Lost in Transition*

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Abstract

This paper uses a novel longitudinal dataset of 752 youth living in Cotonou, Benin, collected over 2 years, to analyze the school-to-work transition in a highly informal, urban environment. We conduct five waves of in-person and mobile phone surveys over three years with youth aged 20-29. We find evidence of queuing for wage jobs: relatively well-educated youth endure long periods of inactivity waiting for wage employment. Even wage jobs are informal and low-paying, and almost none fulfill the ILO formality criteria. Quantifying the transition, we find that the average youth in our sample needs between 5 and 18 months to find their first employment after graduation and between 23 and 27 months to find steady employment. Transition propensities show that casual, but full-time work following a spell of inactivity is the most common path taken; it is more likely to occur directly after graduation for men than from women. Finally, we find that youth who have transitioned to the labor market experience more life satisfaction, though no effect is detected for particular types of transitions.

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Keywords: Informal labor markets, Dual training, Apprenticeship

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1   Introduction

An analysis of transitions from school to work is central to any analysis of the performance of youth in the labour market.

The youth population in Sub-Saharan Africa is rapidly growing 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 be less likely to find jobs and more likely to remain unemployed than adults.

Understanding the factors that influence the transition of young people into the labor market can help policymakers and other stakeholders to identify and implement interventions that can improve economic outcomes for young people and help to support sustainable economic growth in the region. Additionally, studying youth labor market transitions can provide insight into the broader socio-economic dynamics of the region and can help to inform policy decisions in other areas, such as education and training.

Youth constitute a significant portion of the population in the region and their ability to gain employment and enter the labor market has significant implications for economic growth and development. Understanding the factors that affect the transition from education to employment can inform policy interventions aimed at improving the employment prospects of young people. Finally, the study of youth labor market transitions can provide insights into the broader economic and social challenges facing the region, such as poverty, inequality, and gender discrimination.

The transition to the labor 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 semipermanent state of "waithood" is commonly reported

among youth (particularly males) in Sub-Saharan Africa, impeding their social integration and reducing the self-worth of those unable to find employment (Honwana, 2012; Mains, 2011).

The dynamic process of the school-to-work transition (SWT), including all the activities of young people between full-time schooling and stable employment, is best studied with detailed, longitudinal data; as a result, most studies of the SWT have been conducted in high-income countries (Nilsson, 2019). In addition to data scarcity, the informality inherent to most youth labor markets in the low- and middle-income countries render traditional data sources insufficient to capture all the details of the SWT. While the path from formal education to formal employment is sequential and quantifiable, the path to the is more complicated, often leading through halting periods of formal education and informal training, stints at the family household enterprise, prolonged school absences or repeated years, and periods of complete economic inactivity. Official labor market data in developing countries is often too infrequent and unreliable to capture such dynamics.

In this paper, we use a novel, longitudinal data from a survey conducted with 752 youth from Cotonou, Benin in five waves over three years to quantify various aspects of the school-to-work transition in the type of urban, highly informal economy that is common across SSA and is absorbing ever-increasing numbers of youth.

We use a combination of methods to estimate the determinants of transition age and duration in an informal, urban, and low-income setting. We also develop a typology of transitions observable in our data using optimal matching analysis (OMA), a method originally used for DNA sequencing and now applied to variety of contexts.

We first estimate the transition duration and age of transition into the labor market. Since our data is limited to three years of survey data and 7 years of recall data, a proportion of our sample did not transition within the observed time period. We use survival analysis to account for this, though the results are not affected much by whether right-

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censoredness of the data is accounted for or not.

Regression analysis is used to identify factors associated with longer transition durations or later transitions.

Second, we

[ask the question]

We first use a combination of youth event history and a detailed four-wave panel to estimate the age of school-leaving, first employment, and first steady employment. Second, we use the panel data to map out young people's transition between schooling and training, wage employment, self-employment, and inactivity, as well as their propensity to move between more differentiated employment states, such as casual and formal wage employment. Optimal matching analysis (OMA), a technique used to identify groups of similar states of sequences, is used to identify clusters of youth that follow similar trajectories over the observed period. Finally, we leverage the panel data to estimate the effect of various transitions on youth well-being, as measured by reported life satisfaction.

Evidence from high-income countries suggests that protracted unemployment spells, including extended school-to-work transitions, negatively affect future earnings and employment prospects. Based on youth work histories from a sample of 28 lower- and middle-income countries, Manacorda et al. (2017) show that, despite the demographic pressures placed on labor markets by the youth bulge in SSA, transition durations are significantly lower in low-income countries than middle- and high-income countries. The authors point to extreme poverty and a lack of unemployment insurance as two potential factors that reduce reservation wages and push youth into earlier employment.

There is limited evidence on the SWT for youth in low-income countries. Bridges et al. (2017) use the Tanzania Household Urban Panel Survey to study how first experiences in the labor market effects future earnings, and find that school-leavers who

immediately find a wage job, particularly in the formal sector, experience a future wage premium. In lieu of earnings data, this paper studies the effects of transition on youth well-being as measured by self-reported life satisfaction. Using the ILO's School-to-Work Transition Surveys, Matsumoto et al. (2010) focus on the differences between youth employment outcomes in rural and urban areas, and find rural economies to be characterized by higher rates of family work, agriculture, and labor market participation.

The school-to-work transition (SWT) in LICs is quicker in Asia, slower in MENA, and heterogeneous but comparable to industrialized countries on average in LAC and SSA. In SSA, two counteracting factors likely influencing transition speed: poverty and lack of unemployment insurance forces youth into working sooner, while increasing education and decreasing number of public sector jobs has driven up expectations without matching wage job growth.

From a methodological standpoint, three approaches might suit our data in the literature: 1) look at flows (transition matrices), look for heterogeneous effects and spells in each state (Cunningham and Salvagno, 2011), 2) survival analysis to estimate transition duration and probability of labor market exit, plus subgroup analysis, and 3) regression of outcomes on earlier labor market experience, e.g. first job experience. I go into more detail below, with the help of a nice summary of the SWT literature for developing countries by Nilsson (2019).

The Diamond-Mortensen-Pissarides search and matching framework Mortensen and Pissarides (1999) with extension to dual labor markets is common, with the common implication that more productive workers have higher opportunity costs of working in the informal sector and will thus wait longer to find a formal sector job. If education and productivity are correlated, this rationalizes the queuing hypothesis (Nilsson, 2019).

Both cross-sectional and longitudinal data have been used to quantify the SWT.

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 et al. (2007) and Quintini and Martin (2014) use this approach to report transition durations, along with mean school-leaving and first employment ages (see Table 1). For longitudinal studies, the mean transition duration, reported for example in Quintini et al. (2007), the non-inclusion of youth still in transition will bias results. Survival analysis is often used to account for this right-censored nature of the data (Nordman and Pasquier-Doumer (2015); Manacorda et al. (2017), and several other studies in developing countries, albeit of lower quality). Manacorda et al. (2017) does this with 23 SWTS countries and reports similar transition times to the first job as Quintini, but much longer waits until permanent employment (11 year average for five countries in SSA, including Benin).

A third empirical approach to transition is to study transition matrices. Cunningham and Salvagno (2011) do this for panel labor force surveys from Argentina, Brazil, and Mexico and find a common pattern: a short time spent in the informal sector, followed by a move to a formal position for longer spells, and finally entry into self-employment at advanced age. Formal and poor workers less likely to return to school, and females have less turnover. 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.

In addition to education, the importance of networks[1], search costs, and search intensity have been emphasized in a mostly experimental literature. A matching process in Jordan in 2015 proved ineffective, transport and job application workshops were more efficient than job fairs in Ethiopia in 2016, and information about job opportunities reduced women's fertility and marriage rates and increased labor market participation

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[1]@nordman2015 identify the importance of network strength on reducing labor market volatility, but do not focus on youth.

and schooling in India in 2012. While not directly related to transition speed, Bridges et al. (2017) use the Tanzania Household Urban Panel Survey to study how first experiences in the labor market effects future earnings, and find that school-leavers who immediately find a wage job, particularly in the formal sector, experience a future wage premium.

