

# Gender Labor Earnings Gap in Costa Rica Over the Last Decade: What Drives It and the Effect of the Covid-19 Pandemic

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# Motivation and Contribution

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# Motivation

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- Gender Pay Gap (GPG) is still an ongoing question: **In 2018, men monthly earnings were 22% higher than women (ILO, 2018)**
- There is vast literature assessing the GPG in developed countries
- In developing countries, like Costa Rica, empirical research measuring the GPG and its determinants is much scarcer and they:
  - Are concentrated in countries with largest populations (e.g. India and China)
  - Are mostly based on cross-sectional data
  - Mainly estimated Mincerian earnings functions and decomposition methods
  - Found that, despite GPG has been decreasing, it remains in favor of men

# Motivation

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- There is a concern about the effects of the Covid-19 pandemic on widening the gender labor gaps, being the GPG one of the most vulnerable (Power, 2020)
  - In spite of this, to the best of our knowledge, empirical research on the effect of the Covid-19 pandemic on GPG is very scarce
- Deshpande (2020) based on Indian data, fitted an OLS to compare gender earnings pre- and post- pandemic. He found that the men exhibited a sharper reduction in income than women
- Doorly et al. (2021) using cross-sectional Irish data, applied a microsimulation to estimate the expected change in the GPG. They found a likely higher decrease in men's income than in women

# Contribution

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**1** New evidence to the scarce literature on GPG in developing countries, by using a large-scale dataset with a vast set of human capital- and job-related- determinants

**2** To the best of our knowledge, for the first time, it used a panel dataset with individual information pre- and post- pandemic, to estimate the effect of the Covid-19 on the gender earnings gap



