

# Lost in Transition\*

## School-to-Work Transition Mapping in Urban Bénin

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## 1 Introduction and Background

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The youth population in Sub-Saharan Africa (SSA) is growing rapidly, and is expected to continue to do so for the foreseeable future. This presents both challenges and opportunities for the region. Despite recent increases in educational levels in sub-Saharan Africa, which have increased young people's potential to become gainfully employed, youth continue to face many challenges when leaving school and seeking work. Youth in low-income countries (LICs) are more likely to be unemployed or to work informally than adults (Quintini and S. Martin 2014), yet they constitute a significant proportion of the population in the region, and their ability to find employment and enter the labour market has significant implications for economic growth and development.

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Studying the school-to-work transition (SWT) and the linkages between education and employment is crucial to assessing the performance of young people in the labor market. The transition to the labour market marks a critical point in the productive and social development of young individuals. Delayed entry into formal employment has been shown to depress future earnings in high-income and developing countries alike (Bridges et al. 2017), while a semi-permanent state of "waithood" is commonly reported among youth (particularly males) in SSA, impeding their social integration and undermining the self-worth of those unable to find employment (Mains 2011; Honwana 2012). Those youth who find work tend to be underemployed and in informal jobs, leading to youth poverty, exacerbating inequality, and fostering unrest and conflict, raising the possibility of youth unrest observed elsewhere in the world (Urdal 2006; Mains 2011).

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Researchers are particularly interested in three key aspects of the SWT: the duration of the job search after completing education, the fluidity of the transition (marked by the presence or absence of inactivity or unemployment spells), and the potential correlation between a smooth school-to-work transition and future labor market success. Both the age of school-leaving and the speed of transition to the labour market are of particular interest to policy makers in SSA, where young people (aged 15-24) suffer over twice the unemployment rate of adults, albeit with high variation across countries (African Development Bank 2016). A delayed entry into the labour force can reduce youths' lifetime labour market participation and contribution to the economy, while slow transition can result in employment "scarring": early periods of underemployment and unemployment that lead to wage losses and reduce the likelihood of returning to the labour force. Evidence from high-income countries suggests that pro-

tracted unemployment spells, including extended school-to-work transitions, negatively affect future earnings and employment prospects (Schmillen and Umkehrer 2017; Emmenegger, Marx, and Schraff 2017; Möller and Umkehrer 2015; Cockx and Picchio 2012). Understanding the factors that influence the transition into the labour market can help policymakers and other stakeholders identify and implement interventions that can improve youth's employment prospects and economic outcomes in adulthood. Studying the SWT can also provide insight into the broader socioeconomic dynamics of the region and can help to inform policy decisions in other areas, such as education and training.

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Unfortunately, the lack of standardized data and comparable indicators presents a significant obstacle to analyzing this crucial period, especially in lower-middle income countries (LMICs) and LICs, where access to panel data is limited. While standard labor market indicators such as youth employment and unemployment rates are often used to describe the SWT, they provide a static snapshot of a dynamic process. Research on youth labor dynamics reveals a more nuanced reality: only a minority transition directly to stable employment or sustained inactivity. Many navigate a dynamic path marked by multiple job changes, unemployment spells, and labor market exits and re-entries before finding stability or opting for alternative pursuits like extended breaks or further education. This highlights the need for frameworks and indicators that encompass this complexity and capture the diverse and fluid trajectories of young people entering the workforce.

This study delves into these complex dynamics in Cotonou, Bénin, a city characterized by a predominantly informal economic landscape. Utilizing a novel, longitudinal dataset from a survey conducted with 752 youth, we track youth movements between school, employment, and inactivity to map the SWT in an urban, highly informal economy. We analyze both panel observations and employment histories to calculate the age of school-leaving, the age of labor market entry, the duration of the transition, and the propensity to switch between different employment states. We also deploy a novel methodology called Optimal Matching Analysis to identify and quantify the most prevalent pathways young people follow after leaving full-time education in Cotonou.

The paper is organized as follows. We review the extant literature on SWT, focusing on evidence from LICs, in Section 2. Section 3 presents the data and methodology used in the paper. Section 4 contains analysis and results, and Section 5 concludes.

## 2 Literature Review

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The dynamic process of the school-to-work transition (SWT), including all the activities of young people between full-time schooling and stable employment, can only be fully captured with detailed, longitudinal data; as a result, most studies of SWT dynamics to date have been conducted in high-income countries (HICs). In addition to data scarcity, the informality inherent to most youth labour markets in the low- and middle-income countries render traditional data sources insufficient for capturing all the details of the SWT. While the path from formal education to formal employment is sequential and quantifiable, the SWT in informal labour markets tends to be more complicated, often leading through halting periods of formal education and informal training, stints working for the family firm, prolonged school absences or repeated years, and extended periods of economic inactivity. Official labour market data in developing countries is too infrequent and unreliable to capture such dynamics.

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Cross-sectional data, commonly used to describe labor market transitions, suffers from several flaws: it assumes universal education and employment, overlooks individual variations, reflects different cohorts at a single point, and fails to capture informal work (Nilsson 2019). Event history and panel data offer some advantages, as transition statistics can be computed at an individual level, though bias can arise if only completed transitions are considered. To counter this drawback, researchers often rely on survival analysis to study the determinants of transition age or duration, even in the presence of right-censored transition data (Nordman and Pasquier-Doumer 2015; Manacorda et al. 2017). Panel data has also been used to construct transition matrices for employment states, which allow for the calculation of various statistics such as the degree of turnover, the probabilities of leaving a particular sector such as unemployment, or the duration of any given state, such as the transition from school to work, though are limited in their interpretability due to the large number of matrices that such an analyses generates (Cunningham and Salvagno 2011; Bridges et al. 2017). In order to benefit from each of these methods' advantages while limiting our exposure to their drawbacks, we rely on a combination of these approaches in this paper.

Two counteracting factors are generally understood to affect the SWT duration in SSA. Poverty and lack of unemployment insurance lowers reservation wages and drives youth into work sooner, reducing the duration of the SWT, while increasing education and decreasing number of public sector jobs drives

up employment expectations without matching wage job growth, which tends to prolong the SWT as youth wait for an opportunity commensurate with their expectation and education level. Lower reservation wages and accelerated transitions lead to worse employment matches, as measured by the probability of attaining stable employment in the long run (Manacorda et al. 2017), while inflated employment expectations lead to longer periods of inactivity and employment scarring.

Other factors also play a crucial role in determining the duration and smoothness of the SWT in LICs. Rising education rates in SSA mechanically delay the transition: as increasing numbers of youth stay in school for longer, they enter the labour market at a more advanced age (Calvès, Kobiané, and N'Bouké 2013). More educated youth in SSA, especially university graduates, have been shown to be reluctant to work in the informal sector, preferring to wait for formal or public sector employment (Serneels 2007). Education mismatch may also prolong the SWT: if education systems are not aligned with the demands of the labour market, students may graduate with skills that are not in high demand, slowing the transition to wage work and increasing unemployment and underemployment for the most educated youth. Bandara (2019), using eight SWTS surveys from SSA (including Bénin), report that about 47 and 28 percent of employed youth in their sample are overqualified and under-qualified for their jobs, respectively. Finally, Manacorda et al. (2017) report that women generally experience longer transition duration and are more likely to exit the labour market before completing the transition, taking twice as long as men to become employed after leaving school in certain LICs.

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Table 2 summarizes the comparative literature on the school-to-work transition. Though there is much heterogeneity in the data, youth from the highest-income and lowest-income countries are observed to have relatively short school-to-work transitions, though youth in HICs stay in school longer and have lower rates of inactivity after school-leaving (Manacorda et al. 2017; Quintini and S. Martin 2014). The longest observed SWT duration is observed in middle-income countries in LAC, MENA, and southern Europe. Compared to HICs, out-of-school youth in LICs are more likely to become NEET upon leaving school, and under-employment is more widespread (Quintini and S. Martin 2014). Moreover, competition for limited formal jobs is intensified in the presence of rapid population growth: Manacorda et al. (2017) find that a one standard deviation increase in the rate of population growth increases the time it takes youth to find

work after leaving school by as much as 17 months<sup>1</sup>.

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**Table 1: Comparative Studies of School-to-work Transitions**

Paper	Data	Method	Results
Manacorda et al. (2017)	ILO-STWT survey data from 23 LICs and LMICs	Survival analysis for right-censored data	Faster transitions in LICs vs LMICs.
Quintini and S. Martin (2014)	OECD estimates based on labor force surveys	Cross-sectional analysis (time needed for 50% of youth to find work)	Low unemp. rates hide under-employment in LICs
Cunningham and Salvagno (2011)	Panel labor force surveys from Argentina, Brazil and Mexico	Panel data analysis, including transition probabilities and duration in each state	Common path is informal to formal sector, to self-employment later in life
Quintini and Manfredi (2009)	National Longitudinal Surveys in US and Europe	Optimal Matching Analysis	More turnover, shorter employment spells in US vs. Europe

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First labour market experience has also been emphasized as an important component of a successful SWT in the literature. Bridges et al. (2017) use the Tanzania Household Urban Panel Survey to study how first experiences in the labour market effects future earnings, and find that school-leavers who immediately find a wage job experience a future wage premium, especially in the formal sector. Youth who attend private schooling in Ouagadougou, Burkina Faso were shown to be 9 percentage point more likely to find wage work as first employment (Calvès, Kobiané, and N'Bouké 2013). First work experience may even take place while youth are in school, though work-study statistics are often not captured in the data: using the School-to-Work Transition Surveys (SWTS), Dedehouanou et al. (2019) find that working while studying accelerates the SWT in Bénin.

Another strand of literature has focused on the paths youths take in their formative years on the labour market. According to the official definition, the SWT

<sup>1</sup>The authors also find that a one standard deviation increase the poverty rate leads to a reduction in transition duration of about 17 months and an increase in probability of never attaining employment of 14 percentage points.



ends with the first labour market experience. However, particularly in more informal economies, the paths taken by youth have been shown to be more turbulent than those of adults. The OECD literature suggests that there is frequent job turnover among younger workers who engage in a search process of “shopping around” for temporary jobs until they find a career path. The informal sector may play a similar, transitory role in developing countries, rather than being a dead-end career path.

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What is deemed a desirable labour market state may also change as workers gain experience and age. Cunningham and Salvagno (2011) study transition matrices constructed from panel labour force surveys from Argentina, Brazil, and Mexico and find that youth tend to enter the labour market through the informal sector, where they remain for a limited time before finding a formal job; as they age, however, they leave formal wage employment to pursue a self-employed career. Looking at different income groups, the authors find that the poor experience a higher rate of entry to work upon leaving school, the same duration in jobs, and equal entry rates to formal wage employment, but are more likely to transition between states. Egel and Salehi-Isfahani (2010) find frequent transitions between formal and informal sector in Iran, independent of the level of education. Nordman and Pasquier-Doumer (2014) collect work histories from working-age individuals in Ouagadougou and find that family networks increase the probability of transition from unemployment to employment and from self-employment to wage employment (but not from wage employment to self-employment). However, the authors report that this may reflect an increasing prevalence of short-term positions in the public sector, particularly for recent labour market entrants.

Though not the focus of this paper, the comparative literature has also pointed to several institutional factors that may influence the age at which youth transition to the labour market, and how long this transition lasts. In a recent review of the literature, Nilsson (2019) discusses policy drivers such as minimum wage, UI, and wage subsidies, and finds that the existing literature does not point in a single direction for any of these factors. Local labour market conditions appear to be stronger drivers of SWT duration than GDP, trade openness, or income distribution. Active labour market policies (ALMP) have also shown promise in isolated settings: skills training and entrepreneurship promotion appear more successful than facilitation programs like job fairs or subsidies (McKenzie 2017).



In sum, the literature suggests that the school-to-work transition in LICs is not that different from HICs, though there is a large variation between countries, and at the individual level can be influenced by a variety of factors, including schooling, gender, and network size. Studies of the particular paths taken by youth indicate that, at least in a sample of European and Latin American countries, many youth alternate between short stints of formal and informal employment upon school-leaving, transitioning to self-employment as they age.

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In this paper, we bring this research and these methods to bear on a context plagued by poor access to longitudinal data: highly informal labor markets. We investigate the role that socioeconomic background, educational credentials, and gender play in the SWT of young adults in Cotonou, Bénin, and hypothesize that males from higher socioeconomic backgrounds and with more education will experience smoother and faster school-to-work transitions. We also investigate how different types of school-to-work transition trajectories cluster among young adults in Cotonou, Benin, and the factors that differentiate these clusters, using an Optimal Matching Analysis approach, and hypothesize that distinct clusters of school-to-work transition trajectories will emerge, with variations explained by similar factors as those explaining the variation in transition age, duration, and smoothness.

### 3 Data and Methodology

#### Data

In this paper, we map out the school-to-work trajectories of youth in an urban, highly informal labour market in SSA. We use novel longitudinal survey data tracking 752 individuals from the city of Cotonou, Bénin's economic center and de facto administrative capital, over the course of three years. The survey was conducted by the authors with the collaboration of researchers from the University of Abomey-Calavi and the Institut National de la Statistique et de l'Analyse Économique (INSAE).

Youth were selected for the survey using a two-step sampling process. First, a census of quasi-representative administrative zones covering 4,905 households in the metropolitan area of Cotonou was conducted and served as a sample frame. Second, a sample of youth aged 20 to 29 was selected randomly from

the sample frame to take part in the panel survey<sup>2</sup>. Because school attendance rates among younger respondents were found to be very high — more than 70 percent of the 15- to 19-year-olds covered by the census — the 20-29 age range was chosen in place of the standard 15-29 definition employed by the International Labour Organization (ILO) in order to shift the focus from schooling to labour market outcomes. Following the baseline survey in August 2019, three follow-up surveys were conducted by mobile phone in November 2019, April 2020, and September 2020 respectively. An in-person endline was conducted in the summer of 2021 for a total of five survey waves.

Table A3.2 in Appendix A3 shows sample attrition over the five waves. The panel suffers an attrition rate of between 9 percent and 19 percent per survey round, with an overall attrition rate of 34 percent over the course of the first year of the survey (i.e. between waves one and four). This is high but in line with other remote longitudinal surveys in developing countries (Demombynes, Gubbins, and Romeo 2013; Ballivian, Azevedo, and Durbin 2015). However, a large proportion of non-respondents were recovered for the face-to-face endline, resulting in a final attrition rate of 24 percent. The largest drop in response rate, between the first and second follow-up surveys, is likely related to the timing of the second phone-based survey, which took place in the early phases of Bénin's response to the global Covid-19 pandemic. To test for biased respondent attrition, we test for equality in time-invariant characteristics across survey waves. Table A3.2 in Appendix A3 indicates that attrition is neither associated with respondent activity at baseline, nor with their sex, age, or education. Thus, we proceed with the analysis assuming random dropout.

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<sup>2</sup>The sampling process is described in more detail in Appendix A3.1.

