

Bridging the gender wage gap: the role of education in developing economies

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Abstract

Purpose – This study evaluates the determinants of gender wage gaps in developing countries under the globalization context, focusing on Vietnam and Indonesia from 1993 to 2010.

Design/methodology/approach – Using an extended decomposition model based on Oaxaca (1973) and Blinder (1973) and panel data from national household surveys, the research reveals nuanced insights into the dynamics of wage inequality.

Findings – This research underscores the critical role of education, policy reforms, and cultural dynamics in shaping gender wage equality, offering actionable insights for policymakers in transitional and developing economies. The findings highlight the phenomena of “gender twist” and “sticky floor” in Vietnam, where reforms and globalization initially narrowed gender wage disparities but later posed new challenges under intensified competition. Education emerges as a pivotal factor, significantly reducing wage gaps in both countries, though its effectiveness varies.

Originality/value – In Vietnam, higher education shows diminishing returns in the globalization era, whereas in Indonesia, education consistently enhances gender wage parity. Structural reforms and globalization exert complex, context-dependent influences, with Vietnam leveraging reforms more effectively but facing persistent cultural and institutional barriers. Indonesia’s reforms, while impactful, often struggle against systemic biases amplified during economic shocks.

Keywords Gender wage gap, Education, Globalization, Developing countries, Vietnam, Indonesia

Paper type Research paper

1. Introduction

Wages are a key driver of labor market participation, and gender wage parity is both a fundamental right and an economic necessity. Equal pay enhances women’s socioeconomic standing, optimizes resource allocation, and fosters economic growth. Research consistently links education to improved wage equality (Blau and Kahn, 2017; Psacharopoulos and Patrinos, 2018). The OECD (2024) and The ILO (2020) confirm that higher education correlates with increased earnings globally. In Vietnam, education significantly boosts wages (McGuinness *et al.*, 2021), yet developing nations often underinvest in women’s education, exacerbating disparities (Todaro, 2006). Economic reforms further complicate gender wage dynamics (Bednarek, 1998).

Vietnam and Indonesia offer compelling case studies due to their comparable economic transitions and globalization-driven labor market shifts. Vietnam’s Đổi Mới reforms (1986) spurred rapid growth, FDI, and structural labor changes. Yet, wage inequality persisted, with



the gender wage gap rising from 9.4% in 2002 to 11.03% in 2004 (Nguyen, 2006), and female wages reaching only 75% of male wages by 2012 (World Bank, 2012). Indonesia's economic liberalization and decentralization in the 2000s increased female labor force participation, but cultural norms and sectoral segmentation-maintained wage disparities. Initially, rising education levels widened gender pay gaps, while globalization's effects remained complex.

Despite shared rapid development, Vietnam and Indonesia differ in historical, political, and economic structures, providing a comparative perspective on how reforms shape gender wage inequality. This analysis enhances understanding of economic transitions' impacts on wage disparities in developing countries. While many developing countries share characteristics such as male dominance and economic transitions, no comprehensive study has examined the determinants of gender wage gaps under globalization in Vietnam and Indonesia. This research fills that gap by providing a comparative analysis from 1993 to 2010.

Key contributions of this research include: (1) Geographical Scope – A national-level study capturing gender wage trends across domestic reforms (1990s) and globalization (2000s), minimizing migration biases. (2) methodology – an extended decomposition model quantifying education's impact on wage gaps while controlling for region, sector, age, and marital status. (3) comprehensive dataset – utilizing national household surveys for nuanced comparisons. (4) Policy insights – identifying how education and reforms influence wage disparities.

This study provides actionable strategies for policymakers in Vietnam, Indonesia, and beyond. The paper proceeds as follows: Section 2 reviews literature, Section 3 details methodology, Section 4 presents results, and Section 5 offers policy recommendations.

2. Literature review

2.1 Determinants of gender wage gap

The gender wage gap, defined as women's earnings relative to men's (Reskin and Pugh, 1994), persists despite comparable qualifications (Bednarek, 1998; Ntuli and Kwenda, 2020). Two key patterns emerge: the glass ceiling, restricting women's advancement to top positions (Albrecht *et al.*, 2003), and sticky floors, where wage gaps remain wider at lower income levels (Booth *et al.*, 2003).

Economic theories offer differing views (Online Appendix 1). Competitive market theories suggest wage gaps should diminish over time, while institutional perspectives argue that gendered labor market structures sustain disparities (McConnell and Brue, 1995). Blau and Kahn (1994) identify two primary influences: (1) gender-specific factors (e.g. qualifications, discrimination) and (2) broader wage inequality (e.g. differential labor pricing). Demand-side factors often favor lower-skilled women but advantage men at higher occupational levels.

Regional studies highlight variability. In Belgium, self-employed and part-time workers face wider gaps, especially in pensions. Latin America has seen wage gaps narrow, particularly among rural and informal workers (Hoyos and Ñopo, 2010). In Africa, gender discrimination significantly contributes to wage disparities (Bhorat and Goga, 2013; Ntuli and Kwenda, 2020).

Behavioural factors also matter. Women's attitudes toward risk, competition, and negotiation influence their entry into high-paying but volatile industries (Azmat and Petrongolo, 2014; Blau and Kahn, 2017). Caregiving responsibilities further constrain women's labor market participation (Wiswall and Zafar, 2017; Bertrand, 2018). Female-dominated occupations remain undervalued despite comparable skill requirements (Levanon *et al.*, 2009).

Recent studies reveal persistent wage gaps despite rising female education levels. Labor market discrimination and occupational sorting continue to limit wage parity (Blau and Kahn, 2017). The ILO (2020) emphasizes that while minimum wage policies help reduce gaps, unpaid care work and occupational segregation endure. Yahmed (2018) finds that weak labor

protections exacerbate gender pay disparities in Brazil’s informal sector, like trends in Ghana (Opoku and Boahen, 2023). Women’s underrepresentation in executive roles perpetuates the glass ceiling (Bertrand, 2018), while educational segregation pushes them into lower-paying fields (Livanos and Pouliakas, 2012).

Policy interventions are critical. The OECD (2024) highlights childcare support, parental leave, and wage transparency as key measures. The World Bank (2024) estimates that closing gender employment gaps could raise per capita income by 20%. Ngo (2022) underscores education, sectoral choices, and policy frameworks in shaping wage dynamics. Caparrós Ruiz (2024) suggests that policies reducing gender inequality among highly educated workers could complement Spain’s existing labor laws on the gender pay gap.

2.2 The role of education

Education significantly influences wage gaps (Blau and Kahn, 2017). Higher schooling levels correlate with increased earnings (Pereira and Martins, 2000; Tuan et al., 2018), particularly in Austria, Finland, and the UK (Pereira and Martins, 2000).

However, disparities persist. Wage gaps, once more common among lower-educated workers, now affect top earners. Even highly educated women earn 30% less than men, with racial and ethnic differences exacerbating inequalities (Dan et al., 2008). Employer discrimination remains a significant obstacle (Saha and Singh, 2025).

In Latin America, wage gap reductions are most pronounced among marginalized groups (Hoyos and Ñopo, 2010). Yet, negotiation practices, workplace culture, and bias continue to hinder highly educated women’s earnings (Black et al., 2008). In Vietnam, while education boosts earnings, occupational sorting and discrimination sustain wage gaps (McGuinness et al., 2021).

Ultimately, education enhances earnings but does not eliminate gender wage disparities. Addressing occupational segregation and structural discrimination is essential for achieving pay equity.

3. Methodology

3.1 Applied methodology

In 1973, the decomposition method was developed by Oaxaca (1973) and Blinder (1973) which is recently popularly applied for estimation of gender wage gaps. The advantage of model is its ability to separate wage differentials into explained and unexplained components. The explained component (endowment effect) captures differences in productivity-related characteristics such as education, work experience, industry, and occupation ... The unexplained component (discrimination effect) reflects differences in returns to those characteristics, which may be due to discrimination, structural biases, or other unobservable factors. The method has been widely used in gender wage gap research (Blau and Kahn, 2017; Bertrand, 2018), supporting its validity in studying labor market disparities and facilitating for comparison with other research findings.

