RESEARCH ON THE RELATIONSHIP BETWEEN EDUCATION LEVEL AND SALARY OF AGRICULTURAL GRADUATES IN VIETNAM

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Abstract: ***This study examines whether overeducation is associated with wage differentials among agricultural graduates in Vietnam. Using Vietnam Labour Force Survey data for 2018-2024, the analysis documents a significant wage penalty linked to overeducation. Doubly robust estimates indicate that graduates employed in jobs that do not require a university degree earn lower wages than those in positions requiring tertiary qualifications. The result remains robust across age, gender, regional, and job-sector subgroups. Gender, employment sector, and time effects also emerge as important correlates of education-job mismatch. Overall, the evidence points to a misalignment between higher education expansion and labor market demand in Vietnam's agricultural sector. Improving graduate-job matching is therefore crucial to ensure that skilled human capital is utilised effectively and contributes to productivity growth.***

• Keywords: *overeducation, labour market, wage penalty, higher education*

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1. Introduction

Agricultural development increasingly depends on a well-trained workforce, including university graduates in agriculture (Tuyến, 2024). When graduates are employed in jobs that match both their field of study and qualification level, they can apply their knowledge and skills more effectively, which supports higher productivity and future earnings (Montt, 2017).

A substantial international literature shows that overeducation, working in a job that does not require a university degree, is associated with lower wages relative to well-matched employment (Elamin, 2023). In Vietnam, recent evidence using broad samples of university graduates also documents a wage penalty linked to overeducation (Tran et al., 2026). However, research has not yet examined overeducation specifically among agricultural graduates, although a limited number of studies have considered field-of-study mismatch for this group (Tuyến, 2024).

This paper fills that gap by providing the first systematic evidence on the incidence of overeducation and its wage implications among agricultural university graduates in Vietnam. Using individual-level data from the Vietnam Labour Force Survey, representative at provincial, regional, and national levels for 2018-2024, we show that overeducated agricultural graduates earn significantly lower average wages than appropriately matched peers. The wage penalty is robust across subgroups by gender, age, region, and employment sector. We also find that gender, employment sector, and the COVID-19 period are important correlates of overeducation among agricultural graduates. The remainder of the paper is organised as follows. Section 2 reviews relevant theories and empirical findings on overeducation and wages. Section 3 describes the data and empirical strategy. Section 4 presents descriptive patterns and econometric results. Section 5 concludes and discusses policy implications.

2. Literature Review

Overeducation and undereducation are forms of vertical mismatch, describing misalignment between a worker's educational attainment and the education required by their job. Overeducation occurs when a worker's schooling exceeds job requirements, while undereducation arises when a job requires more schooling than the worker possesses (Montt, 2017). Several theoretical perspectives explain why overeducation may be linked to wage differentials (Tran et al., 2026). Human capital theory (Becker, 1964) views education as a form of investment that raises productivity, but it also recognises that schooling and training/experience can partially substitute for one another. In this view, overeducation may reflect deficits in practical skills or experience rather than pure overinvestment in schooling. Individuals with lower abilities or limited experience may acquire additional

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education to compensate, and they may accept lower reservation wages, which can contribute to observed wage penalties (Chuang & Liang, 2022).

Assignment theory (Sattinger, 1993) emphasises that wages depend on both individual human capital and job characteristics. Productivity is shaped by how well workers are allocated to jobs; when workers are mismatched, they cannot fully utilise their skills, reducing productivity and earnings relative to well-matched counterparts (Montt, 2017).

The career mobility model (Sicherman & Galor, 1990) offers a complementary interpretation: overeducation may be a transitional outcome, especially early in careers, as graduates accept lower-level jobs to gain experience and signal ability under information frictions. Overeducated workers may initially earn less but later move into better-matched jobs with higher earnings potential (Chuang & Liang, 2022).

