

Introduction^{*}

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1 Research Context and Motivation

The transition from school to work marks a watershed in life: it is symbolic of the final step into adulthood and independence, and for many the culmination of years of training and schooling. When youth¹ labor markets function smoothly, the transition to steady employment is rapid, as new entrants come prepared with sought-after skills and businesses are prepared and eager to absorb new talent. In many labor markets, however, the school-to-work transition (SWT) does not meet this ideal. In many low-income countries, in particular, stagnating formal sector growth and ever-growing cohorts of graduates combine to set formidable obstacles on the road youth travel to find gainful employment. Rising youth populations, particularly in Sub-Saharan Africa (SSA), mean many more labor market entrants than job openings — the African Development Bank (2022) estimates that about 3 million formal jobs are created for roughly 12 million labor market entrants each year. Difficulties are compounded by the fact that demographic pressures tend to be highest in those countries where youth have the most difficulty finding gainful work.

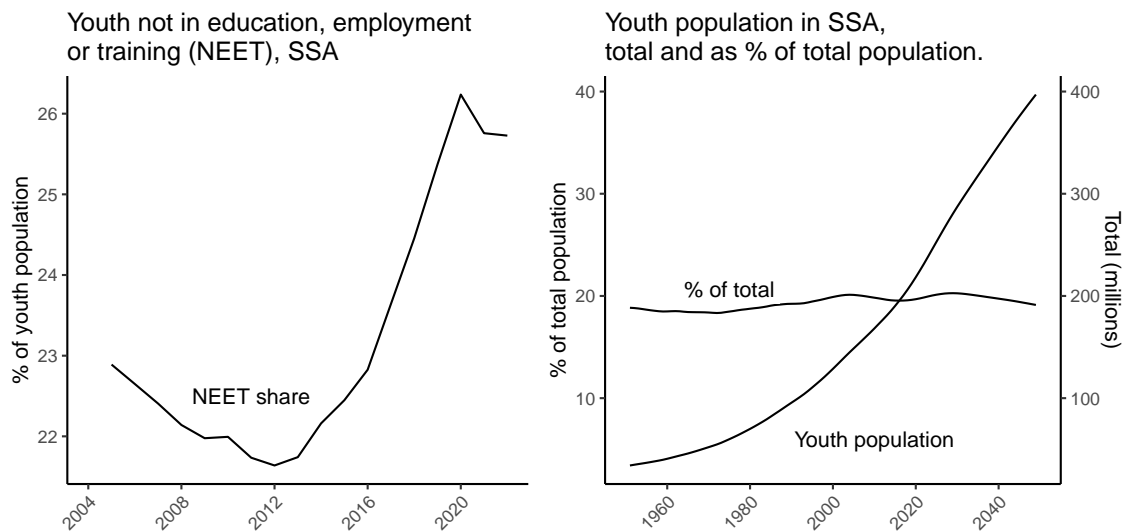
Despite strong growth averaging 3 to 4 percent in the two decades preceding the pandemic, many young Africans remain unsatisfied with the economic progress in their countries. Real GDP was projected to grow just 3.7 percent in 2023 and 3.9 percent in 2024, considerably below the average of 6 percent per annum in the three years preceding the pandemic (African Development Bank 2023). Together with the threat of a global economic slowdown, future employment prospects and job quality in SSA remain fragile – especially for youth. Although the economy has largely recovered since the pandemic, high inflation and economic headwinds have placed downward pressure on demand in HICs, which have impacted economic conditions in SSA through global supply chain linkages (ILO 2023c). The pandemic was a major setback in growth and poverty reduction in the region, after two decades of major progress on both fronts. Even before the pandemic, employment growth was significantly lagging GDP growth. Between 2000 and 2014, a 1 percent increase in GDP was associated with just a 0.41 percent increase in employment (African Development Bank 2019). Projections indicate that extreme poverty (US\$2.15, 2017 PPP) will be increasingly concentrated in SSA (World Bank 2022).

The closure of businesses and the imposition of lockdowns and confinement measures during the Covid-19 pandemic made it extremely difficult for young people to find a steady employer. Young people were disproportionately affected by the crisis, with unemployment rates rising from 18.2 percent in 2019 to 22.4 percent in 2020, compared to a rise from 15 percent to 17.9 percent for all

¹While the United Nations defines youth to be persons aged between 15 and 24, in this dissertation we will often switch to a definition of youth that includes all persons aged 15 to 29. This accounts for the facts that young people are spending ever longer periods of time in education, and ensures that the entirety of the SWT, including labor market entry, is captured for a greater number of youth.

workers over the same time period (ILO 2022; African Development Bank 2023). Falling family incomes, transition to distance learning, and even the temporary shutdown of educational facilities meant that the rate of youth not in employment, education, or training (NEET) peaked at over 26 percent in 2020 - more than double the NEET rate in high-income countries in the same year (Figure 1).

Figure 1: Demographic and economic activity trends among youth in SSA



Source: Left: ILO (2023a) modelled estimates. Right: World Population Prospects, United Nations (2022).

