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Short-run labour mobility in Ghana: Understanding the drivers with high-frequency panel data

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Abstract

This paper examines short-run employment transitions in Ghana using quarterly panel data from the Ghana Annual Household Income and Expenditure Survey (AHIES), 2022Q1–2024Q4. Focusing on economically active individuals aged 15–64, the study analyses transitions from non-income states into income-earning activities using population-averaged Generalised Estimating Equations (GEE) logit models. To characterise aggregate mobility patterns, the study first applies the Positive Labour Mobility (PLM) Index and then investigates the individual-level determinants of labour market entry. The findings reveal a highly segmented labour market in which most transitions from non-income states occur through self-employment rather than wage employment. Gender emerges as an important correlate of labour-market entry: women are less likely to transition into wage employment but more likely to enter self-employment and domestic work. Educational attainment is positively associated with entry into wage employment, while short-term adverse health conditions and household responsibilities are associated with lower probabilities of entering income-generating activities. The results also indicate substantial regional disparities in labour-market opportunities. In addition, the PLM Index reveals marked quarter-to-quarter variation in the quality of labour-market entry, suggesting that mobility outcomes are influenced by both structural constraints and temporal economic conditions. Seasonal patterns are evident, with labour-market entry generally strengthening toward the latter part of the year, although these patterns partly overlap with the period of macroeconomic adjustment associated with Ghana's economic crisis and IMF-supported reform programme. Overall, the findings highlight the importance of education, gender, and spatial inequalities in shaping labour-market entry and underscore the need for policies that expand access to productive employment opportunities while addressing barriers faced by vulnerable groups.

Keywords: Labour transitions, short-run, gender inequality, seasonality, high-frequency data, and Ghana.

Article history: Received: March 15, 2026 || Accepted: September 17, 2026

1. Introduction

Labour market transitions are a central feature of structural change in developing economies, reflecting how workers respond to evolving opportunities and constraints (ILO, 2025). In Ghana, workers frequently move between paid employment, household farming, informal self-employment,

unemployment, and inactivity. These shifts reflect the dual character of the Ghanaian labour market: on the one hand, structural transformation driven by demographic change, urbanization, and diversification away from agriculture; on the other, persistent vulnerabilities rooted in informality, limited job creation, and gendered divisions of labour (Atta-Ankomah et al., 2024). Understanding the nature, direction, and drivers of these transitions is therefore important for designing policies that promote inclusive growth, productive employment and household resilience.

Recent evidence suggests that labour market transitions in Ghana are shaped by segmentation and socio-demographic constraints (Lambon-Quayefio et al., 2023; Nimoh et al., 2020). Atta-Ankomah et al. (2024) demonstrate that, while some individuals experience upward mobility into wage employment or non-farm enterprises, many remain trapped in low-productivity household farming or unpaid domestic work. Women, in particular, face constrained pathways into income-earning activities and are more likely to transition through household-based employment before accessing non-farm employment. Although these studies provide valuable insights into labour-market mobility, they primarily focus on longer-term transitions and do not distinguish short-run inflows and outflows between labour-market states. Consequently, they are less suited to capturing the role of seasonal fluctuations, health shocks and other short-term factors that may shape employment transitions.

The growing availability of high-frequency panel data has created new opportunities to examine labour-market dynamics over shorter time horizons. Quarterly data are particularly useful for identifying how workers respond to seasonal cycles, health conditions and changing economic circumstances that may not be observable in annual surveys (Donovan et al., 2024; Bellmann et al., 2023). Such data are especially relevant in developing country settings, where employment is often characterised by informality, seasonality and vulnerability to economic shocks (Anas & Musah, 2025). In Ghana, the period since 2022 has been marked by elevated inflation, fiscal adjustment measures and the implementation of an IMF-supported economic reform programme. These developments provide a particularly relevant context for examining labour-market transitions using high-frequency data.

This paper provides one of the first high-frequency analyses of labour-market transitions in Ghana using the Annual Household Income and Expenditure Survey (AHIES) quarterly micro-panel data covering the period 2022Q1 to 2024Q4. The analysis focuses on positive labour-market transitions, defined as movements from non-income states, including unemployment, inactivity and unpaid work, into income-earning employment. Positive mobility in this context refers to entry into income-generating activity and may not necessarily represent an improvement in job quality, earnings, or overall welfare. Therefore, the focus of this study is on identifying the factors associated with successful entry into income-earning activities.

Specifically, the study addresses three research questions:

1. What factors are associated with short-run transitions in the Ghanaian labour market?
2. To what extent are short-run transitions related to structural characteristics such as gender, education, spatial location and health?
3. How do seasonal dynamics influence short-term labour-market mobility?

To answer these questions, the study adopts a two-stage empirical strategy. First, it employs the Positive Labour Mobility (PLM) Index to characterise aggregate patterns of entry into income-earning activities across survey waves. Second, it estimates the determinants of labour-market entry transitions using a population-averaged Generalised Estimating Equations (GEE) framework, which accounts for the repeated-observation structure of the data while focusing on average association at the population level.

The findings suggest that transitions out of non-income status are shaped by multiple structural constraints rather than by a single, integrated pathway into employment. Gender, education, spatial

location and health emerge as key correlates of labour market entry, while seasonal factors also play a significant role in shaping transition patterns. These findings highlight the importance of policies that address persistent structural barriers alongside efforts to expand access to productive employment opportunities. They also underscore the value of incorporating intra-annual dynamics into labour market analysis.

The paper makes two main contributions to the literature. First, it provides high-frequency evidence on labour-market transitions in a low-income country context, addressing an important gap in the literature that has largely relied on cross-sectional data or low-frequency panel surveys. Second, it extends the application of the Positive Labour Mobility Index to a quarterly panel setting, allowing for a more detailed assessment of short-term labour-market dynamics and seasonal employment transitions.

2. Literature Review and Conceptual Underpinnings

2.1 *Theoretical Perspectives on Labour Market Transitions*

Two major theoretical traditions underpin analyses of labour market transitions in developing economies: human capital theory and labour market segmentation theory. Together, these frameworks provide complementary lenses for understanding why individuals enter different employment states and why transitions across these states are unevenly distributed.

Human capital theory, developed by Schultz (1961) and formalised by Mincer (1974), views labour market outcomes as the result of individual investments in education, skills, and health. Within this framework, education enhances productivity, raises expected earnings, and improves employability, while good health increases labour supply and job stability. As a result, individuals with higher human capital are expected to face fewer barriers to labour market entry, experience faster transitions into income-earning activities—particularly wage employment—and enjoy more stable wage employment trajectories over time. Human capital theory has been widely applied to explain wage differentials, occupational choice, and employment dynamics across both developed and developing economies.

However, extensive evidence from low- and middle-income countries suggests that human capital alone is insufficient to explain observed labour market outcomes. Labour market segmentation theory, originating from the work of Doeringer and Piore (1971), challenges the notion of a unified labour market in which workers are allocated solely based on productivity. Instead, this theory posits that labour markets are divided into distinct segments, such as formal wage employment, informal self-employment, and unpaid or subsistence activities, each characterised by different entry barriers, institutional rules, returns, and degrees of security. Movement across these segments is often limited, resulting in persistent inequalities in employment quality and earnings.

In the context of African labour markets, segmentation has been shown to arise from a combination of institutional constraints, social norms, spatial inequalities, and unequal access to productive resources. Empirical studies document that women, rural residents, and individuals with lower levels of education are disproportionately concentrated in low-return segments such as household enterprises and unpaid domestic work, even after controlling for observable productivity-related characteristics (Fox & Gaal, 2008; Filmer & Fox, 2014). These patterns suggest that employment outcomes reflect structural constraints rather than individual choice alone.

Recent theoretical and empirical contributions increasingly view human capital and segmentation as interacting mechanisms rather than competing explanations. While education, skills, and health shape individuals' potential labour market outcomes, the extent to which these endowments translate into improved employment depends on the structure of labour demand and the accessibility of higher-return segments. Gender norms, household responsibilities, health shocks, and spatial location mediate the returns to human capital, shaping both the direction and persistence of labour market transitions (Duffo, 2011; World Bank, 2012).

Taken together, these theoretical perspectives underscore that labour market transitions in developing economies are best understood as outcomes of both individual endowments and segmented opportunity structures. This integrated view provides a foundation for analysing why transitions into income-earning activities remain uneven, why certain employment states exhibit persistence, and why upward mobility into wage employment is limited for large segments of the workforce.

2.2 *Employment Transitions and Labour Market Segmentation in Africa*

Labour markets in Africa are widely characterised by limited formal wage employment, high informality, and pronounced segmentation across employment types. Rather than operating as unified markets in which workers smoothly transition into jobs based on productivity alone, African labour markets are segmented into wage employment, self-employment, and unpaid or domestic work, each governed by distinct entry barriers and returns (Fox & Gaal, 2008).

Recent contributions emphasise the importance of analysing employment transitions, particularly movements from non-income or inactive states into different forms of work, as a way of understanding labour-market functioning in low- and middle-income countries (Atta-Ankomah et al., 2024). This transition-based perspective highlights that entry into wage employment is not merely delayed but often structurally constrained, while self-employment and domestic work serve as alternatives, and frequently, residual pathways into economic activity.

Segmentation is therefore not only an outcome of individual choice but reflects broader constraints related to education, health, gender norms, spatial location, and institutional context. In this sense, the observed inequalities in the labour-market dynamics in Africa reflect unequal access to enabling resources rather than differences in preferences alone.

2.3 *Labour Market Structure in Ghana*

Research on labour market dynamics in low- and middle-income countries has increasingly emphasised the relationship between structural transformation and employment outcomes. A central insight from this literature is that productivity-enhancing labour reallocation, particularly movement out of low-productivity agriculture into manufacturing and services, is a key mechanism for sustained growth and poverty reduction. Earlier contributions stress the existence of large productivity gaps across sectors and highlight the importance of inter-sectoral labour reallocation for aggregate productivity growth. More recent work further emphasises how globalisation, evolving trade structures, and domestic institutional constraints jointly shape labour allocation patterns across sectors (McMillan et al., 2014).

