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Getting to Equal:

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**Center for Global Work
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School of Management and Labor Relations

**GETTING TO EQUAL:
PERSISTENCE OF ENTRY SALARY DISADVANTAGE
ON THE GENDER PAY GAP**

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ABSTRACT

This study traces gender salary gap trends among internationally recruited staff at a multinational development institution over 2000–2022. Although the unadjusted gap narrowed substantially, progress was neither linear nor complete. Using panel data on individual staff and Blinder-Oaxaca decomposition methods, we find that gender differences in entry salaries persisted throughout employees’ tenure, outweighing any catch-up from subsequent salary growth and promotions. Entry salary disparities account for approximately one-third of the gender gap in current salaries—an effect concentrated at the lower end of the salary distribution and negligible among higher-paid staff.

KEYWORDS

gender pay gap, decomposition analysis, entry salary effects, inequality at salary distribution quantiles, public sector

JEL codes: J16, J31, J45, J71

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INTRODUCTION

Gender wage gaps are a persistent, well-documented global phenomenon. For median incomes across OECD countries as of 2022, full-time women employees earn approximately 12% less than men, on average, with Belgium achieving the most equal pay (1% gap) and Republic of Korea maintaining the widest gap (31%) (OECD, 2023). Some of these economies have narrowed the disparity—but significant gaps nevertheless persist, and progress toward closing this gap has been slow and uneven. Traditional explanations for gender wage gaps have centered on human capital differences between men and women, but empirical research has fundamentally challenged this. Studies find that human capital differences explain only a small share of pay disparities (Blau and Khan, 2017), prompting research on factors beyond human capital. These include gender differences in salary negotiation and women’s lower salary expectations reducing initial requests compared to men (Babcock et al., 2003; Säve-Söderbergh, 2019; Roussille, 2024); women’s disproportionate caregiving responsibilities causing more career interruptions and slower promotion rates during childbearing years (Goldin, 2024); and workplace policies, organizational cultures, and promotion structures influencing salary paths (Casarico and Lattanzio, 2024; Morchio and Moser, 2024). The cumulative effect of initial disparities persists throughout women’s careers partly because women experience lower promotion rates than men with comparable qualifications and performance. A core finding, supported by advances in longitudinal data analysis, is that entry-level wage gaps persist and often widen over time, making initial disparities not only immediately consequential but trajectory-setting for future earnings.

Our paper makes two contributions to the evolving literature on gender pay gaps. First, we analyze over two decades of panel data on employees from a multinational firm to examine

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how gender differences in entry salaries persist throughout employees' tenure. We take advantage of the longitudinal aspect of the data on individual employees at the Asian Development Bank (ADB) to estimate the persistence of entry salaries over women's and men's tenure. We examine whether entry salaries predict current salaries more strongly for women than for men at ADB.

Second, our paper examines the gender pay gap across the wage distribution. Previous studies find larger within-firm gender wage gaps at the upper tail (that is, among more skilled workers) than at the lower tail (Christofides, Polycarpou, and Vrachimis, 2013; Bertrand, 2018; Guvenen, Kaplan, and Song, 2021)—a “glass ceiling effect” interpreted as an invisible barrier that inhibits women's promotion to higher-paid positions. Finding significant distributional effects would reveal that different policy interventions may be required at different points in the wage distribution.

The ADB offers a particularly instructive case. As a multinational development bank focused on Asia and the Pacific, ADB has made gender equality a central element of its corporate strategy. To advocate that agenda credibly, it must also achieve gender equality within its own workforce. Having committed to the UN Sustainable Development Goal of eliminating discrimination against women and achieving equal pay for equal work (UN, 2015), ADB adopted human resource policies aimed at improving gender equality, including changes to hiring practices (ADB, 2018). Fair compensation is also essential to attract and retain qualified women professionals from the international labor market.

Women's representation among internationally recruited staff—the focus of this paper and the primary target of ADB's gender equity policies—rose from roughly 25% in 2000 to 38% in 2022, with gains extending to leadership roles. Over the same period, the raw gender pay gap narrowed sharply, from 19% to 7%, though the remaining difference still exceeded \$12,500 in

2022. Decomposition analysis shows that most of the gap is explained by gender differences in staff characteristics, with the unexplained share declining from 3% to 1%. A critical finding, however, is that gender differences in entry salaries have persistent effects that impede progress toward pay equity over the course of careers.

Our analysis of heterogeneity reveals that the contribution of entry salaries to the gender pay gap is concentrated at the lower end of the distribution. Entry salaries matter considerably for the gender gap among lower-paid staff but play little role among the higher-paid. This pattern implies that standard decompositions which omit entry salary effects obscure an important channel through which hiring policies shape the gender gap—one that operates primarily at the bottom of the salary distribution.

RELATED LITERATURE

Limited Role of Human Capital Explaining Gender Pay Gaps

The Blinder-Oaxaca (BO) decomposition model (Blinder 1973; Oaxaca 1973) partitions the gender pay gap into two components: the portion attributable to observable differences in worker characteristics—such as education, experience, and marital status—and the portion reflecting differential returns to these endowments between men and women. The latter “unexplained” component captures differences unaccounted for by measurable characteristics and may reflect discrimination, unmeasured productivity differences, or structural factors. Empirical research applying the BO framework consistently shows that the explained component of gender wage gaps is relatively small compared to the unexplained component across diverse contexts.

In the United States, human capital differences explain little of the gender wage gap. Blau and Kahn (2017) found that education and experience together account for less than 10% of the

gap, while occupational and industry segregation explains approximately half, leaving 38% unexplained. Bolitzer and Godtland (2012) showed that the unexplained gap in federal employment remained stable at 8 percentage points over two decades (1988–2007), even as men and women converged in experience, education, and occupational distributions. Substantial unexplained gaps also persist within professional contexts: Azmat and Ferrer (2017) found only half the earnings differential in a private law firm attributable to observable characteristics, while Wang and Sterling (2025) showed that women receive lower initial salary offers than men despite equivalent qualifications.

The pattern holds internationally. Across 26 European countries, Boll and Lagemann (2019) found women earned 14% less than men in 2014, with only one-third of the gap explained by worker characteristics. In New Zealand, women earn 20–28% less than men, with only 5 percentage points of this gap due to gender differences in productivity, and the remainder attributable to sorting across occupations, industries, and firms (Sin, Stillman, and Fabling 2022). Human capital differences explain less than one-fifth of earnings gaps in South America (Urquidi and Chalup 2023) and only 20–30% of disparities in urban China (Chi and Li 2014). A notable exception is rural Africa, where Van den Broeck, Kilic, and Pieters (2023) find that observed characteristics account for 70–83% of the gap, likely reflecting the particular structure of agricultural labor markets and human capital levels in those settings.

The size and persistence of the unexplained component have directed research attention toward firm-level factors. Casarico and Lattanzio (2024) show that ostensibly gender-neutral workplace policies can have asymmetric effects on male and female careers. Morchio and Moser (2024) find that within-firm sorting across job levels and departments contributes substantially to wage disparities, with women concentrated in lower-paying positions. Particularly consequential

is sorting across firms: women's concentration in firms that pay lower wage premia to all workers appears to be a dominant source of the gap in many contexts, indicating that the problem lies not only in differential treatment within firms but in women's differential access to high-wage employers. Growing availability of employer-employee matched administrative data has enabled researchers to decompose the gap into within-firm and between-firm components, advancing this line of inquiry considerably.

