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# A Methodology for Assessing Youth Employment Stability After First Job Entry

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**Abstract:** This study develops a method to measure employment stability among technical school graduates in Uzbekistan after their first recorded formal wage job. It compares National Statistics Committee data for 2022–2025. Overall unemployment fell from 8.9 to 4.8 percent. The recorded number of technical school graduates rose from 52,872 in 2024 to 141,586 in 2025, but the reclassification of educational institutions limits the comparability of these counts. The proposed method links education records and employment contract histories for graduates aged 18–30. Follow-up at 3, 6 and 12 months starts on the date of the first formal wage job recorded within 180 days of graduation. The method separately measures retention with the initial employer, continuous formal wage employment and formal employment on the follow-up date. For graduates who have reached the relevant follow-up date, confirmed positive, confirmed negative and unknown outcomes are counted separately to calculate lower and upper bounds for each share. The approach distinguishes employer changes, returns to formal work after a gap and incomplete observation. Estimating these cohort indicators requires linked individual records.

**Keywords:** Youth employment, technical school graduates, first job, cohort follow-up, formal employment, employment stability.

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## 1. Introduction

Graduates whose employment contracts were terminated in the third month, who transitioned to another enterprise without a break, or who remained at their initial workplace until the end of the year are all recorded identically in the list of employed individuals. However, when analyzing these scenarios, the reasons for leaving a job, changes in employers, and the quality of the retained employment are examined separately.[1][2]

Changes in the composition of vocational education institutions must be taken into account when comparing cohorts of graduates. In 2025, the number of graduates from technical schools increased, while the total number of graduates from secondary specialized and vocational education institutions decreased (National Statistical Committee of the Republic of Uzbekistan).[3][4]

The objective of this study is to develop a methodology for separately calculating—within the same initial cohort—retention with the original employer, continuity of formal employment, and employment status as of a specific reference date (at 3, 6, and 12 months).[5]

The study explores how to distinguish between remaining at the initial workplace, switching employers without a break in employment, and returning to work after a break, all within a single monitoring system.[6]

The International Labour Organization's "School-to-Work Transition Survey" considers job retention as a distinct dimension of the transition outcome. In this context, job satisfaction is as significant as the employment status itself (International Labour Organization,). Chacaltana, Bonnet, and Leung view young people's entry into formal employment as part of their entire career trajectory. Chacaltana, Elder, and Lee highlight the interconnectedness between leaving the education system, securing a first job, and subsequent career shifts. Consequently, analyzing education, employment, and unemployment in isolation—as if they were discrete, unrelated points—limits the scope of the analysis.[7][8]

Labor market conditions at the time of graduation influence an individual's subsequent career path. In a study based on administrative data from Canada, Oreopoulos et al. observed that economic downturns lead to income losses for higher education graduates and result in disparities regarding the employers they join. Such frameworks provide a basis for examining cohorts based on the timing of their graduation and entry into the workforce. In the context of Uzbekistan, Honorati and Marguerie analyzed barriers related to information on career paths, entry into formal employment, and expectations regarding wages. An income survey by the International Labour Organization highlights the need to support young women, rural youth, and young people from low-income families (International Labour Organization).

The OECD views workplace-based learning and employment services as key components of the education and labor market ecosystem. It emphasizes the importance of measurable outcomes and ongoing monitoring to ensure their effectiveness.[9]

## 2. Methodology

A descriptive comparison was conducted using three years of data (2022–2025) from the Stat.uz system. Since open statistical records do not link individual graduates to their subsequent employment, a specific methodology was developed to calculate cohort-based indicators.

The unit of observation is an individual aged 18–30 at the time of graduating from a technical school. The observation period begins on the date ($t_0$) of the first recorded formal employment following graduation—specifically, within the first 180 calendar days post-graduation. Individuals who held an active formal employment contract on the date of graduation, or within the 180 days preceding it, are analyzed as a separate group. This criterion encompasses all employment relationships reflected in the official registry.

Graduates are categorized based on whether they secured employment within 180 days post-graduation, whether no employment was recorded during the full observation period, whether their status remains unknown, or whether their observation period has not yet concluded. The employment rate is calculated for graduates who have reached the end of this 180-day window, while employment stability is assessed for those with a confirmed start date ($t_0$) who have completed the initial observation period. The report specifies the institutions and programs covered by the data.

