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Wage willingness for remote work and gender gap in Peru, 2022

Disposición salarial por trabajo remoto y brecha de género en el Perú, 2022

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Abstract

This study analyzes gender differences in the economic valuation of work flexibility in post-pandemic Peru. Using data from the National Household Survey (ENAH) and a Multinomial Logit model, the study estimates the relative probabilities of working under in-person, hybrid, and remote arrangements, as well as women's willingness to accept lower wages (Willingness to Pay, WTP It is the maximum price a customer is willing to pay for a product or service.) in exchange for flexible work. Results show that women are significantly more likely to choose remote work and are willing to sacrifice up to 78.4% of their income to access it, and 34.1% for hybrid work, revealing a high economic valuation of flexibility. These findings suggest that part of the gender wage gap may be attributed to compensatory preferences for non-monetary benefits. Additionally, significant regional disparities in WTP are observed, particularly in areas with structural barriers. In conclusion, remote work emerges as a highly valued strategy for work-family balance among women but may also reinforce existing inequalities if its economic value is not explicitly recognized in the labor market.

Keywords: Wage gap, teleworking, work flexibility, labor productivity, gender.

Resumen

El presente estudio analiza las diferencias de género en la valoración económica de la flexibilidad laboral en el Perú, en el contexto postpandemia. Utilizando datos de la Encuesta Nacional de Hogares (ENAH) y un modelo Logit Multinomial, se estiman las probabilidades relativas de acceso a modalidades laborales presencial, híbrida y remota, así como la disposición a aceptar menores ingresos (Willingness to Pay, WTP es el precio máximo que un cliente está dispuesto a pagar por un producto o servicio.) por parte de las mujeres para acceder a esquemas flexibles. Los resultados muestran que las mujeres tienen una probabilidad significativamente mayor de optar por el teletrabajo, y estarían dispuestas a sacrificar hasta 78.4% de su ingreso por trabajar de forma remota y 34.1% en modalidad híbrida, revelando un alto valor asignado a la flexibilidad laboral. Estas estimaciones sugieren que parte de la brecha salarial de género puede atribuirse a preferencias compensatorias por beneficios no monetarios. Asimismo, se observan marcadas diferencias regionales, con mayor WTP en departamentos con mayores barreras estructurales. En conclusión, el trabajo remoto constituye una estrategia de conciliación laboral-familiar altamente valorada por las mujeres, pero también puede profundizar desigualdades si no se reconoce su valor económico de forma explícita en el mercado laboral.

Palabras clave: Brecha salarial, teletrabajo, flexibilidad laboral, productividad laboral, género.

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Introduction

The COVID-19 pandemic significantly transformed the organization of work worldwide, accelerating the adoption of non-face-to-face work arrangements and reshaping the relationships between flexibility, productivity, and remuneration (Organización Internacional del Trabajo [OIT], 2022; Alarco & Sanchium, 2023). In Peru, this process led to an unprecedented expansion of remote work and teleworking, particularly in the formal private sector, creating a new context for analyzing labor and wage dynamics (Arévalo, 2024).

Beyond its organizational impact, the expansion of remote work introduced new forms of implicit negotiation between workers and employers, in which labor flexibility became a valued attribute of employment. In this context, labor decisions are no longer explained solely by wage levels, but also by access to non-monetary benefits, such as reduced commuting time, improved work–family balance, and greater autonomy in time management (OIT, 2022). However, these benefits may involve implicit wage costs, especially when workers are willing to accept lower incomes in exchange for greater flexibility.

This phenomenon is particularly relevant from a gender perspective, given that women face differentiated structural constraints in the labor market and often assume a greater share of unpaid work. This situation may increase their preference for jobs offering greater flexibility, even at the expense of lower remuneration (Alarco & Sanchium, 2023). Consequently, the expansion of remote and hybrid work arrangements may be reinforcing subtle mechanisms of wage inequality, contributing to the persistence of the gender wage gap in labor income.

In this context, the present study addresses the following central research question: Does women's greater willingness to accept lower wages in remote or hybrid jobs contribute to the persistence of the gender wage gap in the Peruvian labor economy? The study aims to provide empirical evidence on the potential hidden costs of labor flexibility, particularly for women. The general objective of the research is to identify whether access to remote or hybrid work arrangements is associated with wage differences

and to determine whether these differences vary by gender. In this regard, the central hypothesis posits that women show a greater willingness than men to accept lower wages in exchange for access to remote or hybrid jobs, which would contribute, partially but significantly, to the persistence of the gender wage gap. This hypothesis is grounded in compensating differential models, which propose that workers accept lower wages in exchange for valued non-monetary job attributes, such as workplace flexibility (Rosen, 1986).

From this analytical framework, it is important to contextualize the expansion of remote work in Peru. Prior to the pandemic, telework had a marginal presence in the formal private sector. As of February 2020, only around 30,000 workers were registered under this modality, primarily concentrated in large firms and oriented toward labor inclusion policies under Law No. 30036 (Ministerio de Trabajo y Promoción del Empleo [MTPE], 2021; Yarnold, 2021). However, the declaration of a public health emergency in March 2020 prompted the adoption of a more flexible arrangement—remote work—which allowed employment relationships to be maintained during the period of widespread lockdown (MTPE, 2021).

