

# AGRO PRODUCTIVIDAD

The association between  
**MITES**  
and the *Agave* L. snout  
weevil, more than phoresis

pág. 133

Año 16 • Volumen 16 • Número 9 • septiembre, 2023

- |  |    |
|--|----|
| Evaluation of the use of glyphosate and legumes in valencia orange ( <i>Citrus sinensis</i> L. Osbeck), in the north of Veracruz: case study | 3  |
| Income variability and agricultural policy   | 13 |
| Preliminary study on the reproductive phenology of <i>Eucalyptus urophylla</i> in Huimanguillo, Tabasco (Mexico)                             | 19 |
| Dynamics and structure of research in swine health in Mexico: A methodological approach  | 27 |
| Methods for the control of whitefly (Aleyrodidae) in citrus: a systematic review   | 37 |
| Agricultural drought in the context of climate change: a bibliometric analysis   | 47 |

y más artículos de interés...




Colegio de  
Postgraduados

# CONTENIDO


Año 16 • Volumen 16 • Número 9 • septiembre, 2023


3	Evaluation of the use of glyphosate and legumes in valencia orange ( <i>Citrus sinensis</i> L. Osbeck), in the north of Veracruz: case study
13	Income variability and agricultural policy
19	Preliminary study on the reproductive phenology of <i>Eucalyptus urophylla</i> in Huimanguillo, Tabasco (Mexico)
27	Dynamics and structure of research in swine health in Mexico: A methodological approach
37	Methods for the control of whitefly (Aleyrodidae) in citrus: a systematic review
47	Agricultural drought in the context of climate change: a bibliometric analysis
57	Determination of production costs of vanilla ( <i>Vanilla planifolia</i> Jacks ex Andrews) in Huehuetla, Puebla, Mexico
65	Effect of agronomic characteristics of hybrid and Creole corn using native plant growth-promoting bacteria to reduce the production cost
77	Agronomy and chemical composition of sunflower ( <i>Helianthus annuus</i> L.) as a forage option in a warm-humid intertropical environment
87	Approximation to the social structure of swine health and production research in Colombia
97	Traditional knowledge and actions of the Pisel Nek-mej ( <i>Scaptotrigona mexicana</i> ) stingless bee honey production in Cuetzalan, Puebla
107	Silkworm ( <i>Bombyx mori</i> L.) fed with mulberry ( <i>Morus alba</i> L.) leaves and cow's milk
113	Phenols as an alternative, neuroprotective, and preventive strategy for Alzheimer's disease: (mini-review and bibliometric analysis)
133	The association between mites and the <i>Agave</i> L. snout weevil, more than phoresis
139	Women in the labor market and economic growth in Mexico
149	Yield evaluation of broiler carcasses from a poultry processing plant with automated processing conditions in the Colombian Eastern Plains
157	Emergence and growth of huacle chili seedlings ( <i>Capsicum annuum</i> L.) with the use of biological formulations in commercial plot soil
165	Good aquaculture production practices and detection of pathogens in rainbow trout alevins
173	Surface water balance at the Chapingo River basin: rainfall intercepted by vegetation and water infiltration into the soil


## Comité Científico


Dr. Giuseppe Colla  
University of Tuscia, Italia  
 0000-0002-3399-3622


Dra. Magaly Sánchez de Chial  
Universidad de Panamá, Panamá  
 0000-0002-6393-9299

Dra. Maritza Escalona  
Universidad de Ciego de Ávila, Cuba  
 0000-0002-8755-6356

Dr. Kazuo Watanabe  
Universidad de Tsukuba, Japón  
 0000-0003-4350-0139

Dra. Ryoko Machida Hirano  
Organización Nacional de Investigación en Agricultura y Alimentación (NARO-Japón)  
 0000-0002-7978-0235

Dr. Ignacio de los Ríos Carmenado  
Universidad Politécnica de Madrid, España  
 0000-0003-2015-8983

Dra. María de Lourdes Arévalo Galarza  
Colegio de Postgraduados, México  
 0000-0003-1474-2300

## Comité Editorial

Dr. Jorge Cadena Iñiguez - Editor en Jefe  
Dra. Luccro del Mar Ruiz Posadas - Directora adjunta  
Dr. Rafael Rodríguez Montessoro<sup>†</sup> - Director Fundador  
Lic. BLS. Moisés Quintana Arévalo - Cosechador de metadatos  
M.A. Ana Luisa Mejía Sandoval - Asistente  
Téc. Mario Alejandro Rojas Sánchez - Diseñador  
M.C. Valeria Abigail Martínez Sias - Diagramador



**AGRICULTURA**  
SECRETARÍA DE AGRICULTURA Y DESARROLLO RURAL

**AGRO PRODUCTIVIDAD**



**Colegio de Postgraduados**

Bases de datos de contenido científico

ZOOLOGICAL RECORD<sup>®</sup>



Directorios



Año 16, Volumen 16, Número 9, septiembre 2023, Agro productividad es una publicación mensual editada por el Colegio de Postgraduados. Carretera México-Texcoco Km. 36.5, Montecillo, Texcoco, Estado de México. CP 56264. Tel. 5959284427. www.colpos.mx. Editor responsable: Dr. Jorge Cadena Iñiguez. Reservas de Derechos al Uso Exclusivo No. 04-2017-031313492200-203. ISSN: 2594-0252, ambos otorgados por el Instituto Nacional del Derecho de Autor. Responsable de la última actualización de este número, M.C. Valeria Abigail Martínez Sias. Fecha de última modificación, 13 de noviembre de 2023.