The model starts with a simple unadjusted model of wage determination as follows:

$$\ln w_{it} = X_{it}\beta_{it} + \varepsilon_{it} \tag{1}$$

where w_{it} denotes the natural logarithm of hourly wages for an individual i at year t .

X_{it} presents a set of observed characteristics,

β_{it} denotes the regression coefficients, and

ε_{it} is a random error term.

Then the human capital wage equation is estimated by [Mincer \(1974\)](#) as follows:

$$\ln w_{it} = X_{it}\beta_{it} + D_{it}\gamma_{it} + \varepsilon_{it} \quad (2)$$

where $D_{it} = 1$ if women and otherwise is men

γ_{it} is the coefficient of the gender dummy variable

The men's and women's wage functions are measured separately as follows:

$$\begin{aligned} \ln w_{it}^m &= X_{it}^m \beta_{it}^m + \varepsilon_{it}^m \\ \ln w_{it}^f &= X_{it}^f \beta_{it}^f + \varepsilon_{it}^f \end{aligned} \quad (3)$$

where m denotes men and f is women. By subtracting the second equation from the first equation, a simple difference of log mean wage between men and women can be measured:

$$\ln w_{it}^m - \ln w_{it}^f = X_{it}^m \beta_{it}^m - X_{it}^f \beta_{it}^f + u_{it} \quad (4)$$

In order to further extend to the decomposition of change over time, from year $t-j$ to year t , the Blinder-Oaxaca decomposition could be developed ([Smith and Welch, 1989](#)) as follows:

$$\begin{aligned} g(\ln w_t) - g(\ln w_{t-j}) &= (\ln w_t^m - \ln w_t^f) - (\ln w_{t-j}^m - \ln w_{t-j}^f) \\ &= (dX^m - dX^f)\beta_t^m + (d\beta^m - d\beta^f)X_{t-j}^f + gX_{t-j} * d\beta_{t-j}^m + dX^f * g\beta_t^f + du \end{aligned} \quad (5)$$

when male as the reference group and

Where $d\beta^m = (\beta_t^m - \beta_{t-j}^m)$, $d\beta^f = (\beta_t^f - \beta_{t-j}^f)$, $dX^m = (X_t^m - X_{t-j}^m)$, $dX^f = (X_t^f - X_{t-j}^f)$, $gX_t = (X_t^m - X_t^f)$, $g\beta_t = (\beta_t^m - \beta_t^f)$; $gX_{t-j} = (X_{t-j}^m - X_{t-j}^f)$, $g\beta_{t-j} = (\beta_{t-j}^m - \beta_{t-j}^f)$; $du = u_t - u_{t-j}$

In the [Equation \(5\)](#) the decomposition of gender wage gap concludes 4 terms in the right hand side as follows: (1) The first term denotes the change in wage gap caused by changes in the characteristics between men and women; (2) The second term denotes the difference in the wage gap resulted from changes in the coefficient or discrimination; The *final two terms* represent the interaction effect which is the mixture of the gender gap and changes over time: (3) The third term represents *the interaction effect* which represents changes over time of the coefficients weighted by the gender gap in time $t-j$. When male is used as the reference group, the positive term implies an increase in the coefficient where males have an advantage; (4) The last term is an interaction term which presents changes in characteristics over time weighted by the gender gap in the coefficient in time t . A positive value of the last term indicates growth in characteristics over time where they were disadvantaged in terms of the payoff.

3.2 Variables

3.2.1 Dependent variable. The study focuses on wage earners aged 15 to 60 whose primary activity is wage employment, with reported earnings and hours worked in the past 12 months. The dependent variable is the estimated hourly wage, calculated using total earnings and hours worked. This approach accounts for gender disparities in formal wages ([Liu, 2004](#)), testing whether social supports mitigate total income differences in Vietnam and Indonesia. All financial variables are deflated using the Consumer Price Index (CPI) to ensure real value comparisons.

3.2.2 Explanatory variables. Explanatory variables are theoretically driven ([Online Appendix 2](#)), presenting a comprehensive set of explanatory variables, focusing on key

determinants of gender wage gaps: (1) *Education*: dummy variables represent the highest educational attainment of wage earners, capturing human capital effects (Blau and Kahn, 1992), (2) *Economic factors*: variables include age and experience (learning by doing) and occupational roles (professional, skilled) (Blau and Kahn, 1992), (3) *Reform and globalization*, by examining wage differentials across employment types, we assess how reforms have influenced gender-based wage outcomes: (1) private sector employment – this reflects Vietnam’s privatization efforts, particularly in the post-reform period, capturing the transition from a state-dominated labor market to one where private sector dynamics influence wage structures, including gender disparities (Scott, 2001), (2) foreign sector employment – this variable represents the impact of key reform policies such as the 2005 Enterprise Law, which facilitated foreign investment and economic liberalization (Structure of the KOF Globalization Index); (3) Globalization Proxy – Employment in tradable sectors, particularly foreign-owned firms, serves as an indicator of increased economic openness. This allows us to evaluate how exposure to global markets affects gender wage dynamics, potentially altering traditional labor market structures; (4) *Socioeconomic Impact of Reforms* – we incorporate non-food expenditure as a proxy for living standards and life improvement measures to assess broader socioeconomic benefits stemming from economic reforms, these indicators help capture reform-driven changes that may indirectly influence gender wage disparities (Obayelu et al., 2009). This research incorporates structural, cultural, and policy dimensions, providing a nuanced analysis of factors shaping gender wage gaps in Vietnam and Indonesia Hoyos and Nopo (2010).

3.3 Data

This study empirically examines factors influencing the gender wage gap in the context of globalization, using panel data from national household surveys during Vietnam and Indonesia’s economic reform phases (1993, 1998, 2002, 2004, 2006, 2008). The data sources include Vietnam Living Standard Surveys (Vietnam General Statistics Office) and the National Labour Force Survey (SAKERNAS, Indonesia’s Central Bureau of Statistics).

Both surveys provide detailed employee characteristics (e.g. gender, age, marital status, education, location), working hours, wages, industry, occupation, and economic activity. The study focuses on wage earners aged 15–60, employed in the preceding 12 months. Hourly wages are estimated and adjusted for inflation. Education level is the highest attained degree, while economic globalization is measured by foreign direct investment, trade openness, portfolio investment, and structural reforms (IMF, World Bank). Secondary data from the ILO, UNSCEP, UNESCO, and Indonesia Women’s Union provide insights into gender wage disparities, education, and policy changes from the 1990s onward.

4. Empirical analysis of factors determining gender wage gap in Vietnam and Indonesia

To investigate the impact of education at various levels as well as other determinants on wage during 2 decades from 1992–2008, the regressions are conducted separately for male and female.

4.1 Education and gender wage between Vietnam and Indonesia

For Vietnam, findings confirm the critical role of education in gender wage disparities (see empirical results in Online Appendix 3). In 1998, illiterate females earned 22% less than literate females, whereas illiterate males earned 13.3% less than literate males. This suggests greater wage discrimination among men by education or that men, even without education, have better-paid job opportunities. While men initially gain higher returns at the primary level, women benefit more at higher education levels. Notably, secondary and tertiary education consistently yield greater wage returns for women than men, highlighting education as a key tool for closing the gender wage gap. Higher education, including vocational and university

degrees, remained a significant factor in wage determination for both genders through 2008, with stronger effects for women.

Similarly, in Indonesia, education significantly impacts gender wages (see empirical results in [Online Appendix 3](#)). Higher education levels correlate with greater returns, reinforcing education as a crucial means for women to reduce wage disparities. Women with college or university degrees earned 155.5% more than those without in 1992, decreasing to 131.9% in 2008. Like Vietnam, female wage returns exceed those of males, with minor deviations in 2002 and 2004 when vocational education primarily benefited men.

4.2 Comparative analysis of factors determining gender wage: Vietnam vs Indonesia

This section provides a comparative analysis of the determinants of gender wage in Vietnam and Indonesia from 1992 to 2008, focusing on education, experience, age, occupational roles, economic reforms, globalization, and cultural factors ([Tables 1 and 2](#)). By examining these elements together, we highlight differences and similarities that offer insights into gender dynamics in developing countries (see [online Appendix 1](#)).