**Table 2:** Descriptive Statistics by Baseline Activity

Characteristic	Overall	Baseline Activity					p-value
		In School (22%)	NEET (32%)	Self- Employed (16%)	Employed (22%)	Apprentice (8%)	
N	752	169	238	119	168	58	
Male (=1)	47%	56%	34%	49%	54%	55%	<0.001
Age at baseline	24.15 (24)	22.82 (23)	24.30 (24)	24.84 (25)	25.06 (25)	23.36 (23)	<0.001
Nationality: Beninese (=1)	97%	98%	97%	97%	98%	98%	0.9
Ethnicity: Fon (=1)	69%	62%	69%	71%	71%	83%	0.050
Religion: Christian (=1)	84%	83%	83%	83%	85%	90%	0.8
Grew up in a city (=1)	64%	66%	66%	65%	63%	57%	0.8
<b>Education</b>							
Years of schooling	12.42 (14)	15.03 (15)	11.97 (13)	9.52 (10)	13.24 (14)	10.22 (11)	<0.001
Completed apprenticeship (=1)	20%	4.1%	18%	39%	20%	36%	<0.001
Vocational certificate: CAP (=1)	4.4%	5.9%	4.6%	2.5%	4.8%	1.7%	0.6
Primary diploma: CEP (=1)	85%	98%	82%	70%	92%	69%	<0.001
Junior high diploma: BEPC (=1)	67%	96%	60%	41%	73%	45%	<0.001
Baccalauréat: BAC (=1)	40%	72%	34%	18%	38%	19%	<0.001
2nd cycle university: Licence (=1)	15%	11%	19%	11%	20%	6.9%	0.014
3rd cycle university: Maîtrise (=1)	2.3%	1.8%	2.5%	2.5%	3.0%	0%	0.8
<b>Parents' Education</b>							
Father was an apprentice (=1)	33%	27%	32%	33%	35%	47%	0.075
Father completed primary (=1)	53%	60%	52%	42%	52%	60%	0.028
Father completed secondary (=1)	20%	25%	23%	13%	18%	10%	0.015
Mother was an apprentice (=1)	17%	20%	18%	14%	14%	19%	0.6
Mother completed primary (=1)	27%	30%	28%	24%	27%	28%	0.9
Mother completed secondary (=1)	6.0%	4.7%	9.7%	1.7%	7.1%	0%	0.004
<b>Household Characteristics and Assets</b>							
Married (=1)	20%	4.7%	28%	34%	16%	10%	<0.001
Living with parents (=1)	45%	60%	42%	37%	39%	47%	<0.001
No. of children	0.61 (0)	0.13 (0)	0.86 (0)	1.11 (1)	0.51 (0)	0.24 (0)	<0.001
People in household	5.45 (5)	5.96 (6)	5.55 (5)	5.04 (4)	5.40 (5)	4.48 (3)	0.027
Wealth index quintile	2.91 (3)	2.60 (2)	2.90 (3)	3.19 (3)	3.02 (3)	2.93 (3)	0.002
Home electrified (=1)	92%	94%	92%	92%	93%	88%	0.6
Cell Phone (=1)	76%	69%	76%	82%	76%	83%	0.060
Smartphone (=1)	54%	63%	49%	44%	61%	45%	<0.001
Motorcycle (=1)	27%	20%	23%	42%	36%	14%	<0.001
Television (=1)	39%	28%	40%	50%	43%	38%	0.003

Notes: Mean (median); %. Calculated using responses from baseline survey.

<sup>1</sup> To labor market entry, defined as first work experience with no subsequent return to school or training.

## Summary Statistics

Youth characteristics at baseline are presented for each activity in Table 2. The reported p-value reported compares the equality of means under the null hypothesis that means are equal for all activities. The average age of the youth in our sample is 24.15 years at baseline, with apprentices and youth in schooling being younger on average than the remainder of the sample. Self-employed youth have less schooling than those who are employed or NEET, and at 39 percent have the highest rate of apprenticeship completion – in line with the notion that apprenticeship is a pathway to self-employment in the crafts sector. The wage employed, on the other hand, are more likely than NEET youth to hold a primary and junior high diploma, but hold baccalauréate and university diplomas at essentially the same rate: this suggests that the NEET are comprised of both

underqualified youth (lacking the necessary qualifications for the most formal wage jobs) and overqualified youth (who are unable to find employment despite qualifications comparable to the wage employed). About 45 percent of youth report living with their parents, and 20 percent are married. Thus, the sample can be broadly described as urban and well-educated but still transitioning to independence and financial stability.

In Table A3.3, Appendix A3, we compare the baseline characteristics of young men and women in the sample. Young women are almost twice as likely to be NEET at baseline as their male counterparts, and appear to take on the responsibilities of parenthood earlier than young men: they are more than twice as likely to be married and to have at least one child, and have 41 percent more children on average. They are also less likely than men to have a certificate or diploma at each stage of education, from primary schooling (80 percent vs 90 percent) to baccalauréat (32 percent vs 48 percent) to 2nd cycle university (11 percent vs 20 percent). There are also indications of spousal dependency: young women are much more likely to report residing in the home of their spouse or partner — virtually all respondents (99 percent) who reported “living with their spouse” were women — and less likely to own a smartphone or motorcycle, a critical means of transportation in Cotonou. When aggregated into a wealth index, however, gender differences in material wealth are no longer statistically significant.

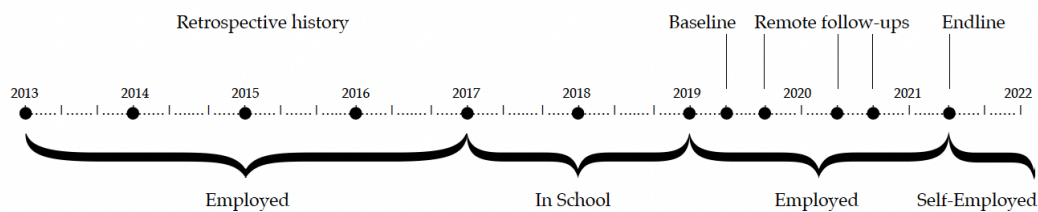
Many youth in Cotonou are still in school in their 20s – almost a third of all 20-29 year-old youths in the census, and 22 percent of our sample. Even youth who have already left the education system (and thus have both less schooling on average and are less likely to continue accruing it) report having completed a mean of 11.2 years of school – much higher than the 5.7 years for 20- to 24-year-olds and the 4.4 years for 25- to 29-year-olds in Bénin estimated for the year 2010 by Barro and Lee (2013)<sup>3</sup>. Among students in the sample, about 20 percent attend a private university, and 75 percent have to pay tuition fees (not shown). School fees vary: 30 percent of university students pay negligible fees (less than 30 CHF per year), while nearly 20 percent report paying over 300,000 FCFA (490 CHF) annually. The overwhelming majority are supported financially by their parents. Few students supplement their studies with external practical training, with only 13 percent of student having participated in a (generally unpaid) internship at a private firm in the year prior to the survey.

<sup>3</sup>This likely reflects both rising education rates across SSA and longer schooling prevalent in urban areas relative to national figures.

## Method

In this paper, we first use a combination of youth event history and a detailed four-wave panel to estimate the age at transition and duration in an informal, urban, and low-income setting. Second, we use the panel data to map out young people's transition between schooling and training, wage employment, self-employment, and inactivity and investigating drivers of particular trajectory types. Finally, we delve into the details of different employment types for active labour market participants in our sample.

To study youth transitions, we focus on the formative period of education and early professional life of youth and establish employment and schooling histories for each youth in our sample. To do this, we merge retrospective employment history data, which was obtained by asking youth about their main economic activity each year over the last seven years (i.e. dating back to 2013), with observed economic activity from the panel survey (collected between 2019–2021). The state space is comprised of five activity states: **In School**, **Apprenticeship**, **Wage Employment**, **Self-Employment**, and **NEET**. For example, the employment history of youth number 1203 can be depicted as follows:



The points indicate the dates at which youth are observed. This example individual was employed between 2013 and 2017, at which time she entered university. After two years at university, she returned to the labour market as a wage employee in early 2019, and continued to be wage employed for the majority of the period over which the survey was conducted. In the endline survey, she reported that she was no longer wage employed, and was instead supporting herself as a self-employed worker. These histories are used to study the SWT in the following three approaches.

## Graduation Age and Duration

First, we characterize the periods of school-leaving and labour market entry for the youth in the sample. As we can deduce the age of the respondent at each point of their observed employment history, we follow Manacorda et al. (2017) and calculate the age at which youth complete their schooling and transition to their first job and calculate the duration of this transition. We also draw on Bridges et al. (2017) and study youth employment status in the period directly after school-leaving. A wealth of socioeconomics and family characteristics allows us to identify factors that influence the time it takes for youth to enter the labour market.

We quantify four aspects of the SWT commonly studied in the literature: age at graduation or school-leaving, age at first employment, age at (permanent) labour market entry, and transition duration to first employment. The start of the SWT is often considered the point at which youth permanently leave school (Bowers 1998; Nilsson 2019). Other definitions stipulate that only youth looking for work upon leaving school should be considered, in order to ensure that certain categories of youth, for instance women predisposed to domestic work, from skewing the unemployment numbers (Matsumoto et al. 2010). The ILO's *Work4Youth* program takes school-leaving age to be the age of the onset of the SWT, as do several studies of the school-to-work transition in OECD countries (e.g. Bowers (1998), Quintini, J. P. Martin, and S. Martin (2007)). We take the age of youth at the time of their last observed period in school to be their **school-leaving age**. If youth are still in school at the time of the last interview, we assume that we have not observed their SWT and exclude them from these calculations.

Similarly, **age at first employment** is defined as the age at which youth first report being employed or self-employed, conditional on having spent at least one period in education or training in the past and not returning to school in subsequent periods. **Age at labour market entry** marks the first period for the same youth, but differs from first employment in that it excludes employment stints after which a return to schooling or training was observed. **School-leavers** are defined as youth for whom at least one period of schooling or training was observed, and whose last observed period was neither schooling nor training. Finally, we define the SWT **transition duration** as the difference between the age at school-leaving and the age at first employment<sup>4</sup>.

<sup>4</sup>Both cross-sectional and longitudinal data have been used to quantify the school-to-work

Youth for whom we cannot observe a first employment experience during the observation period or have already made the transition before the start of the observation period are considered to be right censored (Nilsson 2019). In survival analysis, right-censored data refers event sequences where the exact event time of interest is unknown for some observations. Instead, the only information available is that the event has not occurred by the time the data were collected, or the event occurred after the end of the observation period. To estimate the duration of the transition using survival analysis, one can use a technique called survival function estimation, which involves modeling the probability of experiencing the event of interest (i.e., making the transition from school to work) as a function of time. We follow Nordman and Pasquier-Doumer (2015) and Manacorda et al. (2017) and use the non-parametric Kaplan-Meier estimator to approximate survival probabilities, i.e. the probabilities that a youth needs an additional year to transition to the labour market after completing their schooling or training.

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### Transitions as a Markov Process

A second empirical approach to studying labour market transitions is to interpret employment histories as a continuous Markov process between activity states or employment types (Cunningham and Salvagno 2011; Bosch and W. Maloney 2007). We construct transition matrices using the combined recall and survey data, which estimate the share of youth transitioning into or out of a given employment state over a specified period. This allows us to examine the flows between different activity states over the course of the SWT. Further, as outlined in Bosch and W. Maloney (2007), we separate transition matrices into two discrete components: the propensity (to move) matrix, which represents transition probabilities independent of the rate of exit of any given subgroup from particular state, and the rate of separation matrix, which represents the overall rate of youth exiting from a given state (see Appendix 5 for a more detailed description). This allows us to understand whether the dynamics observed in the transition matrices are due to differences in entry and exit rates of young people

transition in the literature. Cross-sectional data can be used to estimate the transition duration by subtracting the age at which 50 percent of the population has left school from the age at which 50 percent of the population has found work. Quintini, J. P. Martin, and S. Martin (2007) and Quintini and S. Martin (2014) use this approach to report transition duration in advanced economies, along with mean school-leaving and first employment ages. For longitudinal studies, the mean transition duration, reported for example in Quintini, J. P. Martin, and S. Martin (2007), the non-inclusion of youth still in transition will bias results.



into and from specific states or variations in turnover rates by age or gender.

Using the same event histories as before, we estimate transition matrices to understand the magnitude of turnover between various states over the course of the SWT. We estimate transition matrices for the entire sample, as well as propensity (to move) matrices for young men, women and different age brackets separately, to understand how transition dynamics differ by gender and change as youth get older.

### Optimal Matching Analysis

Third, we apply optimal matching analysis (OMA), a technique used to identify groups of similar states of sequences, to identify similarities in the SWT trajectories experienced by youth, and group them into clusters of similar transitions.

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OMA is a statistical technique that generates a measure of the similarity or difference between individual school-to-work transition sequences by comparing all pairs of sequences and performing insertions, deletions, or substitutions of single sequence elements to transform one sequence into the other (Elzinga 2003). Insertion and deletion costs are the cost of adding a new item to the sequence or removing an existing one, respectively, while the substitution cost is the cost of replacing one item in the sequence with another item<sup>5</sup>. The resulting total cost required to change one sequence into another serves as a measure of similarity between all pairs of sequences. The distance matrix generated from this process is used in a hierarchical cluster analysis to group similar sequences into clusters: we use Ward's fusion algorithm to minimize within-group differences and maximize between-group differences (Dlouhy and Biemann 2015; Achatz, Jahn, and Schels 2022).

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This method has been used to study early career patterns in Italy, Great Britain, Sweden, and West Germany (Halpin and Cban 1998; Anyadike-Danes and McVicar 2005; Scherer 2001; Scherer 2005; Biemann, Zacher, and Feldman 2012; Achatz, Jahn, and Schels 2022). The method has also been applied to the school-to work transition in various high-income countries (Schoon et al. 2001; McVicar and Anyadike-Danes 2002; C. Brzinsky-Fay 2007; Christian Brzinsky-Fay 2014; Christian Brzinsky-Fay and Solga 2016; Middeldorp, Edzes, and van Dijk 2019). Quintini and Manfredi (2009) use the method to compare

<sup>5</sup>We use an insertion/deletion cost of 1 and a substitution cost matrix based on observed transition rates, which allows us to control for the likelihood of transitions occurring within the data.

school-to-work transitions between youth in the United States and Europe, and find considerably more dynamism in the US. One recent study has used Optimal Matching in a cross-country study of SWTs in low- and lower-middle income countries (Pesando et al. 2021), while the only other examples of OMA using data from LMICs are a study of the distance between experienced and ideal interpersonal relationships in Malawi (Frye and Trinitapoli 2015), family planning (also in Malawi, Furnas (2016)), and time usage among the elderly in South Africa (Grapsa and Posel 2016).

The TraMineR package in R (Gabadinho et al. 2011) is used to perform the analysis, and the package WeightedCluster (Studer 2013) is used to compute various clustering quality measures to determine the optimal number of clusters. Finally, after identifying the clusters, we analyze how cluster membership is correlated to youth socioeconomic characteristics using logistic regression.

## 4 Results and Drivers

### 4.1 Labour Market Entry

We start by calculating transition statistics for youth who left school<sup>6</sup> over the observed period (7-year recall data and 3-year panel), shown in Table 3. A total of 471 youth, or 62 percent of the sample, finish school or training over the observed period; of these, we observe first employment spells for 451 youth (95.75 percent of observed school-leavers and 59.97 percent of the sample) and a labour market entry for 417 youth (88.54 of observed school-leavers and 55.45 percent of the sample). Half of the sample reports having their first employment experience by the age of 24, and 90 percent by the age of 27. Young men leave school about 7.5 months later than women, but require a comparable amount of time to find first employment. The mean school-leaving age is 22.62 years, with an average transition duration to labour market entry (defined as first employment stint without subsequent return to education or inactivity) of just over one year.

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<sup>6</sup>The remainder were either in apprenticeship or schooling in the final observed period (and thus never transitioned to the labour market according to our definition) or were never in schooling or apprenticeship over the entirety of the period under observation and to whom the school-to-work transition does not apply (Manacorda, 2017).

