 0.84)
	Hinduism	0.71* (0.52 – 0.97)
	Buddhism	0.27 (0.07 – 1.08)
	Other	0.81 (0.38 – 1.73)
Residence (ref: rural)	urban	0.62** (0.55 – 0.71)
Province (ref: Jakarta)	North Sumatra	1.12 (0.89 – 1.42)
	West Sumatra	1.01 (0.77 – 1.33)
	South Sumatra	1.63** (1.25 – 2.11)
	Lampung	1.92** (1.49 – 2.47)
	West Java	1.72** (1.38 – 2.13)
	Central Java	1.46 (1.18 – 1.82)
	DI Yogyakarta	1.03 (0.77 – 1.40)
	East Java	1.63** (1.30 – 2.04)
	Bali	1.35* (1.01 – 1.81)
	West Nusa Tenggara	1.29* (1.01 – 1.65)
	South Kalimantan	1.50* (1.07 – 2.11)
	South Sulawesi	1.05 (0.77 – 1.42)

Table A.4.11. The odds ratios (and 95% CI) of the **simple** discrete-time logistic regression on the hazard of **migration for education** and **migration for work** reason, among all study sample (i.e. persons born in 1970-1985 who were a member of the original 1993 households of IFLS)

Variables	Category	Migration for education	Migration for work
Number of years of schooling		1.77** (1.67 – 1.88)	1.08** (1.06 – 1.09)
Birth cohort (ref: 1970-1979)	1980-1985	1.75** (1.52-2.01)	1.56** (1.43-1.70)
Sex (ref: men)	Women	0.81* (0.70-0.93)	0.52** (0.47-0.57)
PCE quintiles (ref: 3rd)	1st	0.65* (0.50-0.84)	1.27** (1.11-1.44)
	2nd	0.87 (0.68-1.10)	1.11 (0.97-1.27)
	4th	1.27* (1.02-1.58)	1.01 (0.88-1.16)
	5th	2.16** (1.77-2.65)	0.87 (0.75-1.01)
Residence (ref: rural)	Urban	1.07 (0.93-1.22)	0.79** (0.72-0.87)
Province (ref: Jakarta)	North Sumatra	2.26** (1.66 – 3.07)	2.46** (2.00 – 3.03)
	West Sumatra	2.77** (2.00 – 3.83)	2.34** (1.87 – 2.93)
	South Sumatra	2.54** (1.82 – 3.55)	1.62** (1.26 – 2.07)
	Lampung	1.00 (0.65 – 1.55)	2.62** (2.09 – 3.30)
	West Java	1.09 (0.81 – 1.48)	1.56** (1.28 – 1.89)
	Central Java	1.75** (1.30 – 2.35)	2.84** (2.34 – 3.45)
	DI Yogyakarta	3.09** (2.24 – 4.26)	2.54** (2.02 – 3.20)
	East Java	1.49* (1.11 – 2.01)	2.15** (1.77 – 2.61)
	Bali	2.24** (1.57 – 3.18)	2.14** (1.68 – 2.74)
	West Nusa Tenggara	1.74* (1.23 – 2.47)	1.99** (1.58 – 2.48)
	South Kalimantan	2.32** (1.63 – 3.28)	1.64** (1.26 – 2.12)
	South Sulawesi	1.60* (1.12 – 2.28)	1.73** (1.36 – 2.18)
Interaction of sex and birth cohort		South Sulawesi	
Sex (ref: men)	Women	0.77* (0.62 – 0.94)	0.45** (0.40 – 0.52)
Birth cohort (ref: 1970-1979)	1980-1985	1.66** (1.37 – 2.00)	1.39** (1.25 – 1.54)
	women#1980-1985	1.12 (0.85 – 1.48)	1.35* (1.12 – 1.61)