### Contacto principal

Jorge Cadena Iñiguez  
Guerrero 9, esquina avenida Hidalgo,  
C.P. 56220, San Luis Huexotla, Texcoco,  
Estado de México.  
✉ agroproductividadeditor@gmail.com

### Contacto de soporte

Soporte  
5959284703  
✉ agroproductividadesoporte@gmail.com

Es responsabilidad del autor el uso de las ilustraciones, el material gráfico y el contenido creado para esta publicación.

Las opiniones expresadas en este documento son de exclusiva responsabilidad de los autores, y no reflejan necesariamente los puntos de vista del Colegio de Postgraduados, de la Editorial del Colegio de Postgraduados y del editor de la publicación.

## Directrices para Autores/as


**Naturaleza de los trabajos:** Las contribuciones que se reciban para su eventual publicación deben ser resultados originales derivados de un trabajo académico de alto nivel sobre los tópicos presentados en la sección de temática y alcance de la revista.

**Extensión y formato:** Los artículos deberán estar escritos en procesador de textos, con una extensión de 15 cuartillas, tamaño carta con márgenes de 2.5 centímetros, Arial de 12 puntos, interlineado doble, sin espacio entre párrafos. Las páginas deberán estar foliadas desde la primera hasta la última en el margen inferior derecho. La extensión total incluye abordaje textual, bibliografía, gráficas, figuras, imágenes y todo material adicional. Debe evitarse el uso de sangría al inicio de los párrafos. Las secciones principales del artículo deberán escribirse en mayúsculas, negritas y alineadas a la izquierda. Los subtítulos de las secciones se escribirán con mayúsculas sólo la primera letra, negritas y alineadas a la izquierda.

**Exclusividad:** Los trabajos enviados a Agro Productividad deberán ser inéditos y sus autores se comprometen a no someterlos simultáneamente a la consideración de otras publicaciones; por lo que es necesario adjuntar este documento: Carta de originalidad.

**Frecuencia de publicación:** Cuando un autor ha publicado en la revista como autor principal o de correspondencia, deberá esperar tres números de ésta para publicar nuevamente como autor principal o de correspondencia.

**Idiomas de publicación:** Se recibirán textos en inglés con títulos, resúmenes y palabras clave en inglés.

**ID Autores:** El nombre de los autores se escribirán comenzando con el apellido o apellidos unidos por guion, sólo las iniciales del nombre, separados por comas, con un índice progresivo en su caso. Es indispensable que todos y cada uno de los autores proporcionen su número de identificador normalizado  ORCID, para mayor información ingresar a (<https://orcid.org>).

**Institución de adscripción:** Es indispensable señalar la institución de adscripción y país de todos y cada uno de los autores, indicando exclusivamente la institución de primer nivel, sin recurrir al uso de siglas o acrónimos. Se sugiere recurrir al uso de la herramienta wayta (<http://wayta.scielo.org/>) de Scielo para evitar el uso incorrecto de nombres de instituciones.



# Women in the labor market and economic growth in Mexico

Figuroa-Hernández E.<sup>1\*</sup>; Pérez-Soto, F.<sup>2</sup>; Pérez-Figueroa, R. A.<sup>3</sup>

<sup>1</sup> Universidad Autónoma del Estado de México Centro Universitario UAEM Texcoco, Av. Jardín Zumpango S/N Fracc. El Tejocote, Texcoco Estado de México. C.P. 56259.

<sup>2</sup> Universidad Autónoma Chapingo. División de Ciencias Económico-Administrativas (DICEA), Km. 38.5 Carretera México- Texcoco. C.P. 56230. E-mail: perezsotofco@gmail.com

<sup>3</sup> Universidad de Bristol, Escuela de Ciencias en Geografía, Reino Unido.

\* Correspondence: esther.f.her@gmail.com, efigueroah@uaemex.mx

## ABSTRACT

**Objective:** the objective of this study was to analyze the participation of women in the labor market and the effect on economic growth in Mexico, 2000-2021.

**Design/Methodology/Approach:** three multiple linear regression models were developed using the Ordinary Least Squares method.

**Results:** the most statistically significant variables were the exchange rate, wage and the employed female population. The most significant elasticities were found at an increase of 10.0% of the employed female population, the GDP would increase by 7.83%. For the model where only the employed female population was analyzed, at an increase of 10% in it, the GDP would increase by 10.01%.