**Table 3:** Labour Market Entry

Characteristic	Overall	Female (45%)	Male (55%)	Status in first period after school-leaving		
				Employed (38%)	NEET (37%)	Self- Employed (24%)
N (observed school-leavers)	471	213	258	181	176	114
Years of schooling	14.32 (15)	13.84 (15)	14.72 (16)	14.76 (16)	14.49 (16)	13.39 (14)
School-leaving age	22.62 (23)	22.27 (22)	22.90 (23)	22.66 (23)	22.76 (23)	22.33 (22)
Completed SWT (=1)	89%	87%	90%	100%	69%	100%
Age at labor market entry	23.65 (24)	23.36 (23)	23.88 (24)	23.47 (24)	24.42 (24)	23.11 (23)
Status at labor market entry						
Employed	63%	59%	65%	100%	66%	0%
Self-Employed	37%	41%	35%	0%	34%	100%
Duration of transition in years <sup>1</sup>	1.06 (1)	1.13 (1)	1.01 (1)	0.81 (1)	1.70 (2)	0.78 (1)

Notes: Mean (median); %.

<sup>1</sup> To labor market entry, defined as first work experience with no subsequent return to school or training.

The majority of school-leavers enter wage employment (38 percent) or self-employment (24 percent) directly after their last observed period of education or training. Youth who immediately enter self-employment are younger and completed fewer years of schooling compared to youth whose first post-schooling experience is wage employment or inactivity. Table A3.4 in Appendix A3 shows that youth who immediately find wage employment are more often male and marry at a lower rate with fewer children (though only the difference for gender is significant). The self-employed also report the highest rate of completed apprenticeship and are generally less educated. Youth who experience a period of inactivity upon leaving school (i.e. enter the labour market as NEET) have parents with slightly higher educational attainment, on average, than the parents of youth who immediately find work, consistent with the hypothesis that wealthy families are better able to support youth through extended periods of unemployment<sup>7</sup>.

As nearly one sixth of our sample is still in school or training at endline, the data is right-censored and we expect the mean SWT transition to be downward biased. To address this, we apply survival analysis to the retrospective history data, following Nordman and Pasquier-Doumer (2015) and Manacorda et al. (2017). Figure A3.2 in Appendix A3 plots the estimated survival probability: about 82 percent of youth need at least a year to transition to the labour market.

<sup>7</sup>This contrasts with the findings of Bridges et al. (2017), who report the opposite: youth who enter the labour market as self-employed in Tanzania tend to have more educated parents. This may be a result of differences in economic structure (Tanzania may have more opportunities for self-employment in sectors that require higher levels of education, such as professional services) or differences between the two countries in the cultural values attached to entrepreneurship.

Only about one percent of youth who transition report being unemployed for a period of four years or more. The adjustment for right-censored data does not significantly alter the estimated mean transition duration (SWT duration of 1.11 years after adjustment for right-censored data, compared to 1.06 years for the non-adjusted mean duration). After adjustment, we find that young men take 1.07 years to their first employment experience, while young women require 1.16 years, or about a month longer.

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How do our results for urban youth compare to the country as a whole? Dedehouanou et al. (2019), using the 2014 SWTS, find that of a sample of individuals aged 15-29, 40 percent had transitioned to the labour market, with a median transition duration of 1.75 years (21 months). The median graduation age was 22 (23 in our sample) and the median first labour market experience was 25 (24 in our sample). The split of first job experience was 59:41 self-employment/salaried work, compared to the 63:37 split in our survey. While the authors find that men and women are similarly likely to exit the school-to-work transition (42 percent versus 38 percent, respectively), in our sample composed of older, urban youth this likelihood is much more skewed towards men (65 percent versus 47 percent). This suggests that gender differences in transition rates are more pronounced in urban areas, and may be explained by higher levels of female labour in agriculture in rural areas in many low-income countries in SSA (Croppenstedt, Goldstein, and Rosas 2013) and the relative difficulty of young women to take advantage of the formal wage employment opportunities in urban labor markets (Fox and Sohnesen 2012; Fox and Thomas 2016).

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Comparing our results with cross-country studies, we observe that the ages at which youth enter and exit the SWT in urban Bénin are closer to that of high-income countries than for the average youth in SSA. For instance, Quintini and S. Martin (2014) report a median school-leaving age of between 21 and 22 years in a sample of advanced economies, compared to 17-18 in LMICs such as Brazil, India, Indonesia, Mexico and Turkey and 19-20 in selected Latin American countries (Argentina, Chile and South Africa). As their results are based on data over a decade old, this could also indicate a convergence in school-leaving age in recent years. Our results for SWT duration, on the other hand, are similar to the estimates of Quintini and S. Martin (2014) for LICs: the authors report that the duration of completed transitions is longer in emerging economies - 2.7 years for South Africa, and around 1 year for most LMICs, compared to 0.3-1.0 for HICs (except countries particularly affected by the Great Recession, such as Spain and

Italy). Manacorda et al. (2017), also using SWTS data from 23 lower-middle and lower income countries, report similar transition times to first employment as Quintini and S. Martin (2014) (25.7 months for SSA, 9.7 months for Bénin), but considerably longer transitions to permanent employment (11 year average for five countries in SSA, 2.6 years for Bénin). Our estimated transition duration for Bénin is considerably shorter than the SSA average reported in this study, however: 25.7 months to first employment and 129.7 months to steady employment<sup>8</sup>.

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<sup>8</sup>Based on SWTS surveys from Bénin, Madagascar, Tanzania, Togo, Uganda.

**Table 4:** Transition Into First Employment

	Transition Age (1)	Transition Duration (2)	Status in first period after school-leaving	
			NEET vs. Wage (3)	Self vs. Wage (4)
Male (=1)	0.55** (0.26)	−0.08 (0.08)	−0.50** (0.23)	−0.24 (0.26)
Years of Schooling	−0.002 (0.06)	−0.02 (0.02)	−0.05 (0.05)	−0.06 (0.06)
Completed apprenticeship (=1)	0.30 (0.35)	−0.13 (0.10)	−0.47 (0.33)	0.19 (0.34)
Primary school diploma: CEP (=1)	−0.74 (0.58)	0.27 (0.17)	−0.15 (0.54)	0.14 (0.57)
Junior high diploma: BEPC (=1)	1.00** (0.43)	0.18 (0.13)	0.24 (0.39)	−0.42 (0.42)
Baccalauréat: BAC (=1)	0.66* (0.36)	−0.18* (0.11)	−0.33 (0.32)	−0.02 (0.37)
Lower vocational: CAP (=1)	−0.23 (0.57)	−0.05 (0.17)	−0.28 (0.52)	0.22 (0.54)
2nd cycle university: Licence (=1)	0.47 (0.38)	0.19* (0.11)	0.49 (0.32)	0.12 (0.40)
3rd cycle university: Maîtrise (=1)	0.75 (0.71)	0.57*** (0.21)	0.35 (0.62)	0.16 (0.78)
Father was apprentice (=1)	−0.24 (0.28)	0.07 (0.08)	−0.12 (0.25)	−0.27 (0.28)
Father completed primary (=1)	0.65** (0.29)	−0.03 (0.09)	−0.36 (0.26)	−0.38 (0.29)
Father completed secondary (=1)	−0.78** (0.39)	0.12 (0.12)	0.35 (0.34)	−0.44 (0.42)
Mother was apprentice (=1)	0.18 (0.34)	−0.10 (0.10)	0.32 (0.31)	0.33 (0.35)
Mother completed primary (=1)	−0.36 (0.34)	−0.005 (0.10)	0.31 (0.30)	0.65* (0.34)
Mother completed secondary (=1)	−0.35 (0.59)	−0.26 (0.17)	−0.38 (0.48)	−0.02 (0.55)
Married (=1)	0.29 (0.37)	0.36*** (0.11)	0.36 (0.34)	0.25 (0.39)
Beninese (=1)	−0.86 (1.00)	0.04 (0.30)	0.55 (0.96)	−0.003 (0.99)
Ethnicity: Fon (=1)	−0.28 (0.29)	0.01 (0.09)	0.22 (0.25)	0.65** (0.31)
Religion: Christian (=1)	0.90** (0.36)	0.05 (0.11)	−0.14 (0.33)	−0.39 (0.36)
Grew up in a city (=1)	−0.03 (0.26)	0.09 (0.08)	0.28 (0.23)	0.77*** (0.28)
Constant	23.00*** (1.10)	0.92*** (0.34)	0.27 (1.10)	0.04 (1.10)
Observations	417	417	471	471
R <sup>2</sup>	0.10	0.09		
Akaike Inf. Crit.			1,048.00	1,048.00
F Statistic	2.30***	1.90**		

\* p&lt;0.1; \*\* p&lt;0.05; \*\*\* p&lt;0.01

In a next step, we explore potential determinants of transition speed (age and duration) and employment status after school-leaving. We use OLS regression to estimate the effect of educational attainment and other socioeconomic characteristics on transition speed (Columns 1 and 2 of Table 4), and a multinomial logit model to estimate the impact of the same variables on the probability that a youth becomes either wage employed, self-employed, or inactive (NEET) after leaving schooling or training.

The estimation results confirm that men enter the labour market about a half year later than women. The completion of secondary schooling (holding a junior high school diploma, BEPC, or a high school diploma, Baccalauréat) is associated with a later transition to the labour market, but does not affect the transition duration. Extended university education (Licence or higher), on the other hand, is associated with a longer transition: youth who have completed 3rd cycle university (master's level) take about six months longer to transition to the labour market. Youth with more educated fathers enter the labour market at a younger age: a possible reason being that youth whose fathers have higher levels of education may have access to better professional networks and resources that can help them find employment. Finally, the multinomial logit model estimates suggest that young men are less likely than young women to become NEET directly after leaving school, but we do not measure a significant effect of either youth education or parental education on the likelihood of finding employment in the first period after school-leaving.



## 4.2 Transition Paths

### Transition Intensity Matrices

**Figure 1:** Activity status by age (combined survey and event history data)



In the following sections, we go beyond describing the transitions that bookend the SWT - school-leaving and labour market entry - and delve deeper into the dynamics of the SWT and flow between the five activity states by gender and age, depicted graphically in Figure 1.

**Table 5:** Activity transition matrix: Combined data, 2013-2021

From	To				
	In School	NEET	Self-Employed	Employed	Apprentice
<b>In School</b>	<b>85.68%</b>	<b>3.85%</b>	<b>2.61%</b>	<b>4.92%</b>	<b>2.95%</b>
Conditional	-	4.49%	3.04%	5.74%	3.44%
Female	-	5.02%	2.74%	6.04%	4.45%
Male	-	4.08%	3.28%	5.50%	2.66%
14-18	-	1.32%	1.08%	0.96%	2.15%
19-24	-	6.23%	3.94%	8.42%	4.40%
25-30	-	14.47%	11.84%	19.74%	3.95%
<b>NEET</b>	<b>1.82%</b>	<b>64.94%</b>	<b>11.17%</b>	<b>14.29%</b>	<b>7.79%</b>
Conditional	2.80%	-	17.20%	22.00%	12.00%
Female	2.33%	-	13.95%	15.35%	7.91%
Male	5.71%	-	37.14%	62.86%	37.14%
14-18	4.76%	-	7.14%	11.90%	21.43%
19-24	2.31%	-	16.18%	18.50%	9.83%
25-30	2.86%	-	34.29%	51.43%	11.43%
<b>Self-Employed</b>	<b>1.87%</b>	<b>4.68%</b>	<b>87.82%</b>	<b>3.75%</b>	<b>1.87%</b>
Conditional	2.13%	5.33%	-	4.27%	2.13%
Female	0.96%	6.22%	-	4.31%	2.87%

Notes: Row %. First row for each activity refers to unconditional transition rate; remaining rates are conditional on the rate of separation.

**Table 5:** Activity transition matrix: Combined data, 2013-2021

From	To				
	In School	NEET	Self-Employed	Employed	Apprentice
Male	3.61%	4.22%	-	4.22%	1.20%
14-18	0.00%	0.00%	-	0.00%	14.29%
19-24	2.90%	6.22%	-	5.39%	1.66%
25-30	0.83%	4.17%	-	2.50%	1.67%
<b>Employed</b>	<b>1.28%</b>	<b>7.23%</b>	<b>4.68%</b>	<b>84.89%</b>	<b>1.91%</b>
Conditional	1.50%	8.52%	5.51%	-	2.26%
Female	2.00%	18.00%	5.33%	-	2.67%
Male	1.20%	2.81%	5.62%	-	2.01%
14-18	5.00%	10.00%	10.00%	-	0.00%
19-24	1.53%	8.78%	6.49%	-	3.05%
25-30	0.85%	7.69%	2.56%	-	0.85%
<b>Apprentice</b>	<b>0.26%</b>	<b>5.25%</b>	<b>9.45%</b>	<b>10.50%</b>	<b>74.54%</b>
Conditional	0.35%	7.04%	12.68%	14.08%	-
Female	0.00%	11.36%	13.64%	12.88%	-
Male	0.66%	3.29%	11.84%	15.13%	-
14-18	0.00%	3.90%	2.60%	3.90%	-
19-24	0.00%	8.20%	14.75%	18.58%	-
25-30	4.17%	8.33%	29.17%	12.50%	-

Notes: Row %. First row for each activity refers to unconditional transition rate; remaining rates are conditional on the rate of separation.

Table 5 reports transition rates into activity states using pooled recall history and survey data from the entire observation period. Rows represent the initial state and columns the final state, and the percentages in each cell represent the probability of an individual transitioning from the initial to the final state (i.e. the state in the subsequent period). The first row of each state reports the unconditional transition rate, equivalent to the raw percentage of youth transitioning between two activities as a percentage of youth in the initial state. This frequency alone, however, does not allow us to make any inference about the relative desirability of a change, as it does not control for the inherent tendency to “separate” from the activity (Bosch and W. F. Maloney 2010). For instance, few youth leave schooling when compared to NEET: thus, comparing raw transition rates to employment between the two activities will not reflect the relative disposition of youth to enter employment directly from the two initial states (see Appendix 3 for more details). Hence, the rates from estimated propensity matrices are reported in the remaining rows, which standardize the rates on the probability of separation - first for the entire sample, and then by gender and age subgroups.