In addition to these hurdles, youth in SSA face headwinds that beset all labor markets entrants. When employment opportunities are scarce, for instance, young applicants are generally disadvantaged relative to older workers due to their limited work experience and inability to signal their skills to potential employers (Acemoglu and Pischke 1998). Young workers are also more likely to find jobs in the informal sector: ILO estimates that the rate of informal employment among youth is 77 percent worldwide, significantly higher than the 61 percent of adult workers (Bonnet, Leung, and Chacaltana 2018). About 83 percent of youth who enter the job market in Africa need at least one year to find employment (African Development Bank 2022) — and such extended periods of unemployment have been shown to create lasting, negative wage and employment effects in both high-income economies (Möller and Umkehrer 2015; Petreski, Mojsoska-Blazevski, and Bergolo 2016; Schmillen and Umkehrer 2017; Emmenegger, Marx, and Schraff 2017) and emerging ones (Tiongson and Fares 2007; Mojsoska-Blazevski, Petreski, and Bojadziev 2017). Young women are beset by additional difficulties, as they face constricting social norms related to both occupation type and family formation.

Yet the detrimental effects of a faltering SWT extend beyond the economic,

also encompassing social, psychological, and political dimensions. Gainful employment not only provides a means of livelihood but also grants young individuals a sense of self-worth, dignity, and purpose, fostering their holistic development (Mains 2011), while high levels of youth unemployment may fuel social and political instability. The sheer size of the youth population in SSA, with a substantial proportion seeking employment, highlights the need for effective strategies to harness their potential, reduce frictions along the SWT, and prevent their exclusion from meaningful economic participation. Given the sheer number of youth that will be embarking on informal sector careers in the coming decades, and the importance of the school-to-work transition for determining employment prospects in the long run, it is crucial that we develop a deeper understanding the mechanisms of the SWT in informal labor markets and the consequences that arise when these mechanisms are not in place. This is my contribution over the three chapters of this thesis.

In the first chapter, my co-authors and I take a comparative approach and investigate labor market strength across low- and lower-middle income countries by constructing a multi-dimensional index. We focus on incorporating informal employment rates, working poverty, and other aspects not covered by more widespread measures of labor market strength, such as the youth unemployment rate. In the following two chapters, I rely on a detailed panel dataset conducted with about 1500 youth in the urban center of Cotonou, Bénin over the course of three years to analyze transition types and identify determinants of a successful school-to-work transition (Chapter 2) and a matched apprentice-trainer subset of the same dataset to study the costs and benefits of an innovative apprenticeship system in Bénin embedded in the informal sector (Chapter 3).

In the remainder of this introduction, I present an outline of the existing methodological and empirical literature on youth labor markets in informal settings the school-to-work transition that takes place in such labor markets. I also provide a brief synopsis of the methods and results of the three chapters comprising this thesis. In a broad sense, the first chapter sets the stage by providing a cross-country comparison of youth labor markets in low- and lower-middle income countries and by examining the importance of work formality, working poverty, education quality, and other aspects in determining the youth-specific strength of labor markets. The second and third chapters, on the other hand, demonstrate the usefulness of longitudinal microdata for studying the SWT – a unique and underutilized approach given the lack of such data for informal labor markets, and for SSA in general. The third chapter analyzes the costs, benefits, and effectiveness of a unique apprenticeship scheme and evaluates the evidence on whether informal training firms can successfully be incorporated into a national vocational education system.

The African “Youth Bulge” is a growing concern for policy makers

In 2020, 77 percent of Africa’s population was under the age of 35. Yet Sub-Saharan Africa (SSA) is projected to have the fastest population growth in the world through 2100, accounting for more than half of the global population increase by 2050 (UN 2022). As a result, the United Nations (2022) projects that 400 million youth will inhabit sub-Saharan Africa by 2050 (Figure 1), and constitute half of its working-age population by 2063 (African Development Bank 2022). The resulting “youth bulge” means that youth employment in Sub-Saharan Africa (SSA) is a pressing concern for governments, civil society, and development partners alike (ILO 2022). The potential for a “demographic dividend”, such as that experienced by East Asia between 1965 and 1990, are limited by the fact that fertility rates in SSA are tapering off much more slowly, leaving the ratio of dependents to working-age adults unchanged (Eastwood and Lipton 2011; Filmer and Fox 2014).

Today, people between the ages of 15 and 24 account for 60 percent of the unemployed population in Africa (Bonnet, Leung, and Chacaltana 2018). If progress on high-quality job creation and fertility rate reduction continues to stall, persistent youth unemployment and the proliferation of vulnerable and precarious youth employment could lead to political unrest, such as those seen during the Arab Spring (Urdal 2006), as well as destabilizing waves of migration. On the other hand, a successful demographic transition supported by skills development and employment programs, as well as a sharp reduction of fertility usually accompanying economic development, would represent a massive opportunity for the continent. Thus, successful SWTs should be seen as a potential driver of much-needed economic growth, as the productive energy and innovative spirit of youth can contribute to revitalizing industries, fostering entrepreneurship, and steering the region towards a path of sustainable development (Filmer and Fox 2014; World Bank 2019).