Persistence of Gender Inequality in Entry Salaries

Starting salaries have persistent effects on workers' career earnings. Illing, Schwank, and Tô (2024) find women's entry wages are, on average, 10 log points lower than men of equal productivity. Initial wage differences compound over time through differential returns to experience, promotion patterns, and job mobility opportunities. Using German administrative data, Boll, Rossen, and Wolf (2017) find gender wage gaps at job entry account for 70% of the total unexplained gap by age 40.

Wage trajectories after entry vary across settings. Goldin et al. (2017) find that in many high-skilled professions, men and women begin on nearly equal footing—with initial gaps of 5%–10% in corporate business—but diverge substantially over time due to differences in hours worked, career interruptions, and firm-specific wage growth. Benson, Li, and Shue (2026) find that entry salary differences at a large U.S. technology firm explain 30–40% of the gender pay gap after five years, with subsequent disparities arising not from performance differences but from the cumulative effects of smaller raises, fewer bonuses, and fewer promotions—themselves partly anchored in lower starting salaries.

Negotiation behavior contributes to these early-career penalties. Babcock et al. (2003) document that women initiate salary negotiations roughly four times less often than men. Sæve-

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Söderbergh (2019) find that among Swedish college graduates, women negotiated as frequently as men but requested lower salaries and received lower offers even for identical requests; controlling for lower requests reduced the unexplained entry salary gap to 17%. Roussille's (2024) study of engineering job applicants on an online recruitment platform documents an ask gap of 3.3%, a bid gap of 2.4%, and a final offer gap of 1.8%, showing that controlling for the ask salary accounted for the entire residual gender gap in bids and final offers. Taken together, these studies suggest that women's lower salary requests are an important mechanism sustaining pay inequality from the outset of careers.

Heterogeneity in Gender Pay Gaps Across the Salary Distribution

A key insight from the quantile regression literature is that mean wage gaps can obscure substantially different patterns at different points in the earnings distribution. Building on Koenker and Bassett's (1978) introduction of regression quantiles, methodological contributions by García, Hernández, and López-Nicolás (2001), Machado and Mata (2005), Melly (2005), Gardeazabal and Ugidos (2005), and Firpo, Fortin, and Lemieux (2009) have established that gender pay disparities vary significantly across the wage distribution — a finding that a single mean estimate cannot capture.

One reason for this heterogeneity is that wage structures are nonlinear, in part because occupations differ systematically in their returns to schooling. Arias, Hallock, and Sosa-Escudero (2001) argue that this reflects unobserved ability that either substitutes for or complements education: if the two are substitutes, returns decline with ability and schooling matters more for lower-ability workers; if complements, higher-ability workers benefit more from education. Either way, distributional methods are needed to recover how human capital shapes earnings at different points in the wage structure.

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Applying these methods to gender gaps, researchers have documented two recurring phenomena: glass ceiling effects, where the unexplained gap widens at the top of the distribution, and sticky floor effects, where it is concentrated at the bottom. Albrecht, Björklund, and Vroman (2003) find pronounced glass ceiling effects in Sweden; Machado and Mata (2005) document similar patterns in Portugal; Arulampalam, Booth, and Bryan (2007) confirm glass ceilings across 11 European countries even after controlling for observable characteristics; and Blau and Kahn (2017) find the same in the United States, with the unexplained component growing at higher quantiles.

Evidence from developing countries is more heterogeneous. Rahman and Al-Hasan (2019) find both glass ceiling and sticky floor effects in Bangladesh. Kaya (2017) documents glass ceiling effects in Turkey only after controlling for qualifications — suggesting that top-earning women are better educated than their male counterparts — while Dah and Fasih (2016) find that unexplained gaps in Lebanese banking are concentrated at the low and middle ranges, with explained characteristics dominating at the top, a pattern opposite to that observed in developed economies.

Taken together, these findings indicate that the mechanisms driving gender wage inequality differ across earnings levels and economic contexts. In developed economies, glass ceiling effects tend to predominate; in many developing countries, sticky floors or more complex distributional patterns emerge, shaped by the interplay of discrimination, occupational segregation, informal labor markets, and broader development processes.

INSTITUTIONAL BACKGROUND AND DATA

Asian Development Bank Context

ADB employees are mainly comprised of locally hired staff that are nationals of their office location (either headquarters or one of the 42 field offices) and internationally recruited staff (the focus of this study).¹ The share of international staff was relatively stable during 2000–2022, fluctuating between 35% and 37% even as total employees nearly doubled from 2,049 to 3,747. The job architecture for international staff had 10 grade levels during this period: junior staff (IS1–IS4), senior staff (IS5–IS6), division heads (IS7–IS8), and department heads (IS9–IS10).²

Women made up only 25% of international positions in 2020 (Figure 1), with women starkly underrepresented in leadership roles, comprising just 4% of division heads and 11% of department heads. Women’s representation among international staff increased steadily to 39% in 2022, achieving gender equity among junior staff. However, women’s share of leadership roles remained below 35%, as did senior staff roles—an important conduit for future leaders. Still, Kandpal, Webster, and Kenny (2023) found ADB compared favorably in expanding women’s management representation among seven international financial institutions, particularly during 2000–2010.³

¹ This list excludes Senior Management (President, Vice Presidents, and Managing Director General), Board of Directors, Board Staff (Directors’ Advisors), and international staff seconded to ADB from other organizations.

² Junior staff include Young Professionals, a highly competitive program to recruit individuals interested in development usually with an advanced degree but with little previous work experience. Division heads include those who manage large groups of staff (division directors, country directors, and unit heads) and those with limited staff oversight responsibilities (advisors). Department heads include directors general, deputy directors general, heads of offices, country directors managing larger field offices, and senior advisors.

³ The seven institutions were ADB, European Bank for Reconstruction and Development, European Investment Bank, Inter-American Development Bank, Islamic Development Bank, International Monetary Fund, and World Bank

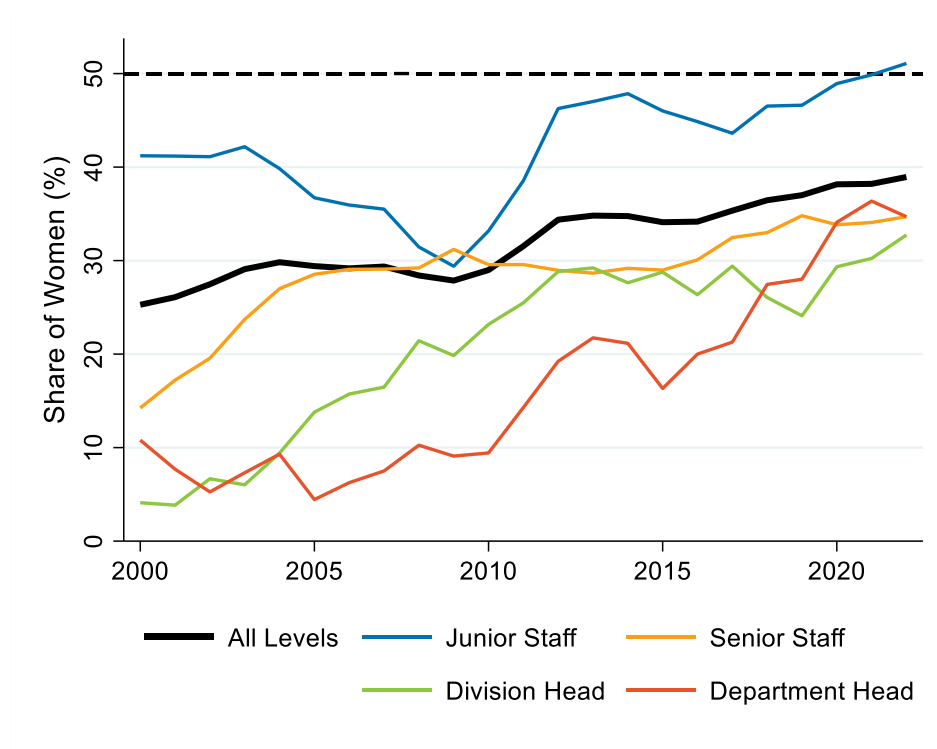


Figure 1. Share of Women by Aggregate Staff Level

Notes: Dashed line indicates the gender parity share of women staff.