* p-value <0.05
** p-value <0.01

Table A.4.12. The odds ratios (and 95% CI) of the **simple** discrete-time logistic regression on the hazard of **migration for education**; among a subsample of those who were born in 1979-1985 (who were less than 14 years old in 1993), by sex

| Covariates | Category | Sex | |
		Men	Women
Number of years of schooling		1.61** (1.44 – 1.80)	1.72** (1.58 – 1.88)
Father's education (ref: senior secondary or higher)	junior secondary	0.90 (0.63 – 1.27)	0.65* (0.44 – 0.96)
	primary	0.37** (0.28 – 0.50)	0.37** (0.27 – 0.49)
	no education	0.21** (0.12 – 0.38)	0.21** (0.12 – 0.36)
PCE quintile (ref: 3rd quintile)	1st	0.61* (0.38 – 0.98)	0.72 (0.47 – 1.12)
	2nd	1.10 (0.72 – 1.66)	0.72 (0.47 – 1.10)
	4th	1.34 (0.90 – 2.00)	1.08 (0.73 – 1.61)
	5th	2.28** (1.57 – 3.33)	1.57* (1.05 – 2.34)
Residence (ref: rural)	urban	1.01 (0.79 – 1.30)	0.84 (0.65 – 1.11)
Province (ref: Jakarta)	North Sumatra	1.74* (1.02 – 2.97)	5.36** (2.77 – 10.37)
	West Sumatra	1.69 (0.91 – 3.13)	4.03** (1.97 – 8.27)
	South Sumatra	1.41 (0.76 – 2.61)	3.05* (1.41 – 6.60)
	Lampung	0.85 (0.41 – 1.76)	1.07 (0.41 – 2.81)
	West Java	1.08 (0.65 – 1.79)	1.58 (0.78 – 3.20)
	Central Java	1.69* (1.02 – 2.80)	2.25* (1.14 – 4.45)
	DI Yogyakarta	1.06 (0.52 – 2.15)	2.53* (1.14 – 5.64)
	East Java	1.22 (0.72 – 2.07)	2.77* (1.43 – 5.38)
	Bali	1.47 (0.77 – 2.81)	3.20* (1.47 – 6.95)
	West Nusa Tenggara	0.92 (0.46 – 1.83)	3.30* (1.63 – 6.67)
	South Kalimantan	1.92* (1.06 – 3.50)	4.43** (2.07 – 9.52)
	South Sulawesi	0.75 (0.37 – 1.55)	2.71* (1.26 – 5.84)

Table A.4.13. The odds ratios (and 95% CI) of the **simple** discrete-time logistic regression on the hazard of **migration for work**; among a subsample of those who were born in 1979-1985 (who were less than 14 years old in 1993), by sex

Covariates	Category	Sex	
		Men	Women
Number of years of schooling		1.03* (1.01 – 1.06)	1.08** (1.04 – 1.12)
Father's education (ref: senior secondary or higher)	junior secondary	1.08 (0.83 – 1.42)	1.25 (0.88 – 1.76)
	primary	1.08 (0.87 – 1.32)	1.33* (1.02 – 1.73)
	no education	1.45* (1.12 – 1.89)	1.41* (1.00 – 1.99)
PCE quintile (ref: 3rd quintile)	1st	1.39* (1.11 – 1.74)	1.57* (1.19 – 2.06)
	2nd	1.36* (1.08 – 1.71)	1.23 (0.93 – 1.63)
	4th	1.05 (0.83 – 1.34)	0.91 (0.67 – 1.24)
	5th	0.97 (0.75 – 1.25)	0.55* (0.38 – 0.79)
Has migrated for education		1.07 (0.85 – 1.34)	1.70** (1.33 – 2.18)
Residence (ref: rural)	urban	0.84* (0.72 – 0.98)	0.65** (0.53 – 0.79)
Province (ref: Jakarta)	North Sumatra	6.15** (3.68 – 10.29)	8.83** (4.22 - 18.46)
	West Sumatra	8.19** (4.73 – 14.16)	5.55** (2.54 – 12.1)
	South Sumatra	4.16** (2.37 – 7.32)	4.19* (1.81 – 9.69)
	Lampung	7.02** (4.04 – 12.22)	9.91** (4.65 – 21.13)
	West Java	3.70** (2.23 – 6.14)	5.09** (2.43 – 10.63)
	Central Java	7.27** (4.40 – 12.01)	10.88** (5.28 – 22.43)
	DI Yogyakarta	5.94** (3.38 – 10.44)	11.68** (5.47 – 24.91)
	East Java	5.16** (3.11 – 8.57)	7.10** (3.41 – 14.77)
	Bali	4.63** (2.58 – 8.30)	10.15** (4.66 – 22.13)
	West Nusa Tenggara	7.44** (4.39 – 12.61)	4.31** (1.98 – 9.39)
	South Kalimantan	5.00** (2.83 – 8.82)	4.50* (1.87 – 10.81)
	South Sulawesi	5.99** (3.48 – 10.31)	4.21** (1.88 – 9.40)