Within Sub-Saharan Africa (SSA), employment growth has largely occurred outside formal wage employment, with informal and household enterprises absorbing most new labour market entrants (Danquah et al., 2021). This pattern has contributed to a labour market characterised by limited formal job creation alongside widespread engagement in low-productivity self-employment and family-based activities. Evidence from household surveys indicates that these dynamics are not unique to SSA but are particularly persistent in the region due to structural constraints such as limited industrial expansion, weak firm growth, and constrained access to capital and markets (Rud & Trapeznikova, 2021; Danquah et al., 2021).

Ghana's labour market reflects many of these broader structural features. While labour-force participation remains relatively high, wage employment accounts for a relatively small share of total employment, with most workers engaged in self-employment or informal activities. National and international evidence consistently shows that informal employment remains dominant, particularly among women and rural residents (Deon & Louis, 2014). Economic growth and structural transformation in Ghana have therefore not translated into proportional growth in formal wage employment (Lambon-Quayefio et al., 2023). Instead, labour absorption has occurred largely through informal self-employment and household-based activities, especially in agriculture, petty trade, and

services (Baah-Boateng, 2016a). Youth and women are particularly affected by these dynamics, often experiencing longer and more uncertain transitions from inactivity into stable income-generating work.

Country-specific studies further show that Ghana's labour market is characterized by substantial earnings disparities between formal and informal employment, alongside continued reliance on household enterprises as a primary source of employment (Lambon-Quayefio et al., 2023; Twumasi Baffour & Abbey, 2023; Baah-Boateng, 2016). While structural transformation has proceeded through gradual diversification into services and non-farm activities, transitions into stable wage employment remain limited for large segments of the population (Lambon-Quayefio et al., 2023). These findings underscore that sectoral reallocation alone does not guarantee improvements in job quality without complementary changes in firm dynamics, worker skills, infrastructure, and market access.

2.4 Determinants of Employment Transitions

A strand of the empirical literature on the determinants of employment transitions focuses on micro-level labour market transitions, examining how individuals move between employment states such as wage employment, self-employment, unpaid domestic work, and inactivity. Evidence across Sub-Saharan Africa shows that labour markets remain segmented, with household enterprises and informal activities often functioning as fallback options rather than stepping stones into higher-productivity employment. Persistent segmentation reflects differences in access to capital, skills, networks, and institutional opportunities, limiting upward mobility for large segments of the workforce.

A large body of literature further documents persistent gender disparities in African labour markets. Women are consistently less likely to enter wage employment and more likely to engage in self-employment or unpaid domestic work, even after controlling for education and labour market experience (Filmer & Fox, 2014). These patterns are closely linked to gender norms, unequal access to productive resources, and the unequal distribution of household responsibilities. Empirical evidence for Ghana similarly shows that women are disproportionately concentrated in household enterprises and unpaid work and face structural barriers to transitioning into wage employment (Atta-Ankomah et al., 2024). As a result, employment trajectories often differ systematically by gender, with women experiencing slower and less stable transitions into higher-productivity employment.

Health and household constraints further shape employment entry and mobility. Poor health status and short-term health shocks can reduce labour-market participation, delay job search, and limit the ability to sustain income-generating activities, particularly in contexts characterised by limited health insurance coverage or weak social protection systems (Strauss et al., 1998). Household characteristics also play an important role. Larger household size, childcare responsibilities, and caregiving obligations, disproportionately borne by women, reduce labour market availability and geographic mobility, thereby lowering the likelihood of entry into wage employment (Atta-Ankomah et al., 2024). These constraints reinforce segmentation by restricting the set of feasible employment choices available to individuals.

Human capital plays a central but uneven role in shaping employment transitions. Education significantly increases the likelihood of entering wage employment and reduces transitions into unpaid domestic work by improving access to formal sector opportunities. However, where formal job creation remains limited, even relatively educated individuals may be channelled into self-employment or informal activities, reflecting the interaction between individual endowments and broader structural constraints (Falco et al., 2011). Measurement challenges further complicate the analysis of transitions, as differences in survey frequency and employment definitions may obscure short-term mobility, seasonal employment patterns, and temporary withdrawals from the labour force (Rud & Trapeznikova, 2021). Consequently, understanding employment transitions requires attention to the joint influence of gender, household constraints, health conditions, and human

capital within segmented labour markets.

2.5 Spatial Inequalities and Seasonality

A growing literature highlights the importance of spatial and temporal dimensions in labour market transitions (Bellmann et al., 2023). In Ghana, regional disparities in infrastructure, market access, electricity provision, and financial services significantly influence employment opportunities and the capacity of workers to transition out of agriculture into higher-return non-farm activities. Rural structural transformation studies show that persistent local constraints slow movement into productive employment, reinforcing spatial inequalities in income and labour outcomes (Honorati & Johansson de Silva, 2016).

Seasonality represents another critical but often underexplored dimension of employment dynamics. Agricultural cycles, temporary migration, and demand fluctuations generate short-lived employment spells that annual surveys frequently fail to capture. High-frequency survey data reveal that individuals may cycle rapidly between employment, inactivity, and unemployment within short periods, suggesting that labour market vulnerability is partly driven by instability rather than persistent exclusion. Quarterly panel surveys, such as Ghana's Annual Household Income and Expenditure Survey (AHIES), provide an opportunity to observe these short-run movements and distinguish between seasonal adjustment and sustained labour market transitions.

Empirical studies examining macro shocks and localised economic changes further show that external shocks, including inflationary pressures, health shocks, and localized economic booms, can alter entry probabilities into different employment states. However, the effects of such shocks are heterogeneous across regions and worker groups, reinforcing the importance of analysing labour mobility at sufficiently high frequency.

2.6 Research Gaps for this Study

Despite substantial progress in understanding labour market dynamics in Ghana and SSA, several gaps remain. First, few studies exploit nationally representative quarterly panel data to distinguish seasonal or transitory employment movements from persistent transitions. As a result, the high-frequency design of the AHIES remains underutilised in academic research. Second, while existing Ghanaian studies document labour market segmentation and gender disparities, they rarely examine short-run responsiveness of employment transitions to shocks, including health events, inflationary pressures, and programmatic interventions, at a quarterly frequency. Third, methodological adaptations of labour mobility measures for high-frequency panels, particularly the decomposition of mobility into inflows and outflows by origin states, such as unemployment, inactivity, and unpaid work, remain limited.

This study addresses these gaps by adapting the Positive Labour Mobility Index to quarterly AHIES micro-panels and estimating population-averaged models that explicitly incorporate gender, household constraints, and short-term shocks. By focusing on short-run employment transitions, the study contributes to understanding resilience and vulnerability in Ghana's labour market and provides policy-relevant evidence on how structural and household-level constraints interact to shape employment mobility.

Drawing on the extant literature, the present study examines employment transitions as outcomes shaped by segmentation, structural access, and individual constraints, rather than as uniform movements into employment. By focusing on transitions from non-income status into wage employment, self-employment, and domestic work, the study contributes to a growing literature that emphasises inequality in labour-market entry pathways in African economies.

3. Data and Methodology

3.1 Data Source

This study uses microdata from the Annual Household Income and Expenditure Survey (AHIES) conducted by the Ghana Statistical Service. The AHIES is a nationally representative high-frequency survey designed to monitor household welfare, labour market outcomes, and income dynamics across Ghana. Although the survey is named the Annual Household Income and Expenditure Survey (AHIES), it is implemented through quarterly data-collection rounds. The survey follows a rotating panel design, in which households are interviewed quarterly. For this study, data from 2022Q1 to 2024Q4¹ are used, covering twelve survey rounds. Each survey round includes approximately 15,000 households and more than 50,000 individuals, allowing individuals to be tracked across multiple waves. Compared with earlier household surveys in Ghana, such as the Ghana Living Standards Survey (GLSS) and the Ghana Socioeconomic Panel Survey (GSPS), the AHIES offers several advantages. First, the quarterly frequency allows the analysis of short-run labour market adjustments. Second, the rotating panel structure permits the tracking of individual labour-market transitions over time. Third, the survey collects high-frequency, detailed information on employment status, income sources, household characteristics, and shocks such as health events. The analysis focuses on individuals aged 15–64, consistent with the Ghana Statistical Service's definition of the economically active population.

3.1.1 Panel Tracking, Matching Procedure, and Attrition

Since the Ghana AHIES utilise a rotating panel design, constructing a clean longitudinal sample requires a strict matching protocol and a clear accounting of attrition. To track individuals across waves, we applied a matching protocol using unique person identification numbers, validated against time-invariant demographic characteristics, including gender, birth year, and region, to ensure correct linkages. Appendix Table A1 reports sample linkage and attrition across consecutive survey waves. Attrition hovers at a stable average of 13.5% between Wave 1 and Wave 11 and rises substantially to 59% in the final wave because of the rotating-panel design. Consequently, while the absolute number of successfully linked observations falls in the final wave, the structural sample remains highly representative of the broader active population, mitigating concerns of non-random selection bias.

3.2 Definition of Labour Market States

Labour Market dynamics are examined using four mutually exclusive labour market states. Wage employment refers to individuals engaged in paid employment for an employer. Self-employment includes individuals operating household enterprises, comprising both farm and non-farm businesses. Domestic work refers to individuals engaged in paid domestic services activities, while non-income states include individuals who are unemployed, inactive, or engaged in unpaid domestic work. For analytical purposes, the latter category aggregates unemployment, inactivity, and unpaid work into a single non-income state, reflecting the absence of income-earning activity. Although behavioural differences may exist between unemployment and inactivity, descriptive evidence presented in Appendix Tables A2 and A3 indicates broadly similar patterns of movement into income-earning activities. However, to ascertain the sensitivity of the analysis to this classification, separate models are estimated for unemployment and inactivity origin. Transitions between labour-market states are measured between consecutive survey quarters.