**Study limitations/Implications:** the main limitation was that the information is not available from a single source and the figures vary depending on the official institution.

**Findings/Conclusions:** based on the results obtained, it is concluded that the participation of women in the labor market does increase economic growth.

**Keywords:** women, employment, labor market, general minimum wage, economic growth.

**Citation:** Figuroa-Hernández, E., Pérez-Soto, F., & Pérez-Figueroa, R. A. (2023). Women in the labor market and economic growth in Mexico. *Agro Productividad*. <https://doi.org/10.32854/agrop.v16i9.2539>

**Academic Editors:** Jorge Cadena Iñiguez and Lucero del Mar Ruiz Posadas

**Received:** March 21, 2023.

**Accepted:** September 18, 2023.

**Published on-line:** November 13, 2023.

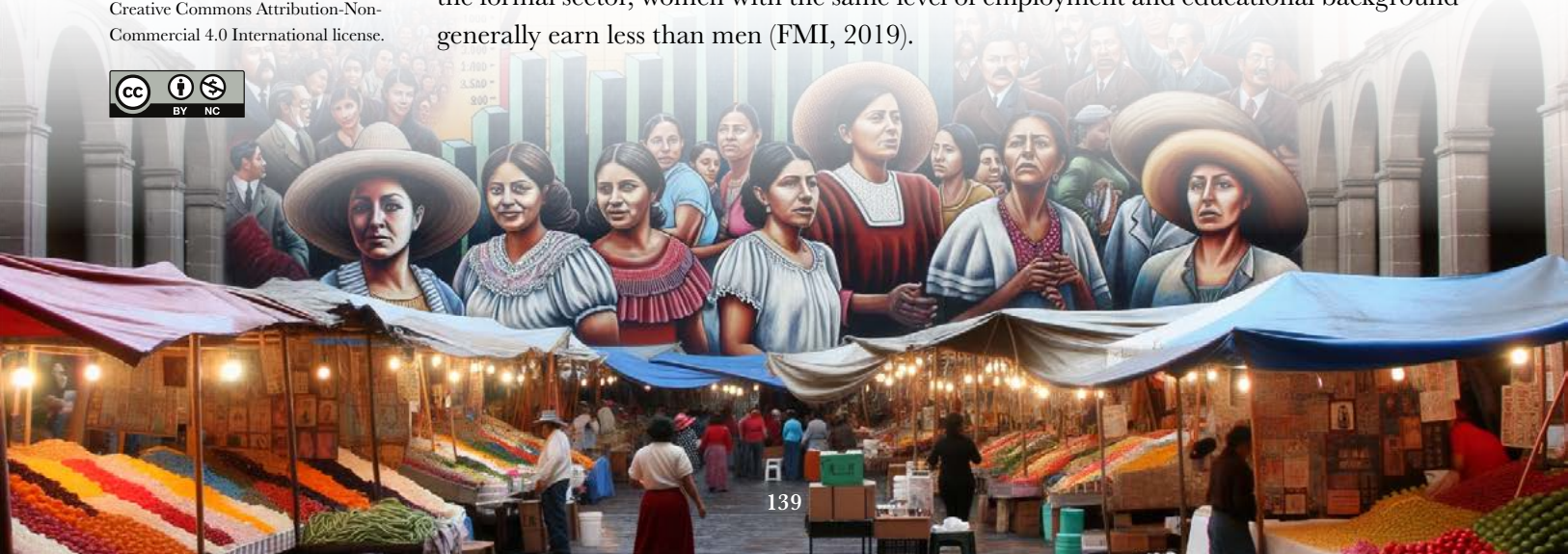
*Agro Productividad*, 16(9). September. 2023. pp: 139-147.

This work is licensed under a Creative Commons Attribution-Non-Commercial 4.0 International license.



## INTRODUCTION

Women account for almost half of the world's working-age population. Of about 5 billion women, only 50% of them participate in the labor force, compared to 80% of men. Not only is labor participation lower, with paid work, but women are also overemployed in the informal sector. Especially in developing economies, where employers are under fewer regulations and workers are more vulnerable to low wages and job loss. Moreover, even in the formal sector, women with the same level of employment and educational background generally earn less than men (FMI, 2019).



Loss derived from the lack of economic female participation is estimated at 10.0% of GDP in advanced economies; at more than 30.0% in South Asia, the Middle East, and North Africa. This is because women and men may have the same potential, but bring distinct and economically valuable skills and ideas (Ostry *et al.*, 2018). Gender differences may reflect social norms and their impact on education, social interactions, risk attitude, and reaction to incentives. Therefore, gender diversity in the boards of banking supervisory agencies is also associated with greater financial stability (Sahay and Čihák, 2018 cited in FMI, 2019).