As a result, the number of people working under non-face-to-face arrangements increased rapidly, exceeding 206,000 in August 2020 and reaching nearly 248,000 in September 2021, equivalent to 6.7% of formally registered private-sector employment reported in the Electronic Payroll System (MTPE, 2021). This growth was concentrated mainly in the service sector, where activities compatible with digital environments—such as financial, administrative, and educational services—predominate (Guabloche & Gutiérrez, 2021; OIT, 2022; MTPE, 2022). At the same time, the Peruvian labor market continues to display structural gender inequalities, particularly in terms of income and labor force participation (León, 2022; Naciones Unidas, 2024). According to the Instituto Peruano de Economía [IPE] (2024) for every sol earned by a male worker, a woman earns on average 0.75 soles, representing a wage gap of 25%, which has remained persistent and has even widened after the pandemic. These gaps are more pronounced in rural areas, in certain regions of the country, and in

contexts characterized by informality or the presence of children in the household (Instituto Nacional de Estadística e Informática [INEI], 2023; IPE, 2024).

Female participation in the economically active population also remains lower than that of men, and women face additional barriers such as occupational segregation, the motherhood penalty, and the so-called sticky floors and glass ceilings, which limit their access to higher-paying jobs and leadership positions (Guillén & Huaranca, 2024). In this context, analyzing remote work and its relationship with wage differences becomes particularly relevant for understanding new forms of gender inequality in the Peruvian labor market.

The COVID-19 pandemic further aggravated these gaps (IPE, 2024). Women not only experienced a slower labor market recovery but also saw their incomes stagnate or decline. In 2004, the gender wage gap stood at 32.2%; although it decreased to 25.8% in 2019, it increased again to 27.2% in 2023. The gap widens under specific conditions: in the informal sector it reaches 32.9%, in rural areas 30.2%, and in households with children up to 36% (IPE, 2024).

Another relevant aspect is the disproportionate burden of unpaid work. Recent studies indicate that 41% of women in Peru leave the labor market after the birth of their first child, and this pattern persists even after a decade (IPE, 2024). In addition, women show lower savings rates and a higher perception of income insufficiency. While 40% of women report having saved during the previous 12 months, the proportion is higher among men (44%). Likewise, 87% of women report that their income is insufficient to cover expenses, compared with 81% of men, and 49% resort to debt to meet basic needs (IPE, 2024). In the Global Gender Gap Index 2023, Peru ranked 79th out of 146 countries, indicating stagnation in progress toward gender equality, particularly in dimensions related to economic participation and opportunities (IPE, 2024).

From a theoretical perspective, the use of the *Willingness to Pay* (WTP) approach is grounded in the theory of compensating differentials in labor markets. This theory posits that wages reflect not only workers'

marginal productivity but also individual preferences for non-monetary job attributes, such as flexible schedules, job stability, or working conditions (Rosen, 1986). Under this framework, the acceptance of lower wages in exchange for the possibility of working remotely or in hybrid arrangements constitutes an observable manifestation of such preferences, allowing researchers to infer the economic value workers assign to labor flexibility.

Moreover, the WTP approach is particularly appropriate in contexts where job attributes are not explicitly traded in the market but are implicitly incorporated into wage structures. Estimating willingness to pay for flexible work arrangements thus allows researchers to identify endogenous wage penalties associated with occupational choices, distinguishing them from purely discriminatory mechanisms. From a gender perspective, this framework is especially relevant because heterogeneous preferences conditioned by structural constraints—such as the unequal distribution of domestic and care work—may lead women to value flexibility more highly, generating persistent wage differences even in the absence of direct discrimination (Rosen, 1986; Organisation for Economic Co-operation and Development [OECD], 2022).

At the international level, an experimental study conducted in Germany estimated that workers were willing to sacrifice on average 5.4% of their income to work from home two days per week and up to 7.7% to work from home five days per week (Nagler et al., 2024). Women expressed a significantly greater willingness than men to forgo wages for working from home (WFH), especially among mothers and individuals with higher education and income levels (Nagler et al., 2024). Similarly, studies in the United States and Italy indicate that the rise of telework coincided with uncertain wage dynamics. Although workers with higher education and better-paid occupations value remote work more—up to approximately 8% of their salary (Fraja et al., 2022)—research also shows that workers in remote jobs experienced lower post-pandemic wage growth rates, estimated between 2% and 7% (Fraja et al., 2022).

In this regard, marked wage penalties have been documented by gender and race. An instrumental study in the United States estimated that Black women faced wage penalties of up to 66% for working five days from home, while White women faced penalties of around 34% (Kouki, 2024). These losses are explained by structural mechanisms such as reduced access to promotions, task reassignment, or diminished productive interaction. Similarly, Kouki (2023) identified a statistically significant negative effect associated with remote work among women, particularly those with children, highlighting the interaction between family variables and labor planning.