3.3 Positive Labour Mobility Index

To quantify labour market transitions, this study adapts the Positive Labour Mobility (PLM) Index originally developed by Symeonaki and Stamatopoulou (2020). Unlike traditional, non-directional

1. The period analyzed coincides with macroeconomic adjustment following the 2022 crisis; therefore, observed dynamics may partly reflect cyclical conditions.

metrics (such as the Prais–Bibby mobility index or Prais–Shorrock Indices), which measure overall mobility without distinguishing direction, the PLM index isolates transitions representing a distinct directional change in labour market status. In the context of this study, positive mobility refers to transitions away from a baseline origin state of non-income (comprising unemployment, economic inactivity, and unpaid work) into active income-earning destinations (wage employment, self-employment and paid domestic work). However, applying a standard mobility index blindly to Ghana’s segmented labour market introduces conceptual bias. As noted by Atta-Ankomah et al. (2024), transitions into self-employment frequently reflect necessity-driven, informal survival adjustments rather than genuine upward progression in job quality. Similarly, paid domestic work remains highly precarious and economically vulnerable.

To reflect the segmented structure of Ghana’s labour market, we adapt Symeonaki and Stam-atopoulou’s continuous probability index by applying structural normative weights (ω_j) to the destination labour states. It is instructive to note here that the normative analytical weights are intended to reflect average labour market security rather than individual welfare outcomes. Formally, the Weighted-Positive Labour Mobility ($W - PLM_t$) for any given quarter t is expressed as:

The Positive Labour Mobility Index is defined as:

$$PLMI_t = \frac{1}{N} \sum_{i=1}^N \sum_{j \in P} \omega_j \cdot I(S_{i,t} = j \mid S_{i,t-1} = 0) \quad (1)$$

Where N is the total count of individuals who successfully transitioned out of the non-income state ($S_{i,t-1} = 0$) during quarter t . $I(\cdot)$ is an indicator function equal to 1 if individual i transitioned into destination state j , and 0 otherwise. $j \in P$ represents the set of income-earning destination states: formal wage employment, self-employment, and paid domestic work. ω_j represents the normative structural weight assigned to each destination based on its economic security, where formal wage employment indicates an upward trajectory (+1), structural self-employment reflects a neutral adjustment margin (0), and precarious domestic work signals a downward or vulnerable integration (-1). By aggregating these weighted individual trajectories, the index collapses a multidimensional gross-flow matrix into a single, time-varying scalar score bounded between -1 and +1. A positive index score signals an upward structural transformation, while a negative score indicates a market where individuals leaving inactivity are disproportionately trapped in insecure tiers. Leveraging this framework on a quarterly panel allows us to map short-run, intra-annual velocity spikes and seasonal adjustments that are inherently smoothed out in traditional annual indices.

3.4 3.4 Econometric Model

To examine the determinants of income-generating transitions, the study estimates population-averaged logit models using the Generalised Estimating Equations (GEE) framework.

$$\Pr(Y_{it} = 1) = F(\beta_0 + \beta X_{it} + \epsilon_{it}) \quad (2)$$

where Y_{it} is a binary outcome indicating whether individual i transitions from a non-income state in period $t - 1$ to an income-earning state in period t . X_{it} is a vector of explanatory variables, including gender, age, education, rural/urban residence, marital status, household size, household headship, and health-related hospitalisation. $F(\cdot)$ represents the logistic cumulative distribution function. ϵ_{it} is an error term capturing unobserved factors.

The GEE approach is appropriate for this study for several reasons. First, it accounts for within-individual correlation across repeated observations, which arises from the panel structure of the data. Second, it yields population-averaged estimates, which are consistent with the study’s objective of examining labour-market transition behaviour at the aggregate level. Third, GEE performs well in

relatively short panel datasets, where traditional fixed-effects models may suffer from an incidental parameter problem. Fourth, the estimator can be applied to unbalanced panel data generated by sample attrition and the rotating-panel design of the survey. Inference is based on robust sandwich standard errors, which remain valid even when the working correlation structure is misspecified (Liang & Zeger, 1986). It should be noted, however, that GEE does not control for unobserved time-invariant individual heterogeneity and therefore identifies population-averaged associations rather than causal effects. The baseline specification assumes an exchangeable working correlation structure, reflecting the expectation that observations from the same individual are correlated over time. As a robustness check, the models are re-estimated using a probit link function and an independent working correlation structure.

3.5 Explanatory Variables

The explanatory variables capture individual characteristics, household constraints, health conditions, spatial location, and season variation. Demographic characteristics include gender, age and marital status. Age enters the model in both linear and quadratic forms to allow for non-linear life-cycle effects. Human capital is measured using four education categories: no education, pre-secondary education, secondary education and tertiary education.

Household constraints are proxied by household size and female household headship. Health shocks are captured using an indicator for recent hospitalisation within the past three months. Spatial heterogeneity is controlled for using ecological zones. The ecological zones were identified following the Ghana Statistical Service classification. The Southern Zone comprises Greater Accra, Central, and Western Regions; the Middle Zone comprises Ashanti, Eastern, Bono, Bono East, Ahafo Regions and Western North; and the Northern Zone comprises Northern, North East, Savannah, Upper East, Upper West and Oti Regions. Individuals’ religious affiliation (categorised as Christian, Islamic, Traditional/No religion) is used to capture unobserved social networks and informal institutional capital. In Ghana, religious institutions function as essential socio-economic hubs that facilitate labour market matching through informal network referrals. Finally, quarterly dummy variables are included to capture seasonal variation in labour demand and employment entry. To ensure that our seasonality indicator captures only recurrent seasonal patterns, we also control for period-specific macroeconomic developments, given that the study period coincides with Ghana’s macroeconomic crisis, debt restructuring and the IMF-supported adjustment programme. Table 1 presents the definitions, measurements, and summary statistics for all variables used in the analysis.

Table 1. Variables Definitions, Measurements, and Summary Statistics

Variable	Definition	Measurement	Mean (Std. Dev)
<i>Dependent variables</i>			
Wage employment	Transition into wage employment from a non-income state	1 if transition occurs from a non-income earning state at time $t - 1$ into wage employment at time t , 0 otherwise	0.025 (0.16)
Self-employment	Transition into self-employment from a non-income state	1 if transition occurs from a non-income earning state at time $t - 1$ into self-employment at time t , 0 otherwise	0.072 (0.26)
Domestic work	Transition into paid domestic work from a non-income state	1 if transition occurs from a non-income earning state at time $t - 1$ into paid domestic work at time t , 0 otherwise	0.019 (0.14)
<i>Independent variables</i>			

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Table 1: Variables Definitions, Measurements, and Summary Statistics – Continued

Variable	Definition	Measurement	Mean (Std. Dev)
Age	How old is the respondent in completed years	Age in completed years	32.910 (13.75)
<i>Education:</i>			
No education	An individual has no formal education	1 if no education, 0 otherwise	0.214 (0.41)
Pre-Secondary	The level of education is Nursery, Kindergarten, Primary, JHS/JSS or Middle school	1 if the level of education is Nursery, Kindergarten, Primary, JHS/JSS or Middle school, 0 otherwise	0.458 (0.50)
Secondary	The level of education is Secondary, Vocational/Technical	1 if the level of education is Secondary, Vocational/Technical, 0 otherwise	0.238 (0.43)
Tertiary	The level of education is HND, Bachelor's, Master's, or PhD	1 if the level of education is Tertiary-HND, Bachelor's, Master's, or PhD, 0 otherwise	0.091 (0.29)
Married	Marital status	Value is 1 if respondent is married, 0 otherwise	0.347 (0.47)
Household size	Household size	Number of people in a household	3.7 (2.00)
Gender of household head	Individual is a household head and a female	1 if respondent is a household head and a female, 0 otherwise	0.23 (0.42)
Hospitalisation	Whether the individual has been admitted to a hospital or health facility in the past 3 months	1 if admitted to a hospital or health facility in the past 3 months	0.01 (0.072)
<i>Religious affiliation:</i>			
Christian	The individual religious denomination is Christianity	1 if Christianity, 0 otherwise	0.71 (0.45)
Islam	The individual religious denomination is Islam	1 if Islam, 0 otherwise	0.23 (0.42)
Other religion	Traditionalist, No religion and others	1 if traditionalist, have no religion or other religions, 0 otherwise	0.062 (0.24)
<i>Ecological Zones:</i>			
Southern zone	Greater Accra, Western and Central Regions	1 if southern zone, 0 otherwise.	0.212 (0.41)
Middle zone	Ashanti, Eastern, Volta, Bono, Bono East, Western North, Ahafo, or Oti Regions	1 if middle zone, 0 otherwise	0.521 (0.50)

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Table 1: Variables Definitions, Measurements, and Summary Statistics – Continued

Variable	Definition	Measurement	Mean (Std. Dev)
Northern zone	Northern, Savannah, North-East, Upper East or Upper West.	1 if Northern zone, 0 otherwise	0.266 (0.44)
<i>Seasonality:</i>			
First Quarter	2022Q1, 2023Q5 or 2024Q9	1 if first quarter, 0 otherwise	0.277 (0.45)
Second Quarter	2022Q2, 2023Q6 or 2024Q10	1 if second quarter, 0 otherwise	0.275 (0.45)
Third Quarter	2022Q3, 2023Q7 or 2024Q11	1 if third quarter, 0 otherwise	0.267 (0.44)
Fourth Quarter	2022Q4, 2023Q8 or 2024Q12	1 if fourth quarter, 0 otherwise	0.181 (0.39)

4. Results and Discussion

4.1 Descriptive Results of Average Gross Worker Flows in Ghana

Figure 1 depicts the quarterly average gross worker flows across four labour market states in Ghana—wage work, self-employment, domestic work, and non-income states—over the period 2022Q1–2024Q4. The figures inside each rectangle (diagonal corners) are the average stock of individuals in each state, while the direction of the arrows indicates gross transitions from one state to another, with numbers next to the arrows denoting transition counts and corresponding transition rates (in parentheses). The broken/dashed arrows capture transitions into income-generating states (i.e., transitions from non-income-earning states to income-earning states).

