# 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 youth[1] labor markets function smoothly, the transition to steady employment is rapid, as new entrants come prepared with sought-after skills and businesses are equipped and eager to absorb new talent. In many labor markets, however, the school-to-work transition (SWT) does not meet this ideal. In low-income countries in particular, stagnating formal sector growth and ever-growing cohorts of graduates set formidable obstacles in the paths of youth seeking gainful employment. Expanding populations, particularly in Sub-Saharan Africa (SSA), result in more labor market entrants than job openings — the African Development Bank (2022) estimates that about 3 million formal jobs are created for the roughly 12 million youth who enter the labor market each year. Difficulties are compounded by the fact that demographic pressures tend to be highest in those countries in which youth have the most difficulty finding gainful work.

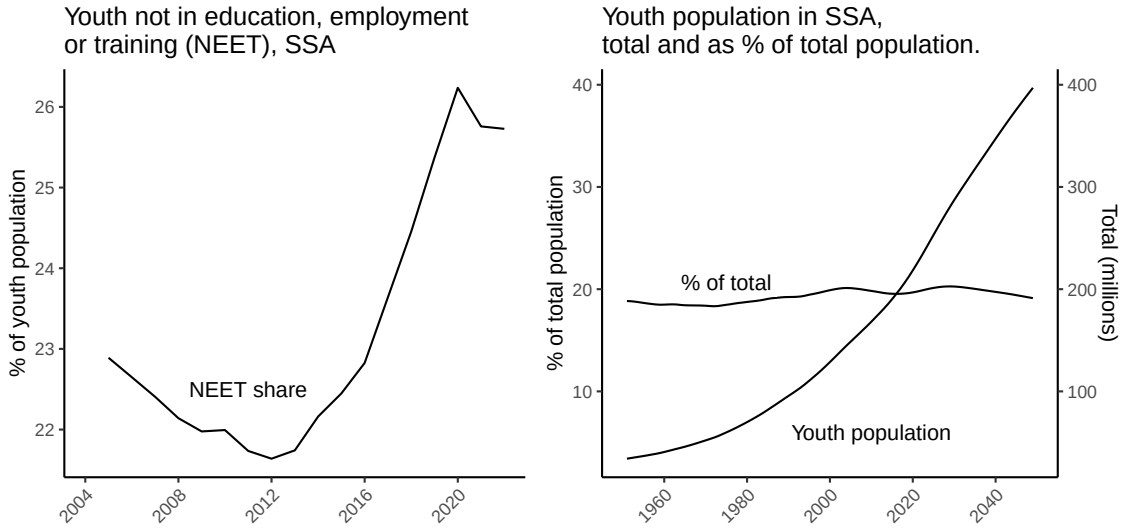
Employment prospects and job quality in SSA remain fragile, especially for youth. The pandemic was a major setback in growth and poverty reduction in the region, after two decades of major progress on both fronts. Real GDP was projected to grow just 3.7 percent in 2023 and 3.9 percent in 2024, considerably below the average of 6 percent per annum in the three years preceding Covid-19 (African Development Bank 2023). 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). The combined lack of employment opportunities and social protection have resulted in persistent impoverishment, with projections indicating that extreme poverty (income below US$2.15 per day, 2017 PPP) will be increasingly concentrated in SSA (World Bank 2022).

During the pandemic, the closure of businesses and the imposition of lockdowns and confinement measures made it difficult for job seekers to find a steady employer. Young people were disproportionately affected, 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 workers over the same time period (**ilo2022a**; African Development Bank 2023). Falling family incomes, transition to distance learning, and even the temporary shutdown of educational facilities led to a rate of youth not in employment, education, or training (NEET) that peaked at over 26 percent in 2020 - more than double the NEET rate in high-income countries (Figure 1). And although the economy has

[1]While 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 fact that young people are spending ever-longer periods of time in education, and ensures that the entirety of the school-to-work transition, including labor market entry, is captured for a greater number of youth.

largely recovered since, 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).

**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, 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 among 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, such as constricting social norms related to occupation type and family formation.