The vast majority of African youth are employed in the informal sector

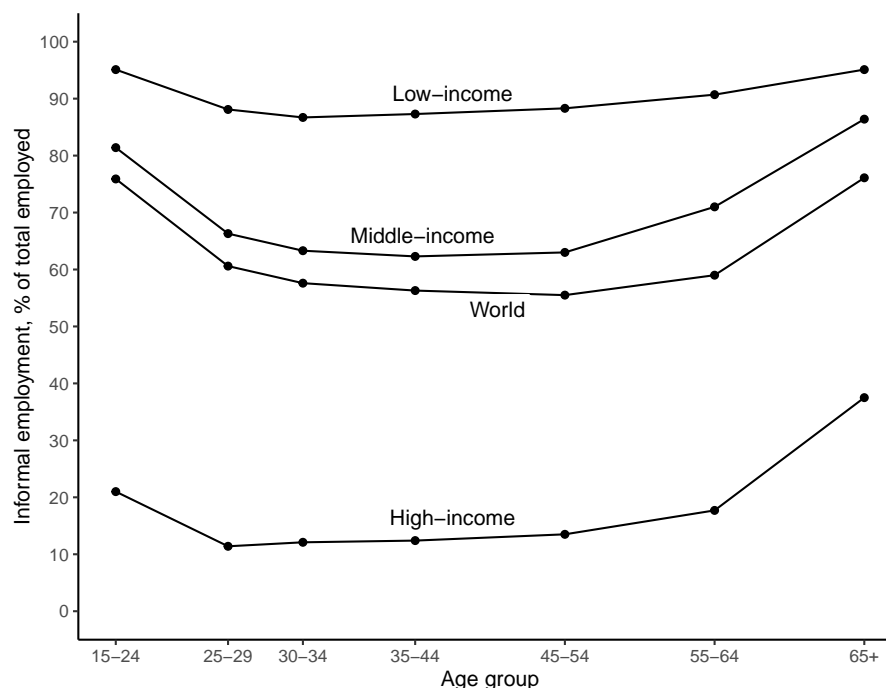
Workers in emerging and developing countries constitute 93 percent of the world’s informal employment (Bonnet, Leung, and Chacaltana 2018). In SSA, 95.8 percent of workers aged 15-24 are employed in the informal sector, compared to 86.6 percent of adults - in other words, adults are more than three time more likely to be employed formally (Kiaga and Leung 2020). In West Africa, the informality rate among youth is as high as 97.9 percent (Bonnet, Leung, and Chacaltana 2018).

Though formality rates are rising in Africa, formalization of the informal sector and formal job growth are not progressing nearly fast enough to absorb the inflow of young labor market entrants (Filmer and Fox 2014). Moreover, while the rate of informal work dropped by about 5 percent between 2004 and 2019 (ILO 2023c), the recovery from the Covid-19 pandemic has been characterized

by a return to informal, rather than formal, work.

Employment in the informal sector is often associated with low wages, precarious working conditions, and a lack of access to social protection — the last of which affects over 4 billion workers worldwide (ILO 2023b). According to the African Development Bank (2016), 41 percent of working youth remain food insecure, indicating that their earnings do not cover even basic needs. Yet for the majority of youth in low-income countries, waiting for a formal employer is not an option. Those who insist on searching for a formal job, and whose families can afford it, may wait years for an opportunity to open up (Serneels 2007; Manacorda et al. 2017).

Figure 2: Age informality profiles: world and country income groups (%), 2019



Source: ILO (2023b) based on calculations from national household surveys from 146 countries, representing 92.6 percent of global employment.

Figure 2 shows that participation in the informal sector is generally concave (or inverted U-shaped): youth enter the labor market through the informal sector, transition to formal work at increasing rates, reaching a maximum rate of about 25 percent formality between the ages of 35 and 44, and then transition back to the informal sector (Chacaltana, Bonnet, and Leung 2019). Over 360 million youth are engaged in informal employment across the globe, according to 2018 ILO estimates. In other words, youth are the most exposed to informality, at least until they near the end of the working lives.

The task for policymakers in LICs lies in putting policies in place that will allow the informal sector to flourish. This entails enacting policies that will pro-

tect workers, especially youth, from precarious or predatory working conditions, as well as providing avenues to financing, training, and market access. Additionally, it involves tackling the regulatory red tape that frequently impedes the smooth operation of informal enterprises (IMF 2017).

Indices are a useful tool for comparative studies of youth labor markets

An unbiased appraisal of the functioning of youth labor markets are critical for understanding the SWT and drafting constructive policy, and there is a general consensus that the measurement of labor market strength needs to incorporate a range of indicators that reflect both supply factors (the preparedness of youth for work) as well as demand factors (the demand of firms for youth labor). The ILO has led the empirical study of labor market dynamics, notably with the introduction of its 18 Key Indicators of the Labor Market (KILM). This set of measures encompass employment factors (status, sector, occupation, and work hours), labor conditions (wages and working poverty), as well as socioeconomic data related to the job seekers, including their education and labor productivity (ILO 2016). Further work focused on reformulating the KILM indicators to better capture labor market dynamics for the youth population (Elder 2010); however, being derived from household surveys rather than national indicators, these served as approximations rather than direct measurements of labor markets.

While providing valuable insights into the functioning of labor markets, these sets of indicators fell short of providing a coherent picture of youth labor market strength. The introduction of the KOF Youth Labor Market Index (Renold et al. 2014; Pusterla 2015; Pusterla 2016) addressed this gap by combining a new set of indicators into a single number, in a similar spirit to the Human Development Index (Sudhir and Amartya Sen 1994). These studies offer valuable insights into labor market conditions for youth in high-income countries, but are poorly equipped to describe low-income economies, both due to the appropriateness and the availability of the included indicators.