Notes: Numbers within the rectangles indicate the average stock of workers in each state; the numbers next to the arrows indicate the quarterly average worker flows. Worker flows are expressed as a percentage of the average working age population in parentheses. Based on AHIES 2022:1–2024:4. Non-income states comprise unemployment, inactivity and unpaid work.

From the descriptives in Figure 1, three features stand out. First, non-income states (unemployment or inactivity) dominate the Ghanaian labour market in terms of stock size over the study period. On average, about 11,796 individuals are observed in non-income states each quarter, compared with 9,792 self-employed workers, 5,510 wage workers, and 1,665 domestic workers. This highlights the large pool of individuals either unemployed or outside the labour force, underscoring the centrality of inactivity and vulnerability in Ghana’s labour market structure.

Second, labour market mobility is substantial, but highly asymmetric across states. Flows into income-earning activities are sizeable, particularly from non-income states. Each quarter, approximately 1,931 individuals (16%) transition from non-income states into self-employment, highlighting that self-employment plays a central role as an entry point for inactivity in the Ghanaian labour market. On the other hand, transitions from non-income states into wage employment and domestic work are much smaller, amounting to only 6

Third, self-employment acts as a central hub in the labour market, absorbing large inflows but also experiencing significant outflows. While self-employment receives substantial inflows from non-income states, it also sends a considerable number of workers back into non-income states—about 1,774 individuals (18%) each quarter. This high rate of bidirectional flow points to a high degree of instability within self-employment and is also consistent with the possibility that a substantial share of self-employment may be necessity-driven. It further highlights the high mortality rate of self-employment businesses and the need for policy interventions to support these businesses.

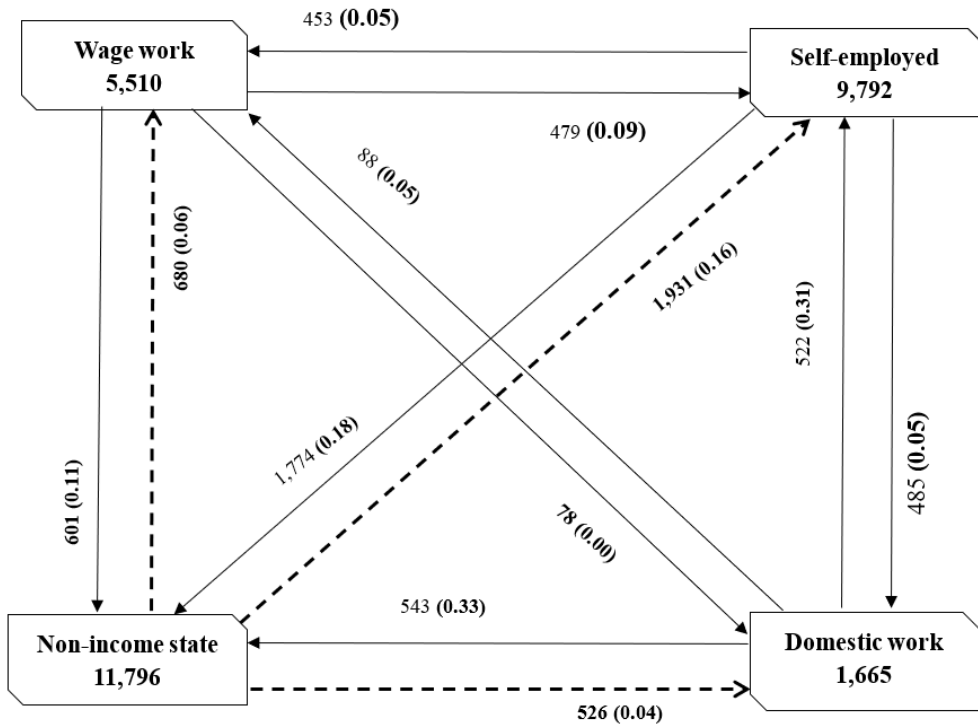


Figure 1. Quarterly Average Gross Worker Flows (2022:1–2024:4), 15–64 age group.

By contrast, wage employment appears more selective and persistent. Outflows from wage work into non-income states amount to 601 individuals (11%) per quarter, while flows into both self-employment and domestic work remain relatively low (9%). This suggests that wage jobs, once obtained, are comparatively more stable than other forms of work, probably due to the formality, although they remain accessible to only a limited segment of the labour force.

Domestic work is the smallest state in terms of stock size over the period considered and is characterised by high turnover relative to its size. Despite an average stock of only 1,665 individuals, domestic work records notable transitions both into and out of the state. Each quarter, about 522 individuals (31%) exit domestic work into self-employment, while 485 individuals (5%) move into domestic work from self-employment. However, transitions between domestic work and wage employment remain limited, indicating weak upward mobility from domestic work into more formal employment.

Overall, while the time-aggregated gross flows in Figure 1 reveal a structural labour market marked by strong state dependence and segmented mobility, they present a static, three-year historical average. These averages obscure high-frequency temporal shifts, seasonal shocks, and the directional quality of structural transformation across the panel timeline.

To resolve this limitation and deliver a precise macro-tracking tool, we translate these multidimensional, individual transitions into the quarter Positive Labour Mobility (PLM) Index reported in Table 2.

Table 2. Quarterly Distribution of Transitions from Non-Income States and Computed PLM Index (2022:1-2024:4)

Quarter (<i>t</i>)	Total Movers (<i>N</i>)	Transition to Wage employment (%)	Transition to self- employment (%)	Transition to domestic work	Computed PLM Index
2022: Q1	0	–	–	–	–
2022: Q2	2117	21.965	59.660	18.375	0.036
2022: Q3	2609	20.966	59.946	19.088	0.019
2022: Q4	2190	17.671	60.183	22.146	-0.045
2023: Q1	2145	27.739	51.655	20.606	0.071
2023: Q2	1407	13.362	67.164	19.474	-0.061
2023: Q3	1155	18.615	58.874	22.511	-0.039
2023: Q4	1584	28.346	49.116	22.538	0.058
2024: Q1	1507	27.538	52.754	19.708	0.078
2024: Q2	954	25.996	54.927	19.078	0.069
2024: Q3	883	21.404	58.097	20.498	0.009
2024: Q4	2172	25.599	64.042	10.359	0.152

Note: 2022 Quarter 1 values are omitted as it serves as the baseline origin quarter for panel transitions

The results show considerable variation in the quality of labour-market entry over the study period. The PLM Index records negative values in 2022 (Q4: -0.045), 2023 (Q2: -0.061), and 2023 (Q3: -0.039), indicating periods when transitions were concentrated into relatively less desirable forms of employment entry. The decline observed in 2023: Q2 is particularly notable. Although self-employment accounted for 67.2% of all observed transitions during this quarter, entry into wage employment fell to 13.4%, the lowest proportion recorded during the study period, resulting in a negative PLM score. In contrast, the index reached its highest value in 2024 (Q4: 0.152). This improvement reflects a combination of increased transitions into wage employment (25.60%), sustained entry into self-employment (64.04%), and a reduction in transitions into paid domestic work (10.36%). Together, these patterns suggest an improvement in the composition of labour-market entry during the latter part of the observation period.

While these quarterly fluctuations point to substantial variation in labour-market transitions, they should be interpreted with this limitation in mind. The twelve-quarter observation window coincides with a period of significant macroeconomic adjustment in Ghana, including elevated inflation, debt restructuring, and the implementation of the IMF-supported Extended Credit Facility programme. Consequently, the observed quarter-to-quarter variation may reflect not only recurring seasonal influences but also year-specific macroeconomic shocks. Thus, the quarterly patterns identified here should therefore be interpreted as reflecting a combination of seasonal dynamics conditioned on broader economic conditions.

Overall, whereas the transition matrices describe the direction of labour-market movements, the PLM Index provides a summary measure of the quality of labour-market entry over time. However, the index itself does not reveal the individual characteristics associated with these transitions. To examine the socio-demographic and household-level factors shaping labour-market entry, the next section estimates population-averaged GEE models.

4.2 Determinants of Positive Labour Transitions

Table 3 presents the average marginal effects from the GEE logit models estimating transitions from a non-income-earning state into wage employment, self-employment, and domestic work. Since the estimates are reported as average marginal effects, the coefficients indicate the percentage-point change in the probability of transitioning into a given employment category associated with a one-unit change in the explanatory variable, holding other factors constant. The discussion focuses on the extended specification, which incorporates quarter-specific and year-specific controls.