Overall, Table 5 reflects the broad contours one would expect from the SWT: youth aged 18-24 are relatively unlikely to transition out of schooling or train-

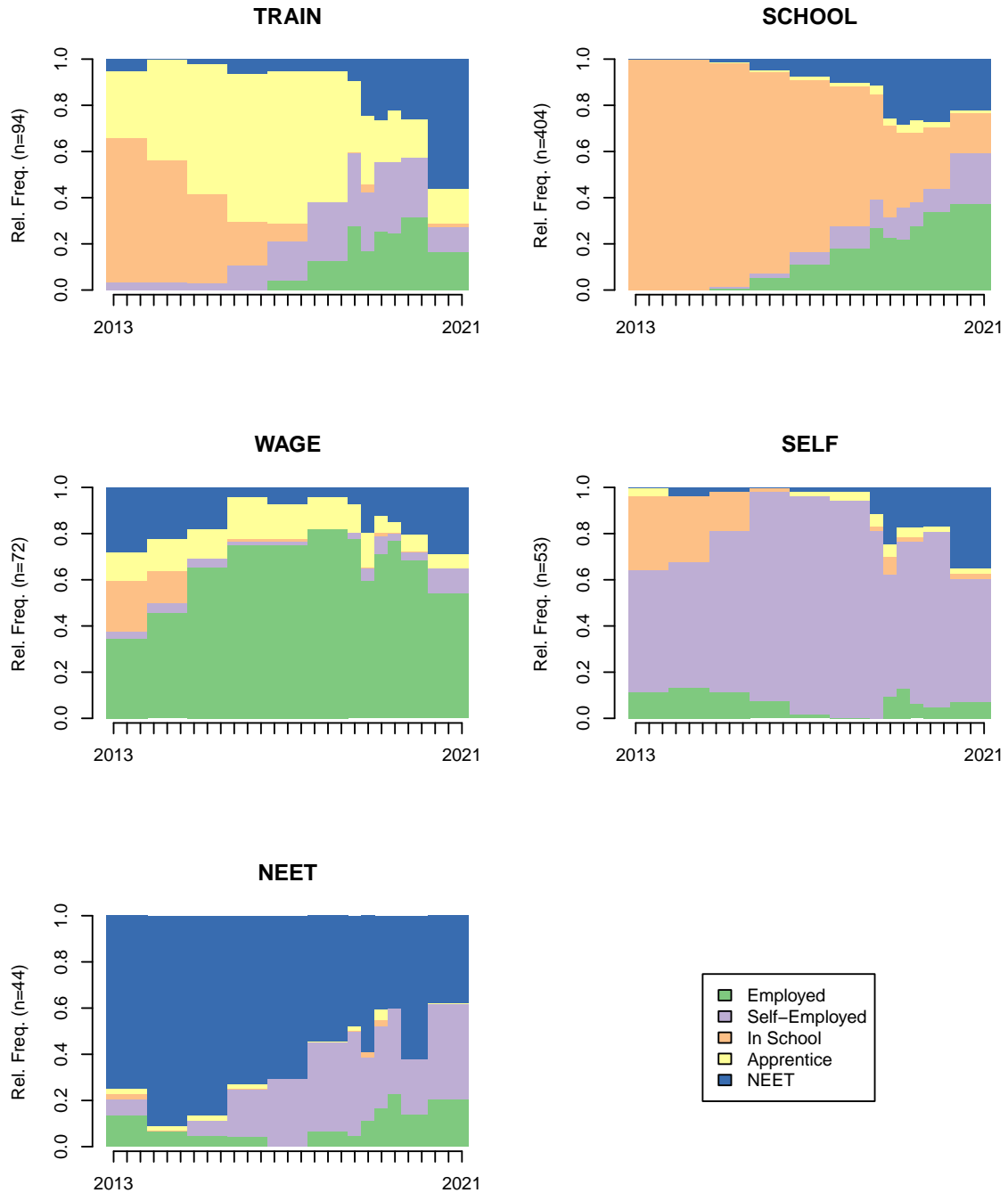
ing; as they age, they enter the labour market as self-employed, employed, or NEET at increasing rates. Apprentices – especially older ones – are more likely to transition to self-employment than wage employment. The rates at which youth exit NEET status and find work, particularly wage employment, increase dramatically as youth age. The inverse is also true of the wage employed: the probability that they exit employment in one period and enter NEET status in the next falls for older age subgroups. Table 5 also reveals stark gender differences in transition patterns. Females are more likely to change states to NEET, regardless of the initial state, and less likely to transition from NEET once inactive. The gaps in the conditional transition rate from employment to NEET (18 percent for women, 2.8 percent for men), from NEET to self-employment (14 percent versus 37.1 percent, respectively) and NEET to wage employment (15 percent versus 62.9 percent) are particularly pronounced.

We note that transitions to wage employment (from either school or apprenticeship training) are more frequent than to self-employment. While this may be expected for schooling, which intuitively increases the likelihood of finding a wage job, it is less expected for apprentices. One explanation may be that apprentices continue working for their former master trainer (or another employer) upon school-leaving in order to save up the capital needed to start their own business.

Transition matrices are presented separately for the event history data and the panel data, as well as the transitions between all rounds of the panel survey, in Appendix B2. On average, 39.7 percent of youth changed activities between each survey round, a much higher rate than the 17 percent observed in the event history data, reflecting both the higher instability associated with the transition phase (compared to school-age years) and, potentially, more frequent variation in youth activity, particularly after school-leaving, than can be captured by annual data.

## Optimal Matching Analysis

**Figure 2:** Occupational status distribution plots by cluster



Next, we employ Optimal Matching Analysis (OMA) to identify clusters of youth following similar paths during their school-to-work transition. Figure 2 plots the five identified clusters of youth transition resulting from minimizing Optimal Matching distances. In examining the figures, we note that the clusters

correspond closely to the five base activity states; we label them TRAIN, SCHOOL, WAGE, SELF and NEET for simplicity. Descriptive statistics for each cluster are presented in Table A3.6, while a logistic regression on cluster membership with the usual socio-economic characteristics as covariates is presented Table A3.7, both in Appendix A3.

The first cluster, TRAIN, is the most heterogeneous, and includes many transitions from school to apprenticeship and from apprenticeship into the three labour market states (NEET, wage employment and self-employment). It is primarily comprised of youth who participated in apprenticeship training in the years leading up to the baseline survey. Youth begin to transition into wage employment, self-employment, or inactivity in roughly equal proportions in around 2018, with a considerable proportion shifting to inactivity at endline. As apprenticeship training is generally considered to be a reliable route to (informal sector) employment, this shift to inactivity is concerning and may be a issue to be addressed with labor market integration policies. The youth in this cluster completed about 9 years of school, with the majority dropping out before completing junior high school.

The second cluster, SCHOOL, accounts for about 60 percent of the sample, and is dominated by formal education, especially in the period leading up to the baseline survey. These trajectories are clearly oriented towards transition into wage employment, with a pronounced increase of NEET youth at the time of the baseline survey. This increase in NEET youth may be explained either by under-reporting of NEET periods in the recall data, a sharp increase in economic inactivity during the Covid-19 pandemic, or the higher frequency and granularity of the panel survey relative to the event history data. Despite the high educational attainment of this group (14.9 years on average, by far the most of any cluster), the relative frequency of NEET status is the lowest of any of the five clusters, indicating that over-education is not an issue for youth in following this trajectory. This cluster is characterised by relatively low marriage and childbearing rates, and logistic regression on cluster membership (Table A3.7 in Appendix A3) also reveals higher parental education of the youth in this cluster.

The third cluster, WAGE, is comprised of 72 youth who are primarily engaged in wage employment over the observed period. Most of these youth had completed their formal education by the beginning of the observation period and enjoyed fairly stable employment throughout – with a small proportion transitioning to inactivity at the start of the panel survey, again signalling potential

under-reporting of NEET status or worsening economic conditions during the pandemic. Estimates from our logistic regression suggest that males are more likely to follow the WAGE trajectory when controlling for both the educational attainment of the youth and that of their parents. The WAGE cluster also contains a latent proportion of youth in apprenticeship training, again emphasizing the frequency with which youth work for a wage after completing their apprenticeship, rather than directly starting a business of their own.

The fourth cluster, SELF, is a relatively small cluster corresponding to established self-employed youth, about a third of whom transition from formal schooling. This is the most homogeneous cluster, with essentially two states observed after 2015: self-employment and NEET. Again, we observe a discontinuous increase in transitions from self-employment to inactivity at around the time of the start of the panel survey. Youth whose mothers had been apprentices were more likely to belong to the SELF cluster, in contrast to youth whose fathers were apprentices, who were more likely to be on the WAGE trajectory. Given the high segregation of occupations in Bénin, this suggests a gender-specific pattern in the inter-generational transmission of apprenticeship status. We also find that both vocational education and tertiary education diplomas predict SELF cluster membership, suggesting that a considerable fraction of self-employed are highly educated. We also note that, overall, there is very little transition between wage employment and self-employment evident in both the WAGE and the SELF clusters, suggesting that self-employment is unlikely to be a “stepping-stone” to formal employment, as Cunningham and Salvagno (2011) show informal employment to be in several Latin American countries.

The final and smallest cluster, NEET, includes youth who were inactive at the beginning of the observation period and began to transition into self-employment (and to a much smaller extent, wage employment) towards the end of the observation period. This cluster is the most unique in terms of its demographics: it contains almost exclusively young women (95 percent) who dropped out very early (after only 6.7 years of schooling, on average – compared to 12.8 for the sample), are married at a higher rate than the sample (59 percent vs. 17 percent) and have more children on average than the sample (1.73 vs. 0.53). These youth can thus be characterized as “stay-at-home-mothers”: the low educational attainment and low rates of transition to wage employment are concerning indicators for policy makers interested in addressing gender inequality in the region.

### Labour Market Participants

In a final step, we focus on youth in the labour force, i.e. exclude youth either not in education or training (NEET) or not looking for work. In order to examine employment quality in greater detail, we develop a new taxonomy of employment types that encompasses all wage and self-employed youth in the sample.

Bénin has a highly informal economy, with an estimated 70 percent of GDP and 95 percent of employment generated by the informal sector (Benhassine et al. 2018). As is the case in most of SSA, young workers are particularly likely to be employed in informal work. The ILO defines informal workers as all those employed by small, unincorporated firms (under five workers), the self-employed, and any wage worker not covered by social protection through their employer, including non-wage workers contributing to a family business (Sumberg et al. 2021). Indeed, of the 289 youth engaged in some income-generating activity at survey baseline (38 percent of the sample), over 95 percent would be considered informal workers by the ILO. Even using a less stringent definition of informality—one that only considers family workers, the self-employed with under five employees, and wage workers with no contract as informal—74 percent of employed youth in our sample work informally.

Thus, we use an adjusted definition of formal and informal work: **formal** work is defined to mean wage workers who have a verbal or written contract under a single regular employer or self-employed workers if they have at least five employees on their payroll. We use the national underemployment threshold of 35 hours per week to determine which (wage or self-employed) youth are **underemployed**. In addition, for wage employees, we differentiate between **casual** work – defined as wage work with one or more employers on an irregular basis or with a single employer on an irregular/task-based payment basis - and **regular** work, i.e. a single employer with regular wages. Finally, we differentiate between self-employed who are **employers** with at least one wage worker on payroll and the **independent** self-employed who have no employees. In contrast to the taxonomy used previously, we now expand our analysis to states that are non-exclusive: for instance, youth can be simultaneously formally employed and underemployed<sup>9</sup>.

Table 6 reports work characteristics by gender and age. Comparing men and women, we find that men are more likely to work full time and be an em-

<sup>9</sup>The following pairs of definitions are exclusive, however: formal and informal, regular and casual, employer and independent worker



ployer, while women have a higher propensity to be underemployed and independently self-employed. At the same time, casual work is more than twice as frequent among males as it is among females, while rates of regular work are about even. Employed men report relatively high wages at a higher rate than women, though not for the highest income bracket. Self-employed women also make significantly less than self-employed men, with two-thirds reporting profits of less than 20,000 FCFA per month. Unlike wage work, however, women are not represented at all in the highest monthly profit bracket. Women report lower job and life satisfaction, but neither difference is statistically significant at standard levels.

**Table 6: Youth Participating in Labor Market - Summary Statistics**

Characteristic	Overall	Female	Male	p-value	19-21	22-24	25-27	28-30
N	476	261	215		60	156	182	78
Formal employment	11%	9.6%	13%	0.2	10%	7.1%	15%	13%
Informal employment	49%	43%	56%	0.007	43%	48%	49%	54%
Working full time	40%	35%	47%	0.013	28%	40%	42%	47%
Underemployed	18%	17%	20%	0.5	22%	13%	20%	19%
Regular employment	14%	15%	14%	0.8	13%	9.0%	18%	18%
Casual worker	19%	13%	27%	<0.001	15%	20%	19%	19%
Employer	6.9%	3.8%	11%	0.003	5.0%	7.1%	7.1%	7.7%
Independent	18%	20%	16%	0.4	18%	18%	18%	19%
Unemployed, looking for work	40%	47%	31%	<0.001	47%	45%	36%	33%
Monthly wage (% of wage employed)				0.8				
<35,000 FCFA	28%	32%	25%		40%	29%	29%	20%
35,000-54,999 FCFA	38%	39%	38%		30%	46%	38%	30%
55,000-149,999 FCFA	30%	26%	34%		30%	21%	29%	45%
>150,000 FCFA	3.6%	3.5%	3.8%		0%	3.6%	3.8%	5.0%
Monthly profits (% of self-employed)				0.017				
<20,000 FCFA	56%	67%	44%		71%	42%	61%	53%
20,000-39,999 FCFA	19%	20%	19%		21%	19%	14%	32%
40,000-124,999 FCFA	21%	13%	30%		7.1%	35%	18%	16%
>125,000 FCFA	3.7%	0%	7.4%		0%	3.2%	6.8%	0%
Wealth index quintile	3.05	2.97	3.16	0.12				
Job Satisfaction (of wage and self-employed) <sup>1</sup>	3.55	3.47	3.63	0.11	3.44	3.47	3.62	3.62
Life satisfaction <sup>1</sup>	3.42	3.38	3.48	0.2	3.33	3.33	3.53	3.45
Where do you see yourself in five years?				>0.9				
Still looking for work (NEET only)	0.8%	1.1%	0.5%		0%	0.6%	1.1%	1.3%
Working for same employer (wage employed only)	4.0%	3.8%	4.2%		0%	2.6%	6.6%	3.8%
Different/new employer	28%	28%	29%		28%	35%	24%	23%
(Still) self-employed	57%	57%	56%		52%	51%	59%	67%
In education/training	5.5%	5.0%	6.1%		10%	7.7%	2.7%	3.8%
Other	5.1%	5.4%	4.7%		10%	3.2%	6.6%	1.3%

Notes: Calculated using responses from youth in wage employment, self-employment, or looking for work at baseline survey. The following pairs of employment types are mutually exclusive: formal and informal employment; full-time work and underemployment; regular and casual employment; employer and independent self-employed.

<sup>1</sup> Likert scale, 1 = Very dissatisfied, 5 = Very satisfied.

We also observe a labour demand shortage among the employed, with 73 percent of youth responding that they would like to work more hours than they currently do (not shown). These youth are also significantly more likely to be dissatisfied with their work. The baseline interview indicates that job turnover

is quite frequent among employed youth after school-leaving. Only about 50 percent of the wage employed had been working for the same employer(s) for more than a year at the time of the interview. Almost three quarters of employed youth claimed that they would like to work more hours, and 65 percent were actively looking for a new job at the time of the survey. Relatively high turnover supports the view that the issue facing African youth is a massive shortfall in labour demand, as opposed to human capital (Fox, Mader, et al. 2020).

Table 6 also reports employment statistics by age. We observe few discernible patterns in employment characteristics as youth age. An exception is regular employment, which doubles in frequency after the age of 24. The rate of unemployed and looking for work also drops from about 45 percent of 22 to 24 year-olds to less than 36 percent for older individuals. This can be interpreted as a stabilization of employment once the youth cohort has completed schooling. Wages also increase as youth age, though the progression is less clear for the profits of the self-employed. Older youth are marginally more satisfied with life and work, though this again statistically insignificant at standard levels.

Table 6 also tabulates responses to the question, “What do you see yourself doing in five years?” More employed youth envision themselves starting their own business than working for their current or a different employer. Moreover, wage workers reported the lowest levels of satisfaction with their current activity. Thus, despite its common characterization as the “ideal” employment situation, wage employment appears to be neither inherently stable nor particularly satisfactory — at least in the early stages of a career. On the other hand, over a quarter of the self-employed expect to be working for an employer in five years, suggesting that many youth do not see self-employment as an absorbing state, either, but rather an intermediate step on the way to wage employment. When asked where they see themselves in 5 years, NEET youth were decidedly optimistic. The majority (70 percent) of youth in this category saw themselves running their own business. The rate of NEET youth who foresee themselves working in a wage job (24 percent) is almost double the actual wage-employed rate observed in our regional census (11.7 percent), however - despite this subgroup having completed less schooling than wage-employed youth on average. In sum, youth expect to be in substantial flux between self- and wage employment, though a higher fraction of youth expect to be in self-employment in five years than to be employed for a wage.

