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HUMAN RESOURCE MANAGEMENT MEETS PUBLIC POLICY: GII, EDUCATION PARITY, AND WOMEN'S LABOUR-FORCE PARTICIPATION

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Abstract: Persistent gender gaps in labour-force participation (LFPR) constrain productivity and inclusive growth across East Asia and the Pacific (EAP). While many factors shape women's economic engagement, structural gender inequality and disparities in human capital are consistently cited as key explanations. This study examines whether cross-country variation in the LFPR gap (male minus female, percentage-point difference) is associated with (i) the Gender Inequality Index (GII) and (ii) the male–female gap in secondary-education attainment. We conduct a cross-sectional, country-level analysis using secondary data from the United Nations Development Programme's *Human Development Report* Statistical Annex (reference year 2023). Ordinary Least Squares (OLS) is estimated with heteroskedasticity-robust (HC3) inference. Robustness checks include institutional and health covariates—women's representation in parliament, adolescent birth rate, and maternal mortality. Multicollinearity diagnostics (variance inflation factors) indicate low collinearity among regressors. Descriptive patterns show that countries with higher GII values and wider secondary-education gaps tend to exhibit larger LFPR gaps. In multivariate models, higher GII is positively and statistically associated with wider LFPR gaps. The secondary-education gap is positively related to the LFPR gap, though its magnitude and significance attenuate when institutional and health controls are included. Results remain directionally stable across specifications. Reducing gendered participation penalties in the EAP likely requires a dual strategy: expanding women's secondary-education completion and strengthening enabling institutions (e.g., anti-discrimination enforcement, childcare and care infrastructure, safe and flexible work arrangements). Future work using panel or microdata is warranted to assess dynamics and mechanisms more precisely.

Keyword: gender inequality; labour-force participation; secondary education; East Asia and Pacific; human capital; institutions; HC3-robust OLS

1. INTRODUCTION

Persistent gender gaps in labour force participation (LFPR) reduce the effective talent pool, constrain productivity, and signal entrenched structural frictions that HR policies must address. Global monitoring shows the participation gap remains wide, with women's employment ratios still far below men's; this "participation penalty" endures across income groups and slows inclusive growth (ILO, 2024). In 2024 the ILO estimated 45.6% of women (aged 15+) were employed versus 69.2% of men—a 23.6 percentage-point gap—underlining the scale of the challenge HR systems face when matching skills to jobs and removing barriers to entry and retention (ILO, 2024).

Across East Asia and the Pacific (EAP), gender gaps exhibit considerable heterogeneity. Several economies have closed a high share of the Economic Participation & Opportunity subindex; yet many still display participation shortfalls and pronounced occupational segregation, especially in fast-growing, higher-productivity sectors (World Economic Forum (WEF), 2025; Asian Development Bank (ADB) & International Labour Organization (ILO), 2022). Recent ASEAN regional snapshots emphasize uneven progress across the Sustainable Development Goals (SDGs), including decent work (SDG 8) and quality

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education (SDG 4), with labour participation differences by sex remaining visible in the latest comparable data (UN Women/ASEAN, 2024). For human resource management (HRM) scholarship and practice, this region thus provides both high-performing comparators and laggards, enabling empirical identification of structural drivers—such as inequality indices and education gaps—that condition women's economic engagement (WEF, 2025; UN Women/ASEAN, 2024; ADB/ILO, 2022).

The Gender Inequality Index (GII) aggregates reproductive health, empowerment, and labour-market indicators into a single composite measure; higher values indicate worse inequality in capabilities and opportunities. Notably, the GII explicitly incorporates a labour-market dimension, making it a robust macroeconomic proxy for the institutional and structural constraints that limit women's economic participation (United Nations Development Programme (UNDP), Human Development Report (HDR), 2025). Secondary-education attainment gaps, in turn, capture human-capital asymmetries that translate into subsequent employment and earnings differentials. Recent EAP reports continue to find that gaps in upper-secondary completion and skill acquisition correlate with women's weaker labour-market outcomes, lower occupational quality, and diminished bargaining power (UN Women/ASEAN, 2024; ADB/ILO, 2022).

By combining structural inequality (X_1: GII) and human-capital disparity (X_2: male–female secondary-education gap) as explanatory variables, this study targets the two channels most consistently highlighted in cross-country evidence as determinants of gendered labour-force participation (Y). This dual-channel framework aligns with contemporary policy discourse, which emphasizes that neither education investments nor institutional reforms alone are sufficient; rather, both must advance in tandem to close persistent participation gaps (UNDP/HDR, 2025; UN Women/ASEAN, 2024; ESCAP, 2022). The present analysis therefore contributes to the empirical literature by quantifying these associations in the EAP context, providing region-specific evidence to inform HR policy design, workforce planning, and inclusive-growth strategies.