Table 3. Average Marginal Effects from GEE Logit Models: Determinants of transitions into income-earning activities

	Basic Model			Extended Model		
	Wage	Self	Domestic	Wage	Self	Domestic
Gender (1 if female, 0 otherwise)	−0.005*** (0.001)	0.008*** (0.001)	0.004*** (0.001)	−0.006*** (0.001)	0.007*** (0.001)	0.004*** (0.001)
Age	0.003*** (0.000)	0.002*** (0.000)	−0.001*** (0.000)	0.003*** (0.000)	0.002*** (0.000)	−0.001*** (0.000)
Age Squared	−0.000*** (0.000)	−0.000*** (0.000)	0.000*** (0.000)	−0.000*** (0.000)	−0.000*** (0.000)	0.000*** (0.000)
Location (1 if Rural, 0 otherwise)	0.006*** (0.001)	0.018*** (0.001)	0.005*** (0.001)	0.007*** (0.001)	0.017*** (0.001)	0.005*** (0.001)
Marital status (1 if married, 0 otherwise)	0.010*** (0.001)	0.003*** (0.001)	0.003*** (0.001)	0.009*** (0.001)	0.004*** (0.001)	0.003*** (0.001)
Household Size	−0.000 (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.000 (0.000)	0.001*** (0.000)	0.001*** (0.000)
Gender of household head (1 if female, 0 otherwise)	−0.007*** (0.001)	0.004** (0.002)	−0.009*** (0.002)	−0.006*** (0.001)	0.005*** (0.002)	−0.009*** (0.002)
Hospitalisation (1 if admitted to a hospital or health facility in the past 3 months)	−0.006 (0.005)	−0.005 (0.006)	−0.003 (0.004)	−0.004 (0.005)	−0.002 (0.006)	−0.003 (0.004)
Educational background (Base = No formal education)						
Pre-Secondary	0.007*** (0.001)	0.007*** (0.002)	0.002 (0.001)	0.008*** (0.001)	0.010*** (0.002)	0.002* (0.001)
Secondary	0.006*** (0.001)	−0.006*** (0.001)	−0.002*** (0.001)	0.006*** (0.001)	−0.006*** (0.001)	−0.002*** (0.001)
Tertiary	0.017*** (0.001)	−0.044*** (0.006)	−0.007* (0.004)	0.017*** (0.001)	−0.042*** (0.006)	−0.007* (0.004)
Religious affiliation (Base = other religions)						
Christian	0.000 (0.001)	−0.004*** (0.001)	0.001 (0.001)	0.000 (0.001)	−0.004** (0.002)	0.001 (0.001)
Islam	−0.001 (0.001)	−0.006*** (0.002)	0.003*** (0.001)	−0.001 (0.001)	−0.006*** (0.002)	0.003*** (0.001)
Ecological Zones (Base = Southern Zone)						
Middle Zone	−0.005*** (0.001)	0.014*** (0.001)	0.005*** (0.001)	−0.005*** (0.001)	0.013*** (0.001)	0.005*** (0.001)
Northern Zone	−0.011*** (0.001)	0.029*** (0.001)	0.005*** (0.001)	−0.012*** (0.001)	0.027*** (0.001)	0.004*** (0.001)
Seasonality (Base = First Quarter of the year)						
Second Quarter				0.005*** (0.001)	0.015*** (0.001)	0.005*** (0.001)
Third Quarter				0.006*** (0.001)	0.017*** (0.001)	0.006*** (0.001)
Fourth Quarter				0.019*** (0.001)	0.045*** (0.001)	0.010*** (0.001)
Year-Specific Shocks (Base = 2022)						
Year – 2023				0.004*** (0.001)	0.016*** (0.001)	0.002*** (0.001)

Continued on next page

Table 3: Average Marginal Effects from GEE Logit Models – Continued

	Basic Model			Extended Model		
	Wage	Self	Domestic	Wage	Self	Domestic
Year – 2024				0.005*** (0.001)	0.003*** (0.001)	0.001** (0.001)
Observations	43589	43589	43589	43589	43589	43589

Notes: Estimates are based on population-averaged panel models using the Generalised Estimating Equations (GEE) framework with a logit link function. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. The dependent variables indicate transitions from a non-income-earning state at time $t - 1$ to wage employment, self-employment, or domestic work at time t .

Gender is an important determinant of labour-market entry. Women are significantly less likely than men to transition into wage employment but more likely to enter self-employment and domestic work. Specifically, being female reduces the probability of entering wage employment by 0.6 percentage points while increasing the probability of entering self-employment and domestic work by 0.7 and 0.4 percentage points, respectively. These findings suggest the continued presence of gender segmentation in Ghana’s labour market, where women remain disproportionately concentrated in informal and household-based economic activities.

The gender of the household head also matters. Female individuals who are also household heads are less likely to transition into wage employment and domestic work but are slightly more likely to enter self-employment. These results may reflect differences in household livelihood strategies and resource constraints across household types.

Age exhibits a non-linear relationship with labour-market transitions. The positive coefficient on age and the negative coefficient on age squared indicate that the probability of entering wage employment and self-employment increases with age initially but declines at older ages. Conversely, the probability of entering domestic work falls with age, although at a decreasing rate. This pattern suggests that individuals in their prime working years are more likely to enter productive employment activities than younger or older individuals.

Rural residence is associated with lower probabilities of entering wage employment but higher probabilities of entering self-employment and domestic work. Individuals living in rural areas are 0.7 percentage points less likely to enter wage employment and 1.7 percentage points more likely to transition into self-employment. This finding reflects the concentration of formal wage opportunities in urban areas and the continued importance of agricultural and informal self-employment activities in rural Ghana.

Educational attainment emerges as one of the strongest predictors of labour-market transitions. Relative to individuals with no formal education, tertiary education increases the probability of entering wage employment by 1.7 percentage points while reducing the probability of entering self-employment by 4.2 percentage points. Secondary education also increases the probability of wage-employment entry and reduces transitions into self-employment and domestic work. Overall, the results suggest that education facilitates access to formal wage employment while reducing reliance on less formal forms of work.

Marital status significantly influences labour-market transitions. Married individuals are less likely to enter wage employment and domestic work but slightly more likely to enter self-employment. The findings may reflect greater household responsibilities alongside increased incentives to engage in own-account economic activities that offer greater flexibility and autonomy.

Hospitalisation during the previous three months is not statistically associated with transitions into wage employment, self-employment, or domestic work. The estimated coefficients are small and statistically insignificant across all specifications, suggesting that short-term hospitalisation episodes do not substantially affect immediate labour-market entry among previously inactive individuals.

While our hospitalisation measure represents a relatively long-term measure of individual health status, it captures only severe health events and may not reflect the full range of health conditions affecting labour-market behaviour. In addition, some degree of reverse causality cannot be ruled out, as employment status may influence healthcare utilisation through income, insurance coverage, or occupational exposure. Consequently, we assess the sensitivity of this finding to the choice of health measure by re-estimating the models using an alternative indicator capturing the number of days an individual suffered from illness or injury during the previous two weeks (see Appendix Table A7). The results became statistically significant, suggesting that labour-market entry is more sensitive to short-term morbidity than to severe hospitalization events.

The result on religious affiliation shows limited influence on labour-market transitions. Christians and Muslims are significantly less likely to enter self-employment than individuals belonging to other religious groups, although the magnitude of these effects is relatively small. No statistically significant relationship is observed between religion and wage-employment transitions.

Considerable regional heterogeneity is evident across ecological zones. Relative to the Southern Zone, individuals living in the Middle and Northern Zones are significantly less likely to enter wage employment and more likely to transition into self-employment and domestic work. The effects are particularly pronounced in the Northern Zone, where the probability of entering self-employment is approximately 2.7 percentage points higher than in the Southern Zone. These findings highlight persistent geographical disparities in labour-market opportunities and economic structures across Ghana.

Robustness Checks

As a robustness check, the models were re-estimated separately for individuals transitioning from unemployment and from inactivity. The results, reported in Appendix Table A8, are remarkably consistent with the baseline findings. The direction, statistical significance, and relative magnitudes of the key coefficients remain largely unchanged across the two origin states. In particular, gender, education, rural residence, and regional location continue to be significant predictors of labour-market entry, suggesting that the findings are not driven by the aggregation of unemployment and inactivity into a single non-income category.

Seasonal Labour Market Dynamics

The quarterly structure of the AHIES data allows for an examination of seasonal variation in labour-market transitions. The results reveal strong seasonal patterns. Relative to the first quarter, the probability of entering wage employment, self-employment, and domestic work increases progressively over the course of the year. The largest effects are observed in the fourth quarter, when the probability of entering wage employment rises by 1.9 percentage points, self-employment by 4.5 percentage points, and domestic work by 1.0 percentage point. The particularly strong fourth-quarter effect for self-employment likely reflects increased economic activity associated with agricultural harvests, seasonal trade, and end-of-year commercial opportunities. These findings suggest that labour-market entry in Ghana is influenced not only by individual and household characteristics but also by seasonal fluctuations in economic activity.

The year-specific controls indicate that labour-market transitions were generally weaker in 2023 relative to 2022, particularly for self-employment, consistent with the challenging macroeconomic environment associated with Ghana's economic crisis and debt restructuring period. By contrast, the estimates for 2024 suggest modest improvements in transitions into wage employment and self-employment, pointing to a gradual labour-market recovery. The persistence of significant quarter effects after accounting for year-specific shocks suggests that seasonal variation represents an important and independent feature of labour-market dynamics in Ghana. However, given only

three annual cycles, estimated quarter effects should be interpreted as seasonal patterns conditional on the observed macroeconomic environment rather than pure seasonal effects.

Discussion The results provide strong evidence of segmented labour-market entry pathways in Ghana, consistent with a growing body of literature that characterises African labour markets as structurally segmented rather than integrated. Rather than a uniform transition from non-income status into employment, individuals follow distinct pathways into wage employment, self-employment, and domestic work, reflecting differences in opportunities, constraints, and labour-market access (Fox Gaal, 2008). While the determinants of these transitions are important, the findings also reveal substantial temporal variation in labour-market outcomes that would remain largely hidden in conventional annual or cross-sectional datasets. A central contribution of the study is the identification of pronounced seasonal variation in labour-market transitions. The probability of entering income-generating activities increases systematically over the course of the year, with the strongest effects observed during the fourth quarter. Importantly, these seasonal patterns persist even after controlling for year-specific macroeconomic shocks, suggesting that labour-market dynamics in Ghana are shaped not only by structural characteristics but also by recurrent within-year fluctuations. This finding highlights the importance of adopting a temporal perspective when analysing labour-market behaviour in predominantly agrarian and informal economies, where economic opportunities often vary substantially across seasons. The observed seasonal patterns are likely linked to agricultural production cycles, harvest-related activities, informal trading opportunities, and fluctuations in demand for temporary labour. In Ghana, the latter part of the year is often associated with increased agricultural marketing, food processing, transportation services, and heightened commercial activity. Public expenditure patterns may also contribute to stronger labour demand during certain periods of the year. These findings suggest that labour-market opportunities are not evenly distributed across time and that labour-market vulnerability may be partly seasonal in nature. Consequently, employment interventions designed without accounting for seasonal fluctuations may underestimate periods of heightened labour-market risk or overlook windows of opportunity for targeted support.