Finally, an OECD report (2022) concludes that telework often reflects pre-existing gender inequalities: while men are more likely to receive wage premiums associated with flexibility, women tend to adopt remote work more frequently without systematically obtaining additional monetary benefits. In some cases, they may even face obstacles to career advancement due to perceptions of lower commitment (Touzet, 2023). These international studies suggest that women—particularly mothers and those of lower socioeconomic status—show a greater willingness to sacrifice part of their salary in exchange for remote or hybrid work flexibility, which may contribute to the persistence of wage gaps.

In the Peruvian context, several recent studies have examined the persistence of the gender wage gap and the factors that explain it. For example, Vaccaro and Paredes (2022) analyzed the effects of COVID-19 on the Peruvian labor market and found that the pandemic exacerbated gender inequalities, particularly by reducing the working hours and incomes of less-skilled women and those without access to telework. Consistent with these findings, a report published by the OECD in 2022 notes that 75% of Peruvian women work in the informal sector—more than in other countries in the region—which limits their access to higher-quality and better-paid jobs (OECD, 2022).

Similarly, an article analyzing the evolution of the wage gap from 2007 to 2018 found that, despite improvements in women's educational attainment, the

gross wage differential remained between 6% and 12% (Vaccaro et al., 2022). Finally, Arroyo et al. (2024) explored wage differences between formal and informal workers in central Peru and concluded that informality has a strong impact on the gender wage gap, with lack of education accounting for approximately 30% of the difference. Together, these studies suggest that the gender wage gap in Peru persists structurally and is related not only to individual factors such as education or work experience but also to informality, occupational segregation, and unobservable discrimination.

The scientific importance of this study lies in the limited empirical evidence available in Peru regarding the relationship between labor preferences, flexible work arrangements, and gender wage gaps. Unlike previous studies that focus exclusively on wage discrimination or occupational segregation, this research proposes examining the willingness to accept lower wages in exchange for greater flexibility—known as *Willingness to Pay* (WTP),—as a potential endogenous mechanism contributing to the persistence of the wage gap.

In terms of contribution to knowledge, this study fills a gap in the national literature by incorporating methods for estimating individual preferences regarding remote or hybrid work and their relationship with labor income. Moreover, by adopting a behavioral labor economics approach, the research examines elements traditionally underestimated in wage analyses, such as non-monetary compensation and heterogeneous preferences, allowing for a broader and more realistic understanding of the determinants of gender income inequality in Peru.

Thus, as noted earlier, the research addresses the following problem: Does women's greater willingness to accept lower wages in remote or hybrid jobs contribute to the persistence of the gender wage gap in the Peruvian labor economy? The study seeks to provide evidence regarding the hidden costs of labor flexibility, particularly for women. The general objective is to identify whether access to remote or hybrid jobs is associated with wage differences and to determine whether these differences vary by gender. Specifically, the study aims to: (i) estimate the

willingness to pay (WTP) for access to jobs with greater labor flexibility; (ii) analyze whether this WTP varies by workers' sex and other sociodemographic characteristics; and (iii) assess whether preferences for flexibility help explain part of the gender wage gap in Peru.

The central hypothesis proposes that women show a greater willingness than men to accept lower wages in exchange for access to remote or hybrid jobs. This would contribute, partially but significantly, to the persistence of the gender wage gap in Peru. This hypothesis is grounded in labor supply and demand theory with heterogeneous preferences, particularly in compensating differential models (Rosen, 1986), which posit that workers accept lower wages in exchange for non-monetary benefits such as flexibility. From this perspective, the wage penalty associated with remote work can be understood as an implicit compensation for a valued job attribute, although with distributive implications that disproportionately affect women.

Methodology

This study adopts a quantitative explanatory approach, using a cross-sectional non-experimental design, based on the analysis of secondary data from official microdata sources. The methodological objective is to identify the existence of a wage penalty associated with access to flexible work arrangements (remote or hybrid) and to estimate whether this penalty manifests differently depending on the worker's gender. To this end, the Willingness to Pay (WTP) for telework—understood here as the willingness to accept lower wages—is estimated using discrete choice models (Díaz et al., 2024).

The data used in this study come from the Encuesta Nacional de Hogares sobre Condiciones de Vida y Pobreza (ENAH) del Instituto Nacional de Estadística e Informática (INEI) of Perú. Specifically, the dataset corresponding to the year 2022 (annual period) was used, accessed through Module 500: "Employment and Income" (survey code 784). It should be noted that since 2020, ENAH has included variables that allow the identification of the worker's employment modality (on-site, remote, or hybrid).

The sample analyzed consists exclusively of individuals in dependent employment (wage earners), aged 18 to 65, who reported positive income and having worked at least one hour during the reference week. Self-employed workers, informal workers without contracts, and individuals with incomplete information in the variables of interest were excluded. The final sample size consists of 11,481 individuals, which ensures statistical robustness in the estimations, even when performing gender-based disaggregation's.

The dependent variable in this study is employment modality, defined based on the respondent's self-identification and categorized into three alternatives: (1) on-site work, (2) hybrid work, and (3) remote work. This variable allows estimation of the probability of choosing each modality as a function of different individual and labor characteristics through a discrete choice model.