Among NEET youth, it is also possible to differentiate between active job-

seekers and the inactive - those youth who have given up on looking for work. Four out of five NEET youth in the sample reported actively looking for a job at the time of the baseline survey; 74 percent of the inactive are young women who also dominated the INACTIVE cluster in the OMA analysis above. Over two thirds of youth who were NEET at baseline also reported never having been employed, and nearly half had been out of work for over six months at the time of the interview. Young job-seekers blame weak labour market demand and their own inadequate skills for their difficulties in securing employment. A shortage of employer demand and their own lack of work experience and training represent the most commonly listed difficulties: at least one of these being mentioned by 148 of 257 youth (58 percent) in the subsample. 26 percent said they did not know where to look, while 16 percent cited unsatisfactory working conditions or unacceptably low wages offered at available jobs. Among those responding “other”, many elaborated on the above categories (e.g., “No jobs in political science”), pointed to their lack of means or connections, or were unable to identify any obstacles at all; three women listed maternity.

Table A3.5 in Appendix A3 shows the transition rates into these more detailed work states. As with the transition propensity matrix above, we consider transition rates from the five mutually exclusive activity states by gender and age; however, due to the overlapping employment states, we only present raw transition intensities rather than conditional rates. Moreover, because we only obtained detailed employment information at the panel survey stage, we exclude the recalled employment histories from the analysis.

We observe a strong association between comparatively gainful employment states - formal and regular work - and wage employment in the previous period. In other words, it is relatively unlikely that youth transition from self-employment, education or training, or NEET status to formal or regular work. The stability of employment also increases as youth age, with the percentage of youth entering formal employment via any state other than wage employment dropping from 71 percent of 19-21 year olds to 38 percent of 28-30 year olds, while staying more or less constant for informal work after the age of 22. It is also noteworthy that women are less likely than men to transition into formal employment from any state other than wage employment.

Furthermore, gender plays a significant role in employment transitions, with independent self-employed women being far less likely to come from wage employment than men, and are more likely to enter from NEET or self-employment.

A higher percentage of males transition to formal work from school; however, this is also true for underemployment, suggesting that males are more impatient to find work after school-leaving. However, gender differences in the transition rates out of school are not as pronounced as those between labour market states. Men are more likely to transition from self-employment to formal work, while women are more likely to transition from self-employment to informal work or underemployment. The high rates of NEET among women are reflected in the relatively high proportion of women in every employment state who were NEET in the previous period. These findings suggest that even employed women are highly prone to reverting to NEET status.

Low transition rates from education into regular or formal work indicate that the path to secure gainful employment is long and may require navigating informal or precarious work arrangements. The most common transition from school to work is into casual employment (apprenticeships represent only a small fraction of transitions into any wage employment type). In almost half the observed cases of formal work, the youth had already been in wage employment in the initial period. Transitions from school to formal work are also very low compared to other emerging nations: Cunningham and Salvagno (2011) (using data with a periodicity of six months) find that between 11 and 32 percent of youth in Argentina, Brazil and Mexico move into the formal sector directly after leaving school; in urban Bénin, this is only true for 8.8 percent of youth transitioning into formal work and 5.2 percent of youth transitioning into regular work.

## 5 Conclusion

This paper studies the dynamics of the school-to-work transition for 752 youth aged 20-29 from urban Cotonou, Bénin. A unique panel is created using mobile phone surveys; in each survey round, youth activity is classified into one of five states. We then combine recall data with responses from the panel survey to generate employment and education histories dating back to 2013. The histories are used to calculate the age of school-leaving and the duration of transition to the first job for each youth. In addition, we estimate transition intensity matrices and employ Optimal Sequence Analysis to generate clusters of similar paths along the SWT.

We observe the period of school-leaving for 62 percent of the sample, a first employment spell for 60 percent of the sample, and (permanent) labor market

entry for 55 percent of the sample. The mean age of school-leaving is 23.65 years, with an average transition duration of just over one year. The ages at which youth in urban Bénin enter and exit the SWT, and the duration of the transition, are closer to that of high-income countries than for the average youth in SSA: if the transition duration calculated for this sample were representative of the entire country of Bénin, it would have the shortest transitions to work in the world. However, given the higher availability of non-agricultural informal work in urban areas, the transition speed to work is likely to be shorter in urban Cotonou than in the rest of the country.

Education is also found to be an important factor in the transition process. Completing secondary schooling is found to delay the transition but not affect its duration. Extended university education leads to a longer transition, while having a father with higher education accelerates entry into the labour market. Additionally, while young men are less likely to become NEET after leaving school, neither youth education nor parental education significantly affects the likelihood of finding employment in the first period after school-leaving.

There are notable gender differences in successful transitions. Men enter the labor market about a half year later than women, though they need a comparable amount of time to find first employment. Youth who enter the labor market as wage employees tend to be male and better educated than their counterparts who enter self-employment. Transition matrices show that women are more likely to enter NEET status, irrespective of their initial states, and are considerably less likely to transition back from NEET to either wage or self-employment. Most strikingly, the NEET cluster identified by Optimal Matching Analysis is populated almost exclusively by young women, who have much lower educational attainment than the rest of the sample. These findings highlight the issue of early and permanent exit from the labor market highlighted in other studies of the SWT (Manacorda et al. 2017; Dedehouanou et al. 2019), though we do not take a stance on whether this exit represents a choice or a constraint.

Optimal Matching Analysis identified five trajectory types, which correspond to the five activity states used. This indicates a strong path dependency, especially among youth active in the labor market: the self-employed generally remain self-employed, while the wage employed remain wage employed. Youth who spend a significant amount of time in apprenticeship experience the most turbulence over the course of their transition, with roughly equal distributions into wage employment, self-employment and inactivity at the tail end of

their trajectories. The cluster dominated by NEET status is comprised almost exclusively of young women who become separated from the labor market almost entirely at a young age, indicating that this separation is associated with family activities.

A closer analysis of active labor market participants underscores the previous findings: employment stabilizes with age, with regular work (as defined by having a single employer paying regular wages) becoming more frequent as youth become older. However, even for the employed, a latent instability is observed, with many youth desiring more hours and looking to switch employers at the time of the occupation. A survey of income reveals a major gender disparity for both wages and self-employed profits, once again highlighting the disadvantages young women face on the labor market.

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We were confronted with several limitations in the course of this research. As is often the case with panel data, ours suffers from considerable attrition, at 24 percent overall and 34 percent over the course of the first year. This can lead to biased estimates if the characteristics of those who drop out differ systematically from those who remain, though tests did not indicate that this was the case. Second, our sample is relatively small and was collected in a single metropolitan area, which limits the generalizability of our findings and our ability to detect smaller sub-group differences in school-leaving age or transition duration. Third, our use of transition matrices assume that transition probabilities remain constant over time, implying a stationary process. However, in dynamic economies like Bénin, where labor market conditions, educational opportunities, and societal norms may change rapidly, this assumption may not hold. Fluctuations in these factors can affect transition durations and the propensity to leave different employment states, rendering transition matrices less reliable for capturing evolving transition dynamics. Finally, our Optimal Matching Analysis was limited by both the size of the activity state space (five activities) and number of observations, resulting in fairly homogenous clusters.

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Despite these limitations, this study offers valuable insights into the school-to-work transition (SWT) for young adults in urban Bénin. The paper's most significant finding challenges existing narratives about youth transitions in Sub-Saharan Africa (SSA). Contrary to expectations, the study reveals that urban youth in Cotonou experience later school-leaving and shorter transition durations compared to the average young person in SSA, as estimated by Manacorda et al. (2017). In fact, the observed transition duration is closer to high-income

countries, potentially due to the higher availability of informal work in urban areas. While transition pathways exhibit stability for those actively searching for jobs, especially among self-employed individuals, these bely the underlying weaknesses in the labor market, including high rates of informality and short working hours. We also observe that young women are more likely to enter and remain in NEET status, pointing towards a significant gender disparity in labor market experiences. An alarmingly high percentage of women do not complete their SWT, calling for immediate action to facilitate first labor market experiences or enable re-integration for young women in the region.

Finally, we show that mobile phone data collection are a promising tool for tracking labour market activity, despite relatively high attrition; notably, we observed higher response to the in-person baseline and endline waves, even though these were more time-consuming than the follow-up surveys. Thus, while urban youth are an ideal subject for phone-based surveys due to their high literacy and relatively high phone ownership and high network coverage in cities, incentives for increasing response and reducing survey fatigue in longitudinal remote studies remain an important topic of research. On the balance, however, we agree that “the cost savings of a phone survey are substantial, as long as the questions of interest call for high frequency panel data” (Dillon 2012).



## References

- Achatz, Juliane, Kerstin Jahn, and Brigitte Schels (Apr. 3, 2022). "On the Non-Standard Routes: Vocational Training Measures in the School-to-Work Transitions of Lower-Qualified Youth in Germany". In: *Journal of Vocational Education & Training* 74.2, pp. 289–310.
- African Development Bank (2016). *Jobs for Youth in Africa: Strategy for Creating 25 Million Jobs and Equipping 50 Million Youth 2016-2025*. African Development Bank.
- Anyadike-Danes, Michael and Duncan McVicar (Aug. 2005). "You'll Never Walk Alone: Childhood Influences and Male Career Path Clusters". In: *Labour Economics* 12.4, pp. 511–530.
- Ballivian, Amparo, João Pedro Azevedo, and Will Durbin (Sept. 2015). "Using Mobile Phones for High-Frequency Data Collection". In: *Mobile Research Methods: Opportunities and Challenges of Mobile Research Methodologies*. Ubiquity Press.
- Bandara, Amarakoon (Feb. 13, 2019). "Youth Labor Market Expectations and Job Matching in Sub-Saharan Africa: Evidence from School-to-Work Transition Surveys". In: *Applied Economics* 51.8, pp. 762–780.
- Barro, Robert J. and Jong Wha Lee (Sept. 2013). "A New Data Set of Educational Attainment in the World, 1950– 2010". In: *Journal of Development Economics* 104, pp. 184–198.
- Benhassine, Najy et al. (Jan. 2018). "Does Inducing Informal Firms to Formalize Make Sense? Experimental Evidence from Benin". In: *Journal of Public Economics* 157, pp. 1–14.
- Biemann, Torsten, Hannes Zacher, and Daniel C. Feldman (Oct. 2012). "Career Patterns: A Twenty-Year Panel Study". In: *Journal of Vocational Behavior* 81.2, pp. 159–170.
- Bosch, Mariano and William Maloney (2007). *Comparative Analysis of Labor Market Dynamics Using Markov Processes: An Application to Informality*. World Bank Policy Research Working Paper 4429. World Bank.
- Bosch, Mariano and William F. Maloney (2010). "Comparative Analysis of Labor Market Dynamics Using Markov Processes: An Application to Informality". In: *Labour Economics* 17.4, pp. 621–631.
- Bowers, Norman (1998). "Getting Started, Settling in: The Transition from Education to the Labour Market". In: *1998 Employment Outlook*. Ed. by OECD. Paris.

- Bridges, Sarah et al. (Mar. 2017). "Youth Unemployment and Earnings in Africa: Evidence from Tanzanian Retrospective Data". In: *Journal of African Economies* 26.2.
- Brzinsky-Fay, C. (Apr. 9, 2007). "Lost in Transition? Labour Market Entry Sequences of School Leavers in Europe". In: *European Sociological Review* 23.4, pp. 409–422.
- Brzinsky-Fay, Christian (Mar. 15, 2014). "The Measurement of School-to-work Transitions as Processes: About Events and Sequences". In: *European Societies* 16.2, pp. 213–232.
- Brzinsky-Fay, Christian and Heike Solga (Dec. 2016). "Compressed, Postponed, or Disadvantaged? School-to-work-transition Patterns and Early Occupational Attainment in West Germany". In: *Research in Social Stratification and Mobility* 46, pp. 21–36.
- Calvès, Anne E., Jean-François Kobiané, and Afiwa N'Bouké (July 2013). "Privatization of Education and Labor Force Inequality in Urban Francophone Africa: The Transition from School to Work in Ouagadougou". In: *World Development* 47, pp. 136–148.
- Cockx, Bart and Matteo Picchio (Dec. 12, 2012). "Scarring Effects of Remaining Unemployed for Long-Term Unemployed School-Leavers". In: *Journal of the Royal Statistical Society: Series A (Statistics in Society)* 176.4, pp. 951–980.
- Croppenstedt, A., M. Goldstein, and N. Rosas (2013). "Gender and Agriculture: Inefficiencies, Segregation, and Low Productivity Traps". In: *The World Bank Research Observer* 28.1, pp. 79–109.
- Cunningham, Wendy and Javier Bustos Salvagno (2011). *Youth Employment Transitions in Latin America*. Policy Research Working Papers. The World Bank.
- Dedehouanou, Senakpon F. A. et al. (2019). "Working While Studying: Employment Premium or Penalty for Youth in Benin?" In: *SSRN Electronic Journal*.
- Demombynes, Gabriel, Paul Gubbins, and Alessandro Romeo (2013). *Challenges and Opportunities of Mobile Phone-Based Data Collection: Evidence from South Sudan*. World Bank Policy Research Working Paper 6321. World Bank.
- Dillon, Brian (May 2012). "Using Mobile Phones to Collect Panel Data in Developing Countries". In: *Journal of International Development* 24.4, pp. 518–527.
- Dlouhy, Katja and Torsten Biemann (Oct. 2015). "Optimal Matching Analysis in Career Research: A Review and Some Best-Practice Recommendations". In: *Journal of Vocational Behavior* 90, pp. 163–173.

- Egel, Daniel and Djavad Salehi-Isfahani (Jan. 2010). "Youth Transitions to Employment and Marriage in Iran: Evidence from the School to Work Transition Survey". In: *Middle East Development Journal* 2.1, pp. 89–120.
- Elzinga, Cees H. (Aug. 2003). "Sequence Similarity: A Nonaligning Technique". In: *Sociological Methods & Research* 32.1, pp. 3–29.
- Emmenegger, Patrick, Paul Marx, and Dominik Schraff (Jan. 2017). "Off to a Bad Start: Unemployment and Political Interest during Early Adulthood". In: *The Journal of Politics* 79.1, pp. 315–328.
- Fox, Louise, Philip Mader, et al. (2020). *Africa's 'Youth Employment' Crisis Is Actually a 'Missing Jobs' Crisis*. Brooke Shearer Series 9. Brookings Institute.
- Fox, Louise and Thomas Pave Sohnesen (Aug. 2012). *Household Enterprises in Sub-Saharan Africa - Why They Matter for Growth, Jobs, and Livelihoods*. Policy Research Working Papers. The World Bank.
- Fox, Louise and Alun Thomas (Mar. 2016). "Africa's Got Work To Do: A Diagnostic of Youth Employment Challenges in Sub-Saharan Africa". In: *Journal of African Economies* 25 (suppl 1), pp. i16–i36.
- Frye, Margaret and Jenny Trinitapoli (June 2015). "Ideals as Anchors for Relationship Experiences". In: *American Sociological Review* 80.3, pp. 496–525.
- Furnas, Hannah E. (Sept. 2016). "Capturing Complexities of Relationship-Level Family Planning Trajectories in Malawi: Capturing Complexities of Relationship-Level Family Planning Trajectories in Malawi". In: *Studies in Family Planning* 47.3, pp. 205–221.
- Gabadinho, Alexis et al. (2011). "Analyzing and Visualizing State Sequences in R with **TraMineR**". In: *Journal of Statistical Software* 40.4.
- Grapsa, Erofilo and Dorrit Posel (Sept. 14, 2016). "Sequencing the Real Time of the Elderly: Evidence from South Africa". In: *Demographic Research* 35, pp. 711–744.
- Halpin, B. and T. W. Cban (1998). "Class Careers as Sequences: An Optimal Matching Analysis of Work-Life Histories". In: *European Sociological Review* 14.2, pp. 111–130.
- Honwana, Alcinda Manuel (2012). *The Time of Youth: Work, Social Change, and Politics in Africa*. Sterling, Va: Kumarian Press Pub.
- Mains, Daniel (2011). *Hope Is Cut: Youth, Unemployment, and the Future in Urban Ethiopia*. Global Youth. Philadelphia: Temple University Press.
- Manacorda, Marco et al. (Dec. 2017). "Pathways from School to Work in the Developing World". In: *IZA Journal of Labor & Development* 6.1, p. 1.