The PLM Index provides additional insight into these dynamics. While traditional transition models identify the determinants of movement between labour-market states, the PLM Index captures the quality and direction of those movements. The results reveal substantial quarter-to-quarter variation in labour-market transition quality, with periods of improvement alternating with episodes of deterioration. This suggests that labour-market mobility is not necessarily synonymous with labour-market progress. Individuals may move frequently between labour-market states without experiencing sustained improvements in employment quality. The findings therefore underscore the value of complementing conventional transition analysis with measures that distinguish between positive and less favourable forms of mobility.

Beyond the temporal dimension, the results also reveal important structural determinants of labour-market entry. Gender disparities emerge as one of the most robust findings. Women are significantly less likely to transition into wage employment and more likely to enter self-employment and domestic work. This pattern is consistent with evidence from Ghana and Sub-Saharan Africa showing that women continue to face barriers to formal employment arising from gender norms, occupational segregation, unequal access to productive resources, and the disproportionate burden of unpaid care work (Filmer Fox, 2014; Baah-Boateng, 2016 Atta-Ankomah et al., 2024). The persistence of these disparities after controlling for education, age, household characteristics, and location suggests that gendered labour-market segmentation remains a significant feature of Ghana's employment structure.

Educational attainment is another important determinant of labour-market transitions. Individuals with secondary and tertiary education are substantially more likely to enter wage employment and less likely to transition into self-employment or domestic work. These findings support the view that education remains a critical mechanism for accessing formal labour-market opportunities and

improving employment prospects. In a labour market where formal employment opportunities remain limited, educational qualifications appear to play an important sorting function, directing workers towards more stable and potentially higher-productivity employment segments. Spatial inequalities also remain a defining feature of labour-market transitions. Rural residents and individuals living in the Middle and Northern ecological zones are less likely to enter wage employment and more likely to transition into self-employment and domestic work. These findings reflect longstanding disparities in infrastructure, economic diversification, market access, and employment opportunities across regions. The results further suggest that self-employment in many rural and less-developed areas continues to function primarily as a livelihood necessity rather than as a pathway to entrepreneurial advancement.

Overall, the evidence points to a labour market characterised by considerable mobility but uneven transition quality. Although many individuals move out of non-income states, a substantial proportion of these transitions lead into self-employment rather than wage employment. This reinforces the central role of household enterprises and informal economic activities as labour absorbers in Ghana. At the same time, the results demonstrate that labour-market outcomes are shaped by the interaction of structural factors such as gender, education, and geography with temporal factors including seasonality and macroeconomic shocks.

From a policy perspective, the findings suggest that improving labour-market outcomes in Ghana requires a dual approach. On one hand policies should expand access to productive wage employment opportunities, particularly for women, rural residents, and individuals in economically disadvantaged regions. On the other hand, given the dominant role of self-employment in labour absorption, greater attention should be devoted to enhancing the productivity, resilience, and earnings potential of household enterprises and informal businesses. The findings also highlight the need for labour-market and social protection interventions to account for seasonal fluctuations in economic activity, as labour-market opportunities vary considerably across the calendar year.

This study contributes to the literature in two important ways. First, it provides rare high-frequency evidence on labour-market transitions in a low-income context, addressing a gap in a literature that has largely relied on cross-sectional surveys or low-frequency panel data. Second, it extends the application of the Positive Labour Mobility Index to a quarterly panel setting and demonstrates its usefulness in capturing not only the incidence of labour-market transitions but also changes in their quality over time. By combining transition modelling with a transition-quality framework, the study offers a more nuanced understanding of labour-market dynamics in Ghana and provides a template for future research in other developing-country settings.

5. Conclusion

This study examined short-run labour-market transitions in Ghana using high-frequency panel data from the Annual Household Income and Expenditure Survey (AHIES). By combining transition modelling with the Positive Labour Mobility (PLM) Index, the analysis provides new evidence on both the incidence and quality of labour-market mobility in a low-income setting. The findings reveal a labour market characterised by substantial mobility but uneven transition quality, with most movements from non-income states directed towards self-employment rather than wage employment. The results further show that labour-market transitions are shaped by a combination of demographic, socioeconomic, spatial, and temporal factors. Women are less likely to enter wage employment and more likely to transition into self-employment and domestic work, while higher levels of education significantly increase the likelihood of entering wage employment. Rural residents and individuals living in the Middle and Northern ecological zones face lower probabilities of entering wage employment and higher probabilities of transitioning into self-employment. The analysis also uncovers strong seasonal variation in labour-market transitions, with entry into income-generating activities increasing towards the latter part of the year. These findings suggest that both structural

inequalities and seasonal fluctuations play an important role in shaping labour-market opportunities.

Notwithstanding these contributions, several limitations should be acknowledged. First, the relatively short duration of the AHIES panel restricts the analysis to short-run labour-market dynamics and does not permit an assessment of longer-term employment trajectories or the persistence of labour-market states over extended periods. Second, the empirical framework identifies statistical associations rather than causal relationships, and some unobserved factors influencing labour-market behaviour may not be fully captured. Third, although the analysis controls for a broad set of demographic, household, and locational characteristics, important determinants of labour-market transitions, including access to finance, local labour demand conditions, and exposure to economic or environmental shocks, are not directly observed in the data. Finally, while the quarterly structure of the dataset allows for the identification of within-year variation in labour-market transitions, some of the estimated seasonal patterns may partially reflect contemporaneous macroeconomic developments occurring during the survey period.

These limitations point to several promising avenues for future research. Incorporating measures of inflation, climate variability, extreme weather events, and other household-level shocks would deepen understanding of the factors driving labour-market vulnerability and resilience. Future studies could also explore heterogeneity across different population groups, including variations by age, dependency burden, household composition, and livelihood strategy. Comparative analyses using harmonised panel datasets from other African countries would help determine whether the patterns observed in Ghana reflect broader regional labour-market dynamics or country-specific conditions. Finally, as longer panel datasets become available, duration and survival modelling approaches could be employed to examine the persistence of employment spells, the timing of labour-market transitions, and the factors associated with sustained movement into higher-quality forms of employment.

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Appendix

Table A1: Sample construction and attrition across waves

Wave to Wave	Base Sample ($i - 1$)	Rotation Out (Lost from survey)	Successfully Linked (i)	Attrition Rate (%)
Q1 to Q2	25,061	2,703	22,358	10.8%
Q2 to Q3	25,956	3,418	22,538	13.2%
Q3 to Q4	25,933	3,839	22,094	14.8%
Q4 to Q5	24,443	4,350	20,093	17.8%
Q5 to Q6	23,209	2,478	20,731	10.7%
Q6 to Q7	24,268	2,052	22,216	8.5%
Q7 to Q8	24,675	3,132	21,543	12.7%
Q8 to Q9	24,354	4,369	19,985	17.9%
Q9 to Q10	22,481	2,118	20,363	9.4%
Q10 to Q11	23,405	3,422	19,983	14.6%
Q11 to Q12	22,058	13,163	8,895	59.7%

Table A2: Composition of non-income states (%)

	Share (%)	Male (%)	Female (%)	Urban (%)	Rural (%)
Unemployed	89.29	89.79	88.61	89.11	89.46
Out of the Labour Force	10.71	10.21	11.39	10.89	10.54
Total	100.00	100.00	100.00	100.00	100.00

Table A3: Transition Probabilities from Initial Non-Income States (Quarter-to-Quarter %)

	Transition to Wage	Transition to Self- employment	Transition to Domestic Work	Remain Non- income
Unemployed	.048	.089	0.031	.832
Inactive	.055	.179	0.046	.72

Table A4: Determinants of transitions into income-earning activities: GEE Logit Results (Main Results)

	(1) Wage	(2) Self	(3) Domestic	(4) Wage	(5) Self	(6) Domestic
Gender (1 if female, 0 otherwise)	-0.321*** (0.036)	0.200*** (0.024)	0.282*** (0.039)	-0.341*** (0.036)	0.184*** (0.024)	0.281*** (0.039)
Age	0.173*** (0.010)	0.052*** (0.005)	-0.087*** (0.011)	0.172*** (0.010)	0.049*** (0.005)	-0.088*** (0.011)
Age Squared	-0.002*** (0.000)	-0.001*** (0.000)	0.001*** (0.000)	-0.002*** (0.000)	-0.001*** (0.000)	0.001*** (0.000)
Location (1 if Rural, 0 otherwise)	-0.372*** (0.036)	0.466*** (0.024)	0.395*** (0.041)	-0.390*** (0.036)	0.448*** (0.024)	0.387*** (0.041)
Marital status (1 if married, 0 otherwise)	-0.558*** (0.046)	0.092*** (0.031)	-0.269*** (0.065)	-0.544*** (0.046)	0.101*** (0.031)	-0.269*** (0.065)
Household Size	-0.006 (0.009)	0.019*** (0.006)	0.069*** (0.008)	-0.007 (0.009)	0.015*** (0.006)	0.067*** (0.008)

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Table A4: Determinants of transitions into income-earning activities – Continued