The start and end dates of a contract are linked to a unique, persistent identifier for the employer. If two contracts begin simultaneously, the one designated as the "primary workplace" is selected. In the absence of such a designation, the contract with the higher number of working hours is chosen. If these values are equal, a conventional rule is applied: the employer with the lower identifier value is selected, and such instances are specifically noted. The sensitivity of the results is verified by excluding these cases and recalculating. When a position changes within the same enterprise, the employer identifier and the continuity of the employment relationship are verified. If a specific date does not exist within the reference month, the last day of that month is used. Reference dates are set at 3, 6, and 12-month intervals. The history of contracts is examined over the entire period to identify short breaks.[10]

Data regarding graduation date, field of study, institution type, and region are obtained from the education registry, while information on contract duration, employer, industry sector, and occupation code is sourced from the employment registry. The inquiry serves to identify reasons for informal employment, job seeking, pursuing education, migration, or the termination of a contract. A coded individual identifier is used within the integrated analytical database. When administrative records are linked, duplicate termination and contract entries are removed, the chronological sequence of dates is verified, and the source version is recorded. If a final working day is indicated in the registry, it is included within the term of the contract. If a contract termination date is specified, it is treated as the first day on which the contract is no longer in effect. Formal employment is considered continuous if a second contract begins on the calendar day immediately following the final working day of the first contract. Any period of at least one confirmed day without an active contract is recorded as a break in employment. In the event of an enterprise reorganization that results in a change to the employer code, the continuity of the employment relationship is verified based on legal succession and contractual documentation.[11]

## 3. Result and Discussion

The rows in Table 1 highlight specific changes within the education and labor markets. In Uzbekistan, the overall unemployment rate declined from 8.9% to 4.8% between 2022 and 2025, while the employment rate rose from 67.2% to 70.5%. This represents a decrease of 4.1 percentage points and an increase of 3.3 percentage points, respectively. The unemployment rate is calculated relative to the economically active population, whereas the employment rate is calculated relative to the working-age population; therefore, these indicators are interpreted separately. The figures for 2025 are presented as preliminary data.[12]

**Table 1.** Technical school graduates and Uzbekistan labor market indicators

| Year | Graduates of technical school, number of persons | General unemployment, % | Employment rate, % |
|---|---|---|---|
| 2022 | 20 567 | 8,9 | 67,2 |
| 2023 | 66 999 | 6,8 | 67,9 |
| 2024 | 52 872 | 5,5 | 68,3 |
| 2025 | 141 586 | 4,8 | 70,5 |

**Sources.** National Statistical Committee of the Republic of Uzbekistan (2026a, 2026b, 2026c), SIAT 2.02.01.1900 (https://siat.stat.uz/data/1311/), 2.02.01.2200 (https://siat.stat.uz/data/1875/) va 2.04.03.0063 (https://siat.stat.uz/data/3936/?lang=uz).

Between 2024 and 2025, the number of graduates from technical school increased by 88,714, while the total number of graduates from secondary specialized and vocational education programs decreased by 29,800, falling to 156,600. The Committee noted that, starting in 2025, the types of educational institutions have been rationalized (National Statistical Committee of the Republic of Uzbekistan, 2026d). For the purpose of comparison, the original institution type and educational program codes are retained, and their consistency across years is verified.

The number of graduates for 2023 is reported as 66,800 in a press release dated April 30, 2026, and as 66,999—or 67,000 when rounded—in the updated SIAT dataset from August 26. Data for all years presented in Table 1 were sourced from a single version of the SIAT system. The press release served to clarify the classification of institutions and

the overall trends in graduate numbers. The reason for the discrepancy is not specified in the metadata.[13]