Women's participation in economic activity is essential for the economic growth of any country. For this, opportunities must be generated to ensure female insertion into the labor market with well-paid and quality jobs for the development of the country. Especially for those who were affected by the impact of the CovID pandemic who not only have lost their jobs, but also have had to dedicate themselves to the care of children or family even more. Women are overrepresented in some of the occupations most affected by the health crisis, such as small retail, tourism, and hosting, while men are more present in construction or manufacturing of goods according to World Bank (Banco Mundial, 2021).

Women's labour force participation globally has been declining from 51.22% in 1990, 47.76% in 2019, to 45.92% during the 2019-2020 pandemic. Women represent just over half of the world's population but their participation in economic activity valued at growth and well-being is below their potential, which has considerable macroeconomic effects. Despite progress in recent decades, global labour markets remain separated by gender and appear to be stuck towards equality.

Female labour force participation (PFFL) has remained below that of men; women perform most unpaid jobs, and when they have paid employment there face wage gaps; or are overrepresented in the informal sector and among the poor. In many countries, distortions and discrimination in the labour market restrict women's options for remunerative employment, and recruitment into senior positions and employers is low (Elborgh-Woytek *et al.*, 2013).

In the Latin American rural context, the Chilean labor market is characterized by the low insertion of women in paid activities (Caro, 2011; Contreras, Hurtado and Sara, 2012; Chong, Herrera, Chávez and Sánchez, 2015; National Institute of Statistics [INE], 2015; Valdés and Rebolledo, 2015; Tomaselli, 2017). Compared to cities, rural areas offer fewer stable jobs and less diversified and low-dynamic economic activity. All this added to lower educational level, cultural restrictions, and attitudinal profiles unfavorable to extra-domestic work that discourages female employability (Alario, Baraja and Pascual, 2008; Ballara and Parada, 2009; Economic Commission for Latin America and the Caribbean–ECLAC, 2010; National Women's Service– Sernam, 2010).

In addition, the discrimination and gender gap observed in the countryside define more precarious and lower-wage jobs for women, with the tendency of the employer to privilege male hiring because its workforce is less onerous (Abramo, 2004; Kay, 2009; Gisa and Rodríguez, 2009; Aninat, González and Szederkenyi, 2017: cited in Rodríguez Garcés; Padilla Fuentes; and Valenzuela Orrego, 2019).

Currently, Mexico has the highest level of informal employment among the most important economies in Latin America with 60.0% according to the OECD, which translates into a population with low wages and poor social security coverage, non-compliance with labor rights and no taxes. According to INEGI, informal employment impacts almost 30 million people working in the informal sector. Mexico is one of the countries with the lowest tax collection, according to the OECD, only 30% of what should be captured is collected. The sale of products through e-commerce supported by Mexican women adds more than 9 million pesos per day to the country's economy, according to a study by Martínez Cortés (2021), who states that the monthly contribution of this social stratum to the economy exceeds 285 million pesos. As long as the initiatives support the participation of women in the country's economic activity, the effects of the pandemic can be restored and a more favorable and inclusive Mexico can be ensured, according to World Bank economists (Forbes Women, 2021).

In 2018, 78% of men and 44% of women participated in economic activities. Despite the increase in women's participation in paid work in recent decades, it remains well below male participation due to many factors such as discrimination in recruitment, remuneration, mobility and promotion practices. As other inflexible working conditions, the inadequacy of services such as childcare, as well as the inadequate distribution of family tasks at home, among others. The participation rate of women and men in unpaid domestic work was 96.1 and 65.4%, respectively (2018). The average income per hour worked was 37.7 pesos for men and 38 for women; while the average hours of paid work per week by men was 45.8 and by women 37.9 hours. Within the EAP portion not employed or unemployed 3.4% corresponded to male population and 3.3% to female population.

As a result of the economic participation of men and women, in the elderly population (60 years and older) the retirement rate of the population was 27.3% of men and 11.5% of women (INMUJERES, 2022). After a gradual growth of several years, Mexico's gross domestic product (GDP) began to decline at the end of 2019 and then suffered the worst drop in the last decade during the second quarter of 2020 due to the health crisis caused by the COVID-19 pandemic. From April to June 2020, the total of goods and services produced in Mexico reached 15.11 trillion Mexican pesos, which represented a decrease of 18.6% compared to the value recorded in the same quarter of the previous year (INEGI, 2022).

In 2017, Mexico's average inflation rate registered its highest point in the last five years, standing above 6.0%. The inflation rate is expected to reach 6.8% in 2022, it is estimated that from 2023 it will continue around 3.0%. The new consumption habits in the first weeks of the confinement to prevent the spread of SARS-Cov-2, the pandemic motivated consumers to make more purchases online, mainly to not leave homes and avoid crowds. Products that were only purchased in physical stores, such as food and medicines, began to be requested online. According to respondents, they said they were interested in doing more online activities after the COVID-19 outbreak in Mexico (Statista, 2022a).