	(1) Wage	(2) Self	(3) Domestic	(4) Wage	(5) Self	(6) Domestic
Gender of household head (1 if female, 0 otherwise)	-0.382*** (0.079)	0.112** (0.044)	-0.735*** (0.141)	-0.367*** (0.079)	0.125*** (0.044)	-0.731*** (0.141)
Hospitalisation	-0.327 (0.291)	-0.128 (0.166)	-0.231 (0.340)	-0.225 (0.290)	-0.047 (0.168)	-0.212 (0.342)
Educational background (Base = No formal education)						
Pre secondary	0.421*** (0.060)	0.196*** (0.041)	0.154 (0.100)	0.445*** (0.061)	0.259*** (0.041)	0.193* (0.101)
Secondary	0.350*** (0.037)	-0.168*** (0.029)	-0.169*** (0.043)	0.349*** (0.037)	-0.160*** (0.029)	-0.164*** (0.043)
Tertiary	1.017*** (0.085)	-1.159*** (0.153)	-0.558* (0.300)	1.021*** (0.084)	-1.123*** (0.151)	-0.533* (0.301)
Christian	0.011 (0.074)	-0.117*** (0.043)	0.094 (0.090)	0.020 (0.074)	-0.103** (0.043)	0.096 (0.090)
Islam	-0.082 (0.084)	-0.166*** (0.047)	0.262*** (0.095)	-0.082 (0.084)	-0.160*** (0.047)	0.266*** (0.095)
Ecological Zones (Base = Southern Zone)						
Middle	-0.265*** (0.039)	0.359*** (0.034)	0.418*** (0.059)	-0.290*** (0.039)	0.345*** (0.034)	0.416*** (0.059)
Northern	-0.629*** (0.057)	0.759*** (0.038)	0.356*** (0.066)	-0.692*** (0.057)	0.712*** (0.038)	0.344*** (0.066)
Seasonality (Base = First Quarter of the year)						
Second Quarter				0.413*** (0.061)	0.599*** (0.042)	0.500*** (0.071)
Third Quarter				0.466*** (0.059)	0.660*** (0.042)	0.624*** (0.070)
Fourth quarter				1.133*** (0.057)	1.288*** (0.041)	0.920*** (0.069)
Based Year=2022						
Year== 2023				-0.260*** (0.046)	-0.424*** (0.030)	-0.136*** (0.049)
Year== 2024				0.284*** (0.037)	0.081*** (0.024)	-0.111** (0.043)
Constant	-5.987*** (0.175)	-4.997*** (0.110)	-3.482*** (0.194)	-6.604*** (0.183)	-5.606*** (0.114)	-3.977*** (0.201)
Observations	43589	43589	43589	43589	43589	43589

Robust standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Notes: Estimates are based on population-averaged panel models using the Generalised Estimating Equations (GEE) framework with a logit link function. The dependent variables indicate transitions from a non-income-earning state at time $t - 1$ to wage employment, self-employment, or domestic work at time t . Robust standard errors are reported in parentheses.

Table A5: Average Marginal Effects from GEE Logit Models: Determinants of transitions into income-earning activities (Quarter-by-Year interaction models)

	Extended Model		
	Wage	Self	Domestic
Gender (1 if female, 0 otherwise)	−0.006*** (0.001)	0.007*** (0.001)	0.004*** (0.001)
Age	0.003*** (0.000)	0.002*** (0.000)	−0.001*** (0.000)
Age Squared	−0.000*** (0.000)	−0.000*** (0.000)	0.000*** (0.000)
Location (1 if Rural, 0 otherwise)	−0.007*** (0.001)	0.017*** (0.001)	0.005*** (0.001)
Marital status (1 if married, 0 otherwise)	−0.009*** (0.001)	0.004*** (0.001)	−0.003*** (0.001)
Household Size	−0.000 (0.000)	0.001*** (0.000)	0.001*** (0.000)
Gender of household head (1 if female, 0 otherwise)	−0.006*** (0.001)	0.005*** (0.002)	−0.009*** (0.002)
Hospitalisation (1 if admitted to a hospital or health facility in the past 3 months)	−0.004 (0.005)	0.000 (0.006)	−0.003 (0.004)
Educational background (Base = No formal education)			
Pre-Secondary	0.008*** (0.001)	0.010*** (0.002)	0.002* (0.001)
Secondary	0.006*** (0.001)	−0.006*** (0.001)	−0.002*** (0.001)
Tertiary	0.017*** (0.001)	−0.042*** (0.006)	−0.007* (0.004)
Religious affiliation (Base = other religions)			
Christian	0.000 (0.001)	−0.004*** (0.002)	0.001 (0.001)
Islam	−0.001 (0.001)	−0.006*** (0.002)	0.003*** (0.001)
Ecological Zones (Base = Southern Zone)			
Middle Zone	−0.005*** (0.001)	0.013*** (0.001)	0.005*** (0.001)
Northern Zone	−0.012*** (0.001)	0.027*** (0.001)	0.004*** (0.001)
Seasonality (Base = First Quarter of the year)			
Second Quarter	0.005*** (0.001)	0.011*** (0.001)	0.004*** (0.001)
Third Quarter	0.006*** (0.001)	0.016*** (0.001)	0.006*** (0.001)
Fourth Quarter	0.019*** (0.001)	0.052*** (0.001)	0.011*** (0.001)
Year-Specific Shocks (Base = 2022)			
Year== 2023	−0.004*** (0.001)	−0.032*** (0.002)	−0.002** (0.001)

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Table A5: Average Marginal Effects from GEE Logit Models – Continued

	Extended Model		
	Wage	Self	Domestic
Year== 2024	0.005*** (0.001)	0.003*** (0.001)	−0.001** (0.001)
Q2_2023	−0.000 (0.002)	0.036*** (0.002)	0.001 (0.001)
Q3_2023	−0.002 (0.002)	0.023*** (0.003)	−0.001 (0.001)
Q4_2023	0.000 (.)	0.000 (.)	0.000 (.)
Q2_2024	0.000 (.)	0.000 (.)	0.000 (.)
Q3_2024	0.000 (.)	0.000 (.)	0.000 (.)
Q4_2024	0.000 (.)	0.000 (.)	0.000 (.)
Observations	43589	43589	43589

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Q4_2023, Q2_2024, Q3_2024, Q3_2024 and Q4_2024 are omitted because of collinearity.

Table A6: Average Marginal Effects: Independent Working Correlation Structures (main results)

	(1) Wage	(2) Self	(3) Domestic	(4) Wage	(5) Self	(6) Domestic
Gender (1 if female, 0 otherwise)	−0.005*** (0.001)	0.008*** (0.001)	0.004*** (0.001)	−0.006*** (0.001)	0.007*** (0.001)	0.004*** (0.001)
Age	0.003*** (0.000)	0.002*** (0.000)	−0.001*** (0.000)	0.003*** (0.000)	0.002*** (0.000)	−0.001*** (0.000)
Age Squared	−0.000*** (0.000)	−0.000*** (0.000)	0.000*** (0.000)	−0.000*** (0.000)	−0.000*** (0.000)	0.000*** (0.000)
Location (1 if Rural, 0 otherwise)	−0.006*** (0.001)	0.018*** (0.001)	0.005*** (0.001)	−0.007*** (0.001)	0.017*** (0.001)	0.005*** (0.001)
Marital status (1 if married, 0 otherwise)	−0.010*** (0.001)	0.003*** (0.001)	−0.004*** (0.001)	−0.009*** (0.001)	0.004*** (0.001)	−0.003*** (0.001)
Household Size	−0.000 (0.000)	0.001*** (0.000)	0.001*** (0.000)	−0.000 (0.000)	0.001*** (0.000)	0.001*** (0.000)
Gender of household head (1 if female, 0 otherwise)	−0.007*** (0.001)	0.004** (0.002)	−0.009*** (0.002)	−0.006*** (0.001)	0.005*** (0.002)	−0.009*** (0.002)
Hospitalisation (1 if admitted to a hospital or health facility in the past 3 months)	−0.006 (0.005)	−0.005 (0.006)	−0.003 (0.004)	−0.004 (0.005)	−0.002 (0.006)	−0.003 (0.004)
Educational background (Base = No formal education)						
Pre secondary	0.007*** (0.001)	0.007*** (0.002)	0.002 (0.001)	0.007*** (0.001)	0.009*** (0.002)	0.002* (0.001)
Secondary	0.006***	−0.006***	−0.002***	0.006***	−0.006***	−0.002***

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Table A6: Average Marginal Effects: Independent Working Correlation Structures – Continued

	(1) Wage	(2) Self	(3) Domestic	(4) Wage	(5) Self	(6) Domestic
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Tertiary	0.017*** (0.001)	−0.046*** (0.006)	−0.007* (0.004)	0.017*** (0.001)	−0.044*** (0.006)	−0.007* (0.004)
Religious affiliation (Base = other religions)						
Christian	0.000 (0.001)	−0.004*** (0.002)	0.001 (0.001)	0.000 (0.001)	−0.004** (0.002)	0.001 (0.001)
Islam	−0.001 (0.001)	−0.006*** (0.002)	0.003*** (0.001)	−0.001 (0.001)	−0.006*** (0.002)	0.003*** (0.001)
Ecological Zones (Base = Southern Zone)						
Middle	−0.005*** (0.001)	0.013*** (0.001)	0.005*** (0.001)	−0.005*** (0.001)	0.013*** (0.001)	0.005*** (0.001)
Northern	−0.011*** (0.001)	0.028*** (0.001)	0.004*** (0.001)	−0.012*** (0.001)	0.026*** (0.001)	0.004*** (0.001)
Seasonality (Base = First Quarter of the year)						
Second Quarter				0.005*** (0.001)	0.015*** (0.001)	0.005*** (0.001)
Third Quarter				0.006*** (0.001)	0.017*** (0.001)	0.006*** (0.001)
Fourth Quarter				0.019*** (0.001)	0.045*** (0.001)	0.010*** (0.001)
Base Year=2022						
year== 2023.0000				−0.004*** (0.001)	0.016*** (0.001)	−0.002*** (0.001)
year== 2024.0000				0.005*** (0.001)	0.003*** (0.001)	−0.001*** (0.001)
Observations	43589	43589	43589	43589	43589	43589