Zveglich, King, and Molina-Lapid (2025) note that low women’s representation among international staff before 2000 spurred human resource policy reforms. From 1998, ADB adopted gender action plans covering recruitment, work arrangements, benefits, career development and promotion, and gender awareness. Recruitment actions included specific targets for women’s share of international staff overall and within grade levels, particularly leadership. Expanded maternity leave, established paternity leave, and flexible working arrangements aimed to retain workers with childcare and family responsibilities, disproportionately borne by women. Recent actions include gender pay gap analysis to ensure salary policy neutrality.

The gender difference in average salaries narrowed considerably from 19% in 2000 to 7% in 2009, but progress stalled thereafter, with the 2022 female-to-male salary ratio roughly

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unchanged from 2009 (Figure 2). ADB's salary structure is relatively compressed, consisting of fixed scales tied to grade levels. To remain competitive, the structure decompressed over time: the maximum salary for department heads relative to the minimum for junior staff widened from 3.2 times in 2000 to 4.6 times in 2022.⁴ Still, the 90th-to-10th percentile salary ratio averaged 1.8 over two decades—relatively low compared with Asian public-sector salaries (Zveglic, King, and Molina-Lapid, 2025). Since salary bands within grades are narrow and decompression modest, rising proportions of women at higher grades likely drove early narrowing.

Moving-average female-to-male entry salary ratios remained relatively stable at around 90% through 2020, despite volatility from small annual cohorts. This stability helped narrow the overall gap when disparities were particularly wide early in the sample period, though the effect became neutral by 2009. Because salary adjustments through annual raises and promotions follow rigid institutional policies, relative advantages and disadvantages established at entry tend to persist—barring exceptional performance or setbacks. That persistence depends on factors not fully captured in our data, such as acquiring credentials that open higher-grade opportunities or excelling in high-visibility assignments.⁵ It is also stronger when job mobility is low. The narrowing gender entry salary gap in recent years (Figure 2) may therefore bode well for future trends in the overall salary gap.

⁴ ADB salary scales are calibrated to be competitive with those of a comparator group that comprises other international financial institutions (such as the World Bank and the International Monetary Fund), public sector organizations, and private sector firms. Regular salary reviews, approved by ADB's Board of Directors, determine the composition of the comparator group, the target ratio to comparator salaries, and the width of the salary bands.

⁵ Experimental evidence in Babcock et al. (2017) finds women more likely to volunteer, be asked to volunteer, and accept requests to volunteer for tasks that benefit their organization but give them low probability of promotion. De Pater, van Vianen, and Bechtoldt (2010) finds that supervisors' task allocations are not gender-blind and may result in women having fewer challenging job experiences than men.

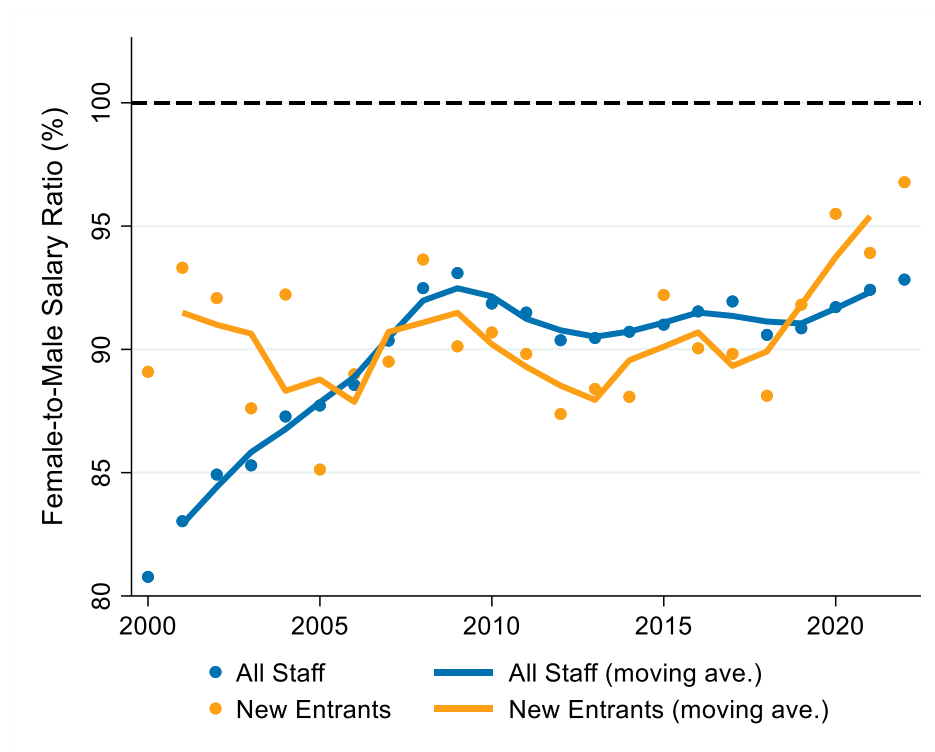


Figure 2. Female-to-Male Salary Ratio for All Staff and New Entrants
Notes: The dashed line indicates the gender parity salary ratio. Solid lines are three-year centered moving averages.

Beyond mean differences, the salary distribution for women is more heavily weighted at the lower end and more narrowly dispersed than for men (Figure 3), differences that are statistically significant. These patterns reflect gender differences in grade composition, given the close link between salary and grade. The gender salary gap is smallest in the left tail—8% at the 10th percentile and 7% at the 25th—and widens steadily toward the right tail, reaching 9% at the median, 10% at the 75th percentile, and 11% at the 90th percentile. This gradient suggests that the marginal effects of endowments on salaries differ across the distribution.