The effect of education differs from study to study, though it seems that it may speed up transition in MENA and central Asian countries and lengthen it in SSA, especially at higher levels of attainment. The queuing hypothesis explains why this may be the case: an extended job search has more value for the highly productive, who tend to signal productivity with their education. It is important to note that the reduction of public sector employment and increase in access to education are reversing the labor market conditions of the past, in which the educated had a relatively easy path to public employment. Studies generally suggest that high reservation wages are not the cause of high unemployment, however. Education has also been shown to increase search intensity (in Ghana, Turkey, Egypt).

Women generally experience longer transition durations and are more likely to exit the labor market before completing the transition. For instance, Manacorda et al. (2017) find that women need twice the time to find a first job. Marriage is often cited as an alternative to labor market participation or "solution to" failed transition, but in certain countries (such as India) high educational and occupation status may be desirable for the marriage market.

Using survival analysis of retrospective job histories from a custom survey conducted in Oudgadougou, Nordman and Pasquier-Doumer (2015) show network strength and resources, in particularly for family ties, increases labor market stability (staying in self-employment or unemployment state) as well as access to public sector wage employment, but not network size. There is some evidence that jobs found via social networks tend to be lower paid and of lower quality in developing coun- tries.

There are also some returns to staying in the same occupation as the parents in West Africa (Pasquier-Doumer, 2013).

Nilsson (2019) discusses institutional factors such as the minimum wage, UI and wage subsidies. Studies do not point in a single direction. On the supply side, demographics should suggest that the pressure on youth is easing as population growth slows; elasticity of youth employment to the share of youth in the population has been estimated to be around 0.5 for both European and developing countries (O'Higgins, 1997). Local labor market conditions appear to be stronger drivers of duration than GDP, trade openness, or income distribution. Active labor market policies (ALMP) are a subject that deserves, and has received in several papers, a literature review all to itself but, overall, skills training and entrepreneurship promotion appear more successful than facilitation programs like job fairs or subsidies. Manacorda et al. (2017) find that a one standard deviation increase in the rate of population growth leads to an increase in average transition duration of ~17 months. One standard deviation increase the poverty rate leads to a reduction in transition duration of ~17 months and an increase in probability of never attaining employment of 14 percentage points.

A comparison of 8 high-income and 8 emerging countries by Quintini and Martin (2014) shows that youth in emerging countries experience longer transitions and leave education earlier, while also having higher rates of inactivity. However, the emerging countries used are located in MENA and Central Asia (plus China) and thus qualitatively different from a low-income country like Benin. The OECD literature suggests that there is frequent job turnover among younger workers who engage in a search process of "shopping around" temporary jobs until they find a career path, whereas the informal sector may play a similar, transitory role in developing countries, rather than being a dead-end career path.

Existing work on transitions between employment states has focused on adult workers. Cunningham and Salvagno (2011) study panel labor force surveys from Argentina,

Brazil, and Mexico and find that short spells in the are often followed by a move to formal, wage-sector positions for a longer duration, and finally followed by entry into self-employment at a more advanced age. 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. Nordman and Pasquier-Doumer (2014) collect work histories from working-age individuals in Ouagadougou, Burkina Faso to identify a strong effect of family networks on the probability of transition from unemployment to employment and from self-employment to wage employment (but not from wage employment to self-employment).

Methodologically, both cross-sectional and longitudinal data have been used to quantify the school-to-work transition. 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 et al. (2007) and Quintini and 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 et al. (2007), the non-inclusion of youth still in transition will bias results. Survival analysis is often used to account for this right-censored nature of the data [Nordman and Pasquier-Doumer (2015); manacorda2017]. Manacorda et al. (2017) apply survival analysis to SWTS data from 23 lower-middle and lower income countries and report similar transition times to first employment as Quintini and Martin (2014), but considerably longer transitions to permanent employment (11 year average for five countries in SSA, including Benin).

The next section describes the data and methodology. Section 3 contains analysis and results. Section 4 concludes.

2 Data and Methodology

Data

Youth were selected randomly from a census of 4,905 households representative of the city of Cotonou, Benin's economic center and de facto administrative capital. The census was conducted exclusively for the purposes of this study in August 2019 and covered the communes of Abomey-Calavi, Cotonou, and Sèmè-Kpodji, which together constitute the Cotonou metropolitan area (see Figure A1 in the Appendix).

Table A1 in the Appendix shows that total of 19,032 individuals was covered by the census, with 3,395 non-apprentices aged 20-29 constituting the sample frame for the survey. Because school attendance rates among younger respondents were found to be very high — more than 70% of the 15- to 19-year-olds covered by the census — youth aged 20-29 were surveyed, rather than the age range of 15-29 years use by the International Labour Organization (ILO), in order to shift the focus of the study from schooling to labor market outcomes. Weights described in the Appendix are used for the calculation of means unless stated otherwise.

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 five survey waves in total. The panel suffers an attrition rate of between 9% and 19% per survey round, with an overall attrition rate of 34% over the course of the first year of the survey (until the third follow-up survey). This is high but in line with other remote longitudinal surveys in developing countries (Demombynes et al., 2013, p. ballivian2015). However, a large proportion of non-respondents were recovered for the face-to-face endline, resulting in a final attrition of just 24%. 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 Benin'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 A2 in the Appendix 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.

Summary Statistics

Table 1: Descriptive Statistics by Baseline Activity

Characteristic	Overall	In School (22%)	NEET (32%)	Self-Employed (16%)	Employed (22%)	Apprentice (8%)	p-value
N	752	169	238	119	168	58	
Male (=1)	47%	56%	34%	49%	54%	55%	<0.001
Age at baseline	24.15	22.82	24.30	24.84	25.06	23.36	<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
Employment Status							
Graduation age	22.62	23.67	22.35	21.74	22.28	23.65	<0.001
Age at first employment	23.65	24.56	23.62	22.82	23.43	24.24	<0.001
Duration of transition in years[1]	1.06	0.64	1.37	1.08	1.17	0.72	<0.001
Education							
Years of schooling	12.4	15.0	12.0	9.5	13.2	10.2	<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
Parents' Education							
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
Married (=1)	20%	4.7%	28%	34%	16%	10%	<0.001
Household Characteristics and Assets							
Living with parents (=1)	45%	60%	42%	37%	39%	47%	<0.001
No. of children	0.61	0.13	0.86	1.11	0.51	0.24	<0.001
People in household	5.45	5.96	5.55	5.04	5.40	4.48	0.027
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

Mean; %. Calculated using responses from baseline survey.
[1] To first employment.

Youth characteristics at baseline are presented for each activity in Table 1 above. The reported p-value reported compare the equality of means under the null hypothesis that the 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 still in the education system being on average younger than the rest of the sample. Self-employed youth have less schooling than employed and NEET youth and are the most likely to have completed an apprenticeship (39%), in line with the notion that apprenticeship is a pathway to self-employed craftsman work rather than a wage job in much of SSA. Wage-employed youth have 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 NEET youth in our sample are comprised of both underqualified youth (with much less schooling than those in wage employment) and overqualified youth (who are unable to find employment despite qualifications comparable to the wage employed.) 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 independent living and financial stability.

In Table A3 in the Appendix, we compare men and women. 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% 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% vs 90%) to baccalauréat (32% vs 48%) to 2nd cycle university (11% vs 20%). There are also indications of spousal dependency: young women are much more likely to report residing in the home of their (male) partner — virtually all respondents (99%) who reported "living with their spouse" were women — and less likely to own a smartphone or motorcycle, a critical means of communication and transportation in Cotonou.

Many youth in Cotonou are still in school in their 20s — representing almost a third of 20-29 year old youth in the census, and 22% 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 Benin estimated in 2010 by Barro and Lee (2013). Among students in the sample, about 20% attend a private university, and 75% have to pay tuition fees. School fees vary: 30% of university students pay negligible fees (less than 30 CHF per year), while nearly 20% 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% of student having participated in a (generally unpaid) internship at private firm in the year prior to the survey.