Based on the above, the objective of this study was to analyze the participation of women in the labor market and the effect on economic growth in Mexico during 2000-2021.

## MATERIALS AND METHODS

This study consulted different sources such as the World Bank (WB), International Monetary Fund (IMF), the Economic Commission for Latin America and the Caribbean (ECLAC), Center for the Implementation of Public Policies for Equity and Growth (CIPPEC), Center for Macroeconomic Analysis (CAMACRO), Mexico's National Institute of Statistics and Geography (INEGI), Bank of Mexico (BM or Banxico), Statista Research Department (Statista), among others. From where quarterly data were obtained on the Gross Domestic Product, the inflation rate, the exchange rate, the general minimum wage, the employed population of women and men during 2000-2021 for each of the variables. Based on the theoretical elements, three multiple linear regression models were developed. To estimate the coefficients or parameters of each of the explanatory variables, the Statistical Analysis System (SAS) was used, using the Ordinary Least Squares (OLS) method, functions were expressed as follows:

$$PIB_t = \alpha_0 + \alpha_1 INF_t + \alpha_2 E_t + \alpha_3 W_t + \alpha_4 PocupH_t + \alpha_5 PocupM_t + \alpha_6 PdesocupM_t + \varepsilon_t \quad (1)$$

$$PIB_t = \beta_0 + \beta_1 INF_t + \beta_2 E_t + \beta_3 W_t + \beta_4 PocupM_t + \alpha_5 PdesocupM_t + \varepsilon_t \quad (2)$$

$$PIB_t = \gamma_0 + \gamma_1 INF_t + \gamma_2 E_t + \gamma_3 W_t + \gamma_4 PocupM_t + \varepsilon_t \quad (3)$$

where: coefficients to be estimated,  $\alpha_0, \alpha_1, \alpha_2, \dots, \alpha_n; \beta_1, \beta_2, \dots, \beta_n; \gamma_1, \gamma_2, \dots, \gamma_n$ ;  $\varepsilon_t$ =error.  $PIB_t$ =Gross Domestic Product of Mexico (Millions of pesos at 2013 prices);  $INF_t$ =Inflation rate (%);  $E_t$ =exchange rate (MXN to USD);  $W_t$ =real general minimum wage (MXN pesos in July 2018);  $PocupH_t$ =the employed population of men (million people), quarterly;  $PocupM_t$ =Employed population of women (million people), quarterly;  $PdesocupM_t$ =unemployed population of women (millions of people). The main limitation was that the information is not available from a single source and the figures vary depending on the official institution.

## RESULTS AND DISCUSSION

In this section, the statistical results were analyzed based on the parameters of the equations obtained; subsequently, the economic results according to the coefficients and their relationship with the estimators of economic theory. Finally, the elasticities were interpreted.

The statistical analysis was based on the coefficient of determination ( $R^2$ ), the value of the calculated F ( $F_c$ ), the mean square of the error, the value of the partial t's for each of the estimators, from the analysis of variance. To test the statistical significance of each of the fitted regression equations, the following set of hypotheses was considered,  $H_0: \beta_1 = \beta_2 = \dots = \beta_n = 0$  against  $H_a: i \neq 0$  for  $i \geq 1$ .

The results of the analysis of variance (Table 1) indicated that according to the statistical data that were collected, the value of the global test for equation 1 of the Gross Domestic Product ( $GDP_t$ ), the null hypothesis ( $H_0$ ) was rejected. The results of the analysis of variance (Equation 2), indicated that the value of the global test for the GDP equation, with a

**Table 1.** Analysis of variance of the structural model of GDP<sub>t</sub>.

Dependent variable	Independent variables					
<b>Equation 1</b>						
<i>PIB<sub>t</sub></i>	<i>INF<sub>t</sub></i>	<i>E<sub>t</sub></i>	<i>W<sub>t</sub></i>	<i>PocupH<sub>t</sub></i>	<i>PocupM<sub>t</sub></i>	<i>PdesocupM</i>
Coefficient	12898	44605	-28591	0.24249	0.69842	-1.81233
t <sub>c</sub>	0.46	1.51	-7.37	2.82	7.90	-6.56
Pr> t	0.6474	0.1345	<.0001	0.0061	<.0001	<.0001
R <sup>2</sup> =0.9750 F-value=514.09	Pr>F<.0001					
<b>Equation 2</b>						
Dependent variable	Independent variables					
<i>PIB<sub>t</sub></i>	<i>INF<sub>t</sub></i>	<i>E<sub>t</sub></i>	<i>W<sub>t</sub></i>	<i>PocupM<sub>t</sub></i>	<i>PdesocupM<sub>t</sub></i>	
Coefficient	26009	81559	-29746	0.90645	-2.06183	
t <sub>c</sub>	0.90	2.96	-7.40	17.85	-7.56	
Pr> t	0.3705	0.0040	<.0001	<.0001	<.0001	
R <sup>2</sup> =0.9725 F-value=566.21	Prob>F<.0001					
<b>Equación 3</b>						
Dependent variable	Independent variables					
<i>PIB<sub>t</sub></i>	<i>INF<sub>t</sub></i>	<i>E<sub>t</sub></i>	<i>W<sub>t</sub></i>	<i>PocupM<sub>t</sub></i>		
Coefficient	61087	167912	-25136	0.63277		
t <sub>c</sub>	1.65	5.15	-4.86	13.65		
Pr> t	0.1035	<.0001	<.0001	<.0001		
R <sup>2</sup> =0.9529 F-value=409.43	Prob>F<.0001					