Similar youth-centric indices have been introduced in the wake of the YLMI which have aimed to capture youth quality-of-life more generally. The Youth Development Index combines 18 measures of youth education, health and well-being, employment opportunity, and political and civic participation to rank 183 countries (Abhik Sen and Kakar 2016). The Youth Progress Index combines 60 indicators to measure a similar concept, but explicitly excludes economic variables to allow for comparisons with GDP (Lisney and Krylova 2018). Both indices suggest that youth well-being is very tightly correlated with per-capita income, especially at lower income ranges, but they do not share our explicit focus on labor market outcomes.

Study of the school-to-work transition is aided by longitudinal data

Both cross-sectional and longitudinal data have been used to quantify the onset and duration of the school-to-work transition. The use of cross-sectional data, which is more widely available, involves the comparison of the age at which a certain proportion of the population has left school (50 percent or 75 percent, depending on the study) to the age at which the same percentage of the population has found a job. In essence, this reflects the average SWT transition for the population (Nilsson 2019). Quintini and Martin (2014) employ this approach to report transition duration, along with mean school-leaving age and age at first employment, showing that youth in emerging countries experience longer transitions and leave education earlier, while also experiencing higher rates of inactivity. This literature suggests that there is frequent job turnover among younger workers who engage in a search process of “shopping around” temporary jobs until they settle on a career path. In emerging economies, the informal sector employment appears to play a similar, transitory role, though it appears to be used as a substitute for skills formation to a greater degree than in high-income economies (Cunningham, McGinnis, et al. 2008; Bosch and W. F. Maloney 2010).

Nilsson (2019) argues that the use of cross-sectional data to quantify the SWT rests on a number of unrealistic assumptions, however. First, the calculation assumes that every individual in the population attends school, secures employment, and remains continuously employed upon labor market entry (O’Higgins 2008). As a result, transitions that include a long period of economic inactivity after school-leaving – a very common occurrence in low-income contexts, especially for women – are not accurately represented in the statistic. Similarly, cross-sectional data covers multiple cohorts, making a measure of transition duration only meaningful in a stationary labor market, i.e. one in which there are no differences in transitions between cohorts. Finally, official employment statistics often overlook large parts of the informal economy.

These issues can be addressed by using job history and panel data, which allows for the computation of transition duration for each individual. However, since most samples will include ongoing or incomplete transitions, aggregating individual transitions still yields a biased estimate of the SWT duration. This limitation can be alleviated in turn by employing survival analysis to estimate the likely transition duration for right-censored observations. A body of literature has emerged employing this approach to study SWTs in emerging countries (e.g. Khan and Yousaf 2013; Nordman and Pasquier-Doumer 2015; Manacorda et al. 2017).

Detailed panel and job history data can also be used in combination with Optimal Matching Analysis (OMA) to yield unique insights into the school-to-work transition of a population. OMA is a statistical method that calculates a metric indicating the relative similarity between individual sequences of

school-to-work transitions, allowing for the sorting of similar sequences into groups by similarity (Elzinga 2003). A body of literature applies OMA school-to-work transitions in various high-income countries (Schoon et al. 2001; McVicar and Anyadike-Danes 2002; C. Brzinsky-Fay 2007; Quintini and Manfredi 2009; Christian Brzinsky-Fay 2014; Christian Brzinsky-Fay and Solga 2016; Middeldorp, Edzes, and van Dijk 2019). 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).

TVET in informal firms and the promise of dual system training

The current generation of Africans is the most educated yet (Filmer and Fox (2014)), yet many find that the promise of stable and gainful employment does not follow. Moreover, despite increasing educational attainment, the quality of education remains critically low in many countries in SSA (World Bank 2018), and does not translate in to measurable improvements in marketable skill levels (Filmer, Rogers, et al. 2020). Many follow their parents into informal work, and find that despite their best efforts in school, their employment prospects are similar to those of their parents.

Technical vocation education and training was a high priority for many bilateral and multilateral agencies in the 1960s and early 1970s. The World Bank funded many projects to promote TVET, and the ILO published a number of influential reports on the importance of training for the informal sector (Palmer 2007). For recipient governments, integrating TVET into their modernization strategies was a logical step, achieved through the incorporation of vocational elements into secondary education and establishing national industrial and vocational training centers, often with the backing of the ILO. Throughout the 1980s, however, structural adjustment policies took the focus away from public education and training. The World Bank spoke out in favor of primary education over vocational training, undermining the rationale for external assistance for TVET (King and Palmer 2007).

In recent years, the youth employment crisis and rising rates of primary education attainment has generated renewed interest in TVET as a post-primary educational path. Providing quality post-primary education to all children and youth in low- and lower-middle-income countries with growing populations is a significant challenge. In SSA, the completion rate of upper secondary education increased by only 3.4 percentage points during the past decade, from 23.3 percent to 26.7 percent, leaving the region furthest behind in an international comparison (UN 2022). In many low-income countries, both politicians and policy

experts are drawn to the potential of TVET to reduce unemployment through by equipping youth with practical and job-specific skills.

Taking an example from Germany, Switzerland, and other European countries, several governments have begun implementing a training system that leverages the immense potential of the informal sector by coupling informal firms with classroom education. In the so-called dual system, apprentices develop practical skills via on-the-job training while acquiring relevant theoretical knowledge and extending their general education at vocational training institutions. Such schemes show promise in fulfilling the fundamental goal of education: the promotion of literacy, numeracy, and socioemotional skills among its youth, even while preparing them for the challenges of the labor market (Arias, Evans, and Santos 2019). As these types of programs are still a novelty in most low-income countries, their place in the broader education system, effectiveness, and challenges are still in the process of being defined (Igarashi and Acosta 2018).