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). High levels of youth unemployment, on the other hand, may fuel social and political instability (Urdal 2006). The sheer size of the youth population in SSA, with a substantial proportion seeking employment, highlights the need for effective strategies to reduce frictions along the SWT, prevent the exclusion of youth from meaningful economic participation, and to harness their energy and potential. 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, as well as the circumstances that arise when these mechanisms are not in place. I contribute to this understanding over the three chapters of 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 factors in determining the youth-specific strength of labor markets. My co-authors and I construct a multi-dimensional index, focusing on incorporating indicators not included in more widespread measures of labor market strength. The second and third chapters 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. In Chapter 2, 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 3 relies on a matched apprentice-trainer subset of the same dataset to analyze the costs, benefits, and effectiveness of a unique apprenticeship scheme embedded in the informal sector in Bénin, and to evaluate whether informal training firms can successfully be incorporated into a national vocational education system.

In the remainder of this introduction, I present an outline of the existing methodological and empirical literature on youth labor markets in informal settings and 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.

### *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 (**ilo2022a**). 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*

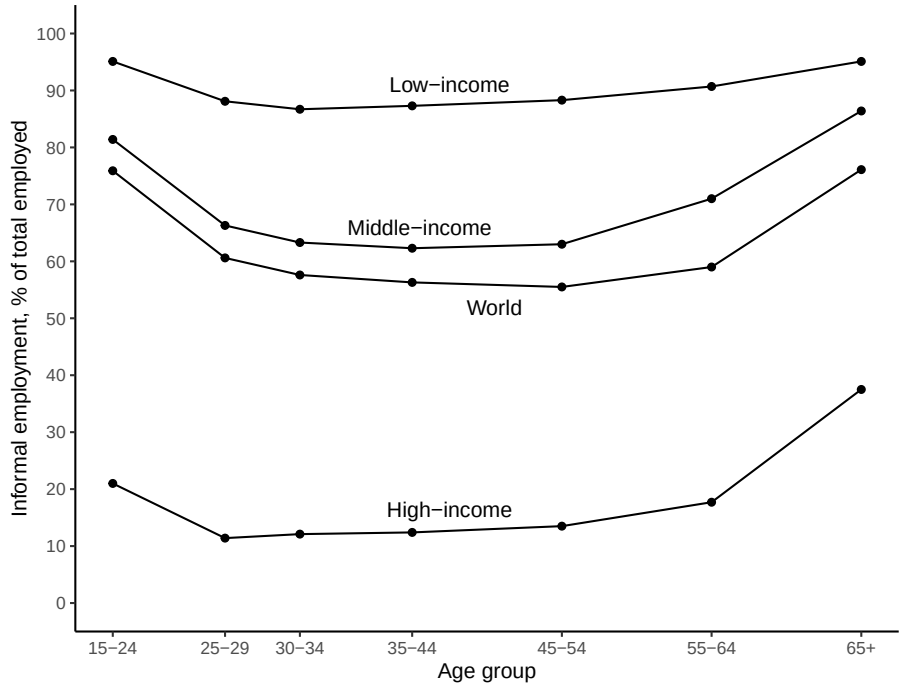
Workers in emerging and developing countries constitute 93 percent of the world's informal employment (Bonnet, Leung, and Chacaltana 2018). In SSA, 95.8 percent of workers aged 15-24 are employed in the informal sector, compared to 86.6 percent of adults - in other words, adults are more than three time 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 **africandevelopmentbank2016a**, 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 protect 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 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.

1

This author and Dr. Isabel Günther played major roles in conceptualizing the study. Erwin Lefoll was fully responsible for initial data collection, visualization, statistical analysis, and the first draft of the manuscript. This author revised the analytical approach, conducted robustness checks, and developed the accompanying web-based tool. Dr. Isabel Günther had a leading role in revising the analytical strategy and interpreting results.

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: *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).

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The author of this dissertation conceptualized the study, developed the analytical strategy, and interpreted the results, with the invaluable input of Drs. Esaïe Gandanou, Guy Nouatin, and Sylvain Kpènavoun Chogou. Dr. Sylvain Kpènavoun Chogou orchestrated data acquisition, including surveyor training and data quality checks. Dr. Rubain Bankole led additional qualitative surveys during the later phases of the project and aided in the interpretation of the results.

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