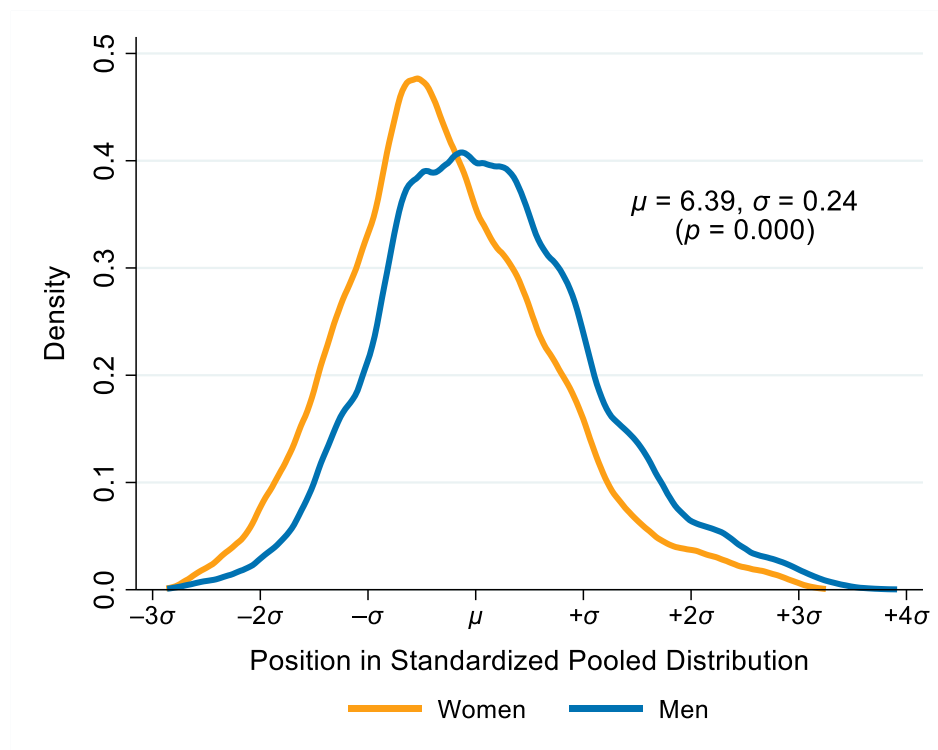


Figure 3. Log Real Salary Distribution by Gender, Full Panel
Notes: Log real salary distribution mean and standard deviation are calculated from the pooled sample of women and men for all years. The p -value is for the Kolmogorov–Smirnov test of the null hypothesis that the salary distributions for women and men are from a common underlying distribution, which is rejected.

Data Description and Summary Statistics

The analysis draws on a proprietary panel dataset from ADB’s Budget, People, and Management Systems Department, covering all internationally recruited staff on the ADB payroll from January 1, 2000, through December 31, 2022, including former local staff. Salary values are recorded as of December 31 of each year; entry salaries are available for all staff, including those appointed before 2000. Nominal salaries in US dollars are deflated using the US CPI series from 1967—the earliest appointment date—to 2022. Real salary variables are merged with staff

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demographics, pre-ADB work experience, extended working and nonworking leave dates, and performance ratings. Variable definitions are provided in the Appendix.

The dependent variable is the natural log of real salary in constant US dollars. Independent variables include education categories (college or less is omitted); years of experience—with separate variables for pre-ADB experience, ADB experience, working leave, and nonworking leave—and its square; a 3-year moving average performance rating with a dummy for missing values; marital status (being single is omitted); a dummy for former local staff; aggregated nationality groups (the group for other developing ADB members is omitted); and year fixed effects (2022 is omitted). Since we use reported actual work experience rather than proxies such as potential experience or age, time-out effects are captured directly. Consistent data on employees' number of children are unavailable, so this variable is omitted.

Entry salary—log real salary at appointment—is likely endogenous. Many time-invariant characteristics that predict entry salaries, such as pre-ADB experience or country of origin, may also influence future salary paths, disqualifying them as instruments. We therefore instrument for entry salary using a quadratic in age at appointment. For former local staff, entry salary is defined as salary upon promotion to international status; local staff tenure is folded into pre-ADB experience, so ADB tenure reflects time as international staff only; and performance ratings from the local staff period are excluded.

Table 1 presents sample statistics by gender with tests of mean equality; gender equality is rejected in all cases. Averaged over the full sample, the gender gaps in current and entry salaries are 9.5 and 4.5 log points, respectively, consistent with the annual series in Figure 2. Women are less likely than men to hold a bachelor's degree or below, but also less likely to hold a PhD. They have roughly one year less pre-ADB experience—consistent with their lower

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average appointment age—and shorter ADB tenures. Women take more extended nonworking leave (including maternity leave), though the difference is under three weeks, and the working leave gap (“special leave without pay,” which allows staff to work outside ADB for typically two to three years with a right of return) is just over five weeks. The performance rating gap is small; women are less likely to have prior ratings, reflecting their higher share among newer staff.⁶

The gender difference in marital status is striking: nearly 90% of men are married compared to under 60% of women. This may partly reflect the added difficulty that dual-income households face in relocating to developing countries and finding non-ADB employment, constraints that may bind more for spouses of women applicants. Promotions from local to international staff are rare, totaling only 117 cases (52 women, mostly from headquarters; 65 men, mainly from field offices), since local staff must compete against the full international applicant pool. By nationality, women are proportionately more represented among nonregional countries and other developing members—including the Philippines, where ADB is headquartered—but less represented among Japanese and Indian staff.

⁶ The variable is the average of the performance ratings available in the immediately preceding three years. The number of past ratings used in the average can be fewer than three for newer staff and those returning from extended leave. New staff only enter the general performance review process after successfully completing their probationary review, which is generally after one year but subject to extension. Probationary review ratings are not comparable to those of the general performance review system and are not included.

Table 1: Descriptive Statistics by Gender

Variable	Women	Men	Difference	<i>p</i> -value
Dependent variable				
Log real salary×100	632.14 (22.89)	641.65 (23.86)	-9.50	<0.001
Independent variables				
Education (%):				
Bachelor's or below *	10.04	11.78	-1.74	<0.001
Master's	63.84	60.94	2.89	
Doctorate	26.13	27.28	-1.15	
Experience (years):				
Pre-ADB experience	12.17 (6.73)	13.23 (7.22)	-1.06	<0.001
ADB experience	6.90 (5.51)	8.15 (6.37)	-1.25	<0.001
Working leave	0.18 (0.67)	0.08 (0.46)	0.10	<0.001
Nonworking leave	0.06 (0.15)	0.00 (0.02)	0.05	<0.001
Total experience	19.01 (8.15)	21.38 (8.83)	-2.37	<0.001
Average performance rating	1.60 (0.89)	1.67 (0.84)	-0.07	<0.001
Missing recent rating? (%):				
No *	77.08	80.45	-3.37	<0.001
Yes	22.92	19.55	3.37	
Marital status (%):				
Single *	35.77	9.97	25.80	<0.001
Married	55.87	86.62	-30.75	
Divorced/widowed	8.36	3.41	4.95	
Former local staff? (%):				
No *	95.36	96.85	-1.49	<0.001
Yes	4.64	3.15	1.49	
Nationality (%):				
Nonregional	39.30	37.97	1.33	<0.001
Japan	10.48	14.00	-3.52	
Oceania	6.78	7.86	-1.08	
Graduated economies	7.22	7.19	0.04	
PRC	5.97	5.49	0.48	
India	5.50	8.39	-2.90	
Other developing Asia *	24.75	19.10	5.65	
Entry salary indicators				
Log real entry salary×100	1,069.62 (19.75)	1,074.15 (22.79)	-4.52	<0.001
Age at entry (years)	38.66 (6.65)	39.96 (6.74)	-1.30	<0.001
Total observations	7,643	15,642		
No. of unique individuals	965	1,982		

Notes: Variable definitions in the Appendix. Standard deviations of continuous variables shown in parentheses. The *p*-values are the levels of significance for *t*-tests of equality of means for continuous variables and Pearson's χ^2 tests of common distributions for categorical variables. ADB = Asian Development Bank; PRC = People's Republic of China. * Omitted category in estimations.

METHODOLOGY

We employ Blinder-Oaxaca (BO) decompositions (Blinder 1973; Oaxaca 1973) to isolate the contribution of gender differences in human capital endowments to the salary gap, with three modifications to the standard approach. First, we use two-stage least squares instrumental variables (IV) to address the endogeneity of entry salary in modeling its persistent effect on current compensation. Second, we perform the decomposition both at the mean and at selected quantiles to identify how gap drivers vary across the salary distribution. Third, exploiting the longitudinal structure of the unbalanced panel, we include year fixed effects to absorb common unobserved period-specific factors and cluster robust or bootstrap standard errors by individual to correct for serial correlation and heteroskedasticity.