Only one study has attempted a full-fledged impact evaluation of dual-system training in Sub-Saharan Africa. In a random experiment involving an apprenticeship scheme that combined 12 to 24 months of on-the-job training with classroom training in local vocational training centers, Crépon and Premand (2019) found that participating youth earned 15 percent more after three years and contributed to more complex and non-routine tasks at their training firms. They also graduated and received formal certification of their training at a higher rate than youth who did not participate in classroom training. In this thesis, I study the effectiveness of the *Certificat de Qualification Professionnelle* (CQP), in which youth similarly attend classroom education once a week while participating at an otherwise traditional apprenticeship.

2 Contribution and Structure of Dissertation

This thesis was completed under the auspices of the research project **LELAM-TVET4INCOME**, funded by the Swiss National Science Foundation. This program addresses a crucial knowledge gap regarding the connection between TVET and youth labor markets. Examining case studies and collaborating with partner institutions in four countries — Benin, Chile, Costa Rica, and Nepal — analyze the connection between education and employment, as well as youth labor market dynamics, across countries at various stages of economic development. Additionally, the goal of the project is to assess the impact of reforms, interventions, and policies in these countries through rigorous empirical evaluation. The central, guiding question of this research program is a fundamental question: what are the necessary and sufficient conditions under which TVET can enhance youth income? Towards this end, the project has outlined four specific research questions that provide a structured framework,

two of which I investigate in greater detail in my thesis:

1. How can we measure the youth labor market situation in low and middle income countries?
2. Does improving the linkage between the actors of the education and employment system reduce unemployment, improve gainful employment, job quality, and thus income of the youth?

In **Chapter 1: Youth Labor Index for Low Income Countries**, co-authored with Erwin Lefoll and Dr. Isabel Günther, we construct and analyze the eponymous Youth Labor Market Index for Low-Income Countries, or YLILI. The YLILI provides a more nuanced evaluation of labor strength than the two most commonly used indicators, namely average income and employment rate. The index comprises 10 indicators grouped into three dimensions: transition, working conditions, and education, using data sourced from public domain and provided by the International Labour Organization (ILO), the World Bank, and UNESCO.

The results reveal a wide variation of youth labor market strength across the 54 (out of 79) low-income and lower-middle income countries for which data is available. The strongest youth labor markets among these countries are concentrated in Central Asia, while labor markets in SSA are generally much weaker than those in South America and South and Central Asia. The highest variation is observed within the education dimension, namely for the share of youth without any secondary education, the youth literacy rate, and a set of harmonized test scores. Thus, the quality of the education system is an important driver of the rankings generated by the index. Our analysis also tests various hypotheses regarding the macroeconomic and demographic drivers of the YLILI ranking. Strikingly, we find that the fertility rate - which essentially captures the lagged severity of the youth bulge in a country population - is the strongest tested predictor of YLILI. High rates of child-bearing decrease the levels of economic activity and educational attainment among the female population, while adding pressure to the already overburdened educational systems in countries with a high youth-to population ratio at the same time.

The YLILI emphasizes that the youth employment crisis is multifaceted, and policy responses should be tailored to the specific strengths and weaknesses of each country's youth labor market. To facilitate this, we make the index available in the form of an interactive webtool (<https://nadel.shinyapps.io/ylili/>), which allows policymakers to clearly visualize the issues that are in most need of being addressed. Finally, in light of the 25 countries that were entirely missing from our index, an important lesson from the paper is the importance of consistent collection of labor market indicators on the one hand, and the publication of these indicators in age- and gender-disaggregated form on the other.

In **Chapter 2: Lost in Translation: School-to-Work Transition Mapping in Urban Bénin**, I shift perspective to focus on school-to-work transitions in a single urban labor market in the West African country of Bénin. Over three years,

I gathered detailed data on the education and labor market activity of a sample of 752 youth living in the country's economic largest center, Cotonou. Employment histories dating back seven years form the backbone of the analysis, and track youths paths through five activity states: *In School*, *Apprenticeship*, *Wage Employment*, *Self-Employment*, and *NEET*.

In order to better understand the dynamics of the SWT in this highly informal economy, I use a variety of methodologies to analyze these employment histories. First, I characterize the periods of school-leaving and labour market entry for the youth in the sample. Deducing the age of the respondent at each point of their observed employment history allows me to calculate the age at which youth complete their schooling and transition to their first job, as well as the duration of this transition, and a wealth of socioeconomic and family characteristics allows me to identify factors that influence the time it takes for youth to enter the labour market. In a second approach, I follow Bosch and W. Maloney (2007) and Cunningham and Salvagno (2011) in considering the employment histories as continuous Markov processes. This allows me to study the flows between different activity states over the course of the entire SWT. Moreover, by separating the probability to transition between two states from the likelihood that a youth exits a particular state in the first place, I am able to compare the transition probabilities for age and gender subgroups. Finally, I apply optimal matching analysis (OMA), a technique used to identify similarities in sequences, to identify shared patterns in the SWT trajectories experienced by youth, and group them into clusters of like transitions.