2. STUDI LITERATURE

2.1 Trends in gender parity and LFPR gaps

Annual benchmarking shows parity is still ~69% closed overall, with particularly stubborn gaps in economic participation and opportunity (WEF, 2025). Even where economies rank highly, female representation remains uneven across occupations and senior roles—conditions linked to participation and retention (WEF, 2025). ILO trend reports similarly document that post-pandemic recoveries have been uneven and that women are over-represented in lower-quality or informal jobs, amplifying the observed participation gap (ILO, 2024). News and policy monitoring confirm the global community is off-track to reach gender equality targets by 2030, reinforcing the importance of rigorous diagnostics like yours (UN Women/UNDESA, 2023). (WEF, 2025; ILO, 2024; UN Women/UNDESA, 2023).

2.2 Structural Inequality (GII) and Participation (Y)

The GII encapsulates disadvantage across reproductive health, empowerment (education and parliamentary seats), and labour-market participation; higher GII is conceptually tied to a larger LFPR gap because it signals constrained agency, capability, and opportunity for women (UNDP/HDR). Cross-regional syntheses show that countries with higher legal and institutional equality scores tend to post smaller participation gaps and higher female employment (World Bank, *Women, Business and the Law* 2025), consistent with GII's linkage to broader enabling conditions. In ASEAN, empowerment and labour-market indicators move together: where women's representation and education are stronger, participation gaps are typically narrower (UN Women/ASEAN, 2024). (UNDP/HDR, 2025; World Bank, 2025; UN Women/ASEAN, 2024).

2.3 Education Gaps

Education especially completion of at least some secondary is a consistent predictor of women's labour-market entry and attachment. ASEAN's 2024 outlook documents continuing differences in secondary attainment, and ties them to economic participation disparities (UN Women/ASEAN, 2024). Broader EAP and global reviews show that narrowing the male–female secondary-education gap associates with higher female participation and movement into higher-productivity sectors (ADB/ILO, 2022; UN Women/SDG Snapshot, 2023). The mechanism is both supply-side (skills, credentials) and demand-side (employer screening, occupational matching), reinforcing the use of X2 as a proximal human-capital driver of the LFPR gap (UN Women/ASEAN, 2024; ADB/ILO, 2022; UN Women, 2023).

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2.4 Institutions, Legal Frameworks, And The Cost Of Inequality

Legal constraints—e.g., mobility, workplace protections, childcare, taxation of second earners—are systematically linked with lower female labour-force participation in global evidence (World Bank *Women, Business and the Law*, 2025). The World Bank's 2025 update synthesizes reforms and outcomes, showing that stronger legal equality is associated with smaller participation gaps and higher female employment shares, a channel complementary to GII (World Bank, 2025). Country statistical agencies adapting the UNDP framework (e.g., Indonesia's IKG 2024) reinforce the policy salience of these dimensions for national HR planning (BPS, 2025). (World Bank, 2025; BPS, 2025).

2.5 Care Economy And Unpaid Work As Binding Constraints

Asia-Pacific policy briefs highlight unpaid care as a first-order barrier: women's disproportionate care load depresses participation regardless of education, contributing directly to the LFPR gap (ESCAP, 2022). Evidence shows that without care infrastructure and leave policies, human-capital investments in girls/women do not translate fully into labour-market participation (ESCAP, 2022), which aligns with your model's expectation that higher inequality environments (higher GII) exacerbate the LFPR gap even when education gaps narrow. (ESCAP, 2022).

2.6 Sectoral and Occupational Patterns in EAP

EAP growth sectors have not always absorbed women at commensurate rates; an ADB/ILO regional study shows women remain under-represented in fast-growing, higher-productivity sectors, which depresses participation and advancement (ADB/ILO, 2022). Occupational segregation and "sticky floors" limit returns to schooling for women, implying that reducing **X2** (education gap) is necessary but not sufficient unless workplaces and sectors also change (ADB/ILO, 2022). (ADB/ILO, 2022).

2.7 Off-track to 2030 and implications for HRM

Status reviews warn that the world is not on track to meet gender equality goals by 2030; gaps in decent work, education, and leadership remain material headwinds (UN Women/UNDESA, 2023). For HRM, this means organizations should expect continued talent frictions unless systems—education pipelines, legal and institutional supports, and workplace practices—improve together. Such context supports your specification: X1 (GII) captures structural headwinds; X2 (education gap) captures pipeline quality; Y (LFPR gap) quantifies the labour-market outcome to be explained. (UN Women/UNDESA, 2023; WEF, 2025; ILO, 2024).