Method

Three methods are used to analyze the dynamics of youth employment in Cotonou.

First, we follow Manacorda et al. (2017) and calculate the duration of transition to first employment. Second, we estimate transition matrices to calculate the rate of turnover, or the share of people that move out of or into a certain state of employment in each period under observation. Using this approach we can, for instance, determine whether youth move from self- to wage employment at a higher rate than from wage to self-employment. Third, we use optimal matching analysis to create a taxonomy of transition sequences, which we compare along individual characteristics. We also identify the most common sequences observable in the data. Finally, we discuss the impact of certain transitions on the life satisfaction of youth, the aspirations expressed by youth at different employment states, and self-reported obstacles on the SWT.

3 Results and Drivers

3.1 Labour Market Entry

Table 2: Summary Statistics - Labour Market Entry

| Characteristic | Overall | Status at Labour Market Entry | | | p-value |
		Employed (38%)	NEET (37%)	Self-Employed (25%)	
N	512	196	190	126	
Male	54%	58%	49%	58%	0.2
Married (=1)	12%	12%	13%	13%	0.9
No. of children	1.40	1.35	1.41	1.44	0.6
Transition					
Graduation age	22.62	22.57	22.66	22.64	>0.9
Age at first employment	23.65	23.41	24.25	23.38	0.014
Duration of transition in years	1.06	0.88	1.63	0.75	<0.001
Education					
Years of schooling	14.4	14.7	14.7	13.6	0.020
Completed apprenticeship (=1)	19%	20%	14%	25%	0.044
Vocational certificate: CAP (=1)	5.1%	6.6%	4.2%	4.0%	0.4
Primary diploma: CEP (=1)	91%	93%	92%	87%	0.091
Junior high diploma: BEPC (=1)	75%	77%	79%	66%	0.017
Baccalauréat: BAC (=1)	47%	52%	49%	39%	0.075
2nd cycle university: Licence (=1)	20%	20%	23%	16%	0.3
3rd cycle university: Maîtrise (=1)	3.1%	3.1%	3.2%	3.2%	>0.9
Parents' Education					
Father was an apprentice (=1)	34%	36%	36%	30%	0.5
Father completed primary (=1)	70%	70%	75%	62%	0.040
Father completed secondary (=1)	42%	42%	49%	32%	0.008
Mother was an apprentice (=1)	18%	16%	21%	16%	0.4
Mother completed primary (=1)	45%	49%	49%	33%	0.008
Mother completed secondary (=1)	21%	22%	23%	17%	0.3

Mean; %. Calculated using responses from baseline survey.

We start by considering the differences between youth who enter the labour market in three different employment states: wage employed, self-employed, and unemployed - which we will continue to label NEET for consistency. Table 2 compares the baseline characteristics of a total of 512 youth whose transition to the labour market was observed, or 68% of the sample[2].

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[2]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 during the entirety of the period under observation (and to whom the school-to-work transition does not

The majority of youth (over 60%) find wage or self-employment immediately after finishing their schooling or training. Youth who find wage employment immediately after entering the labour market are more likely to be male and less likely to be married with fewer children (though only the difference for sex is significant). Youth who enter the labour market as either wage employed or unemployed have 14.7 years of schooling on average, while those who enter as self-employed have approximately one year less. The NEET and wage employed also appear to have more educated parents, in contrast to the findings of Bridges et al. (2017), who find that youth who enter the labor market as self-employed in Tanzania tend to have more educated parents. The self-employed also report the highest rate of completed apprenticeship and are generally less educated - with the exception, interestingly, of 3rd cycle (master's level) university graduates, which are equally represented across the three groups. NEET youth have parents with slightly higher educational attainment, consistent with the hypothesis that wealthy families are better able to support youth through extended periods of unemployment.

The ILO's *Work4Youth* program takes school-leaving age to be the of the onset of the school-to-work transition, as do several studies of the school-to-work transition in OECD countries (e.g. Bowers (1998), Quintini et al. (2007)). We refer to this as the graduation age. The top panel of Table 2 shows that when both retroactive job data and panel data is considered, 512 youth (68 percent) of youth finish school or training between 2013 and the penultimate survey wave, with a mean graduation age of 22 years and 7 months. Youth who secured wage employment as their first labour market experience entered the labour market at the age of 22.57 on average, compared with age 22.64 for those who entered into self-employment and 22.66 for those whose first recorded status was NEET; however, this difference is not statistically significant.

Next, we examine the first employment age, defined as the age at which youth first report being employed or self-employed, conditional on being in education for at least

apply, as in Manacorda (2017)).

one year since 2013 and not returning to school in subsequent periods. Again combining employment history data the panel survey, we estimate a first employment age of 23 years and 8 months - almost precisely one year after the mean graduation age. Half of the sample reports having found their first employment experience by the age of 24, and 90% by the age of 27.

Finally, using measures from the combined event history and panel data, we define the transition duration as the difference between the age at graduation and the age of both first employment. The average duration of the transition to first employment is just over one year. Youth who enter as wage employed take about a month and a half longer to find a job. Those who enter the labour market as inactive (NEET), on the other hand, experience a longer transition that those who enter as wage or self-employed; however, the length of this period of inactivity is less than one year, on average. **After the age of 28 all those who start off as unemployed become self-employed. This finding provides support for the idea of 'waiting and searching', that is, individuals prefer to work in wage employment, but as the probability of getting such employment decreases, they move into self-employment. This evidence is further strengthened by the fact that the majority of the self-employed (87 percent) state their main reason for starting their own business as being because they 'could not find salaried work' (Bridges et al., 2017)**

As mentioned above, the estimates provided in 2 may be biased, as transition age and duration can only be calculated for youth for whom we recorded a graduation age (at least one year of schooling in the observed period) and at least on subsequent period of employment. Youth who are still in apprenticeship or schooling in the last period in which they are observed are considered to be right censored (Nilsson, 2019) – 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 age of school-leaving to be downward biased. To address this issue, we follow and apply survival analysis to the retrospective history data, following

Nordman and Pasquier-Doumer (2015) and Manacorda et al. (2017). Figure A3 in the Appendix plots the estimated survival probability, i.e. the probability that a youth needs an additional year year to transition to the labor market after completing their schooling or training. About 83 percent of youth report at least a year to transition to the labour market, while only about 18 percent require two years or more. Only about one percent of youth who transition report being unemployed for a period of four years or longer.

The adjustment for right-censored data does not significantly alter the estimated mean transition duration: on average, young men take a year and a month to find their first employment experience, while young women require about a month longer. This estimated transition duration is considerably shorter than the one calculated for five countries in SSA by Manacorda et al. (2017), namely 25.7 months to first employment and 129.7 months to steady employment[3]. Comparison with the estimated mean transition rates from Manacorda et al. (2017), however, shows Benin to be somewhat of an outlier in SSA as well, with the lowest mean time to a first and to a permanent job among the five countries in SSA for which transition duration could be estimated.

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[3]Based on SWTS surveys from five countries in SSA: Benin, Madagascar, Tanzania, Togo, Uganda.