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A7: Average Marginal Effects: Robustness of Employment Transition Estimates to Alternative Health Shock Measure

	(1) Wage	(2) Self	(3) Domestic	(4) Wage	(5) Self	(6) Domestic
Gender (1 if female, 0 otherwise)	−0.004*** (0.002)	0.016*** (0.003)	0.005*** (0.001)	−0.005*** (0.002)	0.014*** (0.003)	0.005*** (0.001)
Age	0.001*** (0.000)	0.000 (0.001)	−0.001*** (0.000)	0.001*** (0.000)	0.000 (0.001)	−0.001*** (0.000)
Age Squared	−0.000*** (0.000)	0.000 (0.000)	0.000 (0.000)	−0.000*** (0.000)	0.000 (0.000)	0.000 (0.000)
Location (1 if Rural, 0 otherwise)	−0.009*** (0.002)	0.019*** (0.003)	0.004** (0.001)	−0.009*** (0.002)	0.018*** (0.003)	0.004** (0.001)
Marital status (1 if married, 0 otherwise)	−0.008*** (0.002)	−0.001 (0.003)	−0.001 (0.002)	−0.008*** (0.002)	−0.001 (0.003)	−0.001 (0.002)
Household Size	0.000 (0.000)	−0.002** (0.001)	0.001*** (0.000)	0.000 (0.000)	−0.002*** (0.001)	0.001*** (0.000)

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Table A7: Robustness of Employment Transition Estimates – Continued

	(1) Wage	(2) Self	(3) Domestic	(4) Wage	(5) Self	(6) Domestic
Gender of household head (1 if female, 0 otherwise)	-0.002 (0.003)	-0.005 (0.004)	-0.006* (0.004)	-0.002 (0.003)	-0.004 (0.004)	-0.006* (0.004)
Sick days	-0.000* (0.000)	-0.001** (0.000)	-0.000* (0.000)	-0.000* (0.000)	-0.001* (0.000)	-0.000* (0.000)
Educational background (Base = No formal education)						
Pre secondary	0.011*** (0.002)	0.015*** (0.004)	0.001 (0.004)	0.010*** (0.002)	0.015*** (0.004)	0.002 (0.004)
Secondary	0.007*** (0.002)	0.000 (0.004)	0.001 (0.002)	0.007*** (0.002)	0.001 (0.004)	0.001 (0.002)
Tertiary	0.014*** (0.004)	-0.039** (0.019)	0.007 (0.007)	0.013*** (0.004)	-0.040** (0.019)	0.007 (0.007)
Religious affiliation (Base = other religions)						
Christian	-0.003 (0.003)	-0.001 (0.005)	0.002 (0.003)	-0.003 (0.003)	-0.000 (0.005)	0.002 (0.003)
Islam	-0.006* (0.004)	-0.002 (0.006)	0.002 (0.004)	-0.006* (0.004)	-0.002 (0.006)	0.002 (0.004)
Ecological Zones (Base = Southern Zone)						
Middle	-0.003* (0.002)	0.011** (0.004)	0.004** (0.002)	-0.004** (0.002)	0.009** (0.004)	0.004* (0.002)
Northern	-0.003 (0.003)	0.031*** (0.005)	0.000 (0.003)	-0.004 (0.003)	0.027*** (0.005)	-0.001 (0.003)
Seasonality (Base = First Quarter of the year)						
Second Quarter				0.004** (0.002)	0.022*** (0.003)	0.006*** (0.002)
Third Quarter				0.002 (0.002)	0.016*** (0.003)	0.005*** (0.002)
Fourth Quarter				0.012*** (0.002)	0.041*** (0.004)	0.010*** (0.002)
Base Year=2022						
Year== 2023				0.002 (0.002)	-0.006* (0.003)	0.004** (0.002)
Year== 2024				0.003 (0.002)	0.004 (0.003)	0.001 (0.002)
Observations	24171	24171	24171	24171	24171	24171

Notes: Alternative health shock is proxied by the number of days during the past 2 weeks an individual suffered from ill health or injury.

Table A8: Average Marginal Effects from GEE Logit Models: Robustness of Employment Transition Estimates to Separate Origin State (unemployed vs inactive states)

	(1) Wage	(2) Self	(3) Domestic	(4) Wage	(5) Self	(6) Domestic
	From Unemployed State			From Inactive State		
Gender (1 if female, 0 otherwise)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.005*** (0.000)	-0.005*** (0.000)	-0.005*** (0.000)

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Table A8: Robustness of Employment Transition Estimates to Separate Origin State – Continued

	(1) Wage	(2) Self	(3) Domestic	(4) Wage	(5) Self	(6) Domestic
	From Unemployed State			From Inactive State		
Age	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)
Age Squared	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Location (1 if Rural, 0 otherwise)	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)	0.003*** (0.000)	0.003*** (0.000)	0.003*** (0.000)
Marital status (1 if married, 0 otherwise)	-0.005*** (0.001)	-0.005*** (0.001)	-0.005*** (0.001)	-0.005*** (0.001)	-0.005*** (0.001)	-0.005*** (0.001)
Household Size	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Gender of household head (1 if female, 0 otherwise)	-0.005*** (0.001)	-0.005*** (0.001)	-0.005*** (0.001)	-0.002 (0.001)	-0.002 (0.001)	-0.002 (0.001)
Hospitalisation	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	0.001 (0.004)	0.001 (0.004)	0.001 (0.004)
Educational background (Base = No formal education)						
Pre secondary	0.003*** (0.001)	0.003*** (0.001)	0.003*** (0.001)	0.005*** (0.001)	0.005*** (0.001)	0.005*** (0.001)
Secondary	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)
Tertiary	0.008*** (0.001)	0.008*** (0.001)	0.008*** (0.001)	0.010*** (0.001)	0.010*** (0.001)	0.010*** (0.001)
Religious affiliation (Base = other religions)						
Christian	0.002* (0.001)	0.002* (0.001)	0.002* (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Islam	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	-0.002** (0.001)	-0.002** (0.001)	-0.002** (0.001)
Ecological Zones (Base = Southern Zone)						
Middle	-0.003*** (0.000)	-0.003*** (0.000)	-0.003*** (0.000)	-0.001*** (0.001)	-0.001*** (0.001)	-0.001*** (0.001)
Northern	-0.008*** (0.001)	-0.008*** (0.001)	-0.008*** (0.001)	-0.004*** (0.001)	-0.004*** (0.001)	-0.004*** (0.001)
Seasonality (Base = First Quarter of the year)						
Second Quarter	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	0.003*** (0.000)	0.003*** (0.000)	0.003*** (0.000)
Third Quarter	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	0.003*** (0.000)	0.003*** (0.000)	0.003*** (0.000)
Fourth Quarter	0.005*** (0.001)	0.005*** (0.001)	0.005*** (0.001)	0.014*** (0.001)	0.014*** (0.001)	0.014*** (0.001)
Base Year=2022						
Year== 2023	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.004*** (0.001)	-0.004*** (0.001)	-0.004*** (0.001)
Year== 2024	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	0.003*** (0.000)	0.003*** (0.000)	0.003*** (0.000)
Observations	43589	43589	43589	43589	43589	43589

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

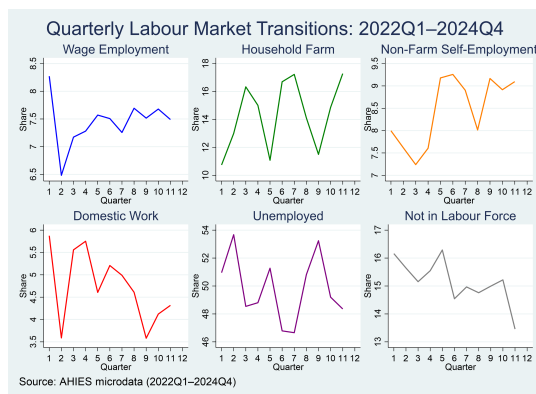


Figure A1: Labour Market Transition, testing for seasonality

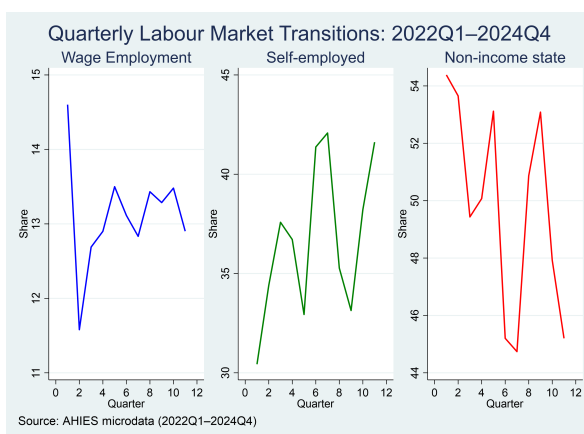


Figure A2: Labour Market Transition, testing for seasonality between wage, self-employment and non-income state.

Funding Statement

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Disclosure Statement

The author declares that there are no competing interests.

Data Availability Statement

The data used in this study are drawn from the Ghana Annual Household Income and Expenditure Survey (AHIES) conducted by the Ghana Statistical Service. Access to the microdata is subject to approval by the Ghana Statistical Service.

AI Use Disclosure

Artificial intelligence tools were used only for language editing and formatting assistance. All analysis, interpretation, and conclusions remain the responsibility of the author.