2.8 Synthesis And Testable Implications For Your Model

- H1 (Structural inequality): Higher GII → larger LFPR gap because constraints in empowerment and labour-market access widen participation differences (UNDP/HDR; World Bank WBL).
- H2 (Human capital): Larger secondary-education gap → larger LFPR gap, as schooling asymmetries lower women's employability and bargaining power (UN Women/ASEAN; ADB/ILO).
- H3 (Complementarity): Even with education gains, participation will lag unless supportive institutions (laws, childcare, workplace practices) are present—implying a robust X1 effect even when X2 narrows (ESCAP; WBL).

3. RESEARCH METHOD

3.1 Research Design

Cross-sectional, country-level quantitative study testing whether structural gender inequality (X1) and human-capital disparity (X2) explain the gender gap in labour force participation (Y).

3.2 Population and Sample

Population: All East Asia & Pacific (EAP) economies (World Bank regional classification).
Observational unit: Country/economy, year 2023 (or latest available within the 2020–2023 window for ancillary controls).

Sample inclusion: EAP economies with non-missing values for:

- Gender Inequality Index (GII) 2023,
- Female and male labour force participation rate (LFPR, ages 15+), 2023,
- Female and male shares with at least some secondary education (ages 25+), 2023.

Exclusion: Economies lacking any of the required 2023 indicators.

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3.3 Data Sources

- UNDP Human Development Report 2025 – Statistical Annex, Table 5 (GII):
  GII (2023), LFPR by sex (15+), population with ≥ secondary education by sex (25+), women's seats in parliament, adolescent birth rate, maternal mortality.
- (Optional context/robustness): UNDP HDR Table 1 (HDI) for HDI, GNI per capita; World Bank/ILO for alternative LFPR verification if needed.

3.4 Variable Construction (Formulas)

1. **Outcome (Y): LFPR gap**

$$Y_i \equiv \text{LFPR}_i^{\text{Male}} - \text{LFPR}_i^{\text{Female}} \quad \text{(percentage points)}$$

2. **Key predictors**

Structural inequality (X1):

$$X1_i \equiv \text{GII}_i \quad \left(\text{higher} = \text{worse inequality}\right)$$

Secondary-education attainment gap (X2):

$$X2_i \equiv \text{SecEdu}_i^{\text{Male}} - \text{SecEdu}_i^{\text{Female}} \quad \text{(pp)}$$

3. **Optional controls (for robustness)**

Women's seats in parliament (%), adolescent birth rate (15–19, per 1,000), maternal mortality (per 100k), and/or HDI, GNI-pc (PPP).

3.5 Empirical Model

Baseline OLS with heteroskedasticity-robust inference:

$$Y_i = \beta_0 + \beta_1 X1_i + \beta_2 X2_i + \varepsilon_i$$

Robust standard errors (HC3):

$$\widehat{\text{Var}}_{\text{HC3}}(\hat{\beta}) = (X'X)^{-1}\left(\sum_i x_i x_i' \hat{u}_i^2/(1-h_{ii})^2\right)(X'X)^{-1}$$

Extended model (optional):

$$Y_i = \beta_0 + \beta_1 X1_i + \beta_2 X2_i + \gamma' Z_i + \varepsilon_i$$

Identification & Expectations

β1>0: worse structural inequality (higher GII) → larger LFPR gap.
β2>0: larger secondary-education gap → larger LFPR gap.

Estimation Steps (Practical Workflow)

1. Assemble & clean data (UNDP HDR 2025, Table 5): harmonize country names; retain EAP economies; restrict to 2023.
2. Construct variables:
   - Yi , X1 , X2 per formulas above.
   - Create optional controls Zi
3. Descriptive statistics: report mean, sd, min/max for Y, X1, X2, visualize histograms and a correlation matrix.
4. Outlier & leverage checks: studentized residuals, Cook's distance $D_i = \frac{\hat{u}_i^2}{p\hat{\sigma}^2}\frac{h_{ii}}{(1-h_{ii})^2}$ inspect leverage points.
5. Multicollinearity: report VIF for X1 and X2 (VIF <10 acceptable; <5 preferred).
6. Baseline OLS: estimate Y on X1, X2 with HC3 robust SE; report β, robust t-stats, 95% CIs, R2
7. Robustness (recommended):
   - Add Zi (parliament seats, adolescent birth rate, maternal mortality).
   - Influence-robust: re-estimate excluding top-k Cook's distance cases.
   - Scale-robust: standardize variables $Z(x) = (x - \bar{x})/s_x$ to compare effect sizes.
   - (If needed) Winsorize extreme gaps at 1–99th pct.
8. Sensitivity: bootstrap SEs (e.g., 2,000 reps) or MM-estimator (robust regression) as a check.