Table 3: Transition Into First Employment

	Age		Duration	
	(1)	(2)	(3)	(4)
Entry: NEET (reference)				
Entry: Employed	−0.92*** (0.30)	−0.90*** (0.30)	−0.71*** (0.08)	−0.70*** (0.08)
Entry: Self-Employed	−0.85*** (0.33)	−0.79** (0.33)	−0.85*** (0.09)	−0.85*** (0.09)
Male (=1)	0.45* (0.25)	0.61** (0.26)	−0.07 (0.07)	−0.03 (0.07)
Years of Schooling	0.004 (0.06)	0.001 (0.06)	−0.02 (0.01)	−0.02 (0.01)
Completed apprenticeship (=1)	0.42 (0.34)	0.39 (0.34)	−0.03 (0.09)	−0.05 (0.09)
Primary school diploma: CEP (=1)	−0.67 (0.57)	−0.72 (0.57)	0.31** (0.15)	0.29* (0.15)
Junior high diploma: BEPC (=1)	1.00** (0.42)	0.96** (0.42)	0.14 (0.11)	0.12 (0.11)
Baccalauréat: BAC (=1)	0.58* (0.35)	0.72** (0.36)	−0.17* (0.09)	−0.13 (0.10)
Lower vocational certificate: CAP (=1)	−0.20 (0.57)	−0.19 (0.57)	−0.01 (0.15)	−0.03 (0.15)
2nd cycle university: Licence (=1)	0.36 (0.38)	0.39 (0.38)	0.14 (0.10)	0.13 (0.10)
3rd cycle university: Maîtrise (=1)	0.61 (0.71)	0.62 (0.71)	0.45** (0.19)	0.46** (0.19)
Father was apprentice (=1)	−0.35 (0.27)	−0.27 (0.28)	0.02 (0.07)	0.02 (0.07)
Father completed primary (=1)	0.59** (0.29)	0.65** (0.29)	−0.04 (0.08)	−0.04 (0.08)
Father completed secondary (=1)	−0.86** (0.39)	−0.88** (0.39)	0.02 (0.10)	0.003 (0.10)
Mother was apprentice (=1)	0.20 (0.34)	0.16 (0.34)	−0.12 (0.09)	−0.11 (0.09)
Mother completed primary (=1)	−0.30 (0.34)	−0.33 (0.34)	0.05 (0.09)	0.04 (0.09)
Mother completed secondary (=1)	−0.07 (0.58)	−0.21 (0.58)	−0.14 (0.15)	−0.16 (0.15)
Married (=1)		0.22 (0.36)		0.30*** (0.10)
Beninese (=1)		−0.87 (1.00)		0.03 (0.26)
Ethnicity: Fon (=1)		−0.27 (0.29)		0.03 (0.08)
Religion: Christian (=1)		0.87** (0.36)		0.01 (0.10)
Grew up in a city (=1)		−0.02 (0.26)		0.12* (0.07)
Constant	23.00*** (0.58)	24.00*** (1.10)	1.60*** (0.15)	1.40*** (0.30)
Observations	417	417	417	417
R^2	0.11	0.13	0.27	0.29
F Statistic	2.90***	2.60***	8.70***	7.50***

Note: *p<0.1; **p<0.05; ***p<0.01

In Table 3, we estimate the effect of the educational attainment of youth and their parents on the age at transition to first employment and the duration of the transition using the following specification:

$$y_i = \alpha + E_i + X_i + \mu_i,$$

where y_i is the outcome of interest for youth i, E_i is the status at labour market entry, X_i is a vector capturing educational characteristics of youth and parents, including diplomas held, as well as time-invariant youth characteristics, and μ_i is the error term.

Columns (1) and (2) of Table 3 examine potential drivers of youth age at transition to first employment, while columns (3) and (4) report the determinants of the duration

of this transition (in years).

Youth who enter as employed or self-employed are on average almost a year younger when they enter the labour market, and take between 9 and 10 months less time to transition, than youth whose first labour market experience is inactivity. Men enter the labor market about half a year later than women. Secondary schooling delays the transition to the labor market on average, but does not affect the transition duration. Extended university education (master's level or higher), on the other hand, is associated with a longer transition, by about six months. Youth with more educated fathers have their first employment experience at a younger age: a possible rationale for this result is that better-educated fathers have better business connections and are able to facilitate a more effective job search for their sons and daughters. Finally, we find that marriage (at baseline) is associated with a longer transition duration.

3.2 Transition Paths

Transition Matrices

Transitions between activity states can be depicted for any pair of survey rounds using transition matrices. Transition matrices can be interpreted as flows of youth between activities from the earlier time period (left-hand column) to the later time period (top row). Shown is the rate of youth at time t flowing into a column activity j from a row activity i, as a percentage of all youth in row activity i at time $t-1$. The number in parentheses shows the rate flowing from activity i into j as a percentage of all youth in column activity j at time t. For instance, the first row, second column entry of Table B2 shows two flow rates corresponding to transition "from school to NEET": 3.72 percent of youth in school transitioned to NEET the next year, while on average 21.95 percent of NEET youth had been in school the year before over the observed employment histories. Entries on the diagonal indicate that youth stayed in the same activity from one period

to the next.

An examination of the pooled transitions between past activities using the event history data (Table B2 in Appendix B) summarizes a total of six transitions. It shows that schooling was still the predominant activity of youth in the seven years prior to being interviewed, accounting for over half of all observations. The most frequent transitions in relative terms (accounting for the number of youth starting from a given activity) are from NEET status into wage employment (14.97 percent) and into self-employment (10.55 percent) and from apprenticeship into wage employment (10.22 percent of apprentices) and into self-employment (9.32 percent). While we observe similar rates of transition out of school (14.14 percent each year, on average), self-employment (11.19), and wage employment (15.24), the flow of youth out of school naturally increase over time (as youth approach graduation age), while the rates out of self- and wage employment remain relatively constant over time. The activities of youth as they age are shown by gender in Figure 1 below.

Table B3 depicts the rates of transition between activities pooled across the five detailed survey rounds, resulting in average transition rates over four transitions between the years of 2019 and 2021. As expected, the rate of graduation (transition out of school) is even higher than the last period of the event history. On average, 39.7 percent of youth changed activities between each survey round, a significantly 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 graduation, than can be captured by annual data. The most stable activity is wage employment, with a 68% retention rate across all survey rounds. The most common transitions are NEET to wage employment (128 transitions), NEET to self-employment (97), wage employed to NEET (93), self-employment to NEET (75) and school to NEET (66). School to wage employment (51) as well as self-employed to employed (48) and employed to self-employed (51) are also

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Figure 1: Occupation by age (recall data)

common. In terms of rates, the most likely transitions overall are from NEET to wage employment (22.18 percent of NEET youth transition to wage employment in the next period) and self-employment to NEET (20.78 percent). The most common transition for youth in school is NEET in the following period (16.22 percent); for the wage employed it is NEET (16.49 percent) and for apprentices it is NEET (19.44 percent). Other frequent transitions are NEET to self-employment (16.81 percent), self-employment to wage employment (13.3 percent), and employed to NEET (16.49 percent).

Table 4: Activity transition matrix: Combined data, 2013-2021

From	In School	NEET	Self-Employed	Employed	Apprentice
			To		
In School	**85.68%**	**3.85%**	**2.61%**	**4.92%**	**2.95%**
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	-	5.59%	3.34%	7.56%	4.51%
25-30	-	14.77%	12.08%	20.13%	3.36%
NEET	**1.82%**	**64.94%**	**11.17%**	**14.29%**	**7.79%**
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	2.78%	-	16.67%	15.97%	11.81%
25-30	1.56%	-	25.00%	42.19%	6.25%
Self-Employed	**1.87%**	**4.68%**	**87.82%**	**3.75%**	**1.87%**
Conditional	2.13%	5.33%	-	4.27%	2.13%
Female	0.96%	6.22%	-	4.31%	2.87%
Male	3.61%	4.22%	-	4.22%	1.20%
14-18	0.00%	0.00%	-	0.00%	14.29%
19-24	3.59%	5.64%	-	4.62%	1.54%
25-30	0.60%	5.42%	-	4.22%	1.81%
Employed	**1.28%**	**7.23%**	**4.68%**	**84.89%**	**1.91%**
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	1.49%	8.96%	5.47%	-	3.48%
25-30	1.12%	7.87%	5.06%	-	1.12%
Apprentice	**0.26%**	**5.25%**	**9.45%**	**10.50%**	**74.54%**
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%	8.48%	15.76%	20.00%	-
25-30	2.38%	7.14%	19.05%	9.52%	-

Row %. First row for each activity refers to unconditional transition rate; remaining rates are conditional.