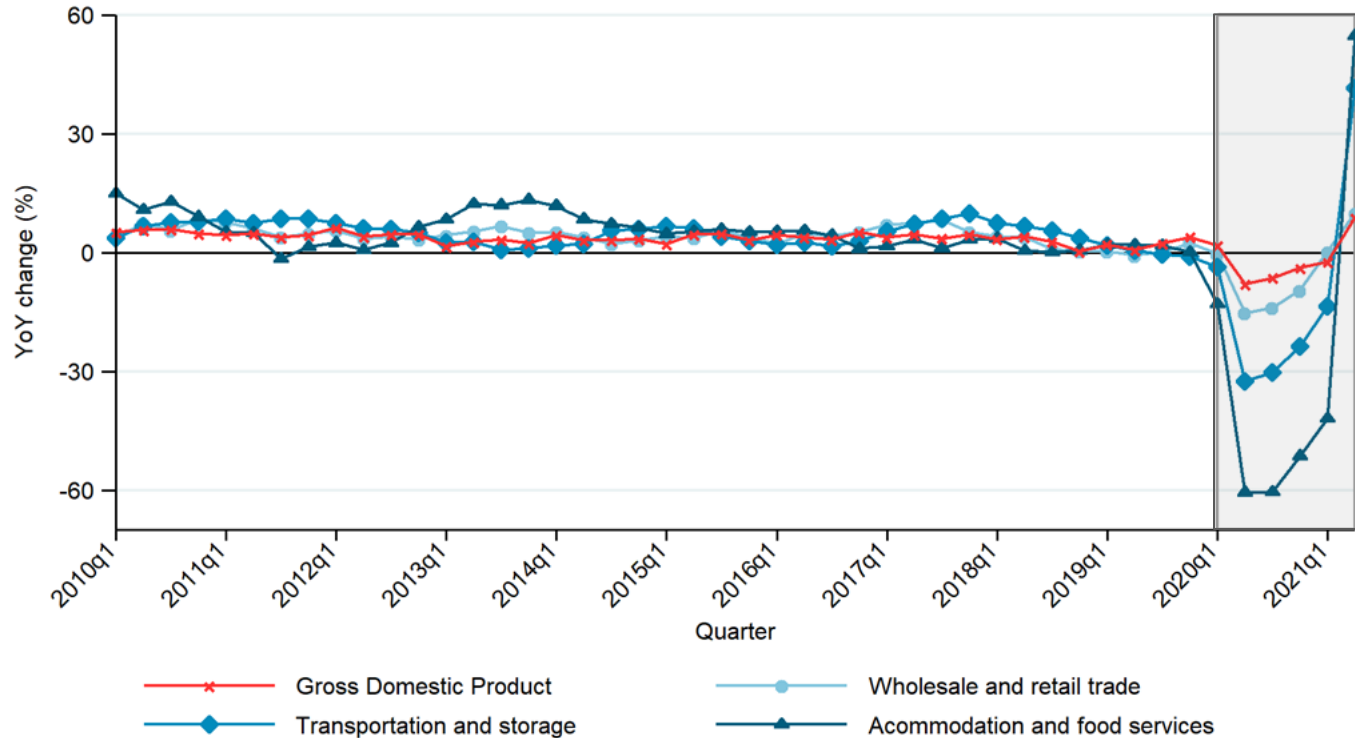
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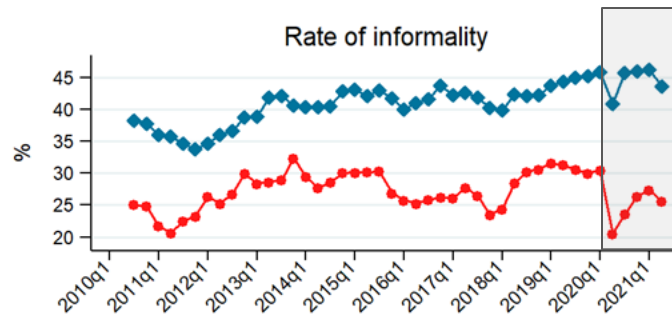
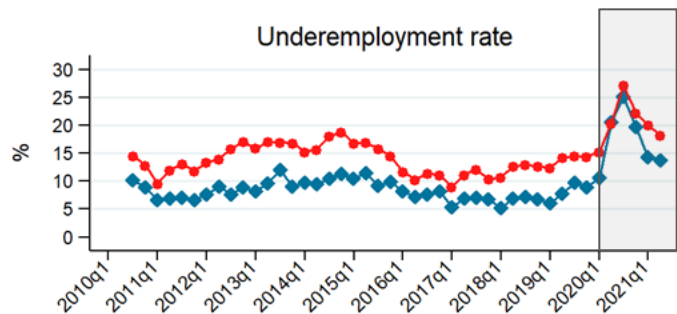
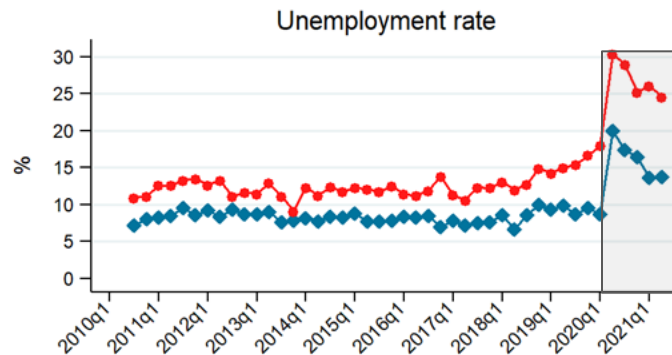
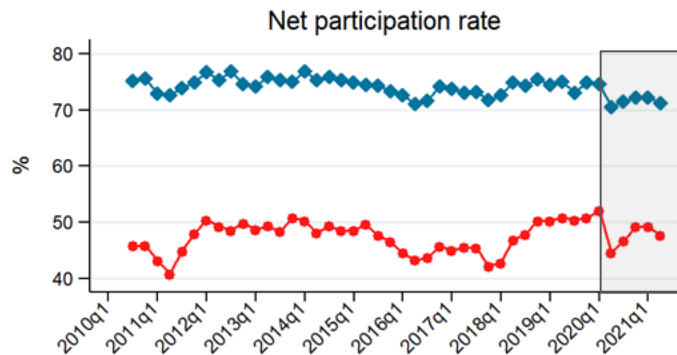
# Economic Activity and Labor Market in Costa Rica: The Effect of the Covid-19 Pandemic

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# Economic Activity and the Covid-19