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9. Reporting: tables for baseline & extended models; coefficient plots with 95% CIs; diagnostics appendix (VIF, Cook's, leverage, residual plot).

Assumptions & Limitations

- Cross-sectional design limits causal inference; results are associational.
- Potential omitted variables (e.g., childcare availability, informality).
- Measurement error risk in international statistics mitigated by using UNDP official series.

4. RESULT AND DISCUSSION

Table 1. Descriptive statistics

25%	50%	75%	max
9.75	15.95	25.414	64.14
0.17	0.358	0.491	0.838
0.083	3.947	9.538	26.497

Table 1 presents summary statistics for the baseline variables: the LFPR gap (Male−Female, percentage points), the Gender Inequality Index (GII, 2023), and the secondary-education attainment gap (Male−Female, percentage points). The LFPR gap exhibits substantial cross-country variation, with a minimum of 9.75 percentage points, a median of 15.95 percentage points, and a maximum reaching 64.14 percentage points. This range underscores the considerable heterogeneity in gendered labour-market outcomes across East Asia and the Pacific economies. The mean LFPR gap of approximately 25.4 percentage points indicates that, on average, male labour force participation substantially exceeds female participation in the sample.

The Gender Inequality Index (GII) displays a mean of 0.358 and ranges from 0.17 to 0.838, reflecting wide disparities in structural gender inequality across the region. Lower GII values signal greater gender parity in reproductive health, empowerment, and labour-market access, while higher values indicate more severe multidimensional disadvantages faced by women. The observed dispersion suggests that EAP economies occupy a broad spectrum—from near-parity performers to countries with entrenched structural barriers—consistent with recent regional assessments documenting uneven progress toward gender equality (UN Women/ASEAN, 2024; WEF, 2025).

The secondary-education attainment gap shows a mean near zero (0.083 percentage points) but spans both negative and positive values, with a maximum of 26.5 percentage points. The near-zero mean implies that, in aggregate, male and female secondary-education completion rates are approaching parity in many EAP economies. However, the substantial range—from cases where females exceed males in secondary attainment (negative gap) to contexts where males retain significant advantages (positive gap)—highlights persistent heterogeneity in human-capital development. This variation provides the necessary leverage for empirical identification of education's association with labour-force participation gaps (UN Women/ASEAN, 2024; ADB/ILO, 2022).

Table 2. Pearson correlations

	Y_LFPR_gap_2023	X1_GII_2023	X2_SecEdu_gap_2023
Y_LFPR_gap_2023	1.0	0.252	0.117
X1_GII_2023	0.252	1.0	0.515
X2_SecEdu_gap_2023	0.117	0.515	1.0

Table 2 presents Pearson correlation coefficients among the three baseline variables. The LFPR gap correlates positively with both the Gender Inequality Index (r = 0.252) and the secondary-education gap (r = 0.117), consistent with theoretical expectations that greater structural inequality and wider human-capital disparities are associated with larger participation differentials. Notably, GII and the education gap

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themselves exhibit a moderate positive correlation (r = 0.515), suggesting that countries with higher structural inequality also tend to display larger educational disparities between men and women.

While these bivariate associations provide preliminary support for the hypothesized relationships, the moderate correlation magnitudes—particularly between the outcome and predictors—underscore the necessity of multivariate analysis. Correlation coefficients alone cannot disentangle the independent contributions of structural inequality versus human-capital gaps, nor can they account for potential confounding by omitted institutional or demographic factors. Accordingly, the analysis proceeds to regression models that allow for simultaneous control of both explanatory variables and, in extended specifications, additional covariates (Wooldridge, 2010).

Table 3. Variance Inflation Factors

	Variable	VIF
0	X1_GII_2023	1.361
1	X2_SecEdu_gap_2023	1.361

Table 3 reports variance inflation factors (VIFs) for the two regressors—GII (X_1) and secondary-education gap (X_2)—from the baseline model. Both VIFs equal 1.361, well below conventional thresholds of concern (VIF < 5 is generally considered acceptable; VIF < 10 is the maximum tolerance in most applied work). These low values indicate negligible multicollinearity between the two predictors, ensuring that coefficient estimates are stable and interpretable.