Table B1 in the Appendix reports the combined event history and panel data, which we will use for subsequent analyses. Over the entire observation period, youth changed activities between periods 18.5 percent of the time. The most frequently-observed transitions overall were from school to wage employment (624), school to NEET (436) and school to apprenticeship (345), followed by inactivity to wage employment (319), school to self-employment, and apprenticeship to employment. In terms of transition rates, on the other hand, the most likely transitions appear to be NEET to employed (17.37 percent), apprentice to wage employed (12.38 percent), NEET to self-employed (10.24 percent), and apprentice to self-employed (9.8 percent). Thus, while we observe the most transitions from school in absolute terms, these are still represent only a small percentage of all youth in the school; in other words, schooling is a period relative stability for youth, whose status becomes more variable as once they enter the labour market. This variability can be interpreted as precariousness, especially for youth in self-employment and wage employment.

We note that transitions to wage employment (from either school or apprenticeship training) were more numerous than to self-employment. While this may be expected for schooling, which increases the likelihood of landing a wage job, it is less expected for apprentices, who often have their sights set on self-employment. One explanation may be that apprentices continue working for their former master trainer (or another employer) upon graduation in order to save up the capital needed to start their own business.

Flows between activity states do not capture transitions between employers. The baseline interview indicates that job turnover is indeed frequent among employed youth after graduation. 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% were actively looking for a new job at the time of the survey. We find that personal

networks are central to the job search, with over 60% of working youth in our sample finding employment either through direct prior acquaintance with or family relation to the employer or through a mutual friend. Unlike Nordman and Pasquier-Doumer (2014), however, we cannot comment on the importance of these networks relative to other job search mechanisms with the data at hand.

Finally, we develop a more detailed taxonomy to capture various aspects of employment quality. To do this, we develop a new taxonomy of employment types that encompasses all wage and self-employed youth in the sample. The employment types are formal, informal, regular, casual and underemployed youth, as well as employers and independent workers. In contrast to the taxonomy used to this point (the five activity states), we now expand our analysis to states that are non-exclusive: in other words, a youth can be both formally employment and underemployed in the same period, for example[4].

Benin has a highly informal economy, with an estimated 70% of GDP and 95% 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% of the sample), over 95% 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% of employed youth in our sample work informally.

Thus, we use an adjusted definition of formal and informal work: formal wage

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[4]The following pairs of definitions are exclusive, however: formal and informal, regular and casual, employer and independent worker

workers have a verbal or written contract under a single regular employer, while self-employed youth are considered formal if they hire at least five employees. We use the underemployment threshold of 35 hours per week to determine which (wage or self-employed) youth are underemployed. Second, 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 - or "regular" work, i.e. a single employer with regular wages. Finally, we differentiate between self-employed who also employ others (at least one wage worker) and those who work independently.

Table 5: Transition Rates into Different Types of Work

				To			
From	Formal	Informal	Regular	Casual	Under-employed	Employer	Indep.
In School	**8.77**%	**7.88**%	**5.19**%	**10.03**%	**9.01**%	**7.04**%	**5.24**%
Female	6.25%	6.86%	5.56%	8.87%	6.40%	6.12%	4.73%
Male	10.61%	8.76%	4.86%	10.67%	10.66%	7.53%	6.12%
NEET	**20.18**%	**24.57**%	**14.07**%	**23.78**%	**24.53**%	**17.61**%	**26.97**%
Female	25.00%	32.00%	15.87%	32.26%	32.00%	24.49%	31.95%
Male	16.67%	18.25%	12.50%	19.11%	19.80%	13.98%	18.37%
Self-Emp.	**20.18**%	**31.54**%	**4.81**%	**9.74**%	**30.12**%	**58.45**%	**51.69**%
Female	14.58%	36.29%	5.56%	10.48%	37.60%	57.14%	53.85%
Male	24.24%	27.49%	4.17%	9.33%	25.38%	59.14%	47.96%
Employed	**49.12**%	**31.67**%	**74.81**%	**52.15**%	**32.30**%	**13.38**%	**11.99**%
Female	54.17%	22.00%	73.02%	45.97%	23.20%	10.20%	7.10%
Male	45.45%	39.90%	76.39%	55.56%	38.07%	15.05%	20.41%
Apprentice	**1.75**%	**4.34**%	**1.11**%	**4.30**%	**4.04**%	**3.52**%	**4.12**%
Female	0.00%	2.86%	0.00%	2.42%	0.80%	2.04%	2.37%
Male	3.03%	5.60%	2.08%	5.33%	6.09%	4.30%	7.14%

Table 5 shows the transition rates into these work states. As with the transition matrices above, we consider transition rates from five mutually exclusive activity states; however, we only report column percentages (the percentage of youth in each column category that started from each of the five activity states). We also present these transition rates calculated separately by gender.

In almost half the observed cases of formal work, the youth had been in wage employment in the previous period. Informal workers, on the other hand, were equally likely to have been employed or self-employed in the previous period. There are very few transitions into regular work from self-employment, school, or apprenticeship: almost three-quarters of youth with this job status were already wage employed in the previous period. This suggests that a period of casual employment is typical before youth settle into regular work; three quarters of youth with regular work were wage employed before, whereas only half of the casually employed were – with almost a quarter entering casual work from a state inactivity. Youth transitioning from NEET represent a much higher proportion of casual and underpaid workers than regular and formal workers.

Regular employees and self-employed employers transition from inactivity (NEET) at a lower rate than the other states; informal workers were self-employed in the previous period at a much higher rate than the regular and casually employed; the wage employed generally stay in employment, whether formal, informal, regular, or casual: relatively few enter self-employment. Casual work draws transitions from school at the highest rate; meanwhile, apprenticeship represent a very small fraction of previous states for transitions into any of the employment types. We note the sparse transitions to formal work: while Cunningham and Salvagno (2011) use data collected every six months and find that between 11 and 32 percent of youth in Argentina, Brazil and Mexico move into the formal sector directly after leaving school, this is only true for 2.16

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percent of youth in urban Benin.

We also observe a labor demand shortage among the employed, with 73% 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. About half of the sample was working at least a year for their employer or employers at the time of the interview; 65% of employed youth 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 labor demand, as opposed to human capital (Fox et al., 2020).

Finally, we find some striking differences in transition rates by gender: a higher percentage of males transition to formal work from school; however, this is also true for underemployment. This may indicate that males are more impatient to find work after graduation. Females are represented at higher rates than males when transitioning from NEET, which reflects the fact that many more young women are NEET than men. Males are more likely to transition from self-employment to formal work, while females are more likely to transition from self-employment to informal work and/or underemployment. Females who are formally employed, on the other hand, are less likely than males to have transitioned out of a different state than wage employment. Thus, employers appear more willing to grant formal contracts to entry-level or self-employed males than females.

Optimal Matching Analysis

Next, we employ Optimal Matching Analysis (OMA) to identify clusters of youth following similar paths during their school-to-work transition. 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). This method has been used to study early career patterns in Italy, Great Britain and West Germany (Scherer, 2001, 2005), the occupation career paths of Swedish women (Huang and Sverke, 2007), and the SWT of German youth (Achatz et al., 2022).

In optimal matching analysis, the cost of making a change to a sequence of states is typically measured using three types of costs: insertion, deletion, and substitution. Insertion/deletion cost is the cost of adding a new item to the sequence or removing an existing one, respectively. Substitution cost is the cost of replacing one item in the sequence with another item. Optimal matching algorithms seek to minimize the total cost of making changes to a sequence of items by choosing the combination of insertions, deletions, and substitutions that result in the lowest total cost, which serves as a measure of similarity between sequences. The distance matrix generated from this process is used in a hierarchical cluster analysis to group similar sequences into clusters. This is achieved by minimizing within-group differences and maximizing between-group differences, using Ward's fusion algorithm (Achatz et al., 2022; Dlouhy and Biemann, 2015). 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 [cite xx]. The TraMineR package in R (Gabadinho et al., 2011) was used to perform the analysis. We then use the R package WeightedCluster (Studer, 2013) to compute various clustering quality measures to determine the optimal number of clusters.