The independent variables include the respondent's sex (0 = male; 1 = female), which constitutes the main variable for analyzing gender differences; age, considered a discrete numerical variable; educational level, classified into seven categories ranging from "no formal education" to "completed higher education"; and marital status, according to the standard ENAH categories.

Additionally, area of residence is included, distinguishing between rural areas (0) and urban areas (1), as well as employment sector, coded as 0 for the public sector and 1 for the private sector. Working time is measured through the number of hours worked in the main occupation, expressed as a continuous numerical variable.

Finally, monthly labor income is included, calculated from income derived from both the main and secondary occupations. These amounts are annualized and subsequently divided by twelve to obtain their monthly value. The sum of both components is then transformed using the natural logarithm, that is $\ln(A + B)$ where A represents monthly income from the main occupation and B corresponds to income from the secondary occupation. This transformation captures proportional

effects and facilitates the interpretation of marginal elasticities within the econometric model.

The analytical methodology is implemented in two stages: In the first stage, a conditional Multinomial Logit model is estimated to analyze the determinants of employment modality choice. The model is based on the random utility framework, which assumes that worker (i) associates a utility (U_{ij}) with each employment modality ($j \in \{1,2,3\}$), defined as:

$$U_{ij} = X_i\beta_j + \varepsilon_{ij} \quad (1)$$

where (X_i) is a vector of observable individual characteristics (sex, age, education, sector, income, etc.), (β_j) is a vector of coefficients specific to each modality, and (ε_{ij}) is an error term assumed to follow a Type I Gumbel distribution.

The probability that individual (i) chooses modality (j) is given by:

$$P(y_i = j) = \frac{e^{X_i\beta_j}}{\sum_{k=1}^3 e^{X_i\beta_k}} \quad (2)$$

The model is normalized by setting on-site work ($j = 1$) as the base alternative, and the model is estimated relative to this category. Thus:

$$P(y_i = j) = \frac{e^{X_i\beta_j}}{1 + \sum_{k=2}^3 e^{X_i\beta_k}}, \text{ para } j = 2,3 \quad (3)$$

and

$$P(y_i = 1) = \frac{1}{1 + \sum_{k=2}^3 e^{X_i\beta_k}} \quad (4)$$

where the dependent variable indicates the chosen employment modality, and the explanatory variables allow identification of its association with observable characteristics, particularly sex.

In the second stage, the Willingness to Pay (WTP) for access to remote or hybrid work arrangements is estimated. WTP is derived from compensatory discrete choice models, following the economic valuation approach based on implicit wage compensation. The WTP is calculated as the ratio between the coefficient of the characteristic of interest (being female) and the coefficient of income, according to the following formula (Díaz et al., 2024):

$$WTP_k = -\frac{\beta_k}{\beta_{income}} \quad (5)$$

where β_k is the coefficient of characteristic X_k (female), and β_{income} is the coefficient of income or log-income. The negative sign is interpreted as the willingness to accept lower income in exchange for the characteristic (telework). This estimate allows interpretation of how much income, in relative terms, workers would be willing to sacrifice in order to access a flexible work arrangement. A significant negative WTP for women would suggest that women accept lower wages in exchange for the flexibility offered by remote work, which could indirectly contribute to the observed gender wage gap (Díaz et al., 2024).

To mitigate potential selection bias, observable characteristics that influence both income and employment modality choice are controlled for in the model. Robust standard error estimations are also employed, and sensitivity analyses are conducted using alternative model specifications.

However, given that the study relies on a cross-sectional non-experimental design, it is not possible to establish strictly causal relationships. Nonetheless, the analysis allows identification of robust and relevant associations, which may inform the formulation of future causal hypotheses.

Results

Stage 1

To ensure the validity of the coefficients estimated in the Multinomial Logit model, the assumption of no multicollinearity among the explanatory variables was assessed. Because the mlogit model does not allow this assumption to be tested directly, an auxiliary linear regression was estimated using work modality as the dependent variable, and variance inflation factors (VIFs) were computed. The results indicated that all VIF values were below the conventional threshold of 5 (maximum value: 1.53), with an average VIF of 1.22 and low correlation among the independent variables. Accordingly, there is no evidence of severe multicollinearity, and the mlogit estimates are not affected by strong linear relationships among the regressors.

Table 1 reports the results of the Multinomial Logit model estimated on a sample of 11,481 employed workers with positive income, confirming that

employment modality choice in Peru is significantly influenced by sociodemographic, economic, and regional factors. The Stage 1 model, estimated using sampling weights and reported as relative risk ratios (RRR), shows a reasonable fit (Pseudo $R^2 = 0.161$) and a highly significant global test, supporting its explanatory power. Using on-site work as the base category, the relative probabilities of choosing hybrid or remote modalities vary systematically by sex, income level, age, educational attainment, marital status, employment sector, and other structural conditions.

Table 1. Discrete Choice Model: Multinomial Logit (RRR). Employment modality: On-site (based outcome).