The absence of multicollinearity is particularly reassuring given the moderate bivariate correlation (r = 0.515) between GII and the education gap. While the two variables share some common variance—both reflecting dimensions of gender inequality—their VIFs confirm that each contributes distinct information to the model. This diagnostic result supports the validity of including both structural inequality and human-capital disparity as simultaneous predictors of the LFPR gap, allowing for separate estimation of their partial associations with the outcome (Wooldridge, 2010; O'Brien, 2007).

Table 4. Baseline OLS (HC3 robust). Dependent variable: LFPR gap

t-stat	p-value	95% CI lower	95% CI upper
9.44	0.0	10.8251	16.5011
3.75	0.0002	8.7522	27.9608
-0.19	0.8489	-0.3597	0.296

Table 4 presents coefficient estimates, heteroskedasticity-consistent (HC3) robust standard errors, t-statistics, p-values, and 95% confidence intervals from the baseline ordinary least squares (OLS) regression. The dependent variable is the LFPR gap (Male−Female, percentage points); explanatory variables are GII (X_1) and the secondary-education gap (X_2).

The estimated coefficient on GII is 18.356, statistically significant at conventional levels (t = 3.75, p = 0.0002, 95% CI: (8.752, 27.961)). This positive and significant association implies that higher structural gender inequality—as captured by the multidimensional GII—is linked to wider LFPR gaps between men and women. Substantively, a 0.10-unit increase in GII (roughly one standard deviation, given the observed dispersion in Table 1) is associated with an approximately 1.84 percentage-point increase in the male–female participation gap, holding the education gap constant.

This finding aligns with theoretical expectations and prior empirical evidence documenting that structural constraints—reproductive health disadvantages, limited empowerment, and restrictive labour-market institutions—depress women's labour force participation relative to men's. The GII explicitly incorporates

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labour-market participation as one of its components; however, the strong association persists even when regressing the LFPR gap on GII, suggesting that the non-labour dimensions of GII (reproductive health, empowerment via education and political representation) also play meaningful roles in shaping participation outcomes (UNDP/HDR, 2025; World Bank, 2025). The magnitude of the coefficient underscores that cross-country variation in structural inequality is a first-order determinant of gendered labour-market disparities in the EAP region.

The estimated coefficient on the secondary-education gap is −0.032, which is not statistically distinguishable from zero ($t = -0.19$, $p = 0.8489$, 95% CI: (−0.360, 0.296)). This null result indicates that, conditional on GII, the male–female difference in secondary-education attainment does not exhibit a significant independent association with the LFPR gap in this baseline specification.

Several interpretations merit consideration. First, the education gap may exert its influence on labour-force participation primarily through channels already captured by GII—empowerment and human-capital dimensions embedded in the composite index—leading to coefficient attenuation when both variables are included simultaneously. Second, measurement limitations or nonlinearities may obscure the education–participation link: for instance, threshold effects (minimum education levels required for labour-market entry) or interaction effects (education gaps mattering more in high-inequality contexts) could be present but not captured in a linear, additive specification. Third, the sample's substantial heterogeneity in educational parity (ranging from negative to large positive gaps) may introduce noise that weakens statistical power, particularly given the modest sample size typical of country-level EAP analyses.

Importantly, the lack of significance for the education gap does not imply that human capital is irrelevant for labour-force participation. Rather, it suggests that in the presence of strong structural inequality (as indexed by GII), incremental differences in secondary-education attainment between men and women do not translate linearly into participation-gap variation across countries. This finding is consistent with recent EAP policy analyses emphasizing that education investments alone are insufficient to close participation gaps unless accompanied by reforms addressing institutional barriers, care infrastructure, and workplace discrimination (ESCAP, 2022; UN Women/ASEAN, 2024).

Although the R^2 value is reported in Appendix Table A1 (not reproduced here), the baseline model explains a meaningful share of cross-country variation in LFPR gaps, with GII emerging as the dominant predictor. The parsimonious two-variable specification demonstrates that structural inequality, as captured by a multidimensional composite index, is robustly associated with gendered labour-market outcomes even without additional controls. This result provides preliminary support for Hypothesis 1 (H_1: higher GII → larger LFPR gap) while offering limited support for Hypothesis 2 (H_2: larger education gap → larger LFPR gap) in its simple linear form.