The BO decomposition begins by estimating individual earnings as a function of observable human capital characteristics—such as education and work experience—and the returns to those characteristics, following Mincer (1974). The typical Mincer earnings function for individual i at time t takes the form

$$\omega_{it} = \beta X_{it} + \varepsilon_{it}, \tag{1}$$

where ω_{it} is an individual's log earnings in a year, X_{it} is a column vector of an individual's endowments of observable characteristics in that period, β is the row vector of associated returns to those characteristics, and ε_{it} is a random error term.

Estimated separately by gender, the decomposition model is derived from equation (1) as follows:

$$W^m - W^f = b^*(\bar{X}^m - \bar{X}^f) + [(b^m - b^*)\bar{X}^m - (b^f - b^*)\bar{X}^f], \quad (2)$$

where W^f is the average of ω_{it} over the subsample of women, \bar{X}^f is the vector of the average of the endowments (X_{it}) for the women's subsample, and b^f is the vector of regression coefficients from the estimation of the earnings function for women. The values for men are calculated similarly. The first term on the right-hand side is the explained gap; that is, the salary difference accounted for by gender differences in endowments. The bracketed term is the unexplained gap; that is, salary differences arising from systematic gender differences in returns to endowments.

In the absence of discrimination, the returns vectors are equal between genders ($b^* = b^f = b^m$), the unexplained gap equals zero, and the earnings gap would be entirely explained by gender differences in endowments. While many studies interpret the unexplained gap as evidence of discrimination, we avoid that equivalence: it ignores both variables omitted from the endowment set (such as unmeasured skills) and discrimination embedded within observables (for example, expected pay influencing education choices). We also note Blau and Kahn's (2017) interpretation of the unexplained term as a treatment effect—the premium a woman would receive if rewarded according to the returns men with identical characteristics obtain.

Throughout, we use the neutral terminology of explained and unexplained gaps, though we do flag where specific findings may plausibly reflect discrimination.

This paper extends the standard earnings function framework by adding entry salary as a determinant of current salary, to examine how gender pay gaps at entry persist over tenure. A naive regression of current on entry salary would suffer from endogeneity, since both reflect unobserved attributes such as innate ability and negotiating skill. We address this by estimating a recursive structural model in which log entry salary is first predicted from observed covariates

and instruments, then entered as a regressor in a second-stage Mincer earnings function of the following form:

$$CS_{it} = \beta_0 + \beta_1 X_{it} + \delta_t + \phi \widehat{ES}_i + v_{it} \quad (3)$$

Equation (3) models the log of an individual's current salary (CS_{it}) as a function of their endowments in that year (X_{it}), lingering effects of log entry salary using the predicted value from the first-stage regression (\widehat{ES}_i), and an error term uncorrelated with instrumented entry salary (v_{it}). Year fixed effects (δ_t) control for period-specific shocks common to all staff, such as budgetary constraints on annual adjustments. Given the log-log structure, the coefficient of entry salary ϕ is an elasticity: larger values indicate greater persistence of entry salary advantages or disadvantages over tenure. For the mean decomposition, we use second-stage coefficients estimated on the pooled sample of men and women as the nondiscriminatory returns benchmark, following Neumark (1988) and Oaxaca and Ransom (1999), and implement the decomposition using the STATA routine in Jann (2008).

As the literature reviewed above documents, wage gaps often vary substantially across the earnings distribution, making a focus on mean differences alone insufficient. Such variation arises when the wage structure is nonlinear, a pattern that may reflect systematic gender differences in occupation and employment type, since occupations concentrated at the lower end of the distribution typically yield lower returns to schooling than those that dominate the upper end. For this study, an additional consideration is that the magnitude of entry salary persistence may itself differ across distribution points.

To estimate the marginal effects endowments at points in the salary distribution other than the mean, we follow Firpo, Fortin, and Lemieux (2009) as implemented in Stata by Rios-

Avila (2020) to calculate recentered influence functions (RIFs) for the distributional statistics—quantiles of the salary distribution in our case. This method has the benefit of being computationally simple and the expectation of the RIF equals the value of distributional statistic being considered. The approach begins with the estimate of the RIF of the dependent variable. Denote the unconditional cumulative distribution function of ω^f as F_ω^f . The RIF for distributional statistic q_k (the value of ω^f at k th quantile of the unconditional distribution function) can be calculated as follows:

$$\text{RIF}(\omega^f: q_k, F_\omega^f) = q_k + (k - D_k^f)/f_\omega^f(q_k), \quad (4)$$

where D_k^f is a binary variable equal to 1 when $\omega^f \leq q_k$ and $f_\omega^f(q_k)$ is the kernel density estimator of the density function calculated at the point of the distributional statistic. Then a linear relationship with the human capital endowments is assumed for the RIF regression to obtain the marginal effects the variables have around that point of the salary distribution. Essentially, equation (3) is estimated replacing the dependent variable with the RIF-transformed current salary. Note that RIFs for women and men are calculated on their separate subsamples so the expected values will be the quantiles within the women's salary distribution and the men's salary distribution, respectively.

The estimated coefficients from the women's and men's RIF regression are used in the decomposition in equation (2) with mean endowments by gender. With the complication of the IV estimator for entry salary, we use a two-stage approach with bootstrap standard errors where the first-stage regression on entry salary is performed on the bootstrapped samples then the fitted value for entry salary is incorporated in the second-stage RIF regression on the same sample. In

the quantile analysis, we use the coefficients from the men's RIF regression as b^* , essentially taking their salary distribution as the base of comparison.

Before presenting results, we flag three data features that bear on the analysis and interpretation. First, staff enter and exit at different points within the study period, yielding an unbalanced panel; year fixed effects are included to absorb common unobserved period-specific factors. Second, repeated observations on the same individuals induce serial correlation in the errors; we correct for this and other forms of heteroskedasticity using robust or bootstrap standard errors clustered by individual. Third, the sample is limited to hired applicants, so all estimates are conditional on selection. This may compress estimated returns to education, since academic credentials serve as a screening criterion—though the absence of information on candidates who rejected offers could bias coefficients in the opposite direction.

FINDINGS

Mincer Earnings Function Estimates

Table 2 reports Mincer earnings function estimates underlying the salary gap decomposition, presented separately by gender under three specifications: a conventional earnings function excluding entry salary (OLS), one including entry salary (OLS), and one instrumenting for entry salary to address endogeneity (IV). Endogeneity tests reject the null of exogeneity, supporting the view that systematic gender disparities in current salaries partly originate in gaps at entry.