Observable characteristics	Hybrid		Remote	
	Relative Risk Ratios (RRR)	P > z	Relative Risk Ratios (RRR)	P > z
Sex (i)				
Female	0.8932	0.000	2.0057	0.000
Age (c)	1.0050	0.000	1.0188	0.000
Zone (i)				
Urban	0.7689	0.000	1.0718	0.000
Labor income (Ln) (c)	0.7629	0.000	1.5734	0.000
Department				
Educational level (i)				
Incomplete primary	2.1823	0.000	2.29e+	0.982
Completed primary	1.0866	0.022	0.2092	0.984
Incomplete secondary	1.4538	0.000	4.77e+	0.981
Completed secondary	1.1797	0.000	1.39e+	0.980
Incomplete higher education	2.0796	0.000	4.95e+	0.978
Completed higher education	3.2144	0.000	8.65e+	0.978
Marital status (i)				
Married (a)	1.5397	0.000	0.8455	0.000
Widow/er (a)	2.5617	0.000	0.6785	0.000
Divorced (a)	6.3935	0.000	1.0087	0.737
Separated (a)	1.0465	0.000	0.8587	0.000
Single (a)	1.1027	0.000	1.3796	0.000
Employment sector (i)				
Private	0.8792	0.000	1.2397	0.000
Hours worked (c)	0.8663	0.000	0.8984	0.000
Constant	0.5563	0.027	9.80e-	0.970

Note: The constant estimates the baseline relative risk for each outcome.

First, women show an 11% lower relative probability of being in a hybrid work arrangement compared to men (RRR = 0.893). In contrast, their relative probability of being in a remote work arrangement is more than twice that of men (RRR = 2.006). This finding is highly significant and consistent with the hypothesis that women place greater value on the flexibility offered by remote work. From an economic perspective, this preference may be associated with the persistent burden of unpaid work in the household—particularly caregiving responsibilities—

that women face in Latin America, making telework a more attractive, or even necessary, strategy for balancing work and family life.

Likewise, as monthly income increases, the relative probability of being in a hybrid arrangement decreases (RRR = 0.763), while the probability of being in remote work increases significantly (RRR = 1.573). This pattern suggests that remote work is concentrated in better-paid occupations, likely linked to sectors such as information technology, professional services, or financial activities, where tasks are more easily delocalized and digital competencies are highly valued. In contrast, hybrid work appears to be more common among workers with middle or lower incomes, perhaps in administrative or technical positions that still require partial on-site presence.

Age also shows a positive and statistically significant effect on the probability of accessing non-presential work arrangements. In particular, each additional year of age slightly increases the relative probability of being in a hybrid modality (RRR = 1.005) and, to a greater extent, in a remote modality (RRR = 1.019). Although the marginal effects per year are small, cumulatively they reflect that older workers tend to concentrate more in flexible arrangements. This may be linked to more established career trajectories, greater contractual stability, or the fact that these workers often hold higher-ranking positions that allow them to negotiate working conditions.

From a geographical perspective, living in an urban area slightly reduces the relative probability of being in a hybrid arrangement (RRR = 0.769), which may seem counterintuitive given the greater access to technology and connectivity in urban areas. However, this effect may be mediated by the sectoral distribution of employment, the in-person requirements of certain urban services, or the coexistence of lower-skilled occupations in intermediate cities. In contrast, living in an urban area increases the probability of working remotely (RRR = 1.072), as expected given the technological and organizational infrastructure concentrated in urban environments.

Educational level emerges as one of the most powerful predictors of access to remote work. Workers with completed higher education have more than three

times the relative probability of being in a hybrid arrangement compared to those who did not complete primary education (RRR = 3.21), and more than double the probability of being in remote work, although the latter result is not statistically significant. This suggests that education not only improves employability but also significantly expands the chances of accessing flexible work arrangements. In terms of human capital, access to telework appears to function as a kind of “reward” linked to the accumulation of academic credentials and associated skills.

Marital status also plays a relevant role in work arrangement choices. Compared to married or cohabiting workers, divorced workers show a much higher relative probability of being in a hybrid arrangement (RRR = 6.39), as do widowed workers (RRR = 2.56). This result may be interpreted from a life-cycle perspective, since these groups tend to be older, with fewer immediate family responsibilities, and employed in occupations that allow greater schedule autonomy.

Finally, regarding the employment sector, workers in the private sector have a lower relative probability of accessing hybrid arrangements (RRR = 0.879) compared with those in the public sector. This suggests that flexible work policies have been more widely adopted within the public administration, possibly as part of post-pandemic measures or broader digital transformation initiatives. Lastly, hours worked show a consistent negative effect: the greater the number of weekly hours worked, the lower the relative probability of being in hybrid (RRR = 0.866) or remote arrangements. This may reflect operational or structural constraints of teleworking in jobs with heavy workloads, or a lower willingness among employers to make flexible arrangements when working hours are extensive.