# Labor Market in Costa Rica by Gender and the Covid-19



Men

Women



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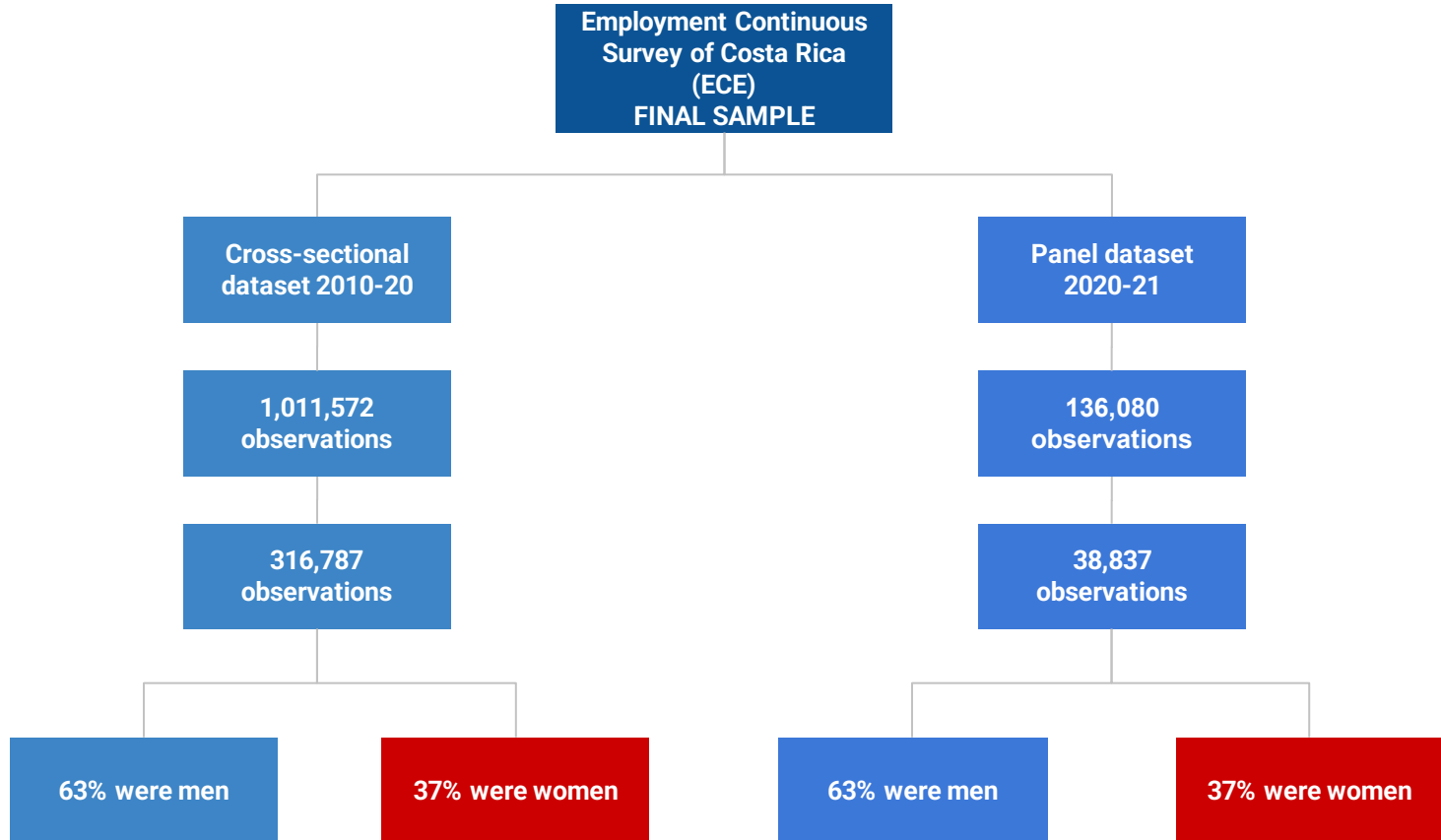
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# Data



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# **Empirical Strategy**

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# Extended Mincerian Earnings Function (Mincer, 1974)

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**Goal:** To estimate earnings by sex over the last decade, using cross-sectional data

$$[\log(w_{it}) | x_i\theta + \varepsilon_{it} > 0] = \beta_0 + \beta_n Z_{it} + \beta_\lambda \lambda_i(x_i\theta) + u_{it}$$

$\log(w_{it})$  : Natural logarithm of hourly earnings

$\beta_0$  : Constant term

$Z_{it}$  : Matrix of human capital and job-related determinants

$\beta_n$  : Vector of coefficients associated to earnings determinants

$\beta_\lambda \lambda_i(x_i\theta)$  : Heckman (1979) correction bias term

**Goal:** To estimate earnings by sex, including a term associated to the effect of the Covid-19 pandemic and using panel data (pre- and post- pandemic)

$$[\log(w_{it}) | x_i\theta + \varepsilon_{it} > 0] = \beta_0 + \beta_n Z_{it} + \delta FE_{q0t} Sex_{it} DV_{it}^m + u_{it}$$