Figure A.3. 1. Lexis diagram of the respondents born in 1970-1979 and 1980-1985, showing the relationship between chronological time, IFLS survey date, and age (years)
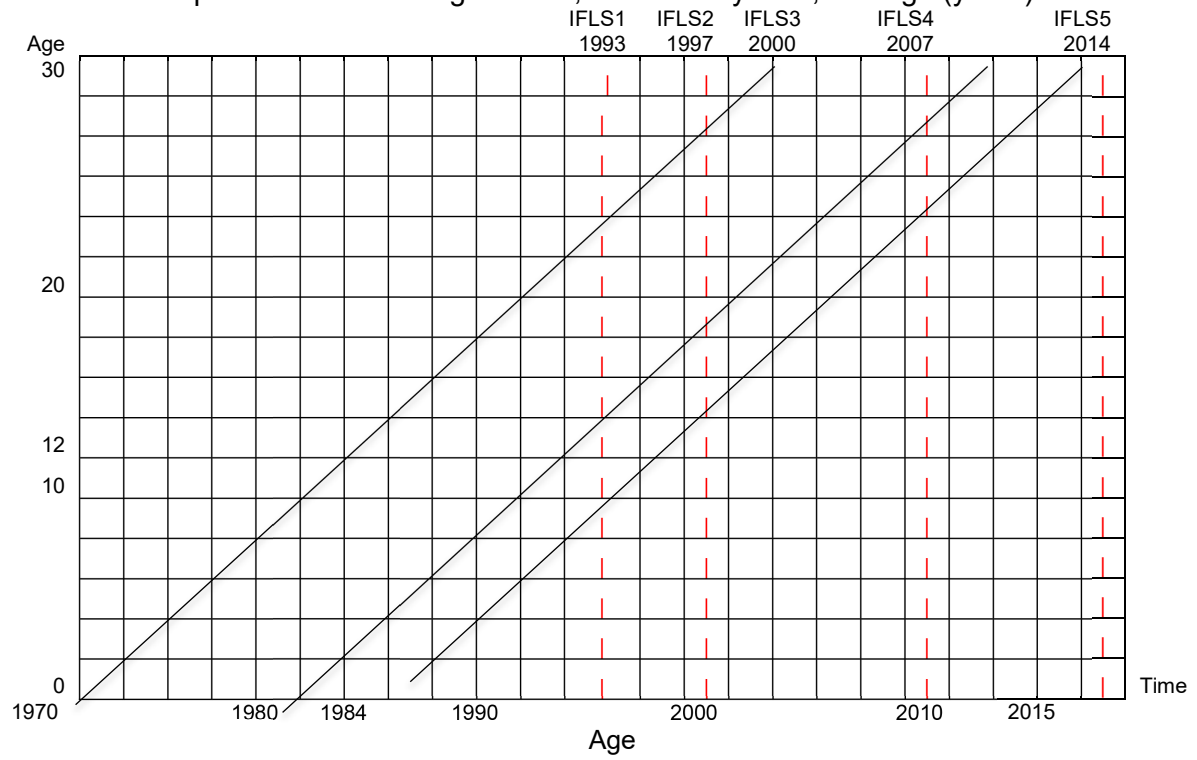
Figure A.3. 2. Comparison of the distribution of age at completing school, first job, and first marriage, between those reported by individuals who joined IFLS1, IFLS2, or IFLS3 and those reported by individuals who only joined IFLS4 and or IFLS5 (late participants).