Stage 2

After estimating the Multinomial Logit model using relative risk ratios (RRR), an initial approximation was obtained regarding the influence of sociodemographic variables on the choice of work arrangement (on-site, hybrid, or remote). However, in order to analyze more deeply the economic valuation individuals assign to

the possibility of working remotely or in hybrid form, it is necessary to reformulate the analysis by using the model coefficients in their base Logit form to estimate the willingness to pay (WTP) for labor flexibility.

WTP is calculated as the ratio between the coefficient of an explanatory variable and the coefficient of the logarithm of labor income with the sign reversed (equation 05). In the second stage of the analysis (Table 2), the willingness of women to accept lower income in exchange for access to flexible work arrangements was estimated.

Using the coefficients from the base Logit model, the results indicate that female workers would be willing to accept a reduction of up to 78.4% of their income in order to access a remote job instead of an on-site one, and a reduction of 34.1% for hybrid arrangements. This implicit wage penalty reflects the high value assigned to flexibility and constitutes empirical evidence of the hidden costs of telework for women.

In this sense, the findings suggest that a non-negligible portion of the gender wage gap may be associated with compensatory preferences for non-monetary benefits, rather than being explained exclusively by direct wage discrimination.

Table 2. Estimated WTP by Gender and Work Modality, 2022.

Modality	Coefficient: Female	Labor Income Coefficient (Ln)	WTP (log points)	WTP (%)
Remote	+0.6960	+0.4532	-1.535	-78.4%
Hybrid	-0.1128	-0.2706	-0.417	-34.1%

Note: Because the coefficients for remote work modality and income are positive, the resulting WTP is negative, indicating that women would be willing to accept lower income in exchange for access to these work arrangements. These estimates correspond to the general model and are interpreted as average marginal effects (without RRR transformation).

In general terms, it is observed that in most departments women would be willing to accept a significant wage reduction in exchange for access to hybrid or remote work, revealing a pattern of implicit wage compensation that may be structurally contributing to the gender wage gap. A negative WTP implies that women would be willing to accept lower wages in exchange for labor flexibility. A positive WTP (or a negative value in percentage terms) would indicate that women require higher wages in order to opt for that modality.

Regarding hybrid work, Figure 1 shows that the highest willingness to accept lower income is observed in the regions of Moquegua (99.9%), San Martín (95.3%), Apurímac (84.3%), Piura (67.9%), Arequipa (67.4%), Puno (67.3%), and Tacna (68.6%). These results suggest that, in these departments, women place a particularly high value on the flexibility associated with hybrid work, being willing to sacrifice between two-thirds and nearly all of their income in order to access this modality. This high WTP may be associated with structural factors, such as mobility constraints, limited access to childcare services, gender-based labor market segmentation, or rigidities in local labor markets.

Other departments also show a moderate but significant WTP for hybrid work, such as Amazonas (61.7%), Cajamarca (78.3%), Callao (55.1%), Tumbes (35.1%), and La Libertad (4.6%), reflecting a national trend in which women assign positive value to labor flexibility, although with important regional variation depending on the local context (Figure 1).

However, atypical cases with positive WTP values are also identified—meaning a negative willingness to pay (i.e., willingness to accept higher income) in order to choose hybrid work—such as in Lambayeque (-698.9%), Lima (-229.3%), and Pasco (-32.7%). These counterintuitive values suggest that, in these departments, women would not be willing to sacrifice income for hybrid work, and might even require higher wages to access this modality. This pattern could be explained by the possibility that, in these areas, on-site work is still perceived as more stable or socially valuable, or that the hybrid jobs available offer poorer working conditions compared to fully on-site employment.

Regarding remote work, the results also reveal a national trend toward valuing this modality positively, with highly significant WTP values in Arequipa (90.5%), Junín (90.6%), La Libertad (87.1%), Piura (82.5%), Callao (79.5%), and Cajamarca (38.8%), indicating a substantial willingness to accept lower income in exchange for the benefits of telework. These findings are consistent with the literature emphasizing that remote work allows women to improve work–life balance, reducing transportation

costs and commuting time while facilitating family care responsibilities.

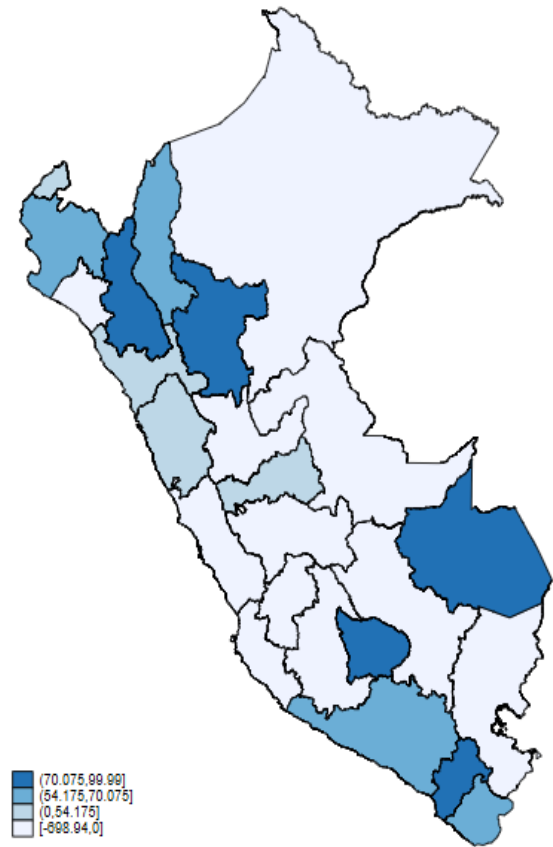


Figure 1. Estimated WTP for the Hybrid Work Modality in Peru, 2022.