Empirically, a large body of evidence documents a wage penalty associated with overeducation across diverse contexts. Studies report penalties for overeducated graduates in Argentina and other Latin American settings (Marioni, 2021), around 30% in China (Wu & Wang, 2018), and roughly 20% in Thailand (Paweenawat & Vechbanyongratana, 2015). In Vietnam, young overeducated graduates face a wage penalty of approximately 30% (Tran et al., 2026), while evidence from North Africa suggests losses ranging from about 12% to 50% (Elamin, 2023). Similar patterns appear in advanced economies, including the UK, Italy, and Taiwan, and across several other OECD countries (Chuang & Liang, 2022). Overall, the literature points to a persistent earnings disadvantage associated with overeducation (Tran et al., 2026).

3. Data and method

3.1. Data

The data for this study are drawn from the Vietnam Labour Force Survey covering the period 2018-2024. The sample includes individuals whose highest qualification is a university degree in agriculture and whose main job is paid employment across different types of organizations. The dataset contains information on work experience, gender, marital status, household membership, employment sector, wages, and other socio-economic characteristics. The pooled sample across years comprises approximately 8,500 individuals.

This study adopts the job analysis method, commonly referred to as the normative approach, to identify overeducation, as this measure is generally considered to yield more consistent and less biased estimates (Flisi et al., 2017). In line with the International Labour Organization (2018) framework and Appendix II of Vietnam's official occupational classification (Government of Vietnam, 2020), graduates are classified as overeducated, or vertically mismatched, when they work in occupations that formally require a qualification below the university level. Undereducation is not examined in this study because the number of university graduates employed in jobs requiring education beyond the university level is negligible.

3.2. Method

To estimate the wage impact of overeducation, we apply a doubly robust estimation strategy, which identifies the causal effect of mismatch status on earnings by combining an outcome regression model with a propensity score (treatment) model (Tran et al., 2025). Either approach can deliver unbiased causal estimates when correctly specified. The key advantage of the doubly robust framework is that estimates remain consistent as long as at least one of the two models is correctly specified (Liu et al., 2019). Following prior studies (Somers, Cabus, Groot, & van den Brink, 2019; Tran et al., 2025), we control for gender, marital status, work experience, employment sector, field of study, household size, dependency ratio, and include year and regional fixed effects. In addition, we examine determinants of overeducation among agricultural graduates using a probit regression model. Consistent with the Vietnamese and international literature (Somers et al., 2019; Tran et al., 2025), covariates include gender, work experience, job sector, and regional and year dummy variables.

4. Results and discussion

4.1. Descriptive statistics

Table 1 presents descriptive statistics for agricultural graduates over the period 2018-2024, disaggregated by job sector. It shows substantial wage differences across sectors. Graduates employed in FDI enterprises earn the highest average monthly wages, followed by private domestic firms and state-owned enterprises. In contrast, those working for households or individuals earn the lowest income. The overall average wage is 7,830, indicating that employment in more formal and capital-intensive sectors, particularly FDI firms, is associated with a wage premium. Table 1 also indicates that the incidence of overeducation varies considerably by sector. The highest proportion of overeducated workers is found among individuals working for households (87.4%) and FDI enterprises (66.5%), while the lowest rates appear in the public sector (21.2%) and

state-owned enterprises (32.1%). The overall rate of overeducation is 33.5%. This pattern suggests that job mismatch is particularly prevalent in less regulated or more flexible labor market segments, whereas public and state sectors may offer better alignment between qualifications and job requirements.

The data in Table 1 show that work experience differs substantially across sectors. Graduates in the public sector and state-owned enterprises exhibit the highest average years of experience (around 19.5 and 17.9 years, respectively), while those in FDI enterprises and households report lower levels. This may reflect greater employment stability and longer tenure in the public and state sectors.

Regarding job sector, Table 1 reveals that the majority of agricultural graduates in the sample are employed in the public sector (5,361 out of 8,500), followed by private domestic firms (1,762). This concentration highlights the continued importance of the public sector as a primary employer of agricultural graduates in Vietnam.