4.2.1 Education and wage disparities. Education significantly influences gender wage disparities in both Vietnam and Indonesia, though with varying effects. In Vietnam, higher education benefits women, but men gain more from vocational training. In 2008, vocational training increased wages by 14.2% for men and only 1.35% for women, while higher education raised wages by 43.5% for men and 37.5% for women. This aligns with [Black et al. \(2008\)](#), highlighting structural barriers in the labor market.

In contrast, Indonesian women consistently had higher returns across education levels. A college degree increased wages by 99% for women and 63.5% for men in 1992, with similar trends in 2008 (91.3 vs 78.5%). [Psacharopoulos and Patrinos \(2018\)](#) confirm the strong economic returns to education, while vocational training showed weaker and inconsistent effects.

4.2.2 Work experience and age. Experience positively impacts wages but differs by gender. In Vietnam, each additional year of experience increased women's wages by 0.7% in 2008 but had minimal effects on men. Men's wages followed an inverse U-shaped pattern, rising 5.3% annually, compared to 3.2% for women, reflecting [Bertrand's \(2018\)](#) "glass ceiling" effect.

In Indonesia, experience consistently boosted wages for both genders, favoring women more than in Vietnam. Age-related wage growth was steadier, suggesting fewer gender constraints.

4.2.3 Occupational roles and wage gaps. Professional roles significantly influence wage dynamics. In Vietnam, such roles increased women's wages by 33.4% in 2008 compared to 19.2% for men, yet skilled occupations favored men (5.7% wage increase vs 4.7% for women). This "sticky floor" effect highlights barriers in lower-tier roles.

Indonesia displayed similar trends, with professional roles increasing women's wages by 33.7% in 2008. However, during the 2008 fiscal crisis, women's occupational benefits declined more sharply, highlighting economic vulnerability.

4.2.4 Reforms and globalization. Economic reforms had mixed effects. In Vietnam, privatization and foreign investment spurred wage growth for women (31.9 vs 19.1% for men by 2008). However, industrialization primarily benefited men, reinforcing gender disparities ([Blau and Kahn, 2017](#)).

Indonesia initially saw gains for women in industrial sectors (15.9 vs 5.6% for men in 1992), but globalization later introduced vulnerabilities. During the 2008 crisis, women's industrial wages fell by 37.7%, compared to 4.9% for men, underscoring economic fragility.

4.2.5 Cultural and geographic factors. Cultural norms shape wage gaps differently. In Vietnam, larger households constrained wage growth for both genders, especially women, while in Indonesia, household size affected men more. Urbanization favored women in Indonesia (17.2% wage advantage in 1992), whereas in Vietnam, benefits fluctuated with economic cycles. [Levanon et al. \(2009\)](#) observe similar patterns in the US, where occupational feminization affects pay structures.

Table 1. Education – determinants of gender wage in Vietnam in the period 1993–2008

	1992 Male (1)	Female (2)	1998 Male (3)	Female (4)	2002 Male (5)	Female (6)	2004 Male (7)	Female (8)	2006 Male (9)	Female (10)	2008 Male (11)	Female (12)
<i>Education</i>												
Primary school	0.1016* (0.057)	−0.0138 (0.068)	−0.0271 (0.062)	−0.0370 (0.079)	−0.0189 (0.025)	−0.0116 (0.033)	0.0211 (0.026)	0.0297 (0.037)	−0.0325 (0.036)	−0.1026* (0.057)	0.0052 (0.048)	−0.1242* (0.067)
Lower secondary	0.0487 (0.098)	−0.1866* (0.102)	−0.1397*** (0.054)	−0.1344** (0.059)	−0.1087*** (0.037)	−0.1779*** (0.050)	−0.0507 (0.040)	−0.1727*** (0.057)	−0.0383 (0.037)	−0.1069* (0.057)	−0.0720 (0.049)	−0.0882 (0.067)
High school	0.0648 (0.104)	−0.1673 (0.117)	−0.0501 (0.058)	−0.0518 (0.076)	0.0702* (0.040)	0.0725 (0.051)	0.0758* (0.046)	0.0532 (0.061)	0.0774* (0.041)	−0.0065 (0.059)	0.0126 (0.049)	−0.0047 (0.073)
Vocational	−0.0272 (0.113)	−0.2907*** (0.108)	0.0333 (0.055)	−0.0994* (0.059)	0.2587*** (0.046)	0.2430*** (0.074)	0.1127*** (0.042)	0.0655 (0.061)	0.1842*** (0.039)	0.0154 (0.059)	0.1421*** (0.046)	0.0135 (0.070)
University-higher	0.0587 (0.117)	0.1190 (0.128)	0.3445*** (0.084)	0.2019*** (0.078)	0.3506*** (0.049)	0.4531*** (0.066)	0.3935*** (0.051)	0.3102*** (0.061)	0.5312*** (0.049)	0.3608*** (0.066)	0.4355*** (0.058)	0.3755*** (0.073)
<i>Learning by doing</i>												
Experience	−0.0049 (0.005)	0.0014 (0.005)	−0.0024 (0.003)	0.0097*** (0.003)	0.0026* (0.002)	0.0059*** (0.002)	0.0016 (0.002)	0.0120*** (0.002)	0.0021 (0.002)	0.0097*** (0.002)	0.0019 (0.002)	0.0073*** (0.003)
Age, year	0.0413*** (0.014)	0.0066 (0.015)	0.0243** (0.010)	0.0011 (0.010)	0.0198*** (0.006)	0.0094 (0.007)	0.0366*** (0.007)	0.0342*** (0.008)	0.0407*** (0.006)	0.0281*** (0.008)	0.0535*** (0.006)	0.0319*** (0.008)
Age ²	−0.0005*** (0.000)	−0.0001 (0.000)	−0.0003** (0.000)	0.0000 (0.000)	−0.0003*** (0.000)	−0.0001 (0.000)	−0.0005*** (0.000)	−0.0005*** (0.000)	−0.0005*** (0.000)	−0.0004*** (0.000)	−0.0007*** (0.000)	−0.0004*** (0.000)
<i>Occupation</i>												
Professional	−0.1835** (0.086)	−0.1876* (0.102)	−0.0212 (0.052)	0.2965*** (0.064)	0.1776*** (0.035)	0.3004*** (0.050)	0.0768** (0.035)	0.2691*** (0.046)	0.0758** (0.037)	0.3508*** (0.044)	0.1923*** (0.039)	0.3337*** (0.051)
Skilled	0.0810 (0.052)	0.1192** (0.050)	−0.0093 (0.041)	0.1451*** (0.042)	0.0917*** (0.018)	0.1421*** (0.032)	−0.0454** (0.022)	0.0177 (0.033)	−0.0124 (0.019)	0.0573* (0.030)	−0.0283 (0.021)	0.0473 (0.033)
<i>Reform and globalization</i>												
Private own	0.1271** (0.064)	−0.1684** (0.073)	0.1221** (0.047)	0.1122* (0.064)	−0.3915*** (0.106)	−0.6077*** (0.131)	0.0832*** (0.026)	0.1217*** (0.035)	0.0430* (0.022)	0.1783*** (0.035)	0.0693*** (0.026)	0.1115*** (0.035)
Foreign own	0.3948*** (0.137)	1.0348*** (0.267)	0.2719*** (0.053)	0.3403*** (0.060)	0.0836 (0.229)	−0.0515 (0.205)	0.2535*** (0.047)	0.3177*** (0.044)	0.1660*** (0.045)	0.3194*** (0.037)	0.1910*** (0.046)	0.2908*** (0.036)
Industrial sector	0.1670*** (0.049)	0.0559 (0.057)	0.1799*** (0.038)	0.0384 (0.041)	0.1582*** (0.017)	0.1470*** (0.028)	0.0764*** (0.020)	−0.0289 (0.030)	0.0780*** (0.019)	−0.0521* (0.028)	0.0629*** (0.021)	−0.1276*** (0.032)
Non-food Exp.	0.0173*** (0.005)	0.0312*** (0.005)	0.0163*** (0.002)	0.0128*** (0.003)	0.0153*** (0.002)	0.0146*** (0.001)	0.0112*** (0.001)	0.0073*** (0.001)	0.0058*** (0.001)	0.0045*** (0.001)	0.0053*** (0.001)	0.0056*** (0.001)
Life improved							0.0108 (0.013)	0.0113 (0.017)	0.0309*** (0.011)	0.0331** (0.015)	0.0284** (0.011)	0.0242* (0.014)