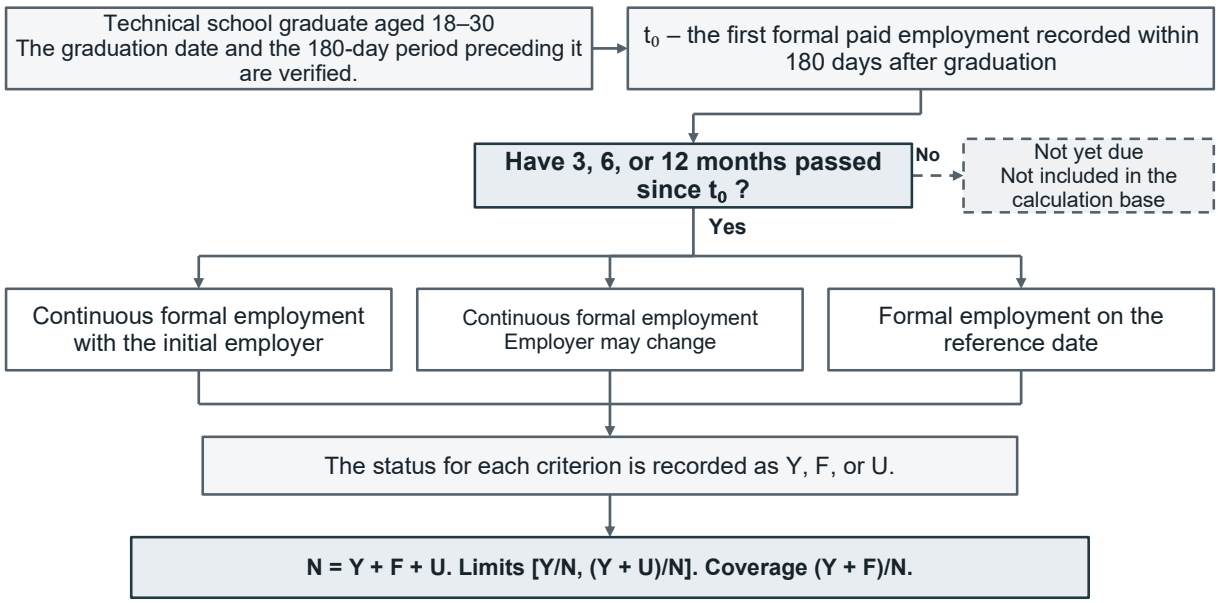
The denominators for the indicators in Table 2 include members of the initial cohort who have reached the relevant reference date. Individuals for whom the reference date has not yet been reached are reported separately. Within a cohort that has been fully observed, the number of individuals remaining with their initial employer cannot exceed the number of those in continuous employment. Furthermore, the number of individuals in continuous employment cannot exceed the number of those officially employed as of the reference date. This logic is used to verify the consistency of the data.[14]

**Table 2.** Initial employment assessment indicators

| **Indicator** | **Confirmed status to be included in the indicator profile** | **Economic interpretation** |
|---|---|---|
| Staying with the initial employer | The relationship with the initial employer was maintained throughout the entire period. | Stability of the first workplace |
| Continuous formal wage employment | At least one formal contract was in effect on every single day of the period. | Employment was maintained even when the employer changed |
| Formal employment on the reference date | There is at least one active official contract on this date. | Current employment, including re-entry into the workforce |
| Returning to work after a break | A break without a formal agreement has been confirmed, and official employment is recorded as of the reference date. | Recovery of formal employment |
| Scope of monitoring | The status of the relevant indicator has been determined | Completeness of data for interpreting the result |

**Sources.** Methodology developed for cohort observation. The approach of Andersen and Keiding (2002) was used to distinguish employment trajectories..

In Figure 1, a graduate's employment status is assessed based on three criteria at 3, 6, and 12 months following the reference date $t_0$. An individual who leaves their initial employer and moves to another employer without a break may be considered continuously formally employed. An individual who returns to formal employment after an authorized break—provided they are employed by the monitoring date—meets only the employment criterion for that specific monitoring date. Gaps in registry coverage or in the linking of individual records may hinder the determination of the relevant status.[15]




Y – confirmed positive case. F – confirmed negative case. U – unknown case.
Source. ILO (2013), Andersen va Keiding (2002).

**Figure 1 .** Procedure for verifying employment stability at 3, 6, and 12 months following the first formal job

**Source.** An observation scheme proposed in the article, based on the multi-state trajectory approach of Andersen and Keiding (2002). https://doi.org/10.1191/0962280202SM276ra

**Note.** $t_0$ — The date of the first formal employment recorded within 180 days after graduation. The diagram illustrates the research design; transition probabilities have not been calculated..