$FE_{q0t}$  : Fixed effects term to control for time invariant characteristics that may impact earnings

$Sex_{it}$  : Sex of the person employed

$DV_i^m$  : Decomposition variables (whether a person was working on the public or private sector, on Covid-sensitive industries or not, on a full-time- or half-time-job)

# Oaxaca-Blinder Decomposition Method (OB)

Proposed by Oaxaca (1973) and Blinder (1973). Threefold decomposition, by using the Stata command *oaxaca* (Jann, 2008)

$$\begin{aligned}
 D &= E(\mathbf{Y}_M) - E(\mathbf{Y}_W) = \underbrace{\{E(\mathbf{Z}_M) - E(\mathbf{Z}_W)\}' \boldsymbol{\gamma}_W}_{\substack{\text{Endowments effect} \\ \text{Explained component}}} \\
 &+ \underbrace{E(\mathbf{Z}_W)'(\boldsymbol{\gamma}_M - \boldsymbol{\gamma}_W)}_{\text{Coefficients effect}} + \underbrace{\{E(\mathbf{Z}_M) - E(\mathbf{Z}_W)\}'(\boldsymbol{\gamma}_M - \boldsymbol{\gamma}_W)}_{\text{Interaction effect}} \\
 &\hspace{10em} \underbrace{\hspace{10em}}_{\text{Unexplained component}}
 \end{aligned}$$

$D$  : Difference in the predicted hourly earnings by sex

$\mathbf{Y}$  : Hourly earnings

$\mathbf{Z}$  : Vector of endowments

$\boldsymbol{\gamma}$  : Vector of coefficients (including the intercept)

It can be interpreted as the difference between two OB decompositions at different time points, using panel data. Stata command *xtoaxaca* (Kröger & Hartmann, 2021)

$$\Delta Y = \Delta Y_t - \Delta Y_s$$

$$\begin{aligned}
 &= (E(Y_t^A) - E(Y_t^B)) - (E(Y_s^A) - E(Y_s^B)) \\
 &= E(Y_t^A) - E(Y_t^B) - E(Y_s^A) + E(Y_s^B) \\
 &= E(Y_t^A) - E(Y_s^A) - E(Y_t^B) + E(Y_s^B) \\
 &= E(Y_t^A) - E(Y_s^A) - (E(Y_t^B) - E(Y_s^B))
 \end{aligned}$$

$$= \Delta Y^A - \Delta Y^B$$

$\Delta Y$  : Observed change in the difference in gender earnings during a period of time (2020q1-2021q2)

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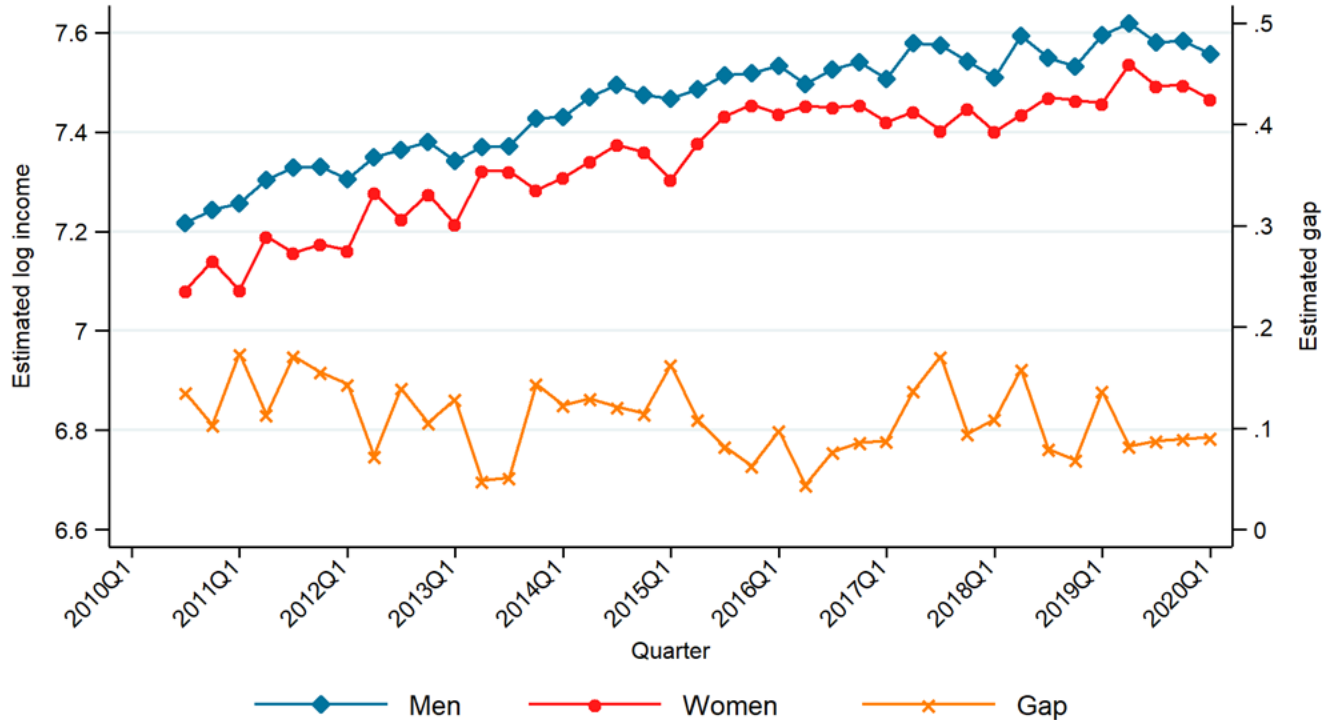
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# Results