Table 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
Age at baseline	24.12	25.36	23.59	25.92	23.71	25.54	<0.001
Nationality: Beninese (=1)	98%	93%	99%	98%	97%	96%	0.010
Grew up in a city (=1)	64%	57%	70%	64%	49%	53%	<0.001
Transition							
Graduation age	22.61	23.00	22.89	21.27	22.47	21.33	0.002
Age at first employment	23.64	24.57	23.98	22.27	23.49	22.14	<0.001
Duration of transition in years	1.06	1.57	1.08	1.00	0.95	1.14	0.8
Education							
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
Parents' Education							
Father was an apprentice (=1)	34%	25%	33%	28%	36%	46%	0.12
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
Mother completed secondary (=1)	6.0%	0%	8.4%	1.9%	2.1%	4.2%	0.024
Household and Assets							
Married (=1)	17%	59%	7.4%	36%	22%	24%	<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
Home electrified (=1)	93%	82%	95%	92%	90%	89%	0.010
Cell Phone (=1)	76%	70%	73%	77%	85%	82%	0.087
Smartphone (=1)	58%	30%	68%	49%	38%	49%	<0.001
Motorcycle (=1)	29%	9.1%	29%	43%	26%	31%	0.006
Television (=1)	41%	36%	42%	49%	33%	42%	0.4

Mean; %. Calculated using responses from baseline survey.

Descriptive statistics for each cluster are shown in Table 6 above, and Figure A2 in the Appendix plots the status distribution by year for the five identified clusters. The first cluster, which we label "TRAIN", 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 of interest to policy makers. The youth in this cluster completed about 9 years of school, with the majority dropping out before completing junior high school.

The second cluster, which we call SCHOOL, accounts for about three-fifths of the sample with 404 youth, and is dominated by formal education, especially in the period leading up to the baseline survey. The state transition plot in Figure A2 suggests that the extended schooling in this group (14.9 years on average, by far the most of any cluster) does increase the probability of finding employment, as this cluster exhibits the lowest rate of inactivity at endline. This cluster is characterised by the relatively low marriage and childbearing rates of the youth and the high educational level of the parents of the youth in the cluster.

Table 6 indicates that this cluster completed their apprenticeships at a relatively advanced age – around the age of 22 years and 6 months – contradicting the intuitive assumption that apprentices enter the labor market sooner than youth who stay in formal schooling.

The third cluster, WAGE, is comprised of 72 youth who are primarily engaged in wage employment over the observed period. Figure A2 shows that most of these youth had completed their formal education by 2014 and enjoyed fairly stable employment throughout – with a small proportion transitioning to inactivity at the tail end of the period, perhaps as a result of worsening economic conditions during the pandemic. The

WAGE cluster contains a latent proportion of youth in apprenticeship training, possibly suggesting that completing an apprenticeship and finding wage employment is a solid predictor of job stability. We also note that there is very little transition between wage employment and self-employment in this cluster.

The fourth, SELF, is a relatively small cluster grouping together sequences of sustained self-employment from the beginning of the observed period or transitions from schooling to self-employment prior to 2016. This is the most homogeneous cluster, with essentially only two states observed after 2015: self-employment and NEET. In this cluster, youth only begin appearing as "NEET" at the start of the panel survey. As this data is more frequent and more granular than the event history data, we can infer that youth had described their past annual activity as self-employed may have in fact experienced stretches of inactivity within those years. This may be an important consideration when using a taxonomy that includes "self-employment" but relies on recall data for infrequent time intervals.

The final and smallest cluster, NEET, comprises youth who were inactive at the beginning of the observation period and began to transition into self-employment (and to a much smaller extend, wage employment) towards the endline. This cluster is the most unique in terms of its demographics: it contains almost exclusively young women (95%) 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% vs. 17%) and have more children on average than the sample (1.73 vs. 0.53). These can be characterised as the "stay-at-home-mothers" - and the low educational attainment and low rates of transition to wage employment are concerning indicators for policy makers interested in gender equality in the region.

Effects of Transition

Aspirations and Obstacles to Transition

Table 7: Youth Aspirations

	NEET N=238	Self-Employed N=119	Employed 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%

Calculated using responses from baseline survey.

Table 7 tabulates the responses of self-employed, wage employed, and NEET youth 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. 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.

When asked where they see themselves in 5 years, NEET youth were decidedly optimistic. Table 7 shows that only 3 percent expected to still be searching for work and over

90 percent envisaged themselves working either for themselves or an employer. 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%), however - despite this subgroup having completed less schooling than wage-employed youth on average. Within NEET, 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 labor 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%) in the subsample. 26% said they did not know where to look, while 16% 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 8: Summary Statistics - Employed Youth

Characteristic	Baseline	Endline
All workers (wage and self-employed)		
N	287	320
Male	52%	55%
Formal	19%	24%
Informal	81%	76%
Full-time	67%	73%
Underemployed	28%	26%
Regular	24%	25%
Casual	31%	32%
Employer	11%	13%
Independent	30%	29%
Wage employed		
N	168	185
Male	54%	59%
Working arrangement		
One employer, regular basis	44%	44%
One employer, irregular basis	41%	43%
Multiple employers, irregular	12%	11%
Family worker	3.6%	1.6%
Number of workers[1]	3.96	4.13
Months worked[2]	7.9	8.2
Wage (previous month)		
<35,000 FCFA	28%	20%
35,000-54,999 FCFA	38%	40%
55,000-149.999 FCFA	30%	35%
>150,000 FCFA	3.6%	4.5%
Job satisfaction (out of 5)[3]	3.46	3.16
Self-employed		
Actively looking for new job	65%	68%
N	119	135
Male	49%	49%
Registered business[4]	18%	30%
Pays taxes[5]	13%	21%
Trade association member	7.6%	11%
Works alone (no employees)	72%	68%
Number of employees[6]	3.45	2.14
Months worked[2]	10.0	7.7
Profits (previous month)		
<20,000 FCFA	56%	27%
20,000-39,999 FCFA	19%	30%
40,000-124.999 FCFA	21%	37%
>125,000 FCFA	3.7%	5.3%
Apprentices trained	0.52	0.23
Job Satisfaction (out of 5)[3]	3.68	3.59
Looking for new job	39%	44%

Mean; %.

[1] Primary employer. Includes surveyed worker.

[2] Of past 12 months.

[3] Likert scale, 1 = Very dissatisfied, 5 = Very satisfied.

[4] 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).

[5] Paying either Synthetic Professional Tax (Taxe Professionnelle Synthètique, TPS), taxes for public space usage (e.g. patente foraine), or any other local taxes.

[6] Not including surveyed business owner.

4 Conclusion

This paper studies the dynamics of the school-to-work transition for 752 youth aged 20-29 from urban Cotonou, Benin. A unique panel is created using mobile phone surveys; in each survey round, youth are classified into one of five groups reflecting their primary activity.

We combine reported activity history data with our panel to approximate the age of graduation and the duration of transition to the first job for each youth. In addition, we estimate transition matrices and sequence analysis to describe common paths along the SWT. Finally, we discuss the impact of specific activity transitions on youth life satisfaction and the reported aspirations of youth, and the obstacles they face on the labor market.

The SWT is observed for about 68 percent of the sample, with the majority reporting a transition to wage work or self-employment in the period directly following their final year of schooling or training. Youth who enter the labor market as self-employed tend to be less educated and have parents with lower educational attainment than youth who enter the labor market as wage-employed or unemployed. Youth who do not find work in the first period after graduation wait less than a year, on average, before entering either wage or self-employment. Youth who complete university education (master's level or higher) take about six months longer to find their first job, though education up to secondary schooling does not appear to extend the duration.

Using a combination of retrospective employment history and panel data to calculate average ages of transition, we find that youth in Cotonou graduate at the age of 22 years, seven months, and find their first employment exactly a year later, on average. If the transition duration calculated for this sample were representative of the nation, it would rank Benin as a country with one of the shortest transitions to work in the world. However, given the higher availability of non-agricultural informal work in urban areas,

one expects the transition speed to be shorter in urban Cotonou than in the rest of the country.

Transition matrices suggest that wage employment and self-employment are stable relative to inactivity, meaning youth in employment are more likely to stay in the same type of employment than NEET youth are likely to stay inactive. However, higher rates of transition are observed for the (approximately quarterly) panel data than in yearly historical data, suggesting that annual data often used for studying the SWT may hide significant turbulence in employment status. There are relatively few transitions into regular work (with a single employer) from self-employment, schooling or inactivity, suggesting that a period of casual employment usually precedes a more stable employment relationship.