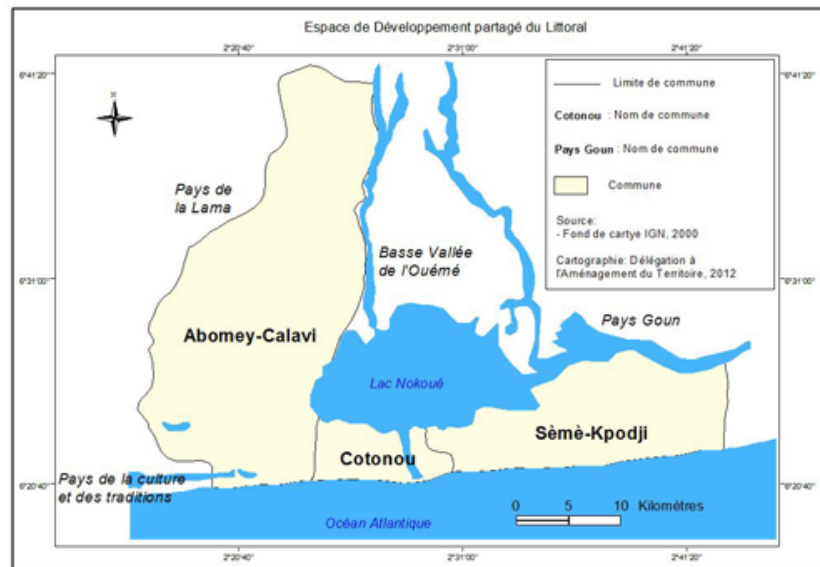
- Matsumoto, Makiko et al. (2010). *Characterizing the School-to-Work Transitions of Young Men and Women: Evidence from the ILO School-to-Work Transition Surveys*. Geneva: ILO.
- McKenzie, David (Aug. 2017). "How Effective Are Active Labor Market Policies in Developing Countries? A Critical Review of Recent Evidence". In: *The World Bank Research Observer* 32.2, pp. 127–154.
- McVicar, Duncan and Michael Anyadike-Danes (June 2002). "Predicting Successful and Unsuccessful Transitions from School to Work by Using Sequence Methods". In: *Journal of the Royal Statistical Society: Series A (Statistics in Society)* 165.2, pp. 317–334.
- Middeldorp, Marten M, Arjen J E Edzes, and Jouke van Dijk (Feb. 1, 2019). "Smoothness of the School-to-Work Transition: General versus Vocational Upper-Secondary Education". In: *European Sociological Review* 35.1, pp. 81–97.
- Möller, Joachim and Matthias Umkehrer (Aug. 1, 2015). "Are There Long-Term Earnings Scars from Youth Unemployment in Germany?" In: *Jahrbücher für Nationalökonomie und Statistik* 235.4-5, pp. 474–498.
- Nilsson, Björn (2019). "The School-to-Work Transition in Developing Countries". In: *The Journal of Development Studies* 55.5, pp. 745–764.
- Nordman, Christophe J. and Laure Pasquier-Doumer (Sept. 2014). "Vocational Education, on-the-Job Training, and Labour Market Integration of Young Workers in Urban West Africa". In: *PROSPECTS* 44.3, pp. 445–462.
- (Feb. 2015). "Transitions in a West African Labour Market: The Role of Family Networks". In: *Journal of Behavioral and Experimental Economics* 54, pp. 74–85.
- Pesando, Luca Maria et al. (Sept. 2021). "A Sequence-Analysis Approach to the Study of the Transition to Adulthood in Low- and Middle-Income Countries". In: *Population and Development Review* 47.3, pp. 719–747.
- Quintini, Glenda and Thomas Manfredi (Aug. 20, 2009). *Going Separate Ways? School-to-Work Transitions in the United States and Europe*. OECD Social, Employment and Migration Working Papers 90.
- Quintini, Glenda, John P. Martin, and Sébastien Martin (2007). "The Changing Nature of the School-to-Work Transition Process in OECD Countries". In: *SSRN Electronic Journal*.
- Quintini, Glenda and Sébastien Martin (2014). *Same Same but Different: School-to-work Transitions in Emerging and Advanced Economies*. OECD Social, Employment and Migration Working Papers 154. OECD.

- Scherer, Stefani (June 1, 2001). "Early Career Patterns: A Comparison of Great Britain and West Germany". In: *European Sociological Review* 17.2, pp. 119–144.
- (Dec. 1, 2005). "Patterns of Labour Market Entry – Long Wait or Career Instability? An Empirical Comparison of Italy, Great Britain and West Germany". In: *European Sociological Review* 21.5, pp. 427–440.
- Schmillen, Achim and Matthias Umkehrer (Dec. 2017). "The Scars of Youth: Effects of Early-Career Unemployment on Future Unemployment Experience". In: *International Labour Review* 156.3-4, pp. 465–494.
- Schoon, Ingrid et al. (Feb. 2001). "Transitions from School to Work in a Changing Social Context". In: *YOUNG* 9.1, pp. 4–22.
- Serneels, Pieter (Feb. 2007). "The Nature of Unemployment among Young Men in Urban Ethiopia". In: *Review of Development Economics* 11.1, pp. 170–186.
- Studer, Matthias (2013). "WeightedCluster Library Manual: A Practical Guide to Creating Typologies of Trajectories in the Social Sciences with R". In.
- Sumberg, James et al. (July 2021). "Africa's "Youth Employment" Crisis Is Actually a "Missing Jobs" Crisis". In: *Development Policy Review* 39.4, pp. 621–643.
- Urdal, Henrik (Sept. 2006). "A Clash of Generations? Youth Bulges and Political Violence". In: *International Studies Quarterly* 50.3, pp. 607–629.

## Appendix A3

### Cotonou census

**Figure A3.1:** Geographic Coverage of Survey



**Table A3.1:** Census of 13 zones de dénombrement

	Aged 15-19	Aged 20-29	Aged 30 and above
In School	1417 (71.64)	1144 (31.07)	87 (1.35)
Other	125 (6.32)	635 (17.25)	574 (24.35)
Self-Employed	95 (4.80)	1183 (32.13)	664 (56.68)
Employed	35 (1.77)	33 (11.76)	117 (17.28)
Apprentice	306 (15.47)	287 (7.79)	22 (0.34)
Total	1978 (100.00)	3682 (100.00)	6464 (100.00)

Notes: n, %.

## Sampling

Cluster sampling was used to select the 752 youth interviewed in the face-to-face baseline survey. The twelve *départements* of Bénin are subdivided into 77 *communes*, which are further subdivided into *arrondissements*. To delimit the geographic area for the census, we first manually selected five *arrondissements* from the three *communes* which constitute the Cotonou metropolitan area (Figure A3.1). The five *arrondissements* were chosen in consultation with survey partners experienced in data collection in the region to be as representative of urban Cotonou as possible.

In a second step, 15 Zones de dénombrement (ZDs) – the smallest administrative divisions in Bénin – were selected from the five *arrondissements* (or clusters) and constitute the primary sampling unit (PSU) of the sample. The number of ZDs chosen per cluster was proportional to the size of the youth population in each *arrondissement* at the time of the 2016 census, such that each household in the five *arrondissements* still had an equally likely chance of being sampled and no reweighting was necessary. Eight ZDs were thus drawn from the *arrondissement* of Cotonou, two from Godomey, two from Calavi, one from Agbanglandan, and one from Ekpè.

All 4,905 households living in within the boundaries of these 15 ZDs were interviewed in person to ascertain the age and employment status (in school, in apprenticeship, employed, self-employed, or inactive) of all household members. Table A3.1 in Appendix A3 shows that a total of 19,032 individuals were covered by the census, with all individuals aged 20-29 in these households (excluding apprentices, due to overlap with a second study by the author<sup>10</sup>) constituting the sample frame for the panel survey. Survey participants were selected randomly from this pool of 3,395 youth; the survey is thus representative of youth aged 20-29 in the metropolitan area of Cotonou whose primary economic activity is not apprenticeship training.

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<sup>10</sup>A number of apprentices appear in the final sample due to misreporting or a change in activity between the time of the census and the baseline interview.

**Table A3.2:** Sample Composition and Attrition

Characteristic	Baseline N=752	Follow-up 1 N=663	Follow-up 2 N=536	Follow-up 3 N=496	Endline N=574	p-value
Activity						<0.001
Apprentice	58 (7.7%)	40 (6.0%)	39 (7.3%)	24 (4.8%)	21 (3.7%)	
In School	169 (22%)	124 (19%)	95 (18%)	74 (15%)	60 (10%)	
Employed	168 (22%)	176 (27%)	164 (31%)	165 (33%)	185 (32%)	
Self-Employed	119 (16%)	148 (22%)	106 (20%)	93 (19%)	135 (24%)	
NEET	238 (32%)	175 (26%)	132 (25%)	140 (28%)	173 (30%)	
Baseline activity						0.31
Apprentice	58 (7.7%)	49 (7.4%)	45 (8.4%)	48 (9.7%)	51 (8.9%)	
In School	169 (22%)	151 (23%)	132 (25%)	124 (25%)	144 (25%)	
Employed	168 (22%)	153 (23%)	122 (23%)	107 (22%)	124 (22%)	
Self-Employed	119 (16%)	105 (16%)	74 (14%)	73 (15%)	94 (16%)	
NEET	238 (32%)	205 (31%)	163 (30%)	144 (29%)	161 (28%)	
Male	47%	48%	52%	52%	52%	0.26
Age	24.15 (2.67)	24.19 (2.67)	23.99 (2.65)	24.05 (2.67)	24.09 (2.67)	0.76
Years of Schooling	13.5 (4.7)	13.6 (4.6)	13.9 (4.5)	13.8 (4.5)	13.7 (4.4)	0.40

Notes: n (%); %; Mean (SD). Calculated using responses from baseline survey.



## Transitions as Markov processes

In Appendix B, we depict transitions between  $K$  states employment states as transition intensity matrices. Each cell of the transition intensity matrix is given by the probability of transitioning from an initial employment state  $i$  to a subsequent employment state  $j$ , which is simply given by  $p_{ij} = n_{ij}/n_i$ , such that the matrices in Appendix B can be depicted as

$$Q = \begin{pmatrix} p_{11} & \cdots & p_{1k} \\ \vdots & \ddots & \vdots \\ p_{k1} & \cdots & p_{kk} \end{pmatrix}$$

where  $n_{ij}$  is the number of youth making the transition from state  $i$  to  $j$  and  $n_i$  is the number of youth in the initial state  $i$ .

Transition intensity matrices alone do not allow us to make informative comparisons between subgroups, as we do not know if a higher  $p_{ij}$  indicates a preference of a subgroup for a certain transition, or simply higher turnover. To mitigate this issue, we follow Bosch and W. Maloney (2007) and Cunningham and Salvagno (2011) in decomposing the transition intensity matrices into two separate elements, which allow us to infer the propensity at which groups make certain transitions independent of that group's likelihood to change states.

"Since we have access to discrete panel data, rather than continuous time data, equation (1) can be interpreted as the transition probability if we assume that the discrete-time mobility process captured by our data is generated by a continuous-time homogenous Markov process. In other words, if we assume that transitions between states occur at random points in time, then a random draw of a transition in one point in time has the same probability (within a confidence interval) of a draw at any other point in time."

This rate of transition, which can be referred to as intensities (Bosch and W. Maloney 2007), make differences across different groups (age groups or gender) difficult because they do not account for the likelihood of separation (i.e. changing states). For example, younger individuals are much less likely to transition out of school; thus, the rate of transition from school to, say, wage employment will be deflated relative to older youth around school-leaving age, and will tell us little about the preference of younger school-leavers for wage employment relative to other options.

The method proposed by Bosch and W. Maloney (2007) and Bosch and W. F. Maloney (2010) and applied to youth transitions by Cunningham and Salvagno

(2011) controls for the likelihood of separation by factoring  $Q$  into two elements, the rate of separation and the propensity to move, denoted by  $Q = \lambda(M - I)$ :

$$Q = \begin{pmatrix} -p_{11} & & \\ & \ddots & \\ & & -p_{kk} \end{pmatrix} \left( \begin{bmatrix} 0 & r_{ij} \\ & \ddots \\ & & 0 \end{bmatrix} - I \right)$$

where  $r_{ij} = -p_{ij}/p_{ii}$  for  $i \neq j$  and  $i = 1, \dots, K$  and  $I$  is the identity matrix.

The first component represents the transition probabilities independent of the rate at which different age groups leave any sector, and is called the propensity matrix. The second is the rate of transition, and is referred to as the rate of separation matrix. By decomposing the transition intensity matrix into the propensity matrix and the rate of separation matrix, we can determine if movements to employment states observed in the transition intensity matrix are reflecting greater entry of certain age groups into certain employment states or if the observed transitions are simply due to greater turnover by certain age groups in general.

Table A3.3: Summary Statistics By Gender

Characteristic	Overall	Gender		p-value
		Female (53%)	Male (47%)	
N	752	396	356	
Age at baseline	24.15 (24.00)	24.03 (24.00)	24.29 (24.00)	0.13
Nationality: Beninese (=1)	97%	96%	99%	0.043
Ethnicity: Fon (=1)	69%	69%	69%	>0.9
Religion: Christian (=1)	84%	89%	78%	<0.001
Grew up in a city (=1)	64%	65%	63%	0.6
<b>School-to-Work Transition</b>				
School-leaving age	22.62 (23.00)	22.27 (22.00)	22.90 (23.00)	0.004
Had first work experience	60%	51%	70%	<0.001
Age at first work experience	23.37 (23.00)	23.08 (23.00)	23.60 (24.00)	0.023
Status at first work exp.				0.7
Employed	63%	62%	63%	
Self-Employed	37%	38%	37%	
Completed SWT	55%	47%	65%	<0.001
Age at labor market entry	23.65 (24.00)	23.36 (23.00)	23.88 (24.00)	0.025
Status at labour market entry				0.2
Employed	63%	59%	65%	
Self-Employed	37%	41%	35%	
Duration of transition in years <sup>1</sup>	1.06 (1.00)	1.13 (1.00)	1.01 (1.00)	0.2
<b>Education</b>				
Years of schooling	13 (15)	13 (14)	14 (15)	<0.001
Completed apprenticeship (=1)	20%	20%	20%	0.8
Vocational certificate: CAP (=1)	4.4%	4.0%	4.8%	0.6
Primary diploma: CEP (=1)	85%	80%	90%	<0.001
Junior high diploma: BEPC (=1)	67%	61%	74%	<0.001
Baccalauréat: BAC (=1)	40%	32%	48%	<0.001
2nd cycle university: Licence (=1)	15%	11%	20%	0.002
3rd cycle university: Maitrise (=1)	2.3%	0.5%	4.2%	<0.001
<b>Parents' Education</b>				
Father was an apprentice (=1)	33%	32%	33%	0.9
Father completed primary (=1)	67%	67%	67%	0.9
Father completed secondary (=1)	41%	43%	38%	0.11
Mother was an apprentice (=1)	17%	18%	16%	0.5
Mother completed primary (=1)	41%	41%	41%	>0.9
Mother completed secondary (=1)	20%	19%	20%	0.9
<b>Household Characteristics and Assets</b>				
Married (=1)	20%	28%	10%	<0.001
Living with parents (=1)	45%	42%	49%	0.057
No. of children	1.61 (1.00)	1.87 (1.00)	1.32 (1.00)	<0.001
People in household	6.45 (6.00)	6.67 (6.00)	6.20 (6.00)	0.034
Wealth index quintile	2.91 (3.00)	2.86 (3.00)	2.96 (3.00)	0.3
Home electrified (=1)	92%	93%	92%	0.5
Cell Phone (=1)	76%	75%	76%	0.7
Smartphone (=1)	54%	47%	62%	<0.001
Motorcycle (=1)	27%	18%	38%	<0.001
Television (=1)	39%	39%	40%	0.9

Notes: Mean (median); %. Calculated using responses from baseline survey.