(continued)

Table 1. Continued

	1992 Male (1)	Female (2)	1998 Male (3)	Female (4)	2002 Male (5)	Female (6)	2004 Male (7)	Female (8)	2006 Male (9)	Female (10)	2008 Male (11)	Female (12)
<i>Cultural-geography</i>												
House size	−0.0010 (0.010)	−0.0114 (0.010)	−0.0249** (0.011)	−0.0093 (0.008)	−0.0221*** (0.005)	−0.0250*** (0.006)	−0.0226*** (0.006)	−0.0024 (0.008)	−0.0213*** (0.005)	−0.0100 (0.008)	−0.0135** (0.006)	−0.0186** (0.008)
Urban	0.1208*** (0.046)	−0.0496 (0.051)	0.0273 (0.034)	0.0108 (0.040)	0.2856*** (0.022)	0.2028*** (0.026)	0.0852*** (0.023)	0.1011*** (0.027)	−0.0061 (0.019)	−0.0282 (0.025)	−0.0495 (0.020)	−0.1115 (0.026)
Marital	0.0273 (0.067)	0.0710 (0.062)	0.0034 (0.048)	0.0519 (0.043)	−0.0149 (0.026)	−0.0512 (0.032)	0.0553** (0.028)	0.0350 (0.034)	0.0698*** (0.027)	0.0144 (0.032)	−0.0072 (0.027)	0.0281 (0.031)
Ethnic	0.0448 (0.056)	0.0174 (0.076)	−0.0057 (0.044)	0.0095 (0.048)	−0.4592*** (0.031)	−0.3049*** (0.042)	−0.1055*** (0.037)	−0.0030 (0.046)	−0.0736** (0.029)	−0.0068 (0.043)	−0.0310 (0.034)	−0.0123 (0.055)
Constant	−0.7976*** (0.244)	−0.0501 (0.254)	0.5531*** (0.171)	0.6058*** (0.166)	0.5009*** (0.098)	0.4783*** (0.120)	0.5123*** (0.113)	0.2597* (0.155)	0.6918*** (0.111)	0.6590*** (0.162)	0.7603*** (0.128)	0.9729*** (0.164)
Observations	1,229	926	1882	1,298	16,602	10,089	4,061	2,494	4,212	2,726	4,288	2,772
R ²	0.100	0.142	0.158	0.201	0.291	0.306	0.324	0.418	0.313	0.382	0.302	0.392

Note(s): All are the weighted least squares regressions with robust option, standard errors are in parentheses. An asterisk (*), (**), (***) denotes statistical significance at least at the 10%, 5%, 1% levels, respectively

Source(s): Authors' own work

Table 2. Education – determinants of gender wage in Indonesia in the period 1992–2008

	1992 Male (1)	Female (2)	1998 Male (3)	Female (4)	2002 Male (5)	Female (6)	2004 Male (7)	Female (8)	2006 Male (9)	Female (10)	2008 Male (11)	Female (12)
<i>Education</i>												
Primary school	0.2117*** (0.010)	0.1957*** (0.016)	0.2237*** (0.015)	0.1562*** (0.022)	0.1419*** (0.020)	0.2252*** (0.029)	0.1432*** (0.019)	0.1491*** (0.030)	0.1925*** (0.012)	0.2506*** (0.023)	0.0840*** (0.021)	0.1350*** (0.031)
Junior secondary Sch.	0.0419** (0.017)	0.2096*** (0.027)	0.0667*** (0.024)	0.0934*** (0.036)	0.0785*** (0.027)	0.2244*** (0.039)	0.0836*** (0.025)	0.1916*** (0.038)	0.1485*** (0.043)	0.2625*** (0.093)	–0.0543* (0.029)	–0.0140 (0.044)
High school	0.2741*** (0.015)	0.6211*** (0.022)	0.3356*** (0.022)	0.6633*** (0.030)	0.3320*** (0.025)	0.6086*** (0.036)	0.3637*** (0.024)	0.5942*** (0.036)	0.1581*** (0.031)	0.2541*** (0.064)	0.3041*** (0.028)	0.5073*** (0.042)
Vocational school	–0.0672*** (0.022)	–0.0447 (0.051)	–0.0052 (0.032)	0.0391 (0.062)	0.0217 (0.028)	–0.0174 (0.059)	0.0584** (0.027)	–0.0355 (0.064)	0.0828** (0.036)	0.0639 (0.082)	0.2645*** (0.014)	0.3380*** (0.023)
College or higher	0.6354*** (0.017)	0.9899*** (0.026)	0.6702*** (0.028)	0.9831*** (0.036)	0.6500*** (0.030)	0.9456*** (0.040)	0.7275*** (0.027)	0.9664*** (0.040)	0.6913*** (0.058)	0.7440*** (0.102)	0.7857*** (0.030)	0.9135*** (0.041)
<i>Learning by doing</i>												
Experience	0.0201*** (0.001)	0.0320*** (0.001)	0.0177*** (0.001)	0.0302*** (0.001)	0.0122*** (0.001)	0.0244*** (0.001)	0.0102*** (0.001)	0.0212*** (0.001)	0.0051*** (0.001)	0.0040 (0.003)	0.0168*** (0.001)	0.0263*** (0.002)
Age	0.0713*** (0.002)	0.0258*** (0.003)	0.0618*** (0.003)	0.0157*** (0.004)	0.0341*** (0.003)	0.0116*** (0.004)	0.0326*** (0.003)	0.0100*** (0.004)	0.0323*** (0.003)	0.0294*** (0.005)	0.0232*** (0.004)	–0.0013 (0.005)
Age ²	–0.0009*** (0.000)	–0.0004*** (0.000)	–0.0007*** (0.000)	–0.0003*** (0.000)	–0.0004*** (0.000)	–0.0002*** (0.000)	–0.0004*** (0.000)	–0.0001*** (0.000)	–0.0004*** (0.000)	–0.0003*** (0.000)	–0.0003*** (0.000)	–0.0000 (0.000)
<i>Occupation</i>												
Professional					0.1217*** (0.017)	0.1594*** (0.029)	0.0500*** (0.018)	–0.0017 (0.028)	–0.0543 (0.062)	0.2323** (0.111)	0.2290*** (0.045)	0.5366*** (0.103)
Skilled worker					0.1038*** (0.011)	0.1091*** (0.020)	0.0844*** (0.010)	0.1753*** (0.017)	0.1091 (0.081)	0.4776** (0.202)	–0.1231*** (0.018)	–0.2136*** (0.025)
<i>Reform-globalization</i>												
Industrial sector	0.0562*** (0.007)	0.1594*** (0.011)	0.1261*** (0.011)	0.2188*** (0.017)	0.1079*** (0.008)	0.2583*** (0.013)	0.1179*** (0.007)	0.1908*** (0.012)	–0.0391** (0.018)	–0.3769*** (0.025)	–0.0492*** (0.010)	–0.1775*** (0.017)
Net export (province)					0.0066*** (0.000)	0.0051*** (0.001)	0.0063*** (0.000)	0.0081*** (0.001)	0.0102*** (0.000)	0.0078*** (0.001)	0.0041*** (0.000)	0.0017*** (0.001)
Inflation (province)					–0.0133*** (0.002)	–0.0337*** (0.003)	0.0045* (0.002)	–0.0113*** (0.004)	0.0183*** (0.003)	0.0165*** (0.005)	0.0223*** (0.003)	0.0576*** (0.005)
<i>Culture-geography</i>												
House size	0.0067*** (0.001)	0.0034* (0.002)	0.0122*** (0.002)	0.0031 (0.003)	0.0029 (0.002)	–0.0045 (0.003)	–0.0017 (0.002)	–0.0046* (0.003)	0.0156*** (0.003)	0.0177*** (0.005)	–0.0213*** (0.004)	–0.0182*** (0.005)

(continued)