We also use optimal matching analysis to identify clusters of youth following similar transition paths. The five identified clusters reflect the five activity types used, reflecting the relative stability of states. However, youth whose paths are dominated by inactivity are shown to be almost exclusively young women with lower educational attainment and larger families.

Finally, we find that youth expect to be self-employed, not employed, even when in wage employment. This stands in contrast to the high stability of wage employed observed in the panel data.

Panel data is a useful tool for examining the dynamics of the transition process, such as how quickly young people enter the labor market, what types of jobs they obtain, and how their employment prospects change over time. Panel data can also be used to analyze the impact of different factors on the transition process, such as the quality of education, the availability of job opportunities, or the effects of policy interventions. By using panel data, researchers can gain a more nuanced and detailed understanding of the school-to-work transition in Africa, and can identify potential areas for improvement in policy and practice.

We make a unique contribution to the literature by estimating the effects of transition on youth well-being. We find that while youth who have transitioned to steady employment are more satisfied with their lives, none of the specific transitions examined, e.g. the transition from wage to self-employment, appear to have an effect on youth satisfaction. Finally, we show that mobile phone data collection are promising for tracking labor market performance, despite moderate attrition; however, we observed higher response to the in-person baseline and endline waves, despite these being 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 remains 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).

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Appendix A

Cotonou census

Figure A1: Geographic Coverage of Survey
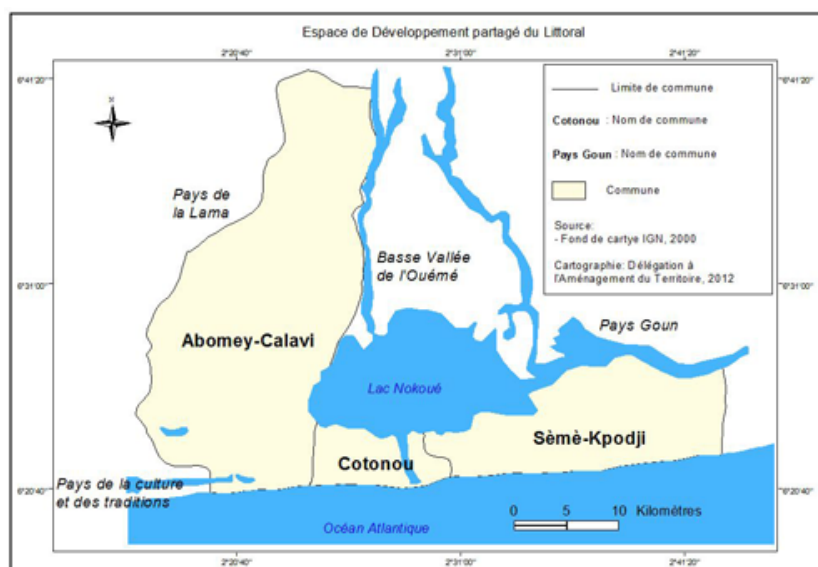
Table A1: Census of 13 zones de dénombrement

	Aged 15-19	Aged 20-29	Aged 30 and above
School	1417 (71.64)	1144 (31.07)	87 (1.35)
Other	125 (6.32)	635 (17.25)	1574 (24.35)
Self-Employed	95 (4.80)	1183 (32.13)	3664 (56.68)
Wage Employed	35 (1.77)	433 (11.76)	1117 (17.28)
Apprentice	306 (15.47)	287 (7.79)	22 (0.34)
Total	1978 (100.00)	3682 (100.00)	6464 (100.00)

Note: Percentage of age group in parentheses.

Weighting

A two-stage clustered sampling approach was employed to select the 752 youth interviewed in the face-to-face baseline survey, conducted in August 2019. Zones de dénombrement (ZDs), the smallest administrative divisions in Benin, consituted the primary sampling unit (PSU). These were selected with probability proportional to size (PPS) of the total number of ZDs in each of the five regions chosen for the sampling frame, and the sample was then stratified according to youth activity. Activity strata are proportional to the relative frequency of each activity appearing in the census. Sample weights are given by the inverse probability of selection of a youth into the sample (Deaton, 1997), given their reported activity during the census and their ZD of residence. This probability is calculated as follows:

$$\pi_i = \left(\frac{n_i^{ZD}}{N_i^{ZD}} \right) \left(\frac{n_i^{act}}{N_i^{act}} \right),$$

where n_i^{ZD} is the number of ZDs selected from the arrondissement of youth i, N_i^{ZD} is the total number of ZDs in that arrondissement, n_i^{act} is number of youth in the census with the same activity as youth i, and N_i^{act} is the total number of youth reporting this activity in the census. Sampling weights are then given by:

$$w_i = (n\pi_i)^{-1}.$$

Table A2: Sample Composition and Attrition

Characteristic	Baseline N=752	Remote 1 N=663	Remote 2 N=536	Remote 3 N=496	Endline N=574	p-value
Activity						<0.001
In School	169 (22%)	124 (19%)	95 (18%)	74 (15%)	60 (10%)	
NEET	238 (32%)	175 (26%)	132 (25%)	140 (28%)	173 (30%)	
Self-Employed	119 (16%)	148 (22%)	106 (20%)	93 (19%)	135 (24%)	
Employed	168 (22%)	176 (27%)	164 (31%)	165 (33%)	185 (32%)	
Apprentice	58 (7.7%)	40 (6.0%)	39 (7.3%)	24 (4.8%)	21 (3.7%)	
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

[1] n (%); %; Mean (SD)

[2] Pearson's Chi-squared test; Kruskal-Wallis rank sum test

Table A3: Descriptive Statistics by Gender

Characteristic	Overall	Female (53%)	Male (47%)	p-value
		Gender		
N	752	396	356	
Age at baseline	24.15	24.03	24.29	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
Employment Status				
Activity at baseline				<0.001
In School	22%	19%	27%	
NEET	32%	40%	22%	
Self-Employed	16%	15%	16%	
Employed	22%	19%	26%	
Apprentice	7.7%	6.6%	9.0%	
Graduation age	22.62	22.27	22.90	0.004
Age at first employment	23.65	23.36	23.88	0.025
Duration of transition in years	1.06	1.13	1.01	0.2
Education				
Years of schooling	13	13	14	<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: Maîtrise (=1)	2.3%	0.5%	4.2%	<0.001
Parents' Education				
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
Household Characteristics and Assets				
Married (=1)	20%	28%	10%	<0.001
Living with parents (=1)	45%	42%	49%	0.057
No. of children	1.61	1.87	1.32	<0.001
People in household	6.45	6.67	6.20	0.034
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

Mean; %. Calculated using responses from baseline survey.
[1] To first employment.

Appendix B

Table B1: Activity transition matrix: Combined data, 2013-2021

			To			
From	In School	NEET	Self-Employed	Employed	Apprentice	Total
In School	84.51% (98.78%)	4.07% (20.96%)	2.83% (10.69%)	5.57% (17.63%)	3.02% (17.03%)	100.00% (165.08%)
NEET	1.96% (0.41%)	62.53% (57.29%)	11.11% (7.47%)	16.56% (9.30%)	7.84% (7.86%)	100.00% (82.32%)
Self-Employed	1.62% (0.41%)	5.57% (6.19%)	87.07% (71.01%)	3.95% (2.69%)	1.80% (2.18%)	100.00% (82.48%)
Employed	1.30% (0.36%)	8.10% (9.98%)	4.70% (4.25%)	83.95% (63.40%)	1.94% (2.62%)	100.00% (80.61%)
Apprentice	0.22% (0.05%)	6.18% (5.59%)	9.93% (6.59%)	12.58% (6.98%)	71.08% (70.31%)	100.00% (89.51%)
Total	89.61% (100.00%)	86.44% (100.00%)	115.64% (100.00%)	122.62% (100.00%)	85.68% (100.00%)	

Row %
(Column %)