Source: elaborated by the authors, with the output of the statistics (SAS) results.

probability of 0.0001, so the null hypothesis (H<sub>0</sub>) was rejected, which revealed that at least one of the parameters estimated by the least squares regression is non-zero. For equation 3, the overall test of Gross Domestic Product (GDP<sub>t</sub>) was significant and the null hypothesis was rejected.

The coefficient of determination (R<sup>2</sup>) for model 1 indicated that the variable Gross Domestic Product of Mexico was explained in 97.5% by the variables included in the equation. Regarding the individual test, the real general minimum wage, the employed and unemployed population of women turned out to be more significant with a value of t of -7.37, 7.9 and -6.56 > 1; the least significant according to the statistical results were the employed population of men and the exchange rate whose value of t was 2.82 > 1 and 1.51 > 1 respectively. The only one that was not significant was the inflation rate (0.46 < 1).

For equation 2, the coefficient of determination (R<sup>2</sup>) for Mexico's Gross Domestic Product was explained by 97.2% by the variables included in the equation. Regarding the individual test, the real general minimum wage, the employed and unemployed population of women turned out to be more significant with a value of t of -7.40, 17.85 and -7.56 > 1;



the least significant according to the statistical results was the exchange rate whose value of  $t$  was  $2.96 > 1$ . The only one that was not significant was the inflation rate ( $0.90 < 1$ ).

Model 3, which had a coefficient of determination ( $R^2$ ) for Mexico's Gross Domestic Product was explained by 95.2% by the variables included in the equation. For the individual test, the employed population of women, the exchange rate, and the real general minimum wage turned out to be more significant with a value of  $t$  of 13.65, 5.15, and  $-4.86 > 1$ , the least significant was the inflation rate whose value of  $t$  was  $1.65 > 1$ .

In the three linear models, the inflation rate presented a positive relationship with the Gross Domestic Product and was not statistically significant ( $0.46 < 1$ ,  $0.90 < 1$ , and  $1.65 > 1$ ), the average inflation rate for the period 2000-2021 was 4.6%, which agrees with the study carried out by Sarel (1996) who found that for inflation levels above 8.0%, the relationship between economic growth and inflation was negative and statistically significant. Whereas for countries with inflations below 8.0%, the relationship between these two variables is practically nonexistent, and in some cases it is even positive, although not statistically significant.

This section presents the economic analysis of the estimated coefficients, according to economic theory:

$$\widehat{PIB}_t = -75959 + 12898INF_t + 44605E_t - 28591W_t + 0.24249PocupH_t + 0.69842PocupM_t - 1.81233PdesocupM_t + \varepsilon_t \quad (4)$$

$$\widehat{PIB}_t = 2441413 + 26009INF_t + 81559E_t - 2974W_t + 0.90645PocupM_t - 2.06183PdesocupM_5 + \varepsilon_t \quad (5)$$

$$\widehat{PIB}_t = 3994212 + 61087INF_t + 167912E_t - 25136W_t + 0.63277PocupM_t + \varepsilon_t \quad (6)$$

In the estimated equations of the Gross Domestic Product (4, 5 and 6), the variables minimum wage, exchange rate, employed population of men, women, and unemployed women met the sign. That is, increasing employment will result in an increase in GDP according to economic theory. However, the inflation rate showed the opposite sign to that expected. According to the Bank of Mexico (Banco de México, 2016), inflation can lead to redistributive effects that increase inequality and impede economic development. It also produces an inefficient allocation of productive resources thus damaging the economy's capacity for growth. In addition, inflation limits the planning horizons of economic agents, negatively affecting their investment and savings decisions. For all the above, there is an inverse relationship between the inflation rate and economic growth.

For the analysis of the elasticities, the estimated parameters of the structural shape of the model were considered for each of the variables studied.