Table 2. Continued

	1992 Male (1)	Female (2)	1998 Male (3)	Female (4)	2002 Male (5)	Female (6)	2004 Male (7)	Female (8)	2006 Male (9)	Female (10)	2008 Male (11)	Female (12)
Urban	0.2148*** (0.007)	0.1719*** (0.011)	0.1192*** (0.009)	0.1112*** (0.014)	0.1103*** (0.009)	0.1301*** (0.017)	0.1159*** (0.009)	0.1431*** (0.016)	0.1961*** (0.010)	0.3144*** (0.018)	0.0230** (0.010)	0.0919*** (0.015)
Marital					0.1459*** (0.012)	0.0433*** (0.016)	0.1277*** (0.010)	0.0414*** (0.014)	0.1439*** (0.015)	−0.1309*** (0.020)	0.1407*** (0.014)	0.0580*** (0.016)
Constant	8.2663*** (0.036)	8.4980*** (0.054)	10.6284*** (0.051)	10.9536*** (0.074)	12.4957*** (0.063)	12.6217*** (0.091)	12.3672*** (0.058)	12.3969*** (0.076)	7.4742*** (0.061)	7.2481*** (0.105)	7.7649*** (0.081)	7.5976*** (0.116)
Observations	30,995	13,832	17,960	8,567	19,316	8,886	22,129	10,172	20,864	8,055	18,542	9,107
R ²	0.377	0.496	0.282	0.457	0.325	0.438	0.318	0.441	0.137	0.164	0.309	0.384

Note(s): All are the weighted least squares regressions with robust option, standard errors are in parentheses. An asterisk (*), (**), (***) denotes statistical significance at least at the 10%, 5%, 1% levels, respectively

Source(s): Authors' own work

Marriage also had contrasting effects. In Vietnam, marriage had limited impact on women's wages by 2008. In Indonesia, married men's wages increased by 14%, while married women's wages declined by 13%, reflecting entrenched gender biases.

This comparative analysis highlights significant differences in the determinants of gender wage disparities between Vietnam and Indonesia (for more detail analysis, please see [Online Appendix 4](#)). While education and professional roles were key factors in both contexts, Vietnam showed greater gender imbalances in higher education and industrialization benefits. Indonesia, on the other hand, offered more consistent advantages to women in education and urban labor markets, though crises exposed vulnerabilities. Addressing these disparities requires targeted policies that balance education reform, labor market support, and gender-sensitive economic strategies to achieve equitable wage outcomes in both countries.

4.3 Determinants of gender wage gap in Vietnam and Indonesia in period of 1992–2008

This section compares the determinants of gender wage gaps in Vietnam and Indonesia using the John Murphy Pierce model to decompose individual differentials, considering education, experience, reform, globalization, and cultural influences. Both countries experienced fluctuations in gender wage gaps, reflecting complex interactions of structural, policy, and cultural factors over 2 decades ([Tables 3 and 4](#)).

4.3.1 Trends in gender wage gap. Both Vietnam and Indonesia experienced reductions in gender wage gaps, though with differing magnitudes. In Vietnam, wage inequality fell by 10.61% (1992–1998) and 5.27% (2002–2004), coinciding with early reforms and global integration. However, gaps widened post-2004, particularly after WTO accession in 2007 (+2.77% in 2004–2006, +1.49% in 2006–2008). Indonesia saw a steadier decline, with major reductions of 8.3% (1992–1998) and 12.8% (1998–2002), followed by a sharp 16% drop (2006–2008). These trends align with [Opoku and Boahen \(2023\)](#) and [Yahmed \(2018\)](#), who highlight persistent gender disparities despite economic growth.

4.3.2 Education's impact. Education significantly reduced wage gaps in both countries, though more effectively in Indonesia. In Vietnam, higher education decreased wage inequality (−0.0129, 2004–2006) but lost impact under globalization (+0.0061, 2008). Similar findings by [Blau and Kahn \(2017\)](#) emphasize education's limitations in eliminating wage gaps. Indonesia showed stronger effects, with reductions from −0.0193 (1992–1998) to −0.0569 (2006–2008), suggesting sustained progress.

4.3.3 Experience, age, and occupational roles. Experience narrowed wage gaps inconsistently in Vietnam due to early female retirement policies. Indonesia exhibited more stable returns from experience, supporting [Ntuli and Kwenda \(2020\)](#). Age effects followed an inverse U-shaped pattern, with disparities widening in Vietnam but stabilizing in Indonesia. Occupational roles mitigated wage gaps, with professional positions reducing disparities in Vietnam (−1.54%, 2006–2008) and skilled roles benefiting Indonesian women during stable economic periods.

4.3.4 Reforms, globalization, and cultural factors. Economic reforms and globalization have shaped gender wage disparities in Vietnam and Indonesia, with Vietnam benefiting more substantially. In Vietnam, early market liberalization—via privatization, FDI inflows, and trade liberalization—played a pivotal role in reducing the wage gap. Empirical results indicate that privatization reduced the gap by −0.0267 (1992–1998) and foreign ownership expansion by −0.0384 (2002–2004). Complementary labor law reforms, such as improved wage-setting policies and enhanced labor standards, further promoted wage equality during this period. However, during 2004–2008, globalization—characterized by rapid industrialization and integration into global value chains—favored male-dominated sectors, widening disparities in manufacturing and heavy industry.

In contrast, Indonesia's deregulation and labor market reforms initially improved gender wage equality, but with less impact (−0.0014 reduction in 1993–1998 compared to −0.02 in Vietnam). Additionally, globalization-led industrialization and inflation widened the wage gap

Table 3. Determinants of gender wage gap in Vietnam in period 1993–2008 decomposition of individual differentials (Juhn-Murphy-Pierce model)

	Sample 1: 1993, sample 2: 1998			Sample 1: 2002, sample 2: 2004			Sample 1: 2004, sample 2: 2006			Sample 1: 2006, sample 2: 2008		
<i>Decomposition of individual differentials</i>												
	Raw difference	Quantity effect	Residual gap	Raw difference	Quantity effect	Residual gap	Raw difference	Quantity effect	Residual gap	Raw difference	Quantity effect	Residual gap
Sample 1	0.2398	0.0289	0.2109	0.1816	−0.0356	0.2172	0.1289	−0.0572	0.1861	0.1566	−0.0360	0.1926
Sample 2	0.1337	−0.0026	0.1363	0.1289	−0.0583	0.1872	0.1566	−0.0360	0.1926	0.1715	−0.0697	0.2412
<i>Difference in (components of) differentials</i>												
	D	E	U	D	E	U	D	E	U	D	E	U
Total	−0.1061	−0.0316	−0.0745	−0.0527	−0.0226	−0.0300	0.0277	0.0212	0.0065	0.0149	−0.0337	0.0486
<i>Decomposition of difference in predicted gap</i>												
	E	Q	P	E	Q	P	E	Q	P	E	Q	P
Total	−0.0316	−0.0016	−0.0299	−0.0226	−0.0526	0.0300	0.0212	0.0065	0.0147	−0.0337	−0.0249	−0.0088
Education	−0.0160	−0.0105	−0.0055	0.0029	−0.0028	0.0058	−0.0112	−0.0029	−0.0082	0.0029	−0.0032	0.0061
Primary school	−0.0046	−0.0053	0.0007	0.0013	0.0001	0.0013	−0.0020	0.0003	−0.0023	0.0016	0.0001	0.0015
Secondary school	−0.0042	−0.0012	−0.0030	0.0046	0.0008	0.0038	0.0016	0.0011	0.0005	−0.0018	−0.0002	−0.0015
High school	0.0013	−0.0003	0.0016	−0.0013	−0.0011	−0.0002	0.0007	0.0007	0.0000	0.0008	−0.0003	0.0011
Vocational school	−0.0022	−0.0019	−0.0003	0.0040	0.0017	0.0023	0.0014	0.0016	−0.0002	−0.0004	−0.0006	0.0002
College or higher	−0.0064	−0.0018	−0.0046	−0.0057	−0.0044	−0.0014	−0.0129	−0.0066	−0.0062	0.0026	−0.0021	0.0047
Learning by doing	−0.0047	−0.0018	−0.0029	0.0031	−0.0010	0.0040	0.00314	0.003	0.00013	−0.0091	−0.0097	0.0006
Experience	0.0015	−0.0002	0.0017	−0.0018	−0.0001	−0.0018	0.0034	0.0020	0.0014	−0.0011	−0.0005	−0.0005
Age	−0.0342	−0.0054	−0.0288	0.0364	0.0070	0.0295	0.0110	0.0032	0.0078	0.0105	−0.0102	0.0207
Age ²	0.0280	0.0039	0.0241	−0.0315	−0.0079	−0.0237	−0.0113	−0.0022	−0.0091	−0.0186	0.0010	−0.0196
Occupation/skill	0.0129	0.0432	−0.0303	0.0002	−0.0097	0.0099	0.0019	0.0004	0.0015	−0.0171	−0.0003	−0.0168
Professional	0.0016	0.0261	−0.0246	0.0058	−0.0086	0.0145	0.0010	0.0008	0.0001	−0.0154	0.0001	−0.0155