<sup>1</sup> To labor market entry, defined as first work experience with no subsequent return to schooling or training.

**Table A3.4: Labour Market Entry - Detailed Summary Statistics**

Characteristic	Overall	Status in first period after school-leaving			p-value
		Employed (38%)	NEET (37%)	Self- Employed (24%)	
N	471	181	176	114	
Male	55%	61%	48%	54%	0.047
<b>School-to-Work Transition</b>					
School-leaving age	22.62	22.66	22.76	22.33	0.3
Had first work experience (=1)	91%	100%	75%	100%	<0.001
Age at first work experience	23.38	23.19	24.05	22.90	0.002
First work experience					<0.001
Employed	62%	95%	66%	4.4%	
Self-Employed	38%	5.0%	34%	96%	
Completed SWT (=1)	89%	100%	69%	100%	<0.001
Age at labor market entry	23.65	23.47	24.42	23.11	<0.001
Status at labor market entry					<0.001
Employed	63%	100%	66%	0%	
Self-Employed	37%	0%	34%	100%	
Duration of transition in years <sup>1</sup>	1.06	0.81	1.70	0.78	<0.001
<b>Education</b>					
Years of schooling	14.3	14.8	14.5	13.4	0.032
Completed apprenticeship (=1)	20%	19%	14%	28%	0.014
Vocational certificate: CAP (=1)	5.1%	5.5%	4.0%	6.1%	0.7
Primary diploma: CEP (=1)	91%	93%	91%	87%	0.2
Junior high diploma: BEPC (=1)	74%	77%	78%	63%	0.009
Baccalauréat: BAC (=1)	46%	51%	47%	38%	0.071
2nd cycle university: Licence (=1)	20%	20%	24%	16%	0.2
3rd cycle university: Maîtrise (=1)	3.4%	3.3%	4.0%	2.6%	0.9
<b>Parents' Education</b>					
Father was an apprentice (=1)	34%	35%	32%	34%	0.9
Father completed primary (=1)	69%	71%	70%	65%	0.5
Father completed secondary (=1)	42%	43%	46%	36%	0.2
Mother was an apprentice (=1)	17%	15%	19%	18%	0.6
Mother completed primary (=1)	45%	46%	47%	39%	0.3
Mother completed secondary (=1)	21%	20%	23%	20%	0.8
Married (=1)	13%	10%	15%	15%	0.4
<b>Household Characteristics and Assets</b>					
Living with parents (=1)	47%	47%	47%	49%	>0.9
No. of children	1.42	1.36	1.42	1.50	0.4
People in household	6.23	6.36	6.26	6.00	0.7
Wealth index quintile	2.98	2.94	2.97	3.04	0.8

Notes: Mean; %. Calculated using responses from baseline survey.

<sup>1</sup> To labor market entry, defined as first work experience with no subsequent return to school or training.

**Table A3.5:** Transition Rates into Various Types of Work

From	To						
	Formal	Informal	Regular	Casual	Under-employed	Employer	Indep.
<b>In School</b>	<b>8.77%</b>	<b>7.88%</b>	<b>5.19%</b>	<b>10.03%</b>	<b>8.89%</b>	<b>7.04%</b>	<b>5.24%</b>
Female	6.25%	6.86%	5.56%	8.87%	7.28%	6.12%	4.73%
Male	10.61%	8.76%	4.86%	10.67%	10.00%	7.53%	6.12%
19-21	28.57%	26.19%	18.75%	17.65%	29.17%	37.50%	27.78%
22-24	13.89%	10.59%	8.45%	14.29%	11.00%	6.98%	7.14%
25-27	5.41%	6.71%	2.00%	10.37%	7.86%	4.00%	3.12%
28-30	3.45%	2.56%	3.85%	3.30%	3.81%	4.88%	0.00%
<b>NEET</b>	<b>20.18%</b>	<b>24.57%</b>	<b>14.07%</b>	<b>23.78%</b>	<b>24.80%</b>	<b>17.61%</b>	<b>26.97%</b>
Female	25.00%	32.00%	15.87%	32.26%	32.45%	24.49%	31.95%
Male	16.67%	18.25%	12.50%	19.11%	19.55%	13.98%	18.37%
19-21	42.86%	23.81%	25.00%	17.65%	16.67%	25.00%	22.22%
22-24	16.67%	25.42%	16.90%	24.76%	27.00%	6.98%	32.14%
25-27	24.32%	24.03%	15.00%	23.70%	24.29%	20.00%	25.00%
28-30	13.79%	24.10%	7.69%	23.08%	24.76%	24.39%	24.62%
<b>Self-Emp.</b>	<b>20.18%</b>	<b>31.54%</b>	<b>4.81%</b>	<b>9.74%</b>	<b>29.11%</b>	<b>58.45%</b>	<b>51.69%</b>
Female	14.58%	36.29%	5.56%	10.48%	33.77%	57.14%	53.85%
Male	24.24%	27.49%	4.17%	9.33%	25.91%	59.14%	47.96%
19-21	0.00%	33.33%	6.25%	17.65%	33.33%	25.00%	50.00%
22-24	22.22%	27.54%	5.63%	5.71%	30.00%	58.14%	48.81%
25-27	24.32%	31.80%	4.00%	11.85%	27.86%	64.00%	47.92%
28-30	20.69%	34.87%	5.13%	9.89%	28.57%	58.54%	60.00%
<b>Employed</b>	<b>49.12%</b>	<b>31.67%</b>	<b>74.81%</b>	<b>52.15%</b>	<b>33.15%</b>	<b>13.38%</b>	<b>11.99%</b>
Female	54.17%	22.00%	73.02%	45.97%	25.17%	10.20%	7.10%
Male	45.45%	39.90%	76.39%	55.56%	38.64%	15.05%	20.41%
19-21	28.57%	9.52%	43.75%	29.41%	12.50%	12.50%	0.00%
22-24	41.67%	30.08%	67.61%	49.52%	28.00%	16.28%	8.33%
25-27	45.95%	33.57%	78.00%	51.11%	35.71%	12.00%	17.71%
28-30	62.07%	36.41%	83.33%	61.54%	40.00%	12.20%	12.31%
<b>Apprentice</b>	<b>1.75%</b>	<b>4.34%</b>	<b>1.11%</b>	<b>4.30%</b>	<b>4.04%</b>	<b>3.52%</b>	<b>4.12%</b>
Female	0.00%	2.86%	0.00%	2.42%	1.32%	2.04%	2.37%
Male	3.03%	5.60%	2.08%	5.33%	5.91%	4.30%	7.14%
19-21	0.00%	7.14%	6.25%	17.65%	8.33%	0.00%	0.00%
22-24	5.56%	6.36%	1.41%	5.71%	4.00%	11.63%	3.57%
25-27	0.00%	3.89%	1.00%	2.96%	4.29%	0.00%	6.25%
28-30	0.00%	2.05%	0.00%	2.20%	2.86%	0.00%	3.08%

Notes: Row %s reported, but do not add up to 100% as activities are not exclusive.

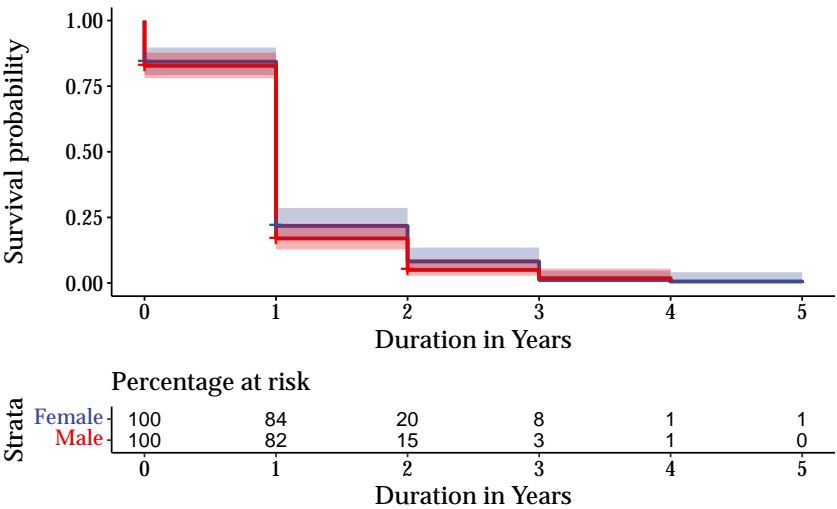
Table A3.6: Comparison of Clusters

Characteristic	Overall	Cluster					p-value
		NEET (7%)	SCHOOL (61%)	SELF (8%)	TRAIN (14%)	WAGE (11%)	
N	667	44	404	53	94	72	
Male	51%	4.5%	54%	49%	54%	60%	<0.001
<b>School-to-Work Transition</b>							
School-leaving age	22.61	23.00	22.89	21.27	22.47	21.33	0.002
Had first work experience (=1)	67%	16%	74%	45%	87%	56%	<0.001
Age at first work experience	23.36	24.57	23.60	21.96	23.28	22.42	0.003
First work experience							<0.001
Employed	62%	29%	66%	17%	50%	92%	
Self-Employed	38%	71%	34%	83%	50%	7.5%	
Completed SWT (=1)	62%	16%	68%	42%	82%	51%	<0.001
Age at labor market entry	23.64	24.57	23.98	22.27	23.49	22.14	<0.001
Status at labor market entry							<0.001
Employed	62%	29%	67%	27%	48%	89%	
Self-Employed	38%	71%	33%	73%	52%	11%	
Duration of transition in years <sup>1</sup>	1.06	1.57	1.08	1.00	0.95	1.14	0.8
<b>Education</b>							
Years of schooling	12.8	6.7	14.9	10.5	9.4	11.1	<0.001
Completed apprenticeship (=1)	19%	25%	7.4%	34%	48%	36%	<0.001
Vocational certificate: CAP (=1)	4.9%	0%	5.9%	5.7%	4.3%	2.8%	0.5
Primary diploma: CEP (=1)	88%	48%	99%	70%	71%	85%	<0.001
Junior high diploma: BEPC (=1)	71%	11%	91%	49%	35%	56%	<0.001
Baccalauréat: BAC (=1)	43%	2.3%	62%	30%	5.3%	18%	<0.001
2nd cycle university: Licence (=1)	16%	0%	24%	17%	1.1%	6.9%	<0.001
3rd cycle university: Maîtrise (=1)	2.5%	0%	3.7%	3.8%	0%	0%	0.090
Father was an apprentice (=1)	34%	25%	33%	28%	36%	46%	0.12
<b>Parents' Education</b>							
Father completed primary (=1)	54%	45%	60%	47%	50%	42%	0.014
Father completed secondary (=1)	20%	11%	26%	17%	6.4%	11%	<0.001
Mother was an apprentice (=1)	17%	2.3%	18%	21%	16%	17%	0.10
Mother completed primary (=1)	28%	23%	34%	25%	18%	17%	0.002
<b>Household Characteristics and Assets</b>							
Mother completed secondary (=1)	6.0%	0%	8.4%	1.9%	2.1%	4.2%	0.024
Married (=1)	17%	59%	7.4%	36%	22%	24%	<0.001
Living with parents (=1)	46%	18%	57%	25%	43%	26%	<0.001
No. of children	0.53	1.73	0.25	1.23	0.54	0.85	<0.001
People in household	5.40	6.07	5.48	5.26	5.23	4.92	0.3
Wealth index quintile	2.94	2.68	2.91	3.13	2.99	3.07	0.4

Notes: Mean; %. Calculated using responses from baseline survey.

<sup>1</sup> To labor market entry, defined as first work experience with no subsequent return to school or training.

Figure A3.2: Survival analysis: duration of transition to first employment



**Table A3.7:** Odds Ratios for cluster membership (Logistic Regression)

	Cluster							
	TRAIN	SCHOOL	WAGE	SELF	NEET	WAGE	SELF	NEET
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Male (=1)	1.00 (28,627.00)	1.00 (28,627.00)	1.00 (28,627.00)	1.00 (28,627.00)	0.04 (0.75)	1.00 (29,118.00)	1.00 (29,118.00)	0.05 (0.79)
Father was apprentice (=1)	1.00 (30,572.00)	1.00 (30,572.00)	1.00 (30,572.00)	1.00 (30,572.00)	0.76* (0.41)	1.00 (30,959.00)	1.00 (30,959.00)	0.79* (0.46)
Father completed primary (=1)	1.00 (32,428.00)	1.00 (32,428.00)	1.00 (32,428.00)	1.00 (32,428.00)	0.74* (0.42)	1.00 (32,718.00)	1.00 (32,718.00)	1.10** (0.48)
Father completed secondary (=1)	1.00 (42,113.00)	1.00 (42,113.00)	1.00 (42,113.00)	1.00 (42,113.00)	0.86 (0.61)	1.00 (42,931.00)	1.00 (42,931.00)	3.70*** (0.75)
Mother was apprentice (=1)	1.00 (38,545.00)	1.00 (38,545.00)	1.00 (38,545.00)	1.00 (38,545.00)	0.11 (1.10)	1.00 (38,793.00)	1.00 (38,793.00)	0.08 (1.20)
Mother completed primary (=1)	1.00 (36,400.00)	1.00 (36,400.00)	1.00 (36,400.00)	1.00 (36,400.00)	1.30*** (0.48)	1.00 (36,748.00)	1.00 (36,748.00)	1.50*** (0.56)
Mother completed secondary (=1)	1.00 (65,556.00)	1.00 (65,556.00)	1.00 (65,556.00)	1.00 (65,556.00)	0.0000 (906.00)	1.00 (66,314.00)	1.00 (66,314.00)	0.0000 (2,162.00)
Married (=1)	1.00 (38,233.00)	1.00 (38,233.00)	1.00 (38,233.00)	1.00 (38,233.00)	5.40*** (0.36)	1.00 (40,145.00)	1.00 (40,145.00)	3.80*** (0.44)
Beninese (=1)	1.00 (101,972.00)	1.00 (101,972.00)	1.00 (101,972.00)	1.00 (101,972.00)	0.43 (0.94)	1.00 (103,483.00)	1.00 (103,483.00)	0.93 (1.00)
Ethnicity: Fon (=1)	1.00 (31,806.00)	1.00 (31,806.00)	1.00 (31,806.00)	1.00 (31,806.00)	1.50*** (0.42)	1.00 (32,004.00)	1.00 (32,004.00)	1.80*** (0.50)
Religion: Christian (=1)	1.00 (39,511.00)	1.00 (39,511.00)	1.00 (39,511.00)	1.00 (39,511.00)	0.35 (0.49)	1.00 (39,773.00)	1.00 (39,773.00)	0.37 (0.56)
Grew up in a city (=1)	1.00 (29,456.00)	1.00 (29,456.00)	1.00 (29,456.00)	1.00 (29,456.00)	0.93** (0.37)	1.00 (29,696.00)	1.00 (29,696.00)	1.50*** (0.43)
Years of Schooling						1.00 (6,676.00)	1.00 (6,676.00)	0.92*** (0.09)
Completed apprenticeship (=1)						1.00 (38,352.00)	1.00 (38,352.00)	0.59 (0.48)
Primary school diploma: CEP (=1)						1.00 (65,364.00)	1.00 (65,364.00)	0.82 (0.71)
Junior high diploma: BEPC (=1)						1.00 (47,349.00)	1.00 (47,349.00)	0.13 (0.70)
Baccalauréat: BAC (=1)						1.00 (40,835.00)	1.00 (40,835.00)	0.24 (1.20)
Lower vocational: CAP (=1)						1.00 (64,801.00)	1.00 (64,801.00)	0.0000 (2,526.00)
2nd cycle university: Licence (=1)						1.00 (45,100.00)	1.00 (45,100.00)	0.0000 (1,371.00)
3rd cycle university: Maîtrise (=1)						1.00 (92,931.00)	1.00 (92,931.00)	0.0000 (3,395.00)
Constant	0.00 (107,481.00)	0.00 (107,481.00)	0.00 (107,481.00)	0.00 (107,481.00)	0.55 (0.97)	0.00 (115,720.00)	0.00 (115,720.00)	0.89 (1.10)
Observations	667	667	667	667	667	667	667	667
Log Likelihood	-0.00	-0.00	-0.00	-0.00	-112.00	-0.00	-0.00	-84.00
Akaike Inf. Crit.	26.00	26.00	26.00	26.00	249.00	42.00	42.00	211.00

\*p&lt;0.1; \*\*p&lt;0.05; \*\*\*p&lt;0.01

Notes: Odds ratios reported.