Overall, the descriptive statistics indicate clear sectoral segmentation in wages, experience, and the prevalence of overeducation. The coexistence of relatively high wages and high overeducation rates in some sectors, particularly FDI enterprises, suggests that mismatch does not necessarily preclude higher earnings but may reflect structural imbalances between educational expansion and labor demand.

Table 1: Descriptive Statistics of Agricultural Graduates, 2018-2024

Jobsector	Households, individuals		Private domestic firms		State Owned Enterprises		FDI Enterprises		Public sector		Other		Total	
Characteristics	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Monthly wages	6311	2705	9181	4463	8194	3631	10006	5991	7372	2962	6843	3089	7830	3602.608
Overeducation	0.874	0.333	0.546	0.498	0.321	0.467	0.665	0.473	0.212	0.409	0.331	0.472	0.335	0.472
Experience	10.992	8.467	12.964	8.810	17.873	9.029	10.037	6.688	19.531	8.396	18.815	10.492	17.359	9.120
Marrital status	0.650	0.478	0.730	0.444	0.840	0.367	0.746	0.436	0.924	0.264	0.901	0.300	0.860	0.347
Household size	4.179	1.616	4.212	1.590	3.948	1.231	4.301	1.758	4.052	1.417	3.854	1.288	4.088	1.465
Dependency ratio	34.909	23.086	34.533	22.878	36.521	21.725	33.455	23.904	37.865	22.373	40.175	22.753	36.851	22.574
Urban	0.624	0.485	0.699	0.459	0.625	0.484	0.471	0.500	0.650	0.477	0.589	0.494	0.651	0.477
Observations	380		1762		574		272		5361		151		8500	

Figure 1. Trend of Overeducation among Agricultural Graduates in Vietnam, 2018-2024

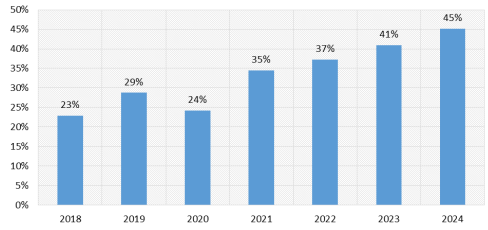


Figure 1 shows that the incidence of overeducation has increased consistently since 2020, rising from approximately 24% to 45% in 2024. The sharp increase in 2021 may be explained by the impact of COVID-19. The upward trend thereafter may reflect a growing imbalance between labor supply and labor demand in the agricultural sector.

4.2. Econometric results

Table 2 reports the estimated wage penalty associated with overeducation across different subgroups, using the doubly robust estimator. For the full sample, the estimated coefficient is -0.2208 and statistically significant at the 1% level. Since the dependent variable is measured in logarithmic form, this estimate implies that overeducated graduates earn approximately 20% lower wages than their matched counterparts. The wage penalty remains highly consistent across gender groups. The estimated coefficients for males (-0.2173) and females (-0.2199) are nearly identical in magnitude, suggesting that the negative wage effect of overeducation does not differ meaningfully by gender. However, substantial heterogeneity emerges across regions. The wage penalty is smaller in urban areas (-0.1814) compared to rural areas (-0.2668). This finding suggests that rural labor markets may provide fewer opportunities for skill reallocation or upward mobility, thereby amplifying the economic cost of mismatch.

Table 2: Wage Differentials between Overeducated and Matched Graduates

	Coefficient	SE	P>z
ALL	-0.2208	0.0196	0.000
Male	-0.2173	0.0239	0.000
Female	-0.2199	0.0291	0.000
Urban region	-0.1814	0.0180	0.000
Rural region	-0.2668	0.0422	0.000
Public sector	-0.2188	0.0261	0.000
Private sector	-0.1784	0.0196	0.000

Differences are also observed across employment sectors. The estimated penalty is slightly larger in the public sector (-0.2188) than in the private sector (-0.1784). This pattern may reflect more rigid wage-setting mechanisms in public employment, where compensation is often tied to formal job classifications rather than individual productivity or educational surplus.