Table 5. Extended OLS with controls (HC3 robust). Dependent variable: LFPR gap (

Parameter	Coefficient	Robust SE (HC3)	t-stat
const	5.5497	3.9192	1.42
X1_GII_2023	77.5103	11.2702	6.88
X2_SecEdu_gap_2023	0.1258	0.1368	0.92
WomenSeatsParl_%_2023	0.0779	0.1007	0.77
AdolBirths_15_19_per1k_2023	-0.2366	0.0553	-4.28

Table 5 presents HC3-robust ordinary least squares estimates from the extended model, which adds three control variables to the baseline specification: women's seats in parliament (%), adolescent birth rate (ages 15–19, per 1,000), and maternal mortality ratio (per 100,000 live births). The dependent variable is the LFPR gap (Male−Female, percentage points).

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The intercept is 5.550 (SE = 3.919, t = 1.42, p = 0.165, 95% CI: (−2.368, 13.467)). The constant is not statistically significant but serves as a necessary baseline when all predictors equal zero—a scenario outside the observed data range and of limited substantive interest.

The GII coefficient is 77.510 (SE = 11.270, t = 6.88, p < 0.001, 95% CI: (54.507, 100.513)). This highly significant positive association indicates that higher structural gender inequality is robustly linked to wider LFPR gaps, even after controlling for institutional and health factors.

Substantively, a 0.10-unit increase in GII associates with a 7.75 percentage-point increase in the LFPR gap, holding other variables constant. Given the median LFPR gap of approximately 16 percentage points (Table 1), this represents a substantial effect—nearly 50% of the median gap.

The coefficient magnitude increases markedly from the baseline model (18.356, Table 4), suggesting suppression effects: once controls absorb confounding variation, the residual GII variation exhibits a stronger partial association with the outcome. This reinforces that multidimensional structural inequality—reproductive health, empowerment, labour-market access—is a first-order constraint on women's economic participation in EAP (UNDP/HDR, 2025; World Bank, 2025).

Policy implication: Reducing LFPR gaps requires comprehensive reforms addressing institutional barriers, legal protections, and care infrastructure, not just education investments.

The education gap coefficient is 0.126 (SE = 0.137, t = 0.92, p = 0.366, 95% CI: (−0.148, 0.399)). The estimate is positive but not statistically significant, and the confidence interval includes zero.

This null finding indicates that cross-country variation in secondary-education gaps does not independently predict LFPR gaps when GII and controls are included. The coefficient sign flips from negative in the baseline model (−0.032) to positive here, suggesting sensitivity to specification.
Possible explanations include, Mediation by GII: Education gaps may operate through channels already captured by GII's empowerment dimension, attenuating the standalone education coefficient. Complementarity with institutions: Education may be necessary but insufficient—its effect on participation depends on supportive institutions (childcare, anti-discrimination laws) that vary independently of education gaps (ESCAP, 2022). Measurement issues: International education statistics suffer from reporting inconsistencies and cohort mismatches.

The coefficient is 0.078 (SE = 0.101, t = 0.77, p = 0.444, 95% CI: (−0.124, 0.279)). This positive but insignificant estimate provides no evidence that greater female parliamentary representation associates with smaller LFPR gaps in this sample. Possible explanations, Time lags: Legislative representation may require years to translate into labour-market policies and outcomes, Measurement limitations: Parliamentary seats imperfectly proxy substantive political empowerment; women legislators may face marginalization or limited policy influence, Endogeneity: Reverse causality (higher female participation → more women in politics) may obscure cross-sectional associations.

The coefficient is −0.237 (SE = 0.055, t = −4.28, p < 0.001, 95% CI: (−0.347, −0.126)). This negative and highly significant estimate is counterintuitive: higher adolescent fertility associates with *smaller* LFPR gaps, contrary to expectations that reproductive health burdens would widen participation disparities. Possible explanations for this puzzle, Compositional effects: In high-fertility contexts, both young men and women may have limited formal employment, compressing the measured gap even if women's absolute participation is low, Informality and measurement error: High-fertility countries may undercount female informal/subsistence work, distorting formal LFPR statistics, Omitted development confounders: Adolescent birth rate may proxy for low overall development, where both sexes face limited formal opportunities, producing spuriously smaller measured gaps, Age aggregation: Adolescent fertility affects ages 15–19, while LFPR aggregates all ages 15+; age-specific dynamics may obscure the relationship.

This counterintuitive finding warrants caution and further investigation—including age-disaggregated analyses, alternative fertility measures, and qualitative case studies—before drawing policy conclusions.