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Table 2: Mincer Earnings Function Estimates by Gender

Item	(1) OLS			(2) OLS			(3) IV		
	All	Women	Men	All	Women	Men	All	Women	Men
Education:									
Master's	-1.97 **	-2.12	-1.66	-0.01	-0.07	0.11	-0.17	-0.48	0.04
Doctorate	0.77	0.03	1.14	0.91	0.40	1.27	0.90	0.32	1.26
Experience:									
Pre-ADB experience	0.29 **	1.25 ***	-0.10	0.03	0.14	0.02	0.05	0.36 ***	0.01
ADB experience	2.09 ***	3.23 ***	1.63 ***	3.78 ***	3.86 ***	3.76 ***	3.64 ***	3.74 ***	3.69 ***
Working leave	-3.92 ***	-4.73 ***	-3.20 ***	-2.84 ***	-2.60 ***	-3.08 ***	-2.93 ***	-3.02 ***	-3.09 ***
Nonworking leave	-9.65 ***	-6.49 ***	-11.34	-0.73	0.55	-14.68 **	-1.43	-0.84	-14.56 **
Total experience squared	0.02 ***	-0.00	0.02 ***	-0.00	-0.01 *	-0.00	-0.00	-0.00	-0.00
Performance rating:									
Average rating	13.60 ***	11.70 ***	14.07 ***	11.40 ***	8.92 ***	12.62 ***	11.57 ***	9.47 ***	12.66 ***
No recent rating	30.31 ***	27.00 ***	31.39 ***	25.24 ***	19.46 ***	28.20 ***	25.64 ***	20.95 ***	28.31 ***
Other:									
Marital status:									
Married	6.88 ***	4.18 ***	7.27 ***	1.63 ***	1.72 ***	0.60	2.05 ***	2.21 ***	0.83
Divorced/widowed	6.44 ***	5.89 ***	6.02 ***	1.02	2.08 **	-0.51	1.45	2.83 ***	-0.28
Former local staff	-11.53 ***	-13.00 ***	-11.24 ***	1.44 *	1.27	1.40	0.42	-1.55	0.95
Nationality:									
Nonregional	7.81 ***	5.68 ***	8.66 ***	1.05 *	1.27	0.88	1.59 ***	2.14 ***	1.15
Japan	4.35 ***	1.75	4.79 ***	-0.59	-1.63	-0.29	-0.20	-0.96	-0.11
Oceania	6.65 ***	5.62 ***	7.07 ***	1.43 *	0.06	2.01 **	1.84 **	1.16	2.19 **
Graduated economies	3.56 ***	3.93 **	3.35 **	-0.34	0.40	-0.75	-0.03	1.10	-0.61
PRC	2.75 **	1.72	3.46 *	1.08	0.72	1.22	1.22	0.92	1.30
India	7.46 ***	2.54	8.92 ***	3.37 ***	0.69	4.10 ***	3.69 ***	1.05	4.27 ***
Entry salary:									
Log real entry salary				0.77 ***	0.77 ***	0.78 ***	0.71 ***	0.61 ***	0.75 ***

(continued on next page)

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Table 2: (continued)

Item	(1) OLS			(2) OLS			(3) IV		
	All	Women	Men	All	Women	Men	All	Women	Men
IV postestimation:									
Endogeneity:									
<i>F</i> statistic							22.71	48.24	2.96
<i>p</i> value							0.00	0.00	0.09
Instrument validity:									
Partial R ²							0.35	0.32	0.36
<i>F</i> statistic							572.81	198.46	379.57
Overidentification									
χ^2							103.53	29.63	73.61
<i>p</i> value							0.00	0.00	0.00
Salary year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	23,285	7,643	15,642	23,285	7,643	15,642	23,285	7,643	15,642
R ²	0.59	0.66	0.55	0.86	0.88	0.84	0.86	0.87	0.84

Notes: Dependent variable is the log of real annual salary multiplied by 100. Instruments in the IV estimates are age at time of entry and its square. Statistical significance tests are based on robust standard errors clustered by individual. ADB = Asian Development Bank; IV = instrumental variables; OLS = ordinary least squares; PRC = People's Republic of China. * Statistically significant at the .10 level; ** at the .05 level; *** at the .01 level.

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Coefficient estimates generally accord with expectations, though with notable gender differences that shape decomposition results. We focus on the IV specification. Neither master's nor doctoral degrees are significantly associated with higher earnings relative to a bachelor's degree—ADB's minimum hiring requirement—for either gender. Work experience, whether accumulated before or during ADB employment, is strongly associated with higher salaries for women, though pre-ADB experience is insignificant for men. Each additional year of ADB tenure is associated with a 3.7% salary increase at the sample mean. Both working and nonworking leaves reduce earnings regardless of gender, with nonworking leave carrying larger penalties. Men face a steeper nonworking leave penalty than women; each additional month is associated with a 1.2% reduction in current salary.

We use marital status to proxy for parenthood or motherhood penalties, given the absence of data on children (Budig, Misra, and Boeckmann 2016; Azmat and Ferrer 2017; Andersen 2018; Ganguli, Hausmann, and Viarengo 2021). Women typically bear larger caregiving burdens and may consequently sort into lower-paying jobs offering flexibility or avoiding travel, long hours, or high stress. Somewhat surprisingly, estimates show marriage premia for both genders, though the results are more consistent for women. The absence of a marriage penalty for women likely reflects sample selection: women who accept ADB employment may be better positioned to arrange alternative caregiving than similarly skilled women who choose other employers.

Former local staff earn substantially less in the OLS specifications—by roughly 13% for women and 11% for men with similar endowments—but the effect becomes insignificant once entry salary differences are controlled for. This is consistent with the fact that promotion from local to international status carries a sizeable salary increase along with additional benefits,

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notably housing and children's education allowances through college. These cases also represent fewer than 5% of sample observations.

Entry salary elasticities below one indicate potential for catch-up through subsequent salary growth. The elasticity is lower for women than men—0.61 versus 0.75 in the IV specification—suggesting that women have more scope to improve their relative position through post-entry salary growth and promotion, which in turn underscores the importance of performance ratings. Performance ratings are significantly associated with current salaries for both genders, but the estimated coefficients are smaller for women, meaning that equivalent ratings translate into smaller salary gains. Together, these findings imply that closing the gender pay gap requires progress on both margins: reducing gender disparities at entry and equalizing salary growth thereafter.

RIF regression estimates by quantile broadly mirror the results at the mean (Figure 4). Education has consistently insignificant marginal effects across the salary distribution for both genders, consistent with the bachelor's degree requirement serving as a hiring screen rather than a within-sample earnings differentiator. Marital status is largely insignificant, with the exception of a positive effect for the highest-earning women and the lowest-earning men—a pattern that argues against a widespread motherhood penalty. Nonworking leave, however, which consists mainly of maternity leave, significantly reduces salaries for the highest-paid women; the corresponding effect for men is imprecisely estimated due to few users.