Table B2: Activity transition matrix: Event History, 2013-2019

			To			
From	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%)

Row %
(Column %)

Table B2: Activity transition matrix: Event History, 2013-2019

From	In School	NEET	Self-Employed	Employed	Apprentice	Total
			To			
Apprentice	0.26%	5.25%	9.45%	10.50%	74.54%	100.00%
	(0.05%)	(4.83%)	(6.70%)	(6.40%)	(71.00%)	(88.98%)
Total	90.91%	85.95%	115.73%	118.34%	89.07%	
	(100.00%)	(100.00%)	(100.00%)	(100.00%)	(100.00%)	

Row %
(Column %)

Figure A2: Occupational status distribution plots by cluster
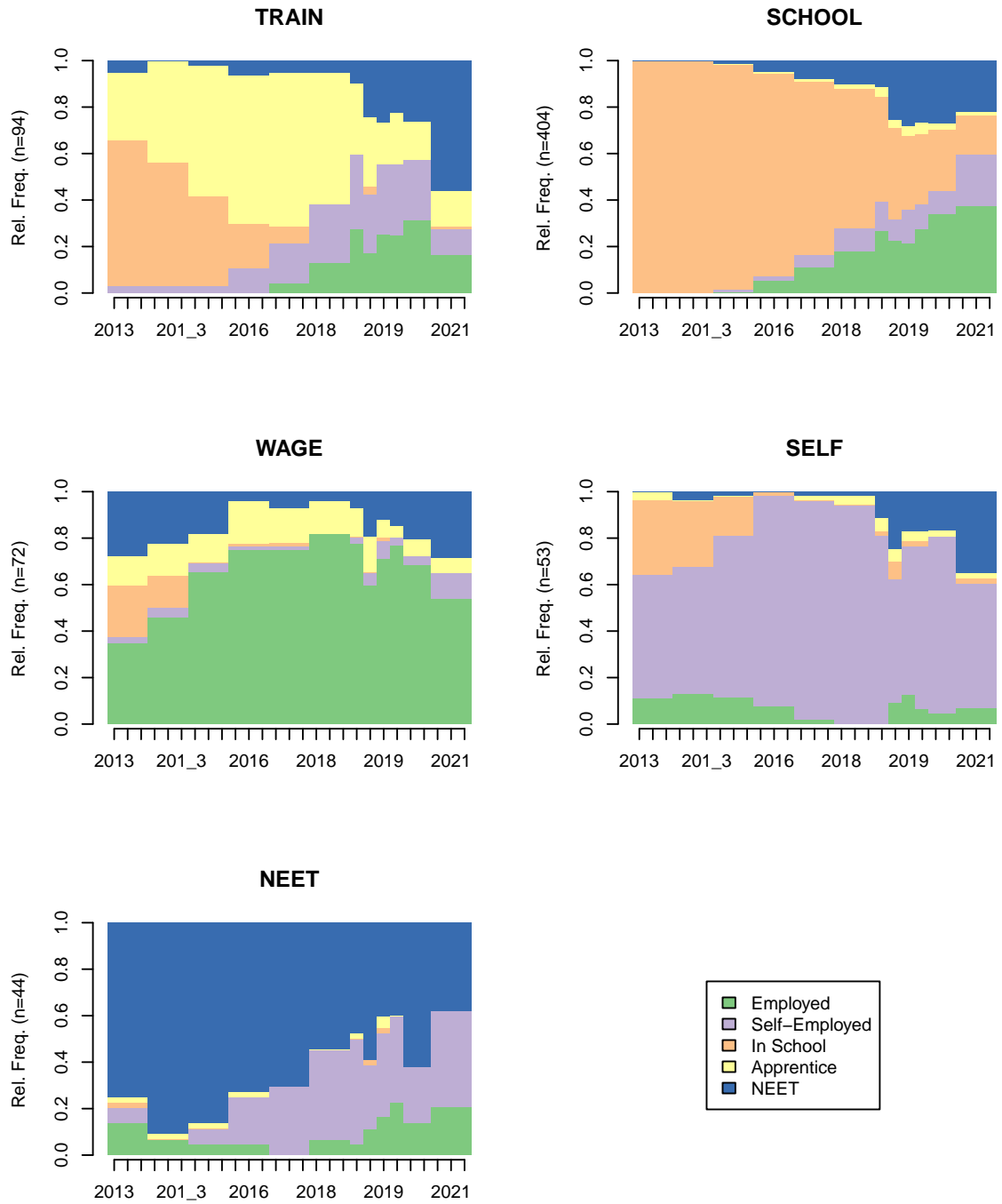
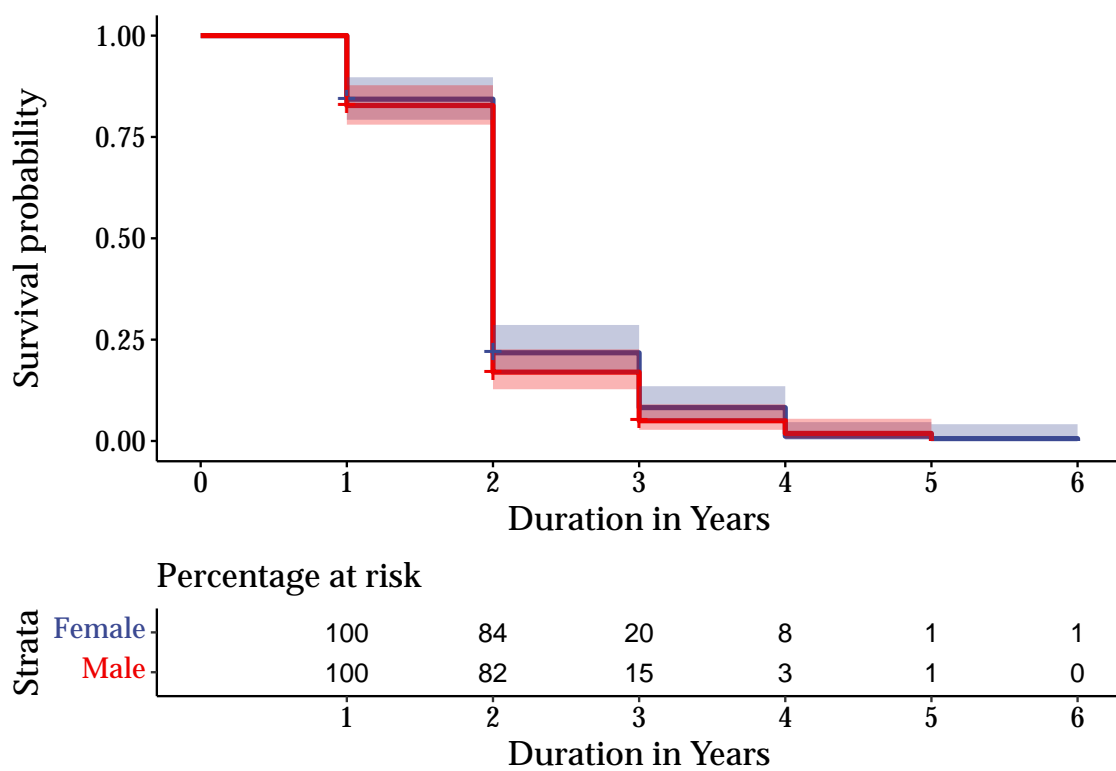**Figure A3:** Survival analysis: duration of transition to first employment

Strata		1	2	3	4	5	6
	Percentage at risk						
Female		100	84	20	8	1	1
Male		100	82	15	3	1	0

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

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

Row %
(Column %)

Table B4: Activity transition matrix: Baseline and follow-up wave 1

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

Row %
(Column %)

Table B5: Activity transition matrix: Follow-up wave 1 and follow-up wave 2

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

Row %
(Column %)

Table B6: Activity transition matrix: Follow-up wave 2 and follow-up wave 3

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

Row %
(Column %)

Table B7: Activity transition matrix: Follow-up wave 3 and endline

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

Row %
(Column %)

Table B8: Activity transition matrix: Baseline and endline

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

Row %
(Column %)