**Table 2.** Model elasticities in their structural form.

<b>Equation 1</b>		
$\varepsilon_{INF}^{PIB} = 0.003786618$	$\varepsilon_E^{PIB} = 0.03972681$	$\varepsilon_W^{PIB} = -0.15247176$
$\varepsilon_{PocupH}^{PIB} = 0.45838199$	$\varepsilon_{PocupM}^{PIB} = 0.78375703$	$\varepsilon_{PdesocupM}^{PIB} = -0.08439326$
<b>Equation 2</b>		
$\varepsilon_{INF}^{PIB} = 0.00763577$	$\varepsilon_E^{PIB} = 0.07263937$	$\varepsilon_W^{PIB} = -0.15863122$
$\varepsilon_{PocupM}^{PIB} = 1.01720535$	$\varepsilon_{PdesocupM}^{PIB} = -0.09601151$	
<b>Equation 3</b>		
$\varepsilon_{INF}^{PIB} = 0.01793403$	$\varepsilon_E^{PIB} = 0.14954845$	$\varepsilon_W^{PIB} = -0.13404674$
$\varepsilon_{PocupM}^{PIB} = 0.71008553$		

Source: elaborated by the authors, with the output of the statistics (SAS).

## RESULTS AND DISCUSSION

The short-term elasticities, obtained from the estimators of the model in their structural form, are shown in Table 2, particularly those most relevant for the analysis. In Model 1, faced with an increase of 10.0% of the employed population of women and men, the economy would grow by 7.83%, and 4.58% on average respectively. On the other hand, with an increase of 10.0% of the unemployed population of women and the minimum wage GDP would decrease by 0.84% and 1.5% on average respectively. For equation 2, by using only employed women, GDP would increase by 10.17% and with unemployed women, it will decrease by 0.96% on average, *ceteris paribus*.

In the case of equation 3, when the unemployed population of women is eliminated to test their importance in economic growth, it was obtained that with an increase of 10.0% of the employed population of women, the economy would grow by 7.1%. For the minimum wage if it were increased by 10.0%, GDP would decrease by 1.34%, keeping the other factors constant, which agrees with what was reported by Corvera-Vergara (2021) where they considered the importance of employment as a fundamental part of all production processes of goods and services.

A study conducted in Chile by CLAPES UC (on the increase in female labor participation, estimating the effect on GDP; Rodrigo Cerda, González and Larraín, 2020), in which among other authors the current Minister of Finance participated, sought to answer what would happen in the economy of that country if female labor participation increased. To estimate the effect on GDP, it was calculated how closing the gap with the OECD would impact total employment; the share of employment in GDP is determined through a Cobb Douglas production function like the one used for the calculation of trend GDP).

With figures for 2019 (pre-pandemic) it was obtained that each point of increase in female labor participation represented the creation of 79 thousand jobs, so that closing

the gap with the OECD would imply creating between 307 thousand and 558 thousand jobs depending on the definition used. In 2019, depending on how the participation rate is defined, this gap was between 3.9 and 7.1%. If women between 15 and 64 years old are considered, the gap is 7.1%, while those between 15 and more reaches 3.9%. On the other hand, each point of increase in participation signifies an increase in GDP of 0.5%, so closing the gap with the OECD would imply an increase in GDP ranging from 1.8 to 3.2%, depending on the definition. This study also calculates that considering the recovery of the fall in female labor participation to pre-pandemic levels plus the increase in participation to the OECD levels that were in force before the crisis, the total effect would be an increase in GDP ranging from 8.3 to 9.7%.

The estimates obtained suggest that expanding economic opportunities through an employment-focused growth would create an enabling macroeconomic environment for women's empowerment, without men and women competing with each other for forms of decent work (Robino and Tebaldi, 2018). Female labor force participation is important for different reasons. First at the macroeconomic level, low levels of collaboration in paid work and entrepreneurship represent a large loss of productivity and thus in GDP. At the microeconomic level, female work could be transformative for them and their households (Duflo, 2012).

When women control a larger part of the household budget, the benefits derived from food, health and education expenditures increase more than when men do so (Rubalcava, Teruel and Thomas, 2009). If women anticipate going to work, they can reduce desired fertility and increase their investments in human capital (Jensen, 2012). The work of women can also give them representation and voice within their societies. With such a low rate of female labor force participation, Mexico squanders a large proportion of its population (Banco Mundial, 2020).

## CONCLUSIONS

The most significant variable was the employed population of women, obtaining 7.1% of economic growth. This value is consistent with other studies. The findings of this study show that in a macroeconomic environment conducive to women's work, there would be less competition between women and men, higher productivity and entrepreneurial intention, and a consequent increase in gross domestic product.

Other derivative effects include improvements in household budget management, a reduction in the fertility rate, and greater investment in human capital. By limiting women's labor force participation, Mexico is undermining the economic potential of this group.