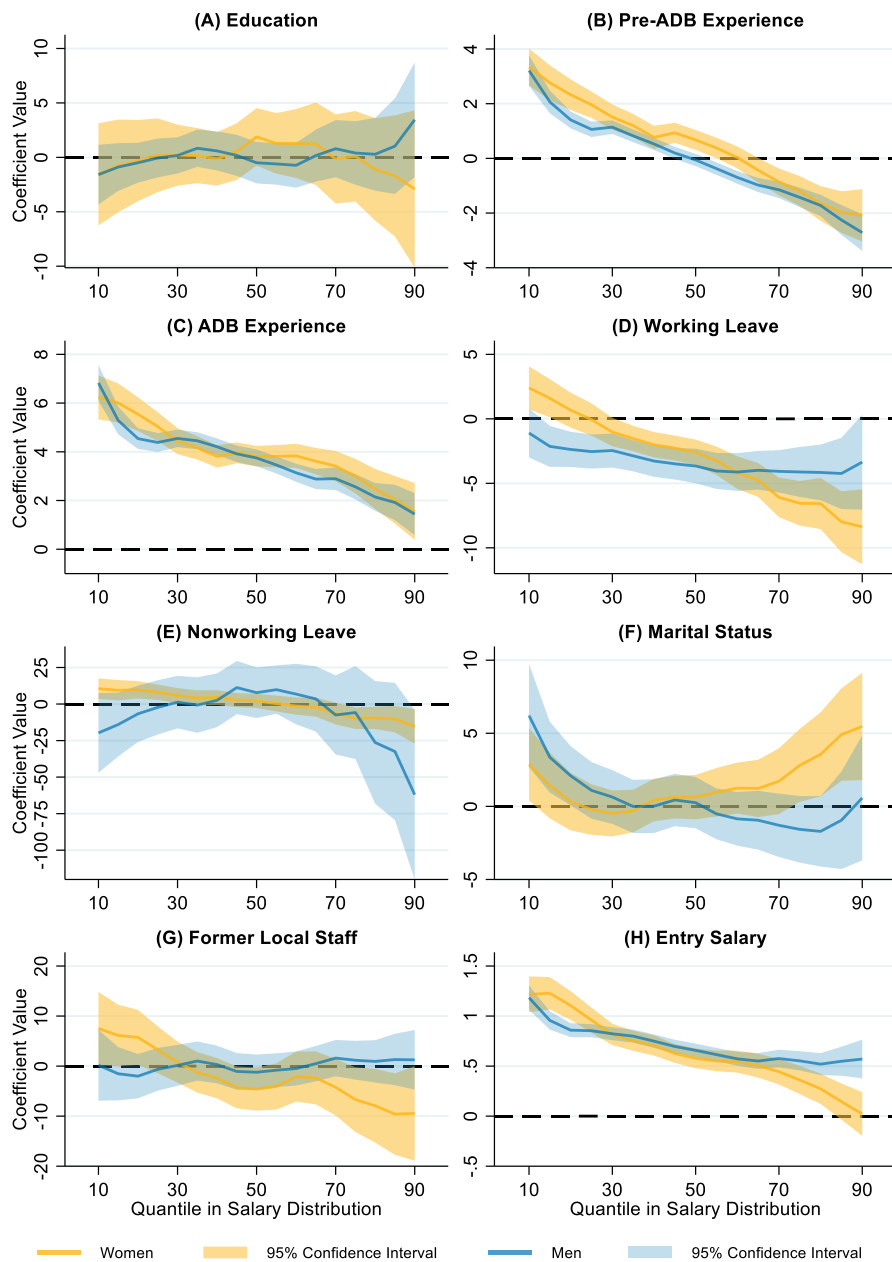


Figure 4. Marginal Effects of Selected Variables in the Earnings Function, By Salary Quantile and Gender

Notes: Coefficients in the recentered influence function instrumental variables regressions, from the 10th to 90th percentile of the log salary distribution in 5-percentile point increments. The 95% confidence interval bands are calculated from bootstrap standard errors clustered by individual with 1,000 replications.

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Work experience shows stronger positive effects at lower than upper earnings quantiles. Returns to pre-ADB experience and working leave turn negative toward the right tail, where jobs include senior and managerial roles, suggesting that firm-specific capital is more highly rewarded at that level. Notably, even ADB experience yields lower returns in the upper than lower tail, pointing to unmeasured attributes—such as managerial ability—that are not captured by standard experience or education measures. A statistically significant negative salary effect of former local staff status appears only for women at the upper end of the distribution.

The elasticity of current salary with respect to entry salary approaches unity for the lowest-paid workers regardless of gender and declines toward higher earnings groups. Unitary elasticity at the bottom of the distribution is unsurprising, as recent entrants are likely concentrated there. More notable is that entry salary persistence is stronger and more precisely estimated for men than for women: the elasticity is statistically insignificant for women above the 75th percentile.

Blinder-Oaxaca Decomposition: Heterogeneity Across the Salary Distribution

Table 3 presents Blinder-Oaxaca decomposition estimates at the mean using OLS and our preferred IV specification. The mean gender salary gap is approximately 10%. Without entry salary controls, naïve OLS attributes roughly three-quarters of this gap to gender differences in individual characteristics (endowments)—principally total work experience (driven by ADB tenure and leave duration) and marital status.

**Table 3: Blinder-Oaxaca Decomposition
—Effect of Entry Salary at the Mean**

Decomposition Component	(1) OLS	(2) OLS	(3) IV
Total log salary gap	9.50 ***	9.50 ***	9.50 ***
Explained	7.17 ***	8.82 ***	8.69 ***
Education	0.07	0.01	0.02
Experience	5.47 ***	4.81 ***	4.86 ***
Pre-ADB experience	0.30 *	0.03	0.06
ADB experience	2.61 ***	4.73 ***	4.56 ***
Working leave	0.40 ***	0.29 ***	0.30 ***
Nonworking leave	0.51 ***	0.04	0.08
Performance rating	-0.06	-0.05	-0.05
Other	2.29 ***	0.50 ***	0.64 ***
Marital status	1.80 ***	0.00	0.56 ***
Former local staff	0.17	-0.02	-0.01
Nationality	0.32 **	0.07	0.09
Log real entry salary		3.50 ***	3.22 ***
Unexplained	2.34 ***	0.68 **	0.81 **
Memorandum items (%):			
Explained share	75.41	92.82	91.45
Education	0.69	0.11	0.16
Experience	57.56	50.64	51.19
Performance rating	-0.67	-0.50	-0.52
Other	24.13	5.29	6.78
Entry salary		36.85	33.94
Unadjusted salary ratio	90.93	90.93	90.93
Adjusted salary ratio	97.69	99.32	99.19

Notes: Dependent variable is the log of real annual salary multiplied by 100. Instruments in the IV estimates include age at time of entry and its square. Statistical significance tests are based on robust standard errors clustered by individual for OLS estimates and bootstrap standard errors with 1,000 replications clustered by individual for IV estimates. ADB = Asian Development Bank, IV = instrumental variables, and OLS = ordinary least squares. * Statistically significant at the .10 level; ** at the .05 level; *** at the .01 level.

Adding entry salary raises the explained share to 91% using IV. Gender disparities in entry salaries thus account for a substantial portion of current earnings gaps, partly displacing the explanatory roles of work experience and marital status. Notably, the role of ADB tenure becomes much more important after adding entry salary, while the overall effect of experience is diminished. This reflects the nonlinear total experience term, which is positive and significant in the first specification but becomes negative and statistically insignificant once entry salary is included. This result reflects both gender differences in endowments and salary growth disparities as proxied by performance ratings which bear no significant decomposition effect.

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Quantile regression-based decomposition reveals heterogeneity underlying the mean gender gap. In Table 4, the first row shows the gender gap across the salary distribution, which is decomposed using specifications with and without entry salary to show the heterogeneous effects of entry salary on the contributions of the various observables across the salary distribution. Converting log points to percentages, the unadjusted gender gap rises from 7.8% at the 10th percentile to 11.1% at the 90th, consistent with a glass ceiling. The slightly higher 10th-percentile gap over the 25th (7.8% versus 7.4%) suggests possible sticky-floor effects. In the specification without entry salary, endowments account for only 53.4% of the explained component at the 10th percentile, compared with 86.3% at the 90th. Thus, measurable characteristics explain more of the larger gaps at the upper tail, but not at the lower salary levels where sizeable unexplained gaps persist.

Two results stand out when gender differences in entry salary are included in the decomposition. First, entry salary's contribution to the explained gap is concentrated at the lower end of the distribution—accounting for 33% of the gap at the 10th percentile and nothing at the 90th. Second, the contribution of experience to the explained gap falls across the distribution, though the decline is far larger at the lower tail: experience's contribution drops by more than 1.3 percentage points at the 10th percentile, rendering its contribution to the gender gap statistically insignificant, versus less than 0.1 percentage points at the 90th. This asymmetry implies that omitting entry salary inflates experience's apparent role in the gender gap at the bottom of the distribution. This stark contrast between lower- and higher-paid employees underscores that ignoring entry salary masks the critical role of hiring practices in generating gender pay gaps, particularly for lower-paid staff.