(continued)

Table 3. Continued

	Sample 1: 1993, sample 2: 1998			Sample 1: 2002, sample 2: 2004			Sample 1: 2004, sample 2: 2006			Sample 1: 2006, sample 2: 2008		
Skilled	0.0114	0.0171	-0.0057	-0.0056	-0.0011	-0.0045	0.0010	-0.0004	0.0014	-0.0016	-0.0004	-0.0012
Reform- openness	-0.0267	-0.0300	0.0032	-0.0384	-0.0279	-0.0105	0.0233	0.0065	0.0167	-0.0117	-0.0094	-0.0023
Private ownership	-0.0081	-0.0079	-0.0002	-0.0010	0.0058	-0.0069	0.0005	-0.0001	0.0006	-0.0003	0.0001	-0.0004
Foreign ownership	-0.0059	-0.0084	0.0025	-0.0118	-0.0038	-0.0080	0.0027	-0.0020	0.0048	-0.0056	-0.0037	-0.0019
Industrial sector	-0.0032	-0.0036	0.0004	-0.0107	-0.0035	-0.0072	0.0007	0.0005	0.0002	-0.0026	-0.0015	-0.0011
Non-food expenditure	-0.0095	-0.0100	0.0005	-0.0148	-0.0264	0.0115	0.0195	0.0088	0.0107	-0.0035	-0.0047	0.0012
Life improved							-0.0003	-0.0006	0.0004	0.0003	0.0004	-0.0001
Culture_ geography	0.0029	-0.0027	0.0056	0.0095	-0.0112	0.0208	0.0041	-0.0005	0.0046	0.0012	-0.0024	0.0036
Marital	-0.0011	0.0002	-0.0014	0.0025	0.0000	0.0025	0.0006	0.0001	0.0005	-0.0026	-0.0026	0.0000
House size	0.0017	0.0002	0.0015	0.0043	0.0042	0.0001	-0.0036	-0.0036	0.0000	0.0003	0.0006	-0.0003
Urban	0.0026	-0.0019	0.0045	0.0056	-0.0108	0.0163	0.0071	0.0034	0.0038	0.0034	0.0002	0.0032
Ethnic	-0.0003	-0.0012	0.0010	-0.0028	-0.0047	0.0019	-0.0001	-0.0004	0.0003	0.0001	-0.0006	0.0008
<i>Decomposition of defense in residual gap</i>												
	U	Q	P	U	Q	P	U	Q	P	U	Q	P
Total	-0.0745	-0.0398	-0.0347	-0.0300	0.0646	-0.0947	0.0065	0.0163	-0.0099	0.0486	0.0325	0.0161

Note(s): D = difference in differential; E = difference in predicted gap; U = difference in residual gap; Q = quantity effect; P = price effect

Decomposition of difference in residual gap

(1) The natural logarithms of these real wage rates are then used in the augmented Mincerian wage equations, which control for, *inter alia*, human capital, ethnicity, industry affiliation, and other characteristics. (2) Globalization is the process of international integration arising from the interchange of [world views](#), products, ideas, and other aspects of [culture](#). In particular, advances in [transportation](#) and [telecommunications](#) infrastructure, including the rise of [the Internet](#), are major factors in globalization and precipitate further [interdependence](#) of economic and cultural activities ([Steuer 1972](#)). (3) The data for the year 2010 use different codes and observations, thus it is impossible to merge with this year's data

Source(s): Authors' own work

Table 4. Determinants of gender wage gap in Indonesia in period 1993–2008 decomposition of individual differentials-John Murphy Pierce model

	Sample 1: 1993, sample 2: 1998			Sample 1: 2002, sample 2: 2004			Sample 1: 2006, sample 2: 2008		
<i>Decomposition of individual differentials</i>									
	Raw difference	Quantity effect	Residual gap	Raw difference	Quantity effect	Residual gap	Raw difference	Quantity effect	Residual gap
Sample 1	0.5536	0.1358	0.4178	0.3495	0.0735	0.2760	0.4543	0.0352	0.4192
Sample 2	0.4709	0.0719	0.3990	0.3351	0.0825	0.2526	0.2975	0.0813	0.2162
<i>Difference in (components of differentials: D = Dsample2 – Dsample1</i>									
	D = E + U	E	U	D	E	U	D	E	U
Total	−0.0827	−0.0639	−0.0188	−0.0143	0.0090	−0.0233	−0.1569	0.0461	−0.2030
<i>Decomposition of difference in predicted gap</i>									
	E = Qe + Pe	Qe	Pe	E	Qe	Pe	E	Qe	Pe
Total	−0.0639	−0.0571	−0.0068	0.0090	0.0163	−0.0073	0.0461	−0.0181	0.0642
Education	−0.0193	−0.0217	0.0023	−0.0016	0.0010	−0.0026	−0.0569	−0.0429	−0.0140
Primary school	0.0003	0.0000	0.0003	−0.0039	−0.0038	0.0000	−0.0084	−0.0080	−0.0004
Secondary school	0.0016	0.0000	0.0016	0.0002	0.0000	0.0002	−0.0103	0.0047	−0.0150
High school	0.0053	0.0042	0.0011	0.0074	0.0054	0.0020	−0.0041	−0.0026	−0.0015
Technical worker	0.0008	0.0002	0.0006	0.0002	0.0000	0.0002	0.0084	0.0003	0.0081
College or higher	−0.0272	−0.0261	−0.0012	−0.0055	−0.0006	−0.0049	−0.0424	−0.0374	−0.0051
Learning doing	−0.0383	−0.0267	−0.0117	0.0032	0.0107	−0.0076	0.0621	0.0300	0.0321
Experience	−0.0182	−0.0113	−0.0069	−0.0011	0.0072	−0.0084	0.0447	0.0101	0.0346
Age	−0.0892	−0.0645	−0.0248	0.0110	0.0179	−0.0069	0.1131	0.1374	−0.0243
Age ²	0.0691	0.0491	0.0200	−0.0067	−0.0144	0.0077	−0.0957	−0.1175	0.0217
Occupation				0.0064	0.0005	0.0059	0.0046	−0.0032	0.0078
Professional				0.0072	0.0016	0.0056	0.0021	−0.0007	0.0028

(continued)

Table 4. Continued

	Sample 1: 1993, sample 2: 1998			Sample 1: 2002, sample 2: 2004			Sample 1: 2006, sample 2: 2008		
Skilled				−0.0008	−0.0011	0.0003	0.0026	−0.0025	0.0051
<i>Reform-globalization</i>	−0.0014	−0.0003	−0.0011	0.0021	0.0009	0.0013	0.0085	0.0162	−0.0077
Industrial sector	−0.0014	−0.0003	−0.0011	0.0049	0.0044	0.0005	0.0051	0.0036	0.0015
Net export				−0.0029	−0.0029	−0.0001	0.0009	0.0104	−0.0095
Inflation				0.0002	−0.0006	0.0008	0.0026	0.0022	0.0003
<i>Culture_geography</i>	−0.0048	−0.0084	0.0036	−0.0011	0.0032	−0.0043	0.0277	−0.0182	0.0459
Marital				−0.0013	0.0034	−0.0047	0.0048	0.0053	−0.0004
House size	−0.0003	−0.0001	−0.0002	0.0004	−0.0003	0.0007	0.0147	−0.0166	0.0313
Urban	−0.0046	−0.0083	0.0038	−0.0002	0.0002	−0.0003	0.0082	−0.0068	0.0150
<i>Decomposition of difference in residual gap</i>									
	U = Qu + Pu			U	Qu	Pu	U	Qu	Pu
Total	−0.0188	−0.0522	0.0334	−0.0233	−0.0141	−0.0092	−0.2030	−0.1975	−0.0055
Note(s): D = difference in differential; E = difference in predicted gap; U = difference in residual gap; Q = quantity effect; P = price effect									
Source(s): Authors' own work									

by 0.21% (2002–2004) and 0.85% (2006–2008), eventually reversing earlier gains (coefficient: 0.0085). These findings underscore that while reforms are critical, additional complementary measures are necessary to achieve sustained gender parity.