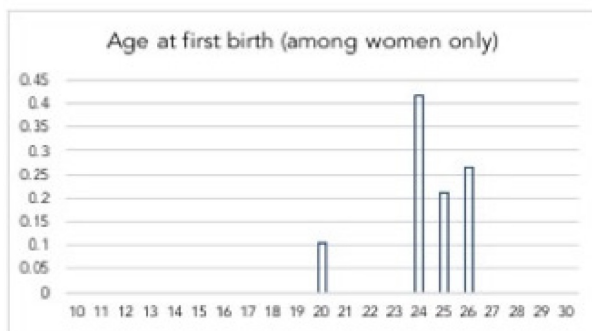
Figure A.3. 3. Comparison of the distribution of age at first birth **(a)** and first migration **(b)**, between those reported by individuals who joined IFLS1, IFLS2, or IFLS3 and those reported by individuals who only joined IFLS4 and or IFLS5 (late participants).
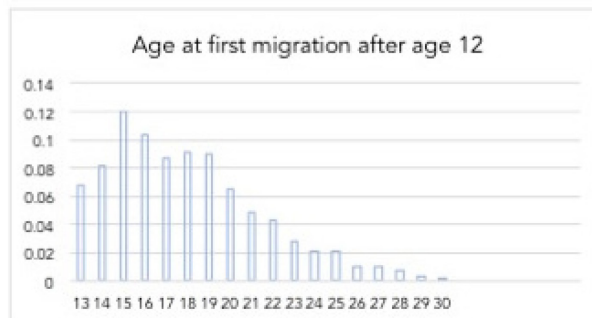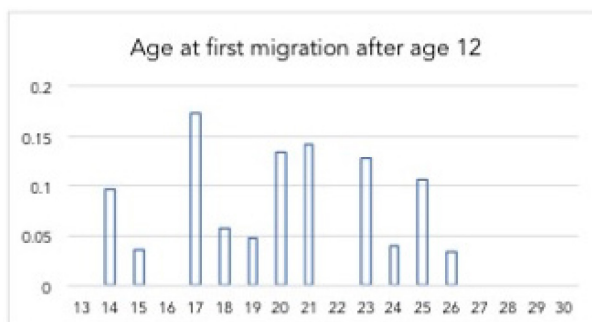
(a)
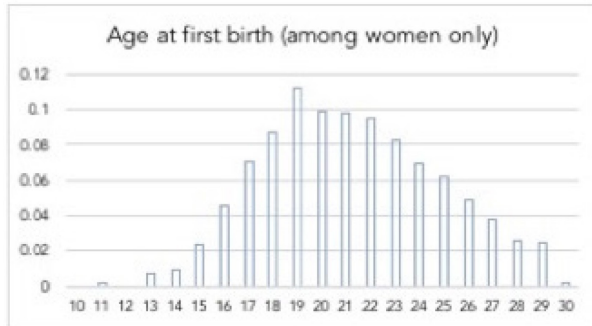
Joined IFLS1, IFLS2, or IFLS3