The conclusions of the paper challenge several assumptions about highly informal, urban labor markets. First, the mean school-leaving age is over 23 and a half years, which more closely resembles the graduation age of high-income countries than that reported in official statistics for Bénin - indicating a massive gap in educational attainment between rural and urban areas. Second, OMA indicates that transition paths are relatively stable – only a small fraction of youth exhibit a transition type that is not dominated either by education, self-employment, wage employment, or inactivity. Third, we find that female labor market participation, as measured by the probability to exit the SWT (i.e., to find employment), is considerably lower than implied by recent studies at the national level. Young men exit the SWT at a rate of 65 percent in our sample, compared to just 47 percent of women. This finding is supported by the OMA approach, as the cluster dominated by NEET activity states is comprised almost exclusively of young women who become separated from the labor market at a young age. The study reveals the potential of longitudinal surveys tracking youth labor market activities, though I argue that longer histories with more than five activity states would allow for even more informative grouping of transition types.

In Chapter 3: Costs and Benefits of Dual Education in the Informal Sector, co-authored with Dr. Sylvain Kpenavoun, Dr. Esaïe Gandonou, Dr. Guy

Nouatin and Dr. Rubain Bankole, I analyze the effectiveness of a unique apprenticeship program in Bénin called *Certificat de Qualification Professionnelle* (CQP). The program builds on existing apprenticeships in the informal sector by adding a weekly classroom training session. We utilize a unique dataset tracking earnings and employment data for 427 apprentices participating in the program, as well as matched survey data from interviews conducted with the master craftsmen from the total of 197 small firms in which the training took place.

The CQP program has two interrelated goals. On the one hand, meta-analyses of the training literature show that programs combining hands-on training with classroom teaching are the most effective at improving youth employment outcomes (Kluve et al. 2019; Ghisletta, Kemper, and Stöterau 2021). On the other hand, the size of the informal sector and limited offering and access to formal technical and vocational education and training (TVET) combine to make informal training play a central role in the preparation of youth for the labor market. Given the prohibitive cost and political frictions that would be involved in a forced formalization of informal sector training, a program that implements a modicum of formalization measures, such as enforced written contracts, coherent training curricula, clear learning objectives, and a nationally-recognized certificate, is an important stepping step towards integrating informal training schemes into the national, formally recognized TVET system.

The paper makes two important contributions to the literature on informal training. First, we contrast the efficacy of dual system training to informal apprenticeship without a classroom education component. Second, we evaluate the costs and benefits of the program for both participating apprentices and their training firms.

We find that, after three years of training, apprentice scores on trade-specific competence measures increase by .13 standard deviations, while their trainers' assessment of their competence and experience on a series of sector-specific tasks increased by 0.46 SDs and 0.58 SDs, respectively. However, it is not possible to distinguish the learning outcomes of the CQP participants from those of comparable apprentices who did not participate in supplemental classroom training. Cost and benefits calculations for all apprentices indicate that apprentices receive more in allowances from their trainers, including food, transport, and "pocket money", than they pay in fees, whereas the net costs for firms are highly dependent on the productive contributions of the apprentices (and how they are measured).

3 Conclusions

In the three chapters of this thesis, I provide evidence on cross-country and country-specific school-to-work transitions in low-income and informal labor

market settings. I demonstrate that longitudinal data provides deep insights into the SWT, and that this data can be gathered at low cost and with relatively low drop-out rates with the help of remote surveys. I also show that dual system apprenticeship is a promising avenue for facilitating successful transitions to employment, in particular for youth who exit the formal education system early. The three chapters also articulate various policy responses to the youth employment crisis, which can be summarized in three cross-cutting recommendations.

First, reducing the size of youth cohorts is critical to easing pressure on new labor market entrants

As argued above, persistently high fertility rates not only reduce growth prospects by delaying a demographic dividend, they also make individual SWTs more difficult by increasing the number of job applicants for a growing, but still limited number of formal jobs. In Paper 1, we show that countries with higher fertility rates exhibit worse scores on the YLILI, especially when calculated for male-specific data. In Paper 2, we show that early childbearing has devastating consequences for female labor market participation and the likelihood of transitioning to the labor market: young women in Cotonou are shown to marry earlier (59 percent of female youth aged 20-29 vs. 17 percent of male youth) and have more children in the sampled age range (1.73 vs. 0.53). Reducing fertility rates through better access to education for girls, higher quality maternal and child health provision, and better access to family planning are thus of paramount importance for both individual SWTs as well as growth prospects for the region as a whole.

Second, quality data is needed to inform a better understanding of the school-to-work transition

The foundation for a successful country-specific analyses of school-to-work transitions is inextricably tied to the need for more and higher-quality data on employment, education, and job history. Even at a time when digitization has made data collection easier and less expensive than ever, labor market statistics emerging from low-income countries are scarce and, in many cases, of low quality (Fox and Pimhidzai 2013). In Paper 1, I advocate for a more systematic disaggregation of otherwise publicly available data, by age and gender in particular. The Paper argues that a holistic indicator of youth labor market strength is necessary for accurately identifying policy priorities, yet various key indicators – including work formality – are only published in aggregate form. Paper 2 argues that cross-sectional data is insufficient to fully quantify the school-to-work transition, and demonstrates three powerful approaches utilizing longitudinal data for the same purpose. While longitudinal employment data and detailed work histories have been collected in high-income countries for decades, they are still sorely

lacking in many regions where the youth employment crisis is most acute. Finally, Paper 3 joins Crépon and Premand (2019), Alfonsi et al. (2020) and Hardy and McCasland (2022) in the utilization of matched apprentice-trainer data to evaluate the effects of a training scheme on both sides of the training agreement. Such two-sided studies are crucial to evaluate not just the success of the program in terms of youth income and skill development, but also their sustainability in terms of their related costs to, and impacts on, training firms.