Cultural norms, urbanization, and marital status influenced wage trends, with Vietnam facing a “glass ceiling” effect (Bertrand, 2018), while Indonesia’s urban women experienced greater wage growth. Persistent gender discrimination remained a key determinant, with Indonesia showing stronger progress in mitigating its effects.

4.3.5 Comparative insights. Vietnam and Indonesia demonstrate shared and distinct trajectories in addressing gender wage gaps (for more detail analysis, please see [Online Appendix 5](#)). Education serves as a universal equalizer, with sustained effects in Indonesia but diminishing returns in Vietnam under globalization. Reforms initially reduced disparities in both countries, but globalization’s uneven impact, particularly in industrial sectors, favoured men in Vietnam and exacerbated gaps in Indonesia (see [Table 5](#)).

Policy efforts should prioritize education, align retirement policies, and address structural inequalities. For Vietnam, reforms should focus on enhancing women’s workforce participation by addressing cultural barriers. For Indonesia, better integration of gender equality goals into reforms can sustain gains achieved through education and globalization. Addressing these disparities will enable both countries to unlock the full potential of their female workforce, fostering equitable and sustainable economic growth.

4.4 Policy implications and generalization of findings

The findings offer valuable lessons beyond Vietnam and Indonesia, providing insights for other developing economies addressing gender wage disparities. Three key policy areas emerge:

4.4.1 Enhancing education and training. Expanding access to quality education, particularly in high-earning fields, is essential for reducing wage disparities. Governments can boost female participation in STEM, finance, and emerging industries by offering targeted scholarships, vocational training, and mentorship programs. Both state and private sector investments in education should be a top priority, as they not only reduce the gender wage gap but also enhance overall human capital efficiency, an essential determinant of firm performance (Nguyen and Nghiem, 2023; Nguyen, 2013, 2016). In addition, policies must address career progression barriers by ensuring that women can accumulate work experience comparable to men. This can be achieved by implementing measures such as equal retirement ages, flexible work arrangements, and improved parental leave reforms, thereby creating a more equitable labor market.

Table 5. Comparison of determinants of gender wage gap between Vietnam and Indonesia

Factor	Vietnam	Indonesia
Education	High education levels reduced gaps, but globalization weakened the effect post-2006	<i>Consistently reduced gaps; globalization enhanced the effect</i>
Experience	Supported women’s wages but were limited by gendered retirement policies	Consistently benefited both genders, with stronger effects for women
Age	Inverse U-shaped effect; sharp declines in returns for women at older ages	Similar trends but steadier gender parity over time
Reforms/globalization	Reforms narrowed gaps, but globalization sometimes widened disparities	Mixed results, with globalization often exacerbate gaps
Occupation	<i>Professional roles</i> significantly reduced gaps, especially for women	Professional and skilled roles provided stable opportunities for wage parity
Cultural/geography	Urbanization widened gaps; cultural norms limited women’s economic participation	<i>Urbanization reduced gaps; cultural flexibility enabled women to pursue careers</i>

4.4.2 *Gender-sensitive labor market reforms.* Vietnam's privatization and foreign ownership initially reduced wage gaps, but globalization pressures offset gains. Policies must integrate gender considerations into trade and labor reforms, promoting professional development for women to enhance their wages and economic standing. Indonesia requires wage-setting regulations to ensure equal pay. Both countries should encourage women's participation in high-value sectors by enforcing wage transparency and affirmative action initiatives. Occupational trends show smaller wage gaps in skilled professions, reinforcing the need for targeted labor policies.

4.4.3 *Addressing cultural and geographic barriers.* Vietnam should reform urban policies to enhance protections for female employees and improve access to training and job mobility. Public awareness campaigns and legal measures must counter gender biases at a national level. Both countries should leverage globalization for wage equity, ensuring trade policies incorporate gender-impact assessments to create balanced opportunities.

5. Conclusion

Achieving gender equality is a complex challenge intertwined with economic, cultural, and institutional factors. This study examines the role of education in narrowing the gender wage gap and provides actionable policy recommendations for sustainable development.

Education and training remain powerful tools for reducing wage disparities, yet their impact depends on structural and cultural contexts. In Vietnam, higher education helps reduce gaps but is constrained by institutional barriers, while in Indonesia, education offers sustained benefits, amplified by globalization. Despite progress, both nations face challenges: Vietnam must address cultural biases limiting women's access to opportunities, whereas Indonesia needs stronger regulatory frameworks for continued progress.

Sustained reform, inclusive policies, and targeted investments in education are essential for equitable development. Promoting gender equality is not just a social imperative but a driver of economic growth. This study underscores the importance of integrating gender-sensitive strategies into national policies to achieve fair labor market outcomes. Its findings provide empirical evidence applicable to other developing economies, emphasizing that gender-focused education and labor reforms are key to fostering inclusive and sustainable economic progress.

References

- Albrecht, J., Björklund, A. and Vroman, S. (2003), "Is there a glass ceiling in Sweden?", *Journal of Labor Economics*, Vol. 21 No. 1, pp. 145-177, doi: [10.1086/344126](https://doi.org/10.1086/344126).
- Azmat, G. and Petrongolo, B. (2014), "Gender and the labour market: what have we learned from field and lab experiments?", *Labour Economics*, Vol. 30, pp. 32-40, doi: [10.1016/j.labeco.2014.06.005](https://doi.org/10.1016/j.labeco.2014.06.005).
- Bednarek, L.B. (1998), "The gender wage gap: searching for equality in a global economy", *Indiana Journal of Global Legal Studies*, Vol. 6 No. 1, pp. 213-236.
- Bertrand, M. (2018), "The glass ceiling", *Economica*, Vol. 85 No. 338, pp. 205-231, doi: [10.1111/ecca.12264](https://doi.org/10.1111/ecca.12264).
- Bhorat, H. and Goga, S. (2013), "The gender wage gap in post-apartheid South Africa: a reexamination", *Journal of African Economies*, Vol. 22 No. 5, pp. 827-848, doi: [10.1093/jae/ejt008](https://doi.org/10.1093/jae/ejt008).
- Black, D.A., Haviland, A.M., Sanders, S.G. and Taylor, L.J. (2008), "Gender wage disparities among the highly educated", *Journal of Human Resources*, Vol. 43 No. 3, pp. 630-659, doi: [10.3368/jhr.43.3.630](https://doi.org/10.3368/jhr.43.3.630).
- Blau, F.D. and Kahn, L.M. (1992), "The gender earnings gap: learning from international comparisons", *American Economic Review*, Vol. 82 No. 2, pp. 533-538.
- Blau, F.D. and Kahn, L.M. (1994), "The impact of wage structure on trends in U.S. gender wage differentials, 1975-1987", NBER working paper.