**Table A3.8: Summary Statistics - Wage Employed**

Characteristic	Overall	Female	Male	19-21	22-24	25-27	28-30
N	168	77	91	18	47	72	31
Working arrangement							
One employer, regular basis	44%	55%	34%	47%	33%	46%	52%
One employer, irregular basis	41%	38%	44%	41%	50%	39%	32%
Multiple employers, irregular	12%	4.1%	18%	12%	15%	9.9%	9.7%
Family worker	3.6%	2.7%	4.4%	0%	2.2%	4.2%	6.5%
Number of workers <sup>1</sup>	3.96	3.71	4.16	3.56	3.77	4.22	3.87
Months worked <sup>2</sup>	7.9	8.2	7.7	4.4	7.2	8.8	8.8
Wage (previous month)							
<35,000 FCFA	28%	32%	25%	40%	29%	29%	20%
35,000-54,999 FCFA	38%	39%	38%	30%	46%	38%	30%
55,000-149,999 FCFA	30%	26%	34%	30%	21%	29%	45%
>150,000 FCFA	3.6%	3.5%	3.8%	0%	3.6%	3.8%	5.0%
Job satisfaction (out of 5) <sup>3</sup>	3.46	3.47	3.46	3.50	3.36	3.53	3.45
Life satisfaction (out of 5) <sup>3</sup>	3.52	3.61	3.45	3.61	3.34	3.61	3.55
Actively looking for new job	65%	58%	70%	67%	66%	62%	68%

Notes: Calculated using responses from baseline survey.

<sup>1</sup> Primary employer. Includes surveyed worker.

<sup>2</sup> Of past 12 months.

<sup>3</sup> Likert scale, 1 = Very dissatisfied, 5 = Very satisfied.

**Table A3.9: Summary Statistics - Self-Employed**

Characteristic	Overall	Female	Male	19-21	22-24	25-27	28-30
N	119	61	58	14	39	45	21
Registered business <sup>1</sup>	18%	6.2%	29%	0%	21%	19%	18%
Pays taxes <sup>2</sup>	13%	6.6%	19%	0%	2.6%	24%	14%
Trade association member	7.6%	3.3%	12%	0%	7.7%	8.9%	9.5%
Works alone (no employees)	72%	84%	60%	79%	72%	71%	71%
Number of employees <sup>3</sup>	3.5	1.4	4.3	1.0	5.4	2.9	2.3
Months worked of past 12	10.00	9.40	10.26	7.33	9.91	9.77	12.00
Profits (previous month)							
<20,000 FCFA	56%	67%	44%	71%	42%	61%	53%
20,000-39,999 FCFA	19%	20%	19%	21%	19%	14%	32%
40,000-124,999 FCFA	21%	13%	30%	7.1%	35%	18%	16%
>125,000 FCFA	3.7%	0%	7.4%	0%	3.2%	6.8%	0%
Apprentices trained	0.52	0.12	1.12	0.00	0.27	0.69	0.89
Job Satisfaction (out of 5, Likert scale)	3.68	3.48	3.90	3.36	3.59	3.78	3.86
Life satisfaction (out of 5, Likert scale)	3.40	3.18	3.64	3.36	3.26	3.58	3.33
Looking for new job	39%	41%	36%	64%	38%	38%	24%

Notes: Calculated using responses from baseline survey.

<sup>1</sup> Either registered with Benin Chamber of Commerce and Industry (CCIB), Register of Commerce and Personal Property Transaction (RCCM), National Social Security Fund (CNSS) or National Institute of Statistics and Economic Analysis (INSAE) or in possession of a professional card (carte professionnelle de commerçant, CPC) or a Unique Fiscal Identifier (IFU).

<sup>2</sup> Paying either Synthetic Professional Tax (Taxe Professionnelle Synthétique, TPS), taxes for public space usage (e.g. patente foraine), or any other local taxes.

<sup>3</sup> Not including the business owner (i.e. the survey respondent).

**Table A3.10: Youth Aspirations**

	<b>NEET</b> N=238	<b>Self-Employed</b> N=119	<b>Employed</b> N=168
Where do you see yourself in five years?			
Still looking for work	3.0%	-	-
Working for same employer	-	-	11%
Different/new employer	24%	29%	27%
(Still) self-employed	67%	58%	48%
In education/training	3.8%	2.5%	8.9%
Other	2.1%	11%	4.8%

*Notes:* Calculated using responses from baseline survey.

## Appendix B3

**Table B3.1:** Activity transition matrix: Combined data, 2013-2021

From	To					Total
	In School	NEET	Self-Employed	Employed	Apprentice	
In School	85.68% (98.91%)	3.85% (21.74%)	2.61% (11.36%)	4.92% (18.40%)	2.95% (17.25%)	100.00% (167.66%)
NEET	1.82% (0.35%)	64.94% (60.39%)	11.17% (8.01%)	14.29% (8.80%)	7.79% (7.50%)	100.00% (85.04%)
Self-Employed	1.87% (0.39%)	4.68% (4.83%)	87.82% (69.83%)	3.75% (2.56%)	1.87% (2.00%)	100.00% (79.62%)
Employed	1.28% (0.30%)	7.23% (8.21%)	4.68% (4.10%)	84.89% (63.84%)	1.91% (2.25%)	100.00% (78.70%)
Apprentice	0.26% (0.05%)	5.25% (4.83%)	9.45% (6.70%)	10.50% (6.40%)	74.54% (71.00%)	100.00% (88.98%)
Total	90.91% (100.00%)	85.95% (100.00%)	115.73% (100.00%)	118.34% (100.00%)	89.07% (100.00%)	

Notes: Row %, (Column %)

**Table B3.2:** Activity transition matrix: Event History, 2013-2019

From	To					
	In School	NEET	Self-Employed	Employed	Apprentice	Total
In School	85.68% (98.91%)	3.85% (21.74%)	2.61% (11.36%)	4.92% (18.40%)	2.95% (17.25%)	100.00% (167.66%)
NEET	1.82% (0.35%)	64.94% (60.39%)	11.17% (8.01%)	14.29% (8.80%)	7.79% (7.50%)	100.00% (85.04%)
Self-Employed	1.87% (0.39%)	4.68% (4.83%)	87.82% (69.83%)	3.75% (2.56%)	1.87% (2.00%)	100.00% (79.62%)
Employed	1.28% (0.30%)	7.23% (8.21%)	4.68% (4.10%)	84.89% (63.84%)	1.91% (2.25%)	100.00% (78.70%)
Apprentice	0.26% (0.05%)	5.25% (4.83%)	9.45% (6.70%)	10.50% (6.40%)	74.54% (71.00%)	100.00% (88.98%)
Total	90.91% (100.00%)	85.95% (100.00%)	115.73% (100.00%)	118.34% (100.00%)	89.07% (100.00%)	

Notes: Row %, (Column %)

**Table B3.3:** Activity transition matrix: Panel data, pooled, 2019-2021

From	To					
	In School	NEET	Self-Employed	Employed	Apprentice	Total
In School	63.64% (78.72%)	16.22% (11.70%)	5.90% (5.87%)	12.53% (8.10%)	1.72% (5.79%)	100.00% (110.17%)
NEET	4.85% (8.51%)	52.34% (53.55%)	16.81% (23.72%)	22.18% (20.32%)	3.81% (18.18%)	100.00% (124.27%)
Self-Employed	3.32% (3.65%)	20.78% (13.30%)	61.22% (54.03%)	13.30% (7.62%)	1.39% (4.13%)	100.00% (82.73%)
Employed	3.72% (6.38%)	16.49% (16.49%)	9.04% (12.47%)	68.09% (60.95%)	2.66% (12.40%)	100.00% (108.69%)
Apprentice	6.25% (2.74%)	19.44% (4.96%)	11.11% (3.91%)	13.19% (3.02%)	50.00% (59.50%)	100.00% (74.13%)
Total	81.79% (100.00%)	125.27% (100.00%)	104.08% (100.00%)	129.29% (100.00%)	59.58% (100.00%)	

Notes: Row %, (Column %)

**Table B3.4:** Activity transition matrix: Baseline and follow-up wave 1

Baseline	Follow-up 1					
	In School	NEET	Self-Employed	Employed	Apprentice	Total
In School	62.25% (75.81%)	19.21% (16.57%)	8.61% (8.78%)	6.62% (5.68%)	3.31% (12.50%)	100.00% (119.34%)
NEET	6.83% (11.29%)	49.27% (57.71%)	18.05% (25.00%)	22.44% (26.14%)	3.41% (17.50%)	100.00% (137.64%)
Self-Employed	0.95% (0.81%)	11.43% (6.86%)	70.48% (50.00%)	16.19% (9.66%)	0.95% (2.50%)	100.00% (69.82%)
Employed	7.84% (9.68%)	13.73% (12.00%)	12.42% (12.84%)	63.40% (55.11%)	2.61% (10.00%)	100.00% (99.63%)
Apprentice	6.12% (2.42%)	24.49% (6.86%)	10.20% (3.38%)	12.24% (3.41%)	46.94% (57.50%)	100.00% (73.56%)
Total	84.00% (100.00%)	118.12% (100.00%)	119.76% (100.00%)	120.90% (100.00%)	57.23% (100.00%)	

Notes: Row %, (Column %)

**Table B3.5:** Activity transition matrix: Follow-up wave 1 and follow-up wave 2

Follow-up 1	Follow-up 2					
	In School	NEET	Self-Employed	Employed	Apprentice	Total
In School	66.00% (78.57%)	12.00% (9.68%)	5.00% (5.00%)	16.00% (10.19%)	1.00% (2.63%)	100.00% (106.07%)
NEET	4.76% (8.33%)	51.02% (60.48%)	15.65% (23.00%)	21.77% (20.38%)	6.80% (26.32%)	100.00% (138.52%)
Self-Employed	8.42% (9.52%)	15.79% (12.10%)	56.84% (54.00%)	15.79% (9.55%)	3.16% (7.89%)	100.00% (93.07%)
Employed	1.59% (2.38%)	14.29% (14.52%)	11.11% (14.00%)	70.63% (56.69%)	2.38% (7.89%)	100.00% (95.48%)
Apprentice	2.86% (1.19%)	11.43% (3.23%)	11.43% (4.00%)	14.29% (3.18%)	60.00% (55.26%)	100.00% (66.86%)
Total	83.63% (100.00%)	104.52% (100.00%)	100.03% (100.00%)	138.48% (100.00%)	73.34% (100.00%)	

Notes: Row %, (Column %)

**Table B3.6:** Activity transition matrix: Follow-up wave 2 and follow-up wave 3

Follow-up 2	Follow-up 3					
	In School	NEET	Self-Employed	Employed	Apprentice	Total
In School	67.05% (83.10%)	13.64% (9.52%)	4.55% (4.88%)	14.77% (8.61%)	0.00% (0.00%)	100.00% (106.11%)
NEET	3.74% (5.63%)	63.55% (53.97%)	13.08% (17.07%)	16.82% (11.92%)	2.80% (13.04%)	100.00% (101.64%)
Self-Employed	0.00% (0.00%)	19.28% (12.70%)	65.06% (65.85%)	14.46% (7.95%)	1.20% (4.35%)	100.00% (90.85%)
Employed	2.88% (5.63%)	17.99% (19.84%)	4.32% (7.32%)	71.94% (66.23%)	2.88% (17.39%)	100.00% (116.41%)
Apprentice	11.11% (5.63%)	13.89% (3.97%)	11.11% (4.88%)	22.22% (5.30%)	41.67% (65.22%)	100.00% (85.00%)
Total	84.77% (100.00%)	128.34% (100.00%)	98.12% (100.00%)	140.22% (100.00%)	48.55% (100.00%)	

Notes: Row %, (Column %)

**Table B3.7:** Activity transition matrix: Follow-up wave 3 and endline

Follow-up 3	Endline					
	In School	NEET	Self-Employed	Employed	Apprentice	Total
In School	58.82% (80.00%)	19.12% (9.35%)	2.94% (2.53%)	17.65% (8.22%)	1.47% (5.00%)	100.00% (105.10%)
NEET	2.54% (6.00%)	49.15% (41.73%)	19.49% (29.11%)	27.12% (21.92%)	1.69% (10.00%)	100.00% (108.76%)
Self-Employed	3.85% (6.00%)	41.03% (23.02%)	50.00% (49.37%)	5.13% (2.74%)	0.00% (0.00%)	100.00% (81.13%)
Employed	2.05% (6.00%)	19.86% (20.86%)	8.22% (15.19%)	67.12% (67.12%)	2.74% (20.00%)	100.00% (129.18%)
Apprentice	4.17% (2.00%)	29.17% (5.04%)	12.50% (3.80%)	0.00% (0.00%)	54.17% (65.00%)	100.00% (75.83%)
Total	71.43% (100.00%)	158.33% (100.00%)	93.15% (100.00%)	117.02% (100.00%)	60.07% (100.00%)	

Notes: Row %, (Column %)

**Table B3.8:** Activity transition matrix: Baseline and endline

Baseline	Endline					
	In School	NEET	Self-Employed	Employed	Apprentice	Total
In School	31.25% (75.00%)	18.75% (15.61%)	18.06% (19.26%)	30.56% (23.78%)	1.39% (9.52%)	100.00% (143.17%)
NEET	4.35% (11.67%)	37.27% (34.68%)	31.68% (37.78%)	25.47% (22.16%)	1.24% (9.52%)	100.00% (115.81%)
Self-Employed	3.19% (5.00%)	42.55% (23.12%)	32.98% (22.96%)	21.28% (10.81%)	0.00% (0.00%)	100.00% (61.90%)
Employed	3.23% (6.67%)	18.55% (13.29%)	17.74% (16.30%)	58.06% (38.92%)	2.42% (14.29%)	100.00% (89.46%)
Apprentice	1.96% (1.67%)	45.10% (13.29%)	9.80% (3.70%)	15.69% (4.32%)	27.45% (66.67%)	100.00% (89.66%)
Total	43.98% (100.00%)	162.22% (100.00%)	110.26% (100.00%)	151.05% (100.00%)	32.50% (100.00%)	

Notes: Row %, (Column %)