Third, policies are needed to further integrate young women into labor markets

At a relatively early age, most young women in Africa must decide whether to enter the labor market (and if so, how) or to marry and have children (and if so, when). For many, marrying is an avenue for escaping poverty and relying on male breadwinner for financial support. Nearly 80 percent of African women marry and give birth by the age of 25 (Filmer and Fox 2014). A cross-cutting theme of this thesis is the importance of integrating these women into the labor market at an early age, in order to increase their economic independence, reduce fertility rates, and boost overall youth labor market participation. Paper 1 shows that countries score significantly higher on the YLILI when only male-specific data is used, driven in large part by high female NEET rates. In Paper 2, we find that women are less likely to work full-time and be an employer than men, while self-employed women make significantly less than self-employed men. In one of the most striking findings, OMA reveals that the cluster of SWTs that is dominated by inactivity (NEET status) is almost entirely comprised of women. Paper 3 is limited by an almost complete lack of female participation in the apprenticeship scheme due to the (highly gendered) trades selected for study. This is in line with the observation that women are selecting into an ever smaller number of occupations, perpetuating gender segregation in youth labor markets (Borrowman and Klasen 2020). Policies encouraging more women to enter the labor market and to branch out into stereotypically male-dominated trades are an thus an important step, not just to promote economic justice, but to increase overall labor market participation and drive growth.

This list of recommendations is not comprehensive, and the individual papers discuss further issues such as need for the monitoring and evaluation mechanisms around youth-targeted labor market programs, strategies for encouraging participation in apprenticeship training, the successes and pitfalls around remote data collection, and alternative methods to composite index construction. Moreover, questions remain about the representativeness of the case studies presented in Papers 2 and 3, and to what extent the lessons from these studies generalize to other cities, countries, and programs.

References

- Acemoglu, Daron and Jörn-Steffen Pischke (1998). "Why Do Firms Train? Theory and Evidence". In: *The Quarterly Journal of Economics* 113.1, pp. 79–119.
- African Development Bank (2016). *Jobs for Youth in Africa*. African Development Bank Group.
- (2019). *African Economic Outlook 2019*. African Development Bank.
- (2022). *Jobs for Youth*. Blog Post. URL: <https://www.afdb.org/en/topics-and-sectors-sectors-human-capital-development/jobs-youth>.
- (2023). *African Economic Outlook 2023*. African Development Bank.
- Alfonsi, Livia et al. (2020). "Tackling Youth Unemployment: Evidence From a Labor Market Experiment in Uganda". In: *Econometrica* 88.6, pp. 2369–2414.
- Arias, Omar, David K. Evans, and Indhira Santos (June 24, 2019). *The Skills Balancing Act in Sub-Saharan Africa: Investing in Skills for Productivity, Inclusivity, and Adaptability*. The World Bank.
- Bonnet, Florence, Vicky Leung, and Juan Chacaltana (2018). *Women and Men in the Informal Economy: A Statistical Picture*. Geneva: International Labour Office.
- Borrowman, Mary and Stephan Klasen (Apr. 2020). "Drivers of Gendered Sectoral and Occupational Segregation in Developing Countries". In: *Feminist Economics* 26.2, pp. 62–94.
- 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.
- 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.
- Chacaltana, Juan, Florence Bonnet, and Vicky Leung (2019). *The Youth Transition to Formality*. Geneva: ILO.
- Crépon, Bruno and Patrick Premand (2019). "Direct and Indirect Effects of Subsidized Dual Apprenticeships". In: *SSRN Electronic Journal*.

- Cunningham, Wendy, Linda McGinnis, et al. (2008). *Youth at Risk in Latin America and the Caribbean: Understanding the Causes, Realizing the Potential*. The World Bank.
- Cunningham, Wendy and Javier Bustos Salvagno (2011). *Youth Employment Transitions in Latin America*. Policy Research Working Papers. The World Bank.
- Eastwood, Robert and Michael Lipton (2011). "Demographic Transition in Sub-Saharan Africa: How Big Will the Economic Dividend Be?" In: *Population Studies* 65.1, pp. 9–35.
- Elder, Sara (2010). *ILO School-to-work Transition Survey: A Methodological Guide*. Geneva: ILO.
- 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.
- Filmer, Deon and Louise Fox (2014). *Youth Employment in Sub-Saharan Africa*. The World Bank.
- Filmer, Deon, Halsey Rogers, et al. (2020). "Learning-Adjusted Years of Schooling (LAYS): Defining a New Macro Measure of Education". In: *Economics of Education Review* 77.
- Fox, Louise and Obert Pimhidzai (May 2013). *Different Dreams, Same Bed: Collecting, Using, and Interpreting Employment Statistics in Sub-Saharan Africa - The Case of Uganda*. Policy Research Working Papers. The World Bank.
- 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.
- Ghisletta, Andrea, Johanna Kemper, and Jonathan Stöterau (2021). *The Impact of Vocational Training Interventions on Youth Labor Market Outcomes. A Meta-Analysis*. Working Paper 20. ETH Zurich.
- Grapsa, Erofil and Dorrit Posel (Sept. 14, 2016). "Sequencing the Real Time of the Elderly: Evidence from South Africa". In: *Demographic Research* 35, pp. 711–744.
- Hardy, Morgan and Jamie McCasland (2022). "Are Small Firms Labor Constrained? Experimental Evidence from Ghana". In: *American Economic Journal: Applied Economics* (Forthcoming).
- Igarashi, Takiko and Pablo Ariel Acosta (2018). *Who Benefits from Dual Training Systems? Evidence from the Philippines*. World Bank Policy Research Working Paper 8429. World Bank.
- ILO (2016). *Key Indicators of the Labour Market*. 9th ed. Geneva: ILO.