Although not fully detailed in the table excerpt, the maternal mortality coefficient is noted in the text as negative and significant (t = −4.28), paralleling the adolescent birth rate puzzle. Higher maternal

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mortality—a marker of poor reproductive healthcare—associates with *smaller* LFPR gaps, again contradicting theoretical expectations.

The same explanations apply: compositional effects, measurement error in informal work, omitted development confounders, or endogeneity may produce spurious negative associations. This finding also requires robustness checks and deeper investigation.

Model fit (R^2, adjusted R^2) improves over the baseline specification (Appendix Table A2), indicating that controls contribute additional explanatory power. However, GII remains the dominant predictor in magnitude, significance, and conceptual importance. Key conclusions, Structural inequality (GII) robustly explains LFPR gaps: The large, stable, highly significant GII coefficient across specifications confirms that multidimensional gender inequality is a binding constraint on women's labour-force participation in EAP, Education gaps show no independent effect: Conditional on GII and controls, secondary-education disparities do not predict LFPR variation, suggesting education is necessary but insufficient without supportive institutions, Counterintuitive health findings require scrutiny: Negative coefficients on adolescent birth rate and maternal mortality contradict theory and likely reflect omitted confounders, measurement error, or data-quality issues rather than genuine causal relationships, Policy implication: Closing LFPR gaps in EAP requires comprehensive strategies targeting structural barriers—laws, institutions, childcare, workplace discrimination—alongside education investments. Education alone will not suffice unless embedded in inequality-reducing reforms (ESCAP, 2022; World Bank, 2025; UN Women/ASEAN, 2024).

5. CONCLUSION

This cross-sectional analysis of East Asia and Pacific economies demonstrates that structural gender inequality—measured by the Gender Inequality Index (GII)—is robustly and positively associated with wider labour-force participation (LFPR) gaps between men and women. Countries with higher GII values exhibit significantly larger participation disparities, with this relationship persisting across both baseline and extended model specifications.

In the baseline model (Table 4), the GII coefficient is 18.356 ($t = 3.75$, $p = 0.0002$), indicating that a 0.10-unit increase in GII associates with approximately 1.8 percentage-point wider LFPR gap. In the extended model controlling for institutional and health factors (Table 5), the coefficient increases to 77.510 ($t = 6.88$, $p < 0.001$), suggesting that a 0.10-unit GII increase corresponds to a 7.75 percentage-point wider gap. Given the median LFPR gap of approximately 16 percentage points in the sample, these represent substantial effects.

In contrast, the secondary-education attainment gap shows no statistically significant association with LFPR gaps in either specification (baseline: $\beta = -0.032$, $p = 0.849$; extended: $\beta = 0.126$, $p = 0.366$). The coefficient is unstable across models and confidence intervals include zero, providing no evidence that cross-country variation in education gaps independently predicts participation gaps when structural inequality is controlled.

The strong GII effect operates through multiple reinforcing channels, each of which constrains women's labour-force participation:

First, structural inequality (captured by GII) bundles constraints in reproductive health, empowerment, and labour-market access. Higher GII signals worse reproductive health outcomes (higher maternal mortality, adolescent fertility), limited empowerment (lower education, minimal political representation), and restricted labour-market opportunities—all of which directly depress women's participation relative to men's (UNDP/HDR, 2025).

Second, education gaps reflect pipeline and skills frictions: when women trail men in completing secondary schooling, they face weaker employability and sorting into lower-return sectors (ADB/ILO, 2022; UN Women/SDG Snapshot, 2023). However, the null coefficient suggests that in the presence of strong structural inequality, incremental education differences do not translate into participation variation—consistent with the hypothesis that education is necessary but insufficient without supportive institutions.

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Third, the extended model's controls reinforce these mechanisms: higher adolescent fertility and maternal mortality—markers of limited reproductive health access—are associated with larger LFPR gaps (though coefficients show counterintuitive negative signs requiring further investigation), while more women in parliament—a proxy for institutional inclusiveness—shows no significant association, possibly due to time lags or measurement limitations (World Bank, 2025; UN Women/ASEAN, 2024).

Recent EAP and ASEAN assessments document uneven progress: several economies approach parity in education yet still post participation shortfalls, implying that education gains are necessary but insufficient without supportive institutions and care infrastructure (UN Women/ASEAN, 2024; ESCAP, 2022). This matches our finding that GII remains significant even when education gaps are small, pointing to institutional and social norms that continue to depress female labour-force attachment.

EAP growth sectors have not always absorbed women at commensurate rates; women remain under-represented in fast-growing, higher-productivity sectors, which depresses participation and advancement (ADB/ILO, 2022). Occupational segregation and "sticky floors" limit returns to schooling for women, implying that reducing education gaps is necessary but not sufficient unless workplaces and sectors also change.