Nevertheless, table 3 also presents extreme and contradictory values, such as in Huancavelica (-1044.4%) and Huánuco (-610.3%), where WTP estimates appear implausible due to their very large negative magnitude. These results are likely the consequence of specification problems arising from the scarcity of observations in remote work modalities in those regions. A similar interpretation applies to Ucayali, Madre de Dios, and San Martín. These estimates may reflect multicollinearity issues, a limited number of observations in certain gender–modality combinations, or atypical structural features of the local labor market. In particular, extreme values suggest the need for robustness checks, the exclusion of departments with low estimation reliability, or the use of more flexible nonlinear models.

By contrast, in departments such as Lima (61.9%), Cusco (42.9%), Ucayali (39.3%), Puno (12.4%), and Tumbes (10.4%), the WTP for remote work maintains

a negative sign consistent with the research hypothesis, although with more moderate magnitudes (Figure 2). These results suggest that in urban areas with greater digital penetration and a more formal economic structure, such as Lima or Cusco, the value assigned to remote work is real but already partially internalized in the labor market

Table 3. Regional Typology of the Valuation of Labor Flexibility, 2022.

Type of region	Characteristic's common	Regions	Estimated Average WTP
Urban regions with high digital penetration	High connectivity, relative labor formalization, greater access to formal employment. Women value time savings and work–life balance.	Lima, Arequipa, Callao, Junín	Remote WTP: -60% a -90% Hybrid WTP: -55% a -68%
Rural or intermediate regions with high family burden	Low connectivity, high informality, transportation rigidities, and high female participation in caregiving tasks.	Cajamarca, Apurímac, San Martín, Piura, Arequipa (rural)	Hybrid WTP: -60% a -95% Remote WTP: -40% a -80%
Regions with extreme or contradictor y effects	Small sample size in non-presential modalities, occupations incompatible with telework, high structural informality. Estimates are unstable or statistically insignificant.	Huánuco, Huancavelica, Loreto, Madre de Dios, Ucayali, Lambayeque	Remota WTP: ±200% a ±1000% Hybrid WTP: -700% a +400% (unstable)

Finally, in departments with positive WTP values for remote work (such as Apurímac, Ancash, or Moquegua), where the willingness to pay is positive (i.e., women would require higher wages in order to move to remote work), it can be inferred that remote work is not perceived as an advantage by women. This may be because telework does not adapt well to the technological conditions, connectivity levels, or the dominant types of occupations in the rural or informal contexts of these regions.

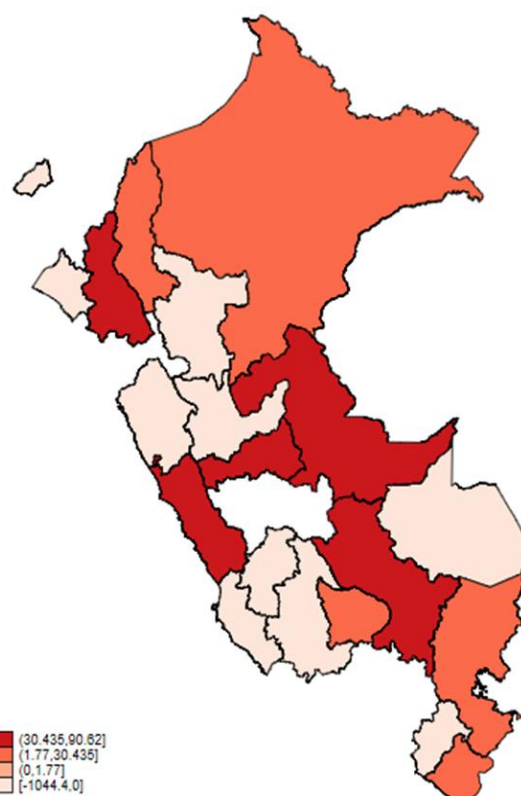


Figure 2. Estimated WTP for the Remote Work Modality in Peru, 2022.

Discussion

In line with previous studies (Nagler et al., 2024; Fraja et al., 2022), the results show that Peruvian women workers exhibit a greater willingness to accept significant wage reductions in exchange for access to flexible work arrangements, such as remote or hybrid work. This finding is consistent with the theory of compensating wage differentials, according to which individuals value non-monetary job attributes, such as flexible schedules or the possibility of working remotely, and are willing to accept lower wages according to their preferences (Rosen, 1986).