The number of participants who have reached the reference date is denoted as N. For each criterion, positive outcomes are counted as Y, negative outcomes as F, and indeterminate outcomes as U, such that N = Y + F + U. The lower bound is calculated as 100 × Y/N, the upper bound as 100 × (Y + U)/N, and the proportion of determined outcomes as 100 × (Y + F)/N. The width of the interval between these bounds is equal to 100 × U/N percentage points. Individuals who have not yet reached the reference date are excluded from N and are counted separately. If N is zero, the proportion is not calculated.

When examining the entire period, a confirmed break in employment is considered a negative outcome for the "continuous employment" criterion. If employment can only be verified for the reference date itself, the status of current employment is known, while continuity over the entire period may remain unknown. Therefore, U is determined separately for each criterion. No conclusions regarding unemployment are drawn for records that are unmatched or for which coverage cannot be verified.

Within a single, fully observed cohort, the difference between the proportion of individuals in continuous formal employment and the proportion remaining with their initial employer represents the share of those who changed employers without a break in service. The difference between the employment rate at the observation date and the rate of continuous employment indicates the share of individuals who returned to formal employment following a break. Earnings, working hours, and occupational alignment characterize the conditions following a change of employer. Legally mandated leave taken during the term of a contract is not considered a break.

In the main report, the impact of incomplete observation on the estimated proportions is presented through lower and upper bounds. Given a precise contract end date and well-defined censoring criteria, the time until departure from the initial employer can be

estimated using the Kaplan–Meier method (Kaplan & Meier, 1958). For outcomes following departure—such as entry into another formal job, registered self-employment, or documented unemployment—the cumulative probabilities of these mutually exclusive states are calculated using the Aalen–Johansen method (Aalen & Johansen, 1978). In cases where the loss of observation might be correlated with the risk of leaving employment, these estimates should be interpreted in conjunction with their lower and upper bounds.

These bounds indicate the potential impact of cases with indeterminate outcomes on the proportion. The calculation of confidence intervals for sampling error accounts for the sampling design, weights, and clustering by institution. Although administrative registers cover the entire cohort, missing records and classification errors are explicitly noted. If individual-level linked records are unavailable, it is not possible to calculate empirical proportions or confidence intervals.

Analyses broken down by occupation, region, and cohort account for age, gender, field of study, the timing of entry into employment, and the type of employment contract. Measuring the impact of a program requires a specific research design that compares groups with similar baseline conditions and accounts for the mechanism by which individuals are selected into the program.

In sensitivity analysis, alternative timeframes for entry into employment—such as 90 or 365 days—may be applied. For these recalculations, only graduation cohorts for which the full observation period is available are included. Outcomes at 3, 6, and 12 months are compared using a consistent rule for defining $t_0$. Because the composition of a cohort may shift as the timeframe for entering employment extends, the distribution of time-to-employment and the total cohort size are provided alongside the proportions. In sectors characterized by frequent short-term contracts or seasonal breaks, both the duration of these breaks and the proportion of continuous employment are reported.

Within the context of the transition to a green economy, this approach can also be applied to track graduates of vocational programs focused on energy efficiency, equipment maintenance, or resource recycling. In such cases, the environmental function of the job and the stability of the employment contract are specifically identified. The name of the sector alone does not provide a sufficient basis for confirming an environmental function. This type of distinction makes it possible to apply the criteria for "decent work" and social protection—as emphasized by the International Labour Organization—to the employment outcomes of green transition programs (International Labour Organization, 2016).

## 4. Conclusion and recommendation

To calculate initial employment stability, data on graduation and employment contract history are linked at the individual level. Starting in 2025, changes in the composition of vocational education institutions will be taken into account when comparing cohorts.

The monitoring report for vocational education institutions will present data on three key indicators: retention with the initial employer at 3, 6, and 12 months; continuity of formal wage employment; and formal employment status as of a specific reference date. For each outcome, the report will display the initial cohort size, the number of participants tracked up to the reference date, and the proportion of individuals with an unknown status. During the initial pilot phase, the consistency of institution and educational program codes across different years will be verified, and registry-based results for a selected group will be cross-referenced with data from a brief survey. Based on this, participants who changed employers, experienced gaps in employment, or dropped out of the monitoring scope will be analyzed separately.

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