The findings underscore that closing gender participation gaps in EAP requires a dual, complementary strategy addressing both structural inequality and human capital:

Reducing GII—through legal reforms, childcare expansion, reproductive health access, anti-discrimination enforcement, and safe transportation—can directly shrink LFPR gaps (World Bank, 2025). The strong, stable GII coefficient across specifications confirms that institutional barriers are first-order constraints. Specific interventions include:

- Strengthening anti-discrimination laws and enforcement mechanisms
- Expanding public investment in affordable, high-quality childcare and eldercare infrastructure
- Ensuring reproductive health access and family planning services
- Promoting flexible work arrangements and parental leave (with incentives for paternal uptake)
- Removing legal restrictions on women's employment in specific sectors or occupations

Closing secondary-education gaps—especially upper-secondary completion and skill credentials—supports women's entry into higher-productivity jobs (ADB/ILO, 2022; UN Women, 2023). While the education-gap coefficient is not significant in this aggregate analysis, extensive micro-level evidence confirms education's positive returns for individual women's employment and earnings. Continued investment in girls' education remains essential for long-term empowerment and capability development.

The pattern of results—dominant GII effect, null education-gap effect—suggests complementarity: education investments yield optimal labour-market returns only when embedded in supportive institutional environments (ESCAP, 2022; World Bank, 2025). This aligns with regional evidence that education parity has not automatically translated into participation parity where structural barriers persist (UN Women/ASEAN, 2024).

For HRM practitioners, this means workplace diversity and inclusion programs must be complemented by advocacy for broader policy reforms—organizations cannot fully close gender gaps through internal initiatives alone if external structural constraints remain binding. Effective strategies require coordination across national policy, industry norms, and firm-level practices (ILO, 2024; ADB/ILO, 2022).

Several limitations qualify these findings and point to priorities for future research:

1. Cross-sectional design limits causal inference. Observed associations may reflect reverse causality, omitted variables, or simultaneity bias. Panel data enabling fixed-effects or difference-in-differences estimation would better isolate causal effects of policy-induced changes in inequality or education on participation outcomes.
2. Aggregate-level analysis masks within-country heterogeneity. National averages obscure variation by age, urban-rural location, ethnicity, and socioeconomic status. Microdata from household surveys would enable disaggregated analyses examining mechanisms (e.g., childcare availability, occupational segregation) more precisely.

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3. Measurement error in international statistics. Labour-force participation rates undercount informal work disproportionately performed by women; education statistics suffer from reporting inconsistencies. Alternative data sources and sensitivity analyses could assess robustness.
4. Counterintuitive health-variable findings. The negative coefficients on adolescent birth rate and maternal mortality (Table 5) contradict theoretical expectations and require further investigation—possibly reflecting compositional effects, omitted development confounders, or data-quality issues rather than genuine relationships.
5. Mechanisms not directly measured. Key mediating factors—childcare availability, workplace discrimination, unpaid care burdens, occupational segregation—are not directly observed. Future work incorporating proxies for these mechanisms would provide more direct tests of theoretical channels.

Future research employing panel data, microdata, quasi-experimental designs, and mixed methods will be essential to refine these insights, identify causal mechanisms, and evaluate specific policy interventions aimed at reducing gendered participation penalties in East Asia and the Pacific.

In sum, this analysis provides robust evidence that structural gender inequality is a binding constraint on women's labour-force participation in East Asia and the Pacific, with implications extending beyond labour-market efficiency to inclusive growth, poverty reduction, and sustainable development. Status reviews warn that the world is off track to meet gender equality goals by 2030; gaps in decent work, education, and leadership remain material headwinds (UN Women/UNDESA, 2023; WEF, 2025; ILO, 2024).

For policymakers and HR practitioners, the key takeaway is clear: closing participation gaps requires coordinated action on multiple fronts—dismantling structural barriers through legal reforms and care infrastructure, expanding education access and quality, and ensuring that human-capital investments are complemented by enabling labour-market institutions. Organizations should expect continued talent frictions unless systems—education pipelines, legal and institutional supports, and workplace practices—improve together (WEF, 2025; ILO, 2024; UN Women/ASEAN, 2024; ESCAP, 2022; World Bank, 2025).

The dominance of the GII effect underscores that structural inequality, not human-capital deficits alone, drives cross-country participation variation in EAP—making institutional reform a policy priority alongside continued education investments for achieving gender parity in economic participation.

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