Overall, the results indicate that overeducation is associated with a sizable and robust wage penalty, with particularly pronounced effects in rural regions and public employment settings. Our findings are partially consistent with Tran et al. (2026), who report that overeducation leads to an approximately 30% wage reduction among young graduates. However, our results differ in terms of regional heterogeneity. While Tran et al. (2026) do not document a stronger rural penalty,

our evidence suggests that graduates in rural areas face a substantially higher wage penalty than their urban counterparts. The stronger wage penalty observed in rural areas may reflect structural constraints in local labor markets, including limited job diversity, weaker competition among employers, and lower demand for high-skilled labor. In such settings, overeducation is more likely to persist and translate into sustained wage disadvantages.

Table 3: Probit Estimates of Factors Associated with Overeducation

Explanatory variables	AME	Robust Standard Errors	P-value
Gender (1=male; 0=female)	0.023	0.019	0.233
Household size (total household members)	-0.007	0.006	0.265
Dependency ratio*	0.001	0.000	0.027
Workd experience (years)	-0.004	0.001	0.003
Marrital status (1=married; 0=others)	-0.030	0.031	0.341
Job sector (public sector is the reference group)			
Households/individuals	0.524	0.043	0.000
Private domestic firms	0.268	0.020	0.000
Stated-owned enterprises	0.124	0.035	0.000
FDI enterprises	0.351	0.041	0.000
Other organizations	0.030	0.058	0.612
Regions (Red River Delta is the reference group)			
North East Region	-0.015	0.031	0.632
North West Region	-0.085	0.030	0.004
North Central Region	-0.034	0.034	0.312
South Central Region	-0.131	0.036	0.000
Highland Region	-0.055	0.036	0.126
South East Region	-0.232	0.041	0.000
South West Region	-0.003	0.029	0.923
Urban region (1=urban; 0=rural)	-0.041	0.018	0.025
Year dummies (2021 is the base year)			
2018	0.008	0.028	0.776
2019	0.038	0.026	0.147
2020	0.048	0.028	0.084
2022	0.093	0.028	0.001
2023	0.154	0.028	0.000
2024	0.161	0.025	0.000
Prob > chi2 = 0.0000			
Pseudo R2 = 0.1727			
Observation: 8500			

*Note: AME (average marginal effect). Estimates are accounted for sampling weights and clustered at the commune level. * The dependency ratio is calculated as the number of household members aged below 16 and above 60 divided by the number of working-age members (16-60).*

Table 3 presents probit estimates of factors associated with the probability of being overeducated, reported as average marginal effects (AME). The model is statistically significant (Prob > chi^2 = 0.0000) with a pseudo R^2 of 0.1727, indicating reasonable explanatory power for cross-sectional data. Gender does not significantly affect the likelihood of overeducation: the marginal effect for males is positive but statistically insignificant (p-value = 0.23), suggesting no meaningful difference between male and female graduates. Marital status and household size are also not statistically significant.

By contrast, work experience has a negative and statistically significant effect. Each additional year of experience reduces the probability of being overeducated by about 0.4 percentage points. This supports the career mobility hypothesis, implying that overeducation may be partly transitory as mismatched graduates move into better-matched jobs over time. The dependency ratio has a small but positive and statistically significant effect: households with higher dependency burdens are slightly more likely to have members in mismatched employment, possibly reflecting financial pressure that leads graduates to accept jobs below their qualification level.