From a gender perspective, this willingness can be understood as the result of persistent structural conditions. As evidenced by Guillén and Huaranca (2024) and the IPE (2024), Peruvian women face systematic barriers in the labor market, including a disproportionate burden of unpaid work, motherhood penalties, and limited access to leadership positions. These constraints help explain why women place greater value on remote work: as a work–family reconciliation strategy, telework allows workers to reduce commuting costs, gain greater flexibility in their

schedules, and facilitate the care of children and dependent adults—factors that, according to Guillén and Huaranca (2024), contribute to women's lower retention in the labor market after motherhood.

The results indicate that women would be willing to sacrifice up to 78.4% of their monthly income to access a remote work arrangement, and up to 34.1% for a hybrid arrangement. These figures are considerably higher than those estimated in European or North American contexts (Nagler et al., 2024; Fraja et al., 2022), suggesting that labor flexibility in Peru is not only valued as a desirable job attribute but also as a structural necessity for many women workers. This phenomenon appears to intensify in rural regions or areas with high levels of labor informality, where barriers to accessing formal or on-site employment are greater and telework represents a potentially viable—though not always suitable—alternative.

The regional heterogeneity observed in WTP estimates also reveals important patterns. In departments such as Moquegua, San Martín, Apurímac, and Piura, women show a very high willingness to accept lower income in exchange for flexibility. This aligns with studies highlighting the logistical and structural costs of on-site work in regions with limited connectivity, scarce childcare services, and segmented labor markets (OECD, 2022; Arroyo et al., 2024). However, in regions such as Lambayeque or Lima, a positive WTP for hybrid work is observed, meaning that women would require higher wages to opt for this modality. This result may reflect the perception that on-site work provides greater stability or is associated with better working conditions, or that previous experiences with telework have been unsatisfactory due to increased workload, isolation, or limited career advancement opportunities (Touzet, 2023; Kouki, 2024).

Similarly, the greater propensity toward remote work among workers with higher incomes and higher levels of education confirms that telework remains largely a privilege associated with highly qualified human capital. This finding is consistent with the results of Fraja et al. (2022) and Vaccaro and Paredes (2022), who highlight that telework was primarily adopted by

workers with higher education levels in service sectors and digitally oriented occupations.

From a methodological perspective, the extreme and implausible WTP values observed in departments such as Huancavelica or Huánuco may result from limited sample representativeness or multicollinearity in gender–modality combinations. This interpretation is consistent with recommendations in the literature on remote work and compensating preference estimation, which emphasize the importance of conducting robustness checks and excluding subsamples with low statistical reliability (Kouki, 2024).

A particularly relevant finding is that the negative WTP observed among women, rather than indicating direct discrimination, may instead reflect a form of compensated discrimination. In the absence of public or corporate policies that monetarily recognize flexibility as a structural employment benefit, women effectively “pay” for access to working conditions that allow them to sustain their participation in the labor market.

Overall, the results of this study confirm that flexible work arrangements are valued differently by men and women, and that their distribution responds both to individual factors (age, education, income) and structural conditions (informality, geography, and access to infrastructure). At the same time, the findings identify mechanisms through which telework, rather than reducing inequalities, may reproduce them if not accompanied by redistributive policies that properly recognize and compensate for non-monetary benefits. From this perspective, the economic value of flexibility should be incorporated into the design of labor policies with a gender-sensitive and territorial approach.

Data availability

The data used in this study are available in institutional repositories and open-access sources cited in the references section. Priority has been given to official documents, academic publications, and reports from international organizations, ensuring the transparency and traceability of the information.

- **Open access:** Many of the sources used come from open-access repositories such as the Central Reserve Bank of Peru (BCRP), the National Institute of Statistics and Informatics (INEI), the Peruvian Institute of Economics (IPE), the International Labour Organization (ILO), the Organisation for Economic Co-operation and Development (OECD), and the Economic Commission for Latin America and the Caribbean (ECLAC/UN Women).
- **Data:** The data supporting the findings of this study are available in the National Household Survey (ENAHO), conducted annually by INEI, which is the primary source of data on living conditions and poverty in Peru. Since 1995, it has surveyed household expenditures, income, and social characteristics; in this case, Module 3 (education) and Module 5 (employment and income) were analyzed, corresponding to the year 2022:
https://proyectos.inej.gob.pe/iinei/srieha/Consulta_por_Encuesta.asp
- **Contact:** For further inquiries, requests for access to data derived from the analysis, or academic collaboration, please contact the author of the study at her institutional email address: nancy.collachagua@unmsm.edu.pe

Peer review comments

This article underwent an anonymous peer review process in accordance with the journal's editorial transparency policy. The reviewers, who participated anonymously in the evaluation process, provided consent for the publication of their comments.

Reviewer Comment 1: A very interesting study with a valuable contribution to knowledge about the relationship between telework and the gender gap. With the suggested revisions, it can achieve greater scientific robustness and stronger prospects for publication.

Reviewer Comment 2: This article represents a valuable contribution to the study of the relationship between remote work and the gender wage gap in Peru. The research combines methodological rigor with solid empirical analysis and offers findings that

are relevant both for academic debate and for the formulation of public policies. The clarity of the presentation of results and the integration of gender and regional perspectives are particularly noteworthy. I recommend its publication.

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