# OB Decomposition Results Over the Last Decade



Variables	Differential
Estimated gap	0.105*** (0.0138)
Prediction for men	7.461*** (0.00337)
Prediction for women	7.356*** (0.0134)

# Gender Labor Earnings Gap and the Covid-19 Pandemic



## Oaxaca-Blinder Decomposition Results from Panel Data

Outcome	Levels (a)						Change (b)					
	2020Q1	2020Q2	2020Q3	2020Q4	2021Q1	2021Q2	2020Q1	2020Q2	2020Q3	2020Q4	2021Q1	2021Q2
Observed	-0.030*	-0.189***	-0.122***	-0.082*	-0.015	-0.012	0.000	-0.160***	-0.092*	-0.052	0.014	0.017
	(0.012)	(0.033)	(0.036)	(0.038)	(0.039)	(0.026)	(.)	(0.029)	(0.036)	(0.040)	(0.039)	(0.027)
Decomposition												
Endowments	-0.097***	-0.141***	-0.151***	-0.140***	-0.103***	-0.085***	0.000	-0.027**	-0.027**	-0.028**	-0.011	-0.008
	(0.011)	(0.014)	(0.020)	(0.020)	(0.013)	(0.011)	(.)	(0.009)	(0.009)	(0.009)	(0.007)	(0.006)
Coefficients	0.104***	0.049*	0.084***	0.108***	0.091***	0.112***	0.000	-0.050**	0.013	0.029	0.003	0.019
	(0.018)	(0.022)	(0.025)	(0.026)	(0.017)	(0.024)	(.)	(0.019)	(0.026)	(0.024)	(0.029)	(0.025)
Interactions	0.008	0.022	0.051**	0.033	0.018	0.000	0.000	-0.006	-0.017*	-0.013	0.001	0.002
	(0.009)	(0.015)	(0.016)	(0.019)	(0.015)	(0.015)	(.)	(0.010)	(0.008)	(0.007)	(0.005)	(0.005)
FE	-0.051**	-0.184***	-0.175***	-0.171***	-0.031	-0.019	0.000	-0.133***	-0.124***	-0.120***	0.021	0.032
	(0.016)	(0.020)	(0.020)	(0.020)	(0.018)	(0.024)	(.)	(0.009)	(0.019)	(0.020)	(0.018)	(0.028)
Total	-0.037***	-0.253***	-0.192***	-0.169***	-0.024	0.008	0.000	-0.216***	-0.155***	-0.132***	0.013	0.045***
	(0.007)	(0.026)	(0.027)	(0.026)	(0.030)	(0.017)	(.)	(0.027)	(0.027)	(0.025)	(0.029)	(0.014)
Obs.	32,151						32,151					
ids.	12,538						12,538					

Notes. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Robust standard errors in parentheses. Additional results of OB decomposition for panel data can be provided by the authors.