Substantial differences across job sectors are observed. Relative to public sector employment (the reference group), working for households/individuals, private domestic firms, state-owned enterprises, and FDI enterprises significantly increases the probability of overeducation. The largest marginal effect is among workers employed by households or individuals, where the probability of overeducation rises by 52.4 percentage points. Employment in FDI firms and private domestic firms is also associated with markedly higher mismatch probabilities, suggesting that sectors outside the public system may exhibit weaker alignment between job requirements and formal qualifications.

Regional variation is pronounced. Compared with the Red River Delta, several regions show significantly lower probabilities of overeducation, particularly the South Central and South East regions. The negative and significant marginal effect for the South East (-0.232) indicates a substantially lower likelihood of mismatch, potentially reflecting stronger labor demand or better industrial absorption capacity in economically dynamic areas. The urban dummy is negative and statistically significant, indicating that graduates in urban areas are about 4.1 percentage points less likely to be overeducated than those in rural areas, consistent with earlier wage results showing stronger penalties in rural labor markets.

Year dummies indicate that overeducation has increased over time, especially after 2021. The marginal effects for 2022-2024 are positive and highly significant, pointing to a rising mismatch probability. This may reflect structural imbalances between higher education expansion and labor market demand, lingering COVID-19 effects (disrupted recruitment, reduced demand, cohort congestion), and global economic uncertainty that constrained hiring. Similar findings are reported by Tran et al. (2025), showing that risks of vertical and horizontal mismatch increased significantly after 2021.

5. Conclusion and Policy Implications

5.1 Conclusion

This study is the first to examine the incidence

and wage consequences of overeducation among agricultural university graduates in Vietnam. Using nationally representative Vietnam Labour Force Survey data for 2018-2024, we find robust evidence of a substantial wage penalty associated with mismatch. Doubly robust estimates indicate that overeducated graduates earn about 20% less than well-matched peers. The penalty is observed across gender and employment sectors and is especially pronounced in rural areas, suggesting that local labor market conditions shape the economic costs of mismatch. Probit results imply that overeducation is driven more by structural and institutional factors than by individual demographics. Work experience significantly reduces mismatch risk, consistent with the career mobility hypothesis that overeducation can be partly transitional. By contrast, employment sector and regional location have large and statistically significant effects, highlighting the role of labor market structure. The likelihood of overeducation increases notably after 2021, which may reflect post-pandemic disruptions, cohort congestion, and wider global economic uncertainty. Overall, overeducation among agricultural graduates appears to be a structural issue, rooted in imperfect alignment between higher education expansion and labor market demand.

5.2. Policy Implications

The findings suggest several policy implications for Vietnam's agricultural sector and higher education system. First, agricultural training should be better aligned with labor market demand. Universities need regular curriculum updates in collaboration with employers, industry associations, and local authorities, with greater emphasis on agri-business, digital agriculture, and green transformation. Second, stronger labor market information systems are essential. More timely and transparent data on vacancies, sectoral trends, and regional opportunities would help students and graduates make informed education and job choices, reducing structural mismatch. Third, rural labor markets require targeted interventions. The higher mismatch risk and stronger wage penalty in rural areas indicate limited absorption of high-skill labor; policies that promote agro-processing, rural enterprise development, and agricultural modernization can expand demand for qualified graduates. Fourth, active labor market policies should support school-to-work transitions through internships, employer partnerships, career counseling, and job placement services. Because work experience reduces mismatch probability, accelerating early career experience accumulation is particularly important. Finally, given post-pandemic uncertainty and global volatility, policymakers should monitor graduate outcomes and adopt countercyclical measures when needed. Temporary shocks can leave lasting scarring effects, so time-bound employment support and graduate hiring incentives may mitigate persistent mismatch.

5.3. Limitations and Future Research

This study has several limitations. First, overeducation is measured using the job analysis (normative) approach, which may not fully capture within-occupation heterogeneity in skill requirements. Second, the analysis relies on pooled cross-sectional data, preventing direct observation of individual mobility from mismatched to matched employment. Third, although the doubly robust estimator reduces bias from observable characteristics, unobserved factors, such as ability, motivation, or job search intensity, may still affect both mismatch and wages. Future research could strengthen causal identification by employing instrumental variable (IV) approaches to address potential endogeneity in overeducation status. If suitable instruments or longitudinal data become available, further studies could also examine mobility dynamics and the persistence of mismatch among agricultural graduates more explicitly.