Joined IFLS4 and or IFLS5 only (late entrants)

(b)

Joined IFLS1, IFLS2, or IFLS3

Joined IFLS4 and or IFLS5 only (late entrants)

Figure A.3. 4. The odds ratios (95% CI) for covariates in the logistic regression predicting ever being interviewed in IFLS

	Odds ratio (95% CI)
Year of birth	
1968 - 1971	ref
1972	.41 (.32 - .52)
1973	.30 (.23 - .37)
1974	.30 (.24 - .37)
1975	.26 (.21 - .33)
1976	.25 (.20 - .31)
1977	.32 (.26 - .40)
1978	.37 (.30 - .46)
1979	1.17 (.90 - 1.53)
1980	2.60 (1.82 - 3.72)
1981-1988	4.71 (3.80 - 5.83)
Household size	
1 - 2	ref
3 - 4	.69 (.61 - .78)
>=5	.52 (.45 - .60)
Province urban-rural	
N. Sumatra urban	ref
N. Sumatra rural	1.00 (.72 - 1.35)
W. Sumatra urban	3.00 (1.93 - 4.67)
W. Sumatra rural	1.37 (1.00 - 1.89)
S. Sumatra urban	1.58 (1.09 - 2.29)
S. Sumatra rural	2.00 (1.39 - 2.89)
Lampung urban	1.80 (1.02 - 3.21)
Lampung rural	1.73 (1.21 - 2.46)
DKI Jakarta urban	1.48 (1.16 - 1.88)
W. Java urban	2.02 (1.54 - 2.66)
W. Java rural	2.69 (1.99 - 3.63)
C. Java urban	2.30 (1.67 - 3.16)
C. Java rural	1.64 (1.21 - 2.22)
DI. Yogyakarta urban	1.54 (1.11 - 2.13)
DI Yogyakarta rural	1.01 (.66 - 1.55)
E. Java urban	2.05 (1.49 - 2.83)
E. Java rural	2.54 (1.84 - 3.49)
Bali urban	1.63 (1.08 - 2.45)
Bali rural	2.33 (1.53 - 3.55)
W. Nusa Tenggara urban	1.59 (1.04 - 2.39)
W. Nusa Tenggara rural	1.74 (1.25 - 2.41)
S. Kalimantan urban	1.76 (1.17 - 2.64)
S. Kalimantan rural	2.07 (1.37 - 3.12)
S. Sulawesi urban	1.43 (.99 - 2.06)
S. Sulawesi rural	1.98 (1.41 - 2.79)
Monthly per capita expenditure in quintiles	
Lowest four quintiles	ref
Highest quintile	.74 (.65 - .85)
Constant	7.13 (5.54 – 9.19)

Number of observations = 14,938
LR chi^2(37) = 2056.08
Prob > chi^2 = 0.0000
Pseudo R^2 = 0.1814
Log likelihood = -4640.3973

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<p style="text-align:center">**Curriculum Vitae**
IFTA CHOIRIYYAH</p>

Home Address:
6202 Green Meadow Parkway
Apt. A Baltimore MD 21209
Cell: 443-980-0509
Email: ifta.choiriyyah@gmail.com

Birthdate: Yogyakarta, Indonesia, December 23, 1984

EDUCATION

Expected 2019 **Doctor of Philosophy (Ph.D.)**
Department of Population, Family, and Reproductive Health, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD
Dissertation: The Transition to Adulthood of the 1970-1985 Birth Cohort in Indonesia: Comparison of the Two Youngest Birth Cohorts Completing the Transition to Adulthood, and the Demographic and Socioeconomic Predictors of the Transition to Adulthood

May 2013 **Master of Science in Public Health (MSPH)**
Department of Population, Family, and Reproductive Health, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD
Thesis: U.S. men aged 15-44 in need of preconception health: their health problems and sexual and reproductive health receipts

May 2009 **Medical Doctor (MD)**
School of Medicine Universitas Gadjah Mada, Yogyakarta, Indonesia

February 2007 **Bachelor of Medicine**
School of Medicine Universitas Gadjah Mada, Yogyakarta, Indonesia
Thesis: Adolescent reproductive health knowledge, attitudes, and practices of Islamic boarding school's (pesantren) students

WORK AND RESEARCH EXPERIENCE

Oct 2014 – Dec 2018 Research Assistant, Performance Monitoring and Accountability 2020 (PMA2020)

PMA2020 uses innovative mobile technology to support low-cost, rapid-turnaround, nationally-representative surveys to monitor key indicators for family planning and water and sanitation in ten countries. The surveys are conducted every year in each country to obtain timely

indicators for policy and program monitoring. As student research assistant, I assisted in the management and analysis of PMA2020 data; this includes cleaning and preparing data for public release, generating briefs and reports on key family planning indicators, and generating indicators for partners/organizations upon request.