- ILO, ed. (2022). *Global Employment Trends for Youth 2022 Investing in Transforming Futures for Young People*. Geneva: International Labour Organisation (ILO).
- (2023a). *ILOSTAT Database*. URL: www.ilo.org/shinyapps/bulkexplorer3/.
- (2023b). *Women and Men in the Informal Economy: A Statistical Update*. Geneva: International Labour Office.
- (2023c). *World Employment and Social Outlook: Trends 2023*. Geneva: ILO.
- IMF, ed. (2017). *Restarting the Growth Engine*. Regional Economic Outlook 2017. Washington, DC: International Monetary Fund. 111 pp.
- Khan, Tasnim and Fatima Yousaf (2013). “Unemployment Duration of First Time Job Seekers: A Case Study of Bahawalpur”. In: *Asian Journal of Economic Modelling* 1.1, pp. 8–19.
- Kiaga, Annamarie and Vicky Leung (2020). *The Transition from the Informal to the Formal Economy in Africa*. Background Paper N°4. ILO.
- King, Kenneth and Robert Palmer (2007). *Technical and Vocational Skills Development*. London: Department for International Development.
- Kluve, Jochen et al. (Feb. 2019). “Do Youth Employment Programs Improve Labor Market Outcomes? A Quantitative Review”. In: *World Development* 114, pp. 237–253.
- Lisney, John and Petra Krylova (2018). *Youth Progress Index 2017: Measuring Young People’s Social Progress Globally*. European Economic Forum.
- 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.
- 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.
- Mojsoska-Blazevski, Nikica, Marjan Petreski, and Marjan I Bojadziev (June 2017). “Youth Survival in the Labour Market: Employment Scarring in Three Transition Economies”. In: *The Economic and Labour Relations Review* 28.2, pp. 312–331.
- 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 (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.
- O'Higgins, Niall (2008). "Guide to the School-to-Work Transition". Unpublished manuscript.
- Palmer, Robert (2007). "Skills Development, the Enabling Environment and Informal Micro-Enterprise in Ghana". The University of Edinburgh.
- 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.
- Petreski, Marjan, Nikica Mojsoska-Blazevski, and Marcelo Bergolo (Dec. 29, 2016). "Labor-Market Scars When Youth Unemployment Is Extremely High: Evidence from Macedonia". In: *Eastern European Economics* 55.2, pp. 168–196.
- Pusterla, Filippo (Oct. 2015). *How Did the Youth Labour Market Situation Evolve between 2012 and 2013?: Second Release of the KOF Youth Labour Market Index*. ETH Zurich, 28 p.
- (Oct. 2016). *The Great Recession and the Working Conditions of Youth: A Descriptive Analysis of the European Labour Market*. ETH Zurich, 28 p.
- 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 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.
- Renold, Ursula et al. (2014). *On the Multiple Dimensions of Youth Labour Markets: A Guide to the KOF Youth Labour Market Index*. ETH Zurich, 69 p.
- 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.
- Sen, Abhik and Rafiullah Kakar, eds. (Nov. 2016). *Global Youth Development Index and Report 2016*. Global Youth Development Index and Report. Commonwealth Secretariat.
- Serneels, Pieter (Feb. 2007). "The Nature of Unemployment among Young Men in Urban Ethiopia". In: *Review of Development Economics* 11.1, pp. 170–186.
- Sudhir, Anand and Amartya Sen (1994). *Human Development Index: Methodology and Measurement*. New York.
- Tiongson, Erwin R. and Jean Fares (Mar. 27, 2007). *Youth Unemployment, Labor Market Transitions, And Scarring : Evidence From Bosnia And Herzegovina, 2001-04*. Policy Research Working Papers. The World Bank.
- UN (2022). *World Population Prospects 2022: Summary of Results*. New York: United Nations.

- United Nations (2022). *World Population Prospects 2022*. URL: population.un.org/dataportal/home.
- Urdal, Henrik (Sept. 2006). "A Clash of Generations? Youth Bulges and Political Violence". In: *International Studies Quarterly* 50.3, pp. 607–629.
- World Bank (2018). *World Development Report 2018: Learning to Realize Education's Promise*. Washington, DC: World Bank.
- (2019). *World Development Report 2019: The Changing Nature of Work*. Washington, D.C.: World Bank.
- ed. (2022). *Poverty and Shared Prosperity 2022: Correcting Course*. Poverty and Shared Prosperity 2022. Washington: World Bank.