References:

Becker, G. S. (1964). Investment in human capital: A theoretical analysis. Journal of political economy, 70(5, Part 2), 9-49. doi:https://doi.org/10.1086/258724

Chuang, Y. c., & Liang, C. Y. (2022). Overeducation and skill mismatch of university graduates in Taiwan. Review of Development Economics, 26(3), 1693-1712. doi:https://doi.org/10.1111/rode.12891

Elamin, O. A. (2023). Overeducation wage penalty for university graduates: evidence from the MENA region using machine learning techniques. Middle East Development Journal, 15(1), 151-188.

Flisi, S., Goglio, V., Meroni, E. C., Rodrigues, M., & Vera-Toscano, E. (2017). Measuring occupational mismatch: overeducation and overskill in Europe—Evidence from PIAAC. Social Indicators Research, 131(3), 1211-1249. doi:https://doi.org/10.1007/s11205-016-1292-7

Government of Vietnam. (2020). Phụ lục II: Danh mục nghề nghiệp Việt Nam [Appendix II: LIST OF OCCUPATIONS OF VIETNAM]. Hanoi, Vietnam: Government of Vietnam.

Liu, L., Hudgens, M. G., Saul, B., Clemens, J. D., Ali, M., & Emch, M. E. (2019). Doubly robust estimation in observational studies with partial interference. Stat, 8(1), e214.

Marioni, L. d. S. (2021). Overeducation in the labour market: evidence from Brazil. Education economics, 29(1), 53-72.

Montt, G. (2017). Field-of-study mismatch and overqualification: labour market correlates and their wage penalty. IZA Journal of Labor Economics, 6(1), 1-20. doi:https://doi.org/10.1186/s40172-016-0052-x

Paweenawat, S. W., & Vechbanyongratana, J. (2015). Wage Consequences of Rapid Tertiary Education Expansion in a Developing Economy: The Case of Thailand. The Developing Economies, 53(3), 218-231. doi:https://doi.org/10.1111/deve.12078

Sattinger, M. (1993). Assignment models of the distribution of earnings. Journal of economic literature, 31(2), 831-880.

Sicherman, N., & Galor, O. (1990). A theory of career mobility. Journal of political economy, 98(1), 169-192.

Somers, M. A., Cabus, S. J., Groot, W., & van den Brink, H. M. (2019). Horizontal mismatch between employment and field of education: Evidence from a systematic literature review. Journal of economic surveys, 33(2), 567-603. doi:https://doi.org/10.1111/joes.12271

Tran, T. Q., Nguyen, H. T. T., Vu, N. B. T., & Le, D. V. (2025). Factors Associated With Vertical and Horizontal Job-Education Mismatches: Insights From University Graduates in Vietnam. Evaluation Review, 0193841X251409287. doi:https://doi.org/10.1177/0193841X251409287

Tran, T. Q., Tran, L. A., Vu, N. B. T., & Le, D. V. (2026). Overeducation and wage penalties among young university graduates in Vietnam. International Journal of Educational Research, 135(1), 1-15. doi:https://doi.org/10.1016/j.ijer.2025.102864

Tuyến, T. Q. (2024). Tác động của việc làm trái ngành đào tạo tới tiền lương của người lao động tốt nghiệp đại học ngành nông nghiệp ở Việt Nam. Kinh tế và Phát triển.

Wu, N., & Wang, Q. (2018). Wage penalty of overeducation: New micro-evidence from China. China Economic Review, 50(2), 206-217. doi:https://doi.org/10.1016/j.chieco.2018.04.006