# Gender Labor Earnings Gap and the Covid-19 Pandemic



## Sample Robustness Check: Subsamples Estimations

Outcome	Youth (aged from 15 to 34)			Not youth (aged over 35)		
	2020Q1	2020Q2	2020Q3	2020Q1	2020Q2	2020Q3
Observed	-0.061**	-0.171***	-0.106*	-0.013	-0.198***	-0.128**
FE	-0.015	-0.147	-0.083	-0.070*	-0.205***	-0.219***

Outcome	Living in an urban area			Living in a rural area		
	2020Q1	2020Q2	2020Q3	2020Q1	2020Q2	2020Q3
Observed	0.016	-0.156***	-0.074***	-0.050	-0.178***	-0.130*
FE	-0.050	-0.202***	-0.149***	-0.046	-0.156***	-0.200***

Outcome	Cohabiting			Does not Cohabiting		
	2020Q1	2020Q2	2020Q3	2020Q1	2020Q2	2020Q3
Observed	-0.027	-0.247***	-0.170***	-0.075**	-0.170***	-0.122**
FE	-0.026	-0.276***	-0.219***	-0.112*	-0.134***	-0.183***

Notes. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Additional results of OB decomposition for panel data can be provided by the authors.

## Specification Robustness Check: Conventional OB Estimation

Outcome	2020Q1	2020Q2	2020Q3	2020Q4	2021Q1	2021Q2
	Observed	-0.0277 (0.0186)	-0.188*** (0.0264)	-0.118*** (0.0244)	-0.0885*** (0.0225)	-0.0237 (0.0206)
Decomposition						
Endowments	-0.0933*** (0.0153)	-0.237*** (0.0227)	-0.218*** (0.0215)	-0.189*** (0.0201)	-0.110*** (0.0180)	-0.122*** (0.0180)
Coefficients	0.0727*** (0.0150)	0.0484** (0.0204)	0.0606*** (0.0188)	0.0789*** (0.0175)	0.0773*** (0.0165)	0.105*** (0.0162)
Interactions	-0.00707 (0.0104)	7.50e-05 (0.0153)	0.0395*** (0.0145)	0.0221 (0.0141)	0.00873 (0.0130)	0.000645 (0.0123)
Observations	7,877	5,013	5,660	6,474	6,957	6,860

Notes. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Robust standard errors in parentheses. Additional results of OB decomposition for panel data can be provided by the authors.

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# Final Remarks

# Conclusion and Discussion

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- Over the last decade, the estimated gender earnings gap in Costa Rica has shown a regular pattern in favor of men
  - The higher rewarded women obtained from their endowments did not compensate their lesser endowments' leveraging
  - Main determinants that favor women's relative earnings were schooling, institutional sector, and whether they had full-time jobs
  - For men, the constant term was the most influential determinant of their relative higher earnings, which is associated with higher unobserved productivity or discrimination against women (Blau & Lawrence M, 2017)
- The Covid-19 pandemic significantly affects the levels and changes of the gender earnings gap in two out of six quarters post- pandemic in favor of women (the two immediate quarters after the pandemic started)
  - We regard the explanation behind these results might be that: when the Covid-19 pandemic started, job losses were sharper in the private sector and industries in which there were more men than women and also were those in which men earned relatively higher than women
  - However, this relative advantage in women earnings were diminishing the following quarters, because men pace of hiring (measured by job creation and the number of working hours) was faster than the one for women in jobs where men earned higher

# Conclusion and Discussion

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- Our results on the expected effect of the Covid-19 to the gender earnings gap are consistent with those obtained by previous literature: Deshpande (2020) for India and Doorley et al. (2021) for Ireland
- As a complementary result (not the main objective of our paper), overall, we found that the impact the of Covid-19 on women's labor market was greater than men (as the section 2 of the paper showed). Thus, our results should not be interpreted as a lesser effect of the Covid-19 pandemic on the overall women's labor market conditions and only as it effect on the difference in earnings gap between men and women working over the period analyzed

# Policy Implications

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- We provide empirical evidence about the main determinants of the gender labor earnings gap, which may be useful to guide the public policy seeking on diminishing the differences in gender earnings gap
  - For example, being the schooling the most influential determinant of the reduction of the gender earnings gap and the qualification of the occupation another significant determinant, educational programs focus on increasing women human capital in occupations with higher levels of qualification would contribute to reducing the gender labor earnings gap
- On the context of the Covid-19 pandemic, policy makers and stakeholders should use this empirical evidence to identify the more profitable human capital- and job-related- determinants to increase people's labor earnings



**António Guterres** ✓

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The gender pay gap is rooted in systemic inequalities.

Equal pay is essential not only for women, but to build a world of dignity and justice for all. [#EqualPayDay](#)

# EQUAL PAY FOR WOMEN

*and nothing less.*

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