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Table 4: Blinder-Oaxaca Decomposition—Effect of Entry Salary across the Salary Distribution

Decomposition Component	(1) Mean	(2) 10th Percentile	(3) 25th Percentile	(4) 50th Percentile	(5) 75th Percentile	(6) 90th Percentile
Total log salary gap	9.50 ***	8.15 ***	7.72 ***	9.79 ***	10.24 ***	11.75 ***
Without entry salary:						
Explained	7.17 ***	4.35 ***	3.99 ***	5.33 ***	8.46 ***	10.14 ***
Education	0.07	0.11	0.06	0.02	0.09	0.10
Experience	5.47 ***	1.96 ***	3.42 ***	5.25 ***	8.35 ***	9.31 ***
Performance rating	-0.06	0.32 ***	0.11 **	-0.05	-0.30 **	-0.52 ***
Other	2.29 ***	1.77 ***	0.78 *	0.80 **	1.35 ***	2.16 ***
Unexplained	2.34 ***	3.80 ***	3.73 ***	4.42 ***	1.78	1.61
With entry salary:						
Explained	8.69 ***	4.62 ***	4.21 ***	5.47 ***	8.54 ***	10.16 ***
Education	0.02	0.02	-0.01	-0.02	0.06	0.10
Experience	4.86 ***	0.65	2.36 ***	4.58 ***	7.91 ***	9.22 ***
Performance rating	-0.05	0.36 ***	0.14 ***	-0.03	-0.29 **	-0.51 ***
Other	0.64 ***	-0.11	-0.76 **	-0.16	0.72 *	2.03 ***
Entry salary	3.22 ***	2.63 ***	2.15 ***	1.34 ***	0.88 **	0.18
Unexplained	0.81 **	3.53 ***	3.51 ***	4.32 ***	1.70	1.59
Memorandum items (%):						
Explained share:						
Without entry salary	75.41	53.42	51.69	54.48	82.57	86.32
With entry salary	91.45	56.66	54.49	55.86	83.44	86.47
(Entry salary share)	33.94	32.24	27.81	13.69	8.62	1.56
Salary ratios:						
Unadjusted	90.93	92.17	92.57	90.68	90.27	88.92
Adjusted (w/o entry salary)	97.69	96.27	96.34	95.64	98.23	98.41
Adjusted (with entry salary)	99.19	96.53	96.55	95.77	98.32	98.42

Notes: Dependent variable is the log of real annual salary multiplied by 100. Coefficients and standard errors for estimates at the mean are calculated in the same way as in Table 3. Recentered influence functions are used to estimate unconditional quantile regressions. Specifications with entry salary are instrumental variables estimates with instruments age at time of entry and its square. Statistical significance tests are based on bootstrap standard errors with 1,000 replications clustered by individual. * Statistically significant at the .10 level; ** at the .05 level; *** at the .01 level.

CONCLUSION

The most striking finding from our analysis of two decades of longitudinal employee data from a single firm is an asymmetric pattern of gender inequality across the salary distribution. Entry salary disadvantage accounts for 68% of the explained gender gap at the 10th percentile but nothing at the 90th. Initial disparities thus create persistent barriers primarily for women at lower salary levels—a sticky floor effect potentially more consequential for long-term gender equity than the widely studied glass ceiling. Correcting for entry salary endogeneity, we find that entry salaries account for roughly one-third of the explained gender gap in current salaries, with subsequent promotions and salary growth insufficient to offset initial disadvantages. In short, the gender pay gap begins at hiring—an influence especially pronounced in organizations with tight salary structures such as public sector institutions and multilateral development banks.

Standard quantile regression confirms that gender salary gaps are larger at the upper tail, signaling glass ceiling effects. Incorporating entry salaries and addressing endogeneity through instrumental variables reveals a more nuanced picture, however. Performance evaluation differences have opposing effects across the distribution: they widen the gap at lower salary levels and narrow it at higher ones. For women at the lower end, initial salary penalties and subsequent evaluation disparities compound one another, reinforcing disadvantages established at entry. This pattern underscores the importance of achieving gender equity at the point of hiring.

The gender salary gap narrowed significantly among ADB’s internationally recruited staff over 2000–2022. Beginning in 1998, ADB introduced gender-targeted policies for international staff—affirmative recruitment, extended maternity leave, family-friendly leave, and childcare support. These measures, sustained over two decades, coincided with meaningful progress,

though we stop short of claiming causality given concurrent organizational changes unrelated to gender.

Our findings point to three priority interventions. First, address gender pay gaps at entry through transparent salary-setting and equitable initial placements; correcting disparities at hiring is likely more effective than remedying entrenched inequalities later. Second, direct particular attention to the lower end of the distribution, where sticky floor effects create persistent barriers that compound over careers. Third, monitor pay equity across lower salary ranges, as this may yield greater returns than the conventional focus on glass ceiling effects at senior levels.

Two data limitations of our study bear noting. First, single-organization analysis precludes examining how men and women sort across firms or whether inter-firm mobility reduces gender disparities. Second, the absence of direct negotiation measures prevents distinguishing whether entry salary gaps reflect gender differences in negotiation behavior, employer discrimination, or both. Future research using multi-firm datasets incorporating job search behavior, offer negotiations, and mobility patterns could be used to assess the generalizability of our findings and the relative contributions of within-firm versus between-firm processes to gender salary inequality. Such analysis would clarify whether sticky floor effects at entry are organization-specific or reflect broader labor market patterns, and whether the asymmetric role of entry salaries across the distribution holds in settings with different salary structures and mobility rates.

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Appendix Table: Variable Names and Summary Definitions

Variable	Definition
Dependent variable	
Log real salary	Natural logarithm of annual salary in US dollars deflated using the US consumer price index
Independent variables	
Education	Current highest educational degree earned 1 = Bachelor's degree or below * 2 = Master's 3 = Doctorate
Pre-ADB experience	Years of work experience prior to appointment as ADB international staff; includes time working as ADB local staff less extended nonworking leave taken during local staff tenure
ADB experience	Cumulative years of tenure as ADB international staff, not adjusted for periods of extended leave; excludes time spent working as ADB local staff
Working leave	Cumulative years spent on "special leave without pay" during ADB employment, assumed spent in alternative employment
Nonworking leave	Cumulative years spent on extended nonworking leave (periods of more than one month) during ADB employment, which includes sick leave, leave to care for a family member, and parental leave (inclusive of maternity leave and adoption leave)
Total experience	Sum of pre-ADB experience and ADB experience, less periods of nonworking leave
Average performance rating	Moving average of the available performance ratings in the immediately preceding three years; ratings are 1 for low performance, 2 for satisfactory, and 3 for high
Missing recent ratings	Binary variable equal to 1 if no performance rating available in previous three years
Marital status	Current marital status 1 = Single * 2 = Married 3 = Divorced or widowed
Former local staff	Binary variable equal to 1 if promoted to international staff from a local staff group in ADB headquarters or field office
Nationality	Staff nationality at time of hiring 1 = Nonregional (Europe and North America) 2 = Japan 3 = Oceania (Australia and New Zealand) 4 = Graduated regional economies (non-borrowing members of ADB) 5 = People's Republic of China 6 = India 7 = All other ADB developing members *
Entry salary indicators	
Log real entry salary	Natural logarithm of annual salary at entry (or at the time of promotion to international staff for former local staff) in US dollars deflated using the US consumer price index
Age at entry	Age in years at time of entry or at time of promotion to international staff for former local staff

Notes: Data descriptions and variable definitions detailed further in Zveglic, King, and Molina-Lapid (2025). ADB = Asian Development Bank. * Omitted category in estimations.