- Blau, F.D. and Kahn, L.M. (2017), "The gender wage gap: extent, trends, and explanations", *Journal of Economic Literature*, Vol. 55 No. 3, pp. 789-865, doi: [10.1257/jel.20160995](https://doi.org/10.1257/jel.20160995).
- Blinder, A.S. (1973), "Wage discrimination: reduced form and structural estimates", *Journal of Human Resources*, Vol. 8 No. 4, pp. 436-455, doi: [10.2307/144855](https://doi.org/10.2307/144855).
- Booth, A., Francesconi, M. and Frank, J. (2003), "A sticky floors model of promotion, pay, and gender", *European Economic Review*, Vol. 47 No. 2, pp. 295-322, doi: [10.1016/s0014-2921\(01\)00197-0](https://doi.org/10.1016/s0014-2921(01)00197-0).
- Caparrós Ruiz, A. (2024), "Gender wage gap among highly educated workers: some evidence from Spain", *Journal of Economic Studies*, Vol. ahead-of-print No. ahead-of-print, doi: [10.1108/JES-06-2024-0371](https://doi.org/10.1108/JES-06-2024-0371).
- Dan, A.B., Haviland, A.M., Sanders, S.G. and Taylor, L.J. (2008), "Gender wage disparities among the highly educated", *Journal of Human Resources*, Vol. 43 No. 3, pp. 630-659, doi: [10.3368/jhr.43.3.630](https://doi.org/10.3368/jhr.43.3.630).
- Hoyos, A. and Ñopo, H. (2010), *Evolution of Gender Wage Gaps in Latin America at the Turn of the Twentieth Century: An Addendum to New Century, Old Disparities*, Research Department Publications 4665, Inter-American Development Bank, Research Department.
- Levanon, A., England, P. and Allison, P. (2009), "Occupational feminization and pay: assessing causal dynamics using 1950–2000 U.S. Census data", *Social Forces*, Vol. 88 No. 2, pp. 865-891, doi: [10.1353/sof.0.0264](https://doi.org/10.1353/sof.0.0264).
- Liu, A.Y.C. (2004), "Gender wage gap in Vietnam: 1993 to 1998", *Journal of Comparative Economics*, Vol. 32 No. 3, pp. 586-596, doi: [10.1016/j.jce.2004.04.004](https://doi.org/10.1016/j.jce.2004.04.004).
- Livanos, I. and Pouliakas, K. (2012), "Educational segregation and the gender wage gap in Greece", *Journal of Economic Studies*, Vol. 39 No. 5, pp. 554-575, doi: [10.1108/01443581211259473](https://doi.org/10.1108/01443581211259473).
- McConnell, C.R. and Brue, S.L. (1995), *Economics: Principles, Problems, and Policies*, 13th ed., McGraw-Hill, New York, NY.
- McGuinness, S., Kelly, E., Pham, T.T.P., Ha, T.T.T. and Whelan, A. (2021), "Returns to education in Vietnam: a changing landscape", *World Development*, Vol. 138, 105205, doi: [10.1016/j.worlddev.2020.105205](https://doi.org/10.1016/j.worlddev.2020.105205).
- Mincer, J.A. (1974 In press), "The human capital earnings function", *Schooling, Experience, and Earnings*, National Bureau of Economic Research, Inc., pp. 83-96.
- Ngo, T. (2022), "The minimum wage and the gender wage gap: evidence from Vietnam", *Journal of Economic Studies*, Vol. 49 No. 7, pp. 1262-1285, doi: [10.1108/JES-10-2020-0506](https://doi.org/10.1108/JES-10-2020-0506).
- Nguyen, N.T. (2006), "Gender wage gap of employees in Vietnam: problems and policy implications", *Ministry of planning and investment project (6/2005–12/2006)*.
- Nguyen, N.T. (2013), "Determinants of firm growth in the Vietnamese commercial-service sector", *Journal of Economics and Development*, Vol. 14 No. 1, pp. 57-77.
- Nguyen, N.T. (2016), "Survival of new private enterprises in transition economies: the case of Vietnam", *Society and Economy*, Vol. 38 No. 1, pp. 47-67, doi: [10.1556/204.2016.38.1.4](https://doi.org/10.1556/204.2016.38.1.4).
- Nguyen, N.T. and Nghiem, V.T. (2023), "Intellectual capital and financial performance of industrial firms in emerging countries: empirical evidence from Vietnam", *Global Business and Finance Review*, Vol. 28 No. 2, p. 107, doi: [10.17549/gbfr.2023.28.2.107](https://doi.org/10.17549/gbfr.2023.28.2.107).
- Ntuli, M. and Kwenda, P. (2020), "Gender gaps in employment and wages in Sub-Saharan Africa: a review", in Konte, M. and Tirivayi, N. (Eds), *Women and Sustainable Human Development. Gender, Development and Social Change*, Palgrave Macmillan, Basingstoke, pp. 183-203, doi: [10.1007/978-3-030-14935-2_11](https://doi.org/10.1007/978-3-030-14935-2_11).
- Oaxaca, R.L. (1973), "Male–female wage differentials in urban labour markets", working paper no. 23, Princeton University.
- Obayelu, A.E., Okoruwa, V.O. and Oni, O.A. (2009), "Analysis of rural and urban households' food consumption differential in the North-Central, Nigeria: a micro-econometric approach", *Journal of Development and Agricultural Economics*, Vol. 1, pp. 18-26.

- OECD (2024), *Equity in Education and on the Labour Market: Main Findings from Education at a Glance 2024*, OECD Education Policy Perspectives, No. 107, OECD Publishing, Paris. doi: [10.1787/b502b9a6-en](https://doi.org/10.1787/b502b9a6-en).
- Opoku, K. and Boahen, E.A. (2023), "Gender wage gaps in Ghana: a comparison across different selection models", *SN Business and Economics*, Vol. 3 No. 7, p. 130, doi: [10.1007/s43546-023-00502-8](https://doi.org/10.1007/s43546-023-00502-8).
- Pereira, P.T. and Martins, P.S. (2000), "Does education reduce wage inequality? Quantile regressions evidence from fifteen European countries", IZA discussion paper no. 120.
- Psacharopoulos, G. and Patrinos, H.A. (2018), "Returns to investment in education: a decennial review of the global literature", *Education Economics*, Vol. 26 No. 5, pp. 445-458, doi: [10.1080/09645292.2018.1484426](https://doi.org/10.1080/09645292.2018.1484426).
- Reskin, B.F. and Pugh, I. (1994), *Women and Men at Work*, Pine Forge Press, Thousand Oaks.
- Saha, T. and Singh, P. (2025), "Role of labor market dynamics in influencing global female labor force participation", *Journal of Economic Studies*, Vol. 52 No. 1, pp. 17-37, doi: [10.1108/JES-11-2023-0633](https://doi.org/10.1108/JES-11-2023-0633).
- Scott, W. (2001), "An empirical analysis of competition, privatization, and regulation in Africa and Latin America", *Journal of Industrial Economics*, Vol. 49, pp. 1-19.
- Smith, J.P. and Welch, F.R. (1989), "Black economic progress after Myrdal", *Journal of Economic Literature*, Vol. 27 No. 2, pp. 519-564.
- Stever, H.G. (1972), "Science, systems, and society", *Journal of Cybernetics*, Vol. 2 No. 3, pp. 1-3, doi: [10.1080/01969727208542909](https://doi.org/10.1080/01969727208542909).
- The ILO (2020), *Global Wage Report 2020–21: Wages and Minimum Wages in the Time of COVID-19*, International Labour Office, Geneva.
- Todaro, M.P. and Smith, S.C. (2006), *Economic Development*, Pearson Education, Essex.
- Tuan, L.V., Simioni, M. and Huong, T.T. (2018), "Application of the copula-based decomposition method to study the income inequality between rural and urban areas in Vietnam", *Journal of Trade Science*, Vol. 6 No. 3, pp. 53-60.
- Wiswall, M. and Zafar, B. (2017), "Preference for the workplace, investment in human capital, and gender", *Quarterly Journal of Economics*, Vol. 133 No. 1, pp. 457-507, doi: [10.1093/qje/qjx035](https://doi.org/10.1093/qje/qjx035).
- World Bank (2012), *World Development Report 2012: Gender Equality and Development (Vol. 1 of 2): Main Report*, World Bank Group, Washington, DC, available at: <http://documents.worldbank.org/curated/en/492221468136792185>
- World Bank (2024), *Gender Strategy 2024-2030: Accelerate Gender Equality to End Poverty on a Livable Planet (English)*, World Bank Group, Washington, DC, available at: <http://documents.worldbank.org/curated/en/099061124182033630>
- Yahmed, S.B. (2018), "Formal but less equal: gender wage gaps in formal and informal jobs in urban Brazil", *World Development*, Vol. 101, pp. 73-87, doi: [10.1016/j.worlddev.2017.08.012](https://doi.org/10.1016/j.worlddev.2017.08.012).

Further reading

- Afrooz, A. and Abdul Rahim, K. (2010), "A review of the effects of gender, age, and education on wage and productivity", *International Research Journal of Finance and Economics*, Vol. 46, pp. 71-79.

Supplementary material

The supplementary material for this article can be found online.

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