Research Assistant, VectorWorks, Johns Hopkins Center for Communication Program

- Updated the report on insecticide-treated net population access and use
- Updated the list of journal articles published on vector control
- Performed data analysis for journal articles on insecticide-treated net access and use

March 2018 - present	Researcher, Global Early Adolescent Study The Global Early Adolescent Study seeks to understand the factors in early adolescence that predispose young people to subsequent sexual health risks and conversely promote healthy sexuality, so as to provide the information needed to promote sexual and reproductive well-being. - Trained the local researchers and data collection supervisors to administer the study questionnaires - Developed the do-files to generate survey results - Analyze the survey data and contribute in the writing of the study report
Aug 2009 - present	Researcher, Center for Reproductive Health, University of Gadjah Mada, Indonesia The center develops and conducts regional and national studies on family planning, reproductive health, and maternal and child health. The center also provides training on research and demographic survey. As a member of the research team, I developed research plan and conducted the study on the field; including Quality of Family Planning Service in Central Java, Community Baseline Survey for Maternal and Newborn Health Care System Strengthening in West Java, Effectiveness study to integrate the use of Micronutrient Powders (MNP) in Local Food Based School Meals (LFBSM) in North Nusa Tenggara, and Study of Infant Mortality in South Sulawesi. I also conducted data analysis on publicly available Indonesia health and demographic surveys.
Aug 2011 - present	Faculty member, Department of Public Health, School of Medicine, University of Gadjah Mada, Indonesia

I assisted in developing and teaching the public health and biostatistics modules for undergraduate medical students and graduate public health students. I also assisted graduate students in developing their master thesis projects (i.e. topic and data selection, analysis plan, and data analysis).

WRITING AND PUBLICATION

Effectiveness study to Integrate the use of Micronutrient Powders (MNP) in Local Food Based School Meals (LFBSM) in TTS District and Kupang District of NTT Province: Baseline Report. CRH, 2013

Baseline Survey for Maternal and Newborn Health Care System Strengthening Pilot programme in West Java Province, Indonesia, 2011: Final Report. CRH, 2011

The Quality of Family Planning Services in Primary Healthcare Center in Purworejo, Central Java. CRH, 2012

Choiriyyah I, Sonenstein FL, Astone NM, Pleck JH, Dariotis JK, Marcell A. Men Aged 15-44 in Need of Preconception Care. (2015). Maternal and Child Health Journal. 19(11):2358-65. doi: 10.1007/s10995-015-1753-7.

Poster presentation for International Conference on Family Planning: Modern Contraceptive Use among Married Women in Indonesia Who Are Undecided on Their Next Pregnancy

Marcell A, Gibbs SE, Choiriyyah I, Sonenstein FL, Astone NM, Pleck JH, Dariotis J. National Needs of Family Planning Among US Men Aged 15 to 44 Years. (2015). American Journal of Public Health. 106(4): 733-739.

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Choiriyyah I, Becker S. Measuring Women's Covert Use of Modern Contraception in Cross-Sectional Surveys. (2018). Studies in Family Planning. 49(2):143-157. doi: 10.1111/sifp.12053

Olapeju B, Choiriyyah I, Lynch M, Acosta A, Filemyr E, Harig H, Monroe A, Selby RA, Killian A, Koenker H. Age and gender trends in insecticide-treated net use in sub-Saharan Africa: a multi-country analysis. (2018). Maaria Journal. 17:423. https://doi.org/10.1186/s12936-018-2575-z