## REFERENCES

- Banco de México. (2016). *Salario Mínimo e Inflación*. Documento Preparado para la Comisión Consultiva para la Recuperación Gradual y Sostenida de los Salarios Mínimos Generales y Profesionales, Banco de México, junio. Recuperado de: [https://www.gob.mx/cms/uploads/attachment/file/160220/SalarioMinimoeinflacion\\_1.pdf](https://www.gob.mx/cms/uploads/attachment/file/160220/SalarioMinimoeinflacion_1.pdf)
- Banco Mundial. (2020). *La participación laboral de la mujer en México*. Banco Internacional de Reconstrucción y Fomento /Banco Mundial. Washington D.C. 20433, Estados Unidos de Norteamérica. Recuperado de: <https://documents1.worldbank.org/curated/en/753451607401938953/pdf/La-Participacion-Laboral-de-la-Mujer-en-Mexico.pdf>

- Banco Mundial. (2021). *La participación laboral de la mujer en México*. Banco Mundial, publicación del 8 de marzo. Recuperado de: <https://www.bancomundial.org/es/region/lac/publication/la-participacion-de-la-mujer-en-el-mercado-laboral-en-mexico>
- Banco Mundial. (2022). *Tasa de población activa, mujeres (% de la población femenina mayor de 15 años)* (Estimación modelada por OIT). Recuperado de: <https://datos.bancomundial.org/indicador/SL.TLF.CACT.FE.ZS>
- Corvera Vergara, M. T. (2021). *Participación laboral femenina y recuperación pospandemia*. Minuta Núm. 25-21 26/04/2021. Departamento de Estudios, Extensión y Publicaciones. Biblioteca del Congreso Nacional de Chile. Recuperado de: [https://www.bcn.cl/repositorio/10221/32265/1/N\\_25\\_21\\_Participacion\\_laboral\\_femenina\\_y\\_recuperacion.pdf](https://www.bcn.cl/repositorio/10221/32265/1/N_25_21_Participacion_laboral_femenina_y_recuperacion.pdf).
- Elborgh-Woytek, K.; Newiak, M.; Kalpana Kochhar, S. F.; Kangni Kpodar, P. W.; Benedict Clements y Gerd Schwartz. (2013). *Las mujeres, el trabajo y la economía: Beneficios macroeconómicos de la equidad de género*. Departamento de Estrategia, Políticas y Evaluación y Departamento de Finanzas Públicas, Fondo Monetario Internacional. Autorizada su distribución por Siddharth Tiwari y Carlo Cottarelli, septiembre. Recuperado de: [https://www.igualdadnlaempresa.es/enlaces/webgrafia/docs/Las\\_mujeres\\_el\\_trabajo\\_y\\_la\\_economia-FMI.pdf](https://www.igualdadnlaempresa.es/enlaces/webgrafia/docs/Las_mujeres_el_trabajo_y_la_economia-FMI.pdf)
- INEGI. (2022). *Indicadores económicos*. Instituto Nacional de Estadística, Geografía e Informática (INEGI). Recuperado de <https://www.inegi.org.mx/temas/pib/#Tabulados>
- INMUJERES. (2022). *Indicadores básicos*. Instituto Nacional de las mujeres. Recuperado de: [http://estadistica.inmujeres.gob.mx/formas/panorama\\_general.php?IDTema=6&pag](http://estadistica.inmujeres.gob.mx/formas/panorama_general.php?IDTema=6&pag).
- Forbes Women. (2021). Las mujeres 'informales' aportan 9 mdp diarios al PIB... y tienen más riesgo de ser pobres. *Revista Forbes*, 5 abril. Recuperado de: <https://www.forbes.com.mx/forbes-women-mujeres-informales-9-millones-pesos-pib-pobreza/>
- FMI. (2019). Las mujeres y el crecimiento económico. *Finanzas & Desarrollo*, Vol. 56, Núm. 1, de marzo. Fondo Monetario Internacional. Recuperado de: <https://www.imf.org/external/pubs/ft/fandd/spa/2019/03/pdf/fd0319s.pdf>
- Robino Carolina y Tebaldi Raquel. (2018). *Las mujeres en el trabajo: abordar las desigualdades. Policy in Focus*, vol. 15, Edición núm. 1, abril. Centro Internacional de Políticas para el Crecimiento Inclusivo (IPC-IG) (Centro de Implementación de Políticas Públicas para la Equidad y el Crecimiento, CIPPEC). Consultado en: <https://www.cippec.org/wp-content/uploads/2018/10/Razones-economicas-para-reducir-las-brechas-de-genero-en-el-mercado-laboral.pdf>
- Rodríguez Garcés, C. R., Padilla Fuentes, G. B., y Valenzuela Orrego, M. A. (2019). La inactividad laboral como invisibilización del trabajo femenino: aportes a la nueva cartografía del mercado laboral rural en Chile. *Cuadernos de Desarrollo Rural*, 16(83). <https://doi.org/10.11144/Javeriana.cdr16-83.ilit>
- Sarel, M. (1996). Nonlinear effects of inflation on economic growth. *IMF Staff Papers*, 43: 199-215. International Monetary Fund (IMF). <https://doi.org/10.2307/3867357>, <https://www.jstor.org/stable/3867357>
- Statista. (2022). *Tipo de cambio promedio de pesos por dólar en México en septiembre de 2010 a 2021*. Statista Research Department, 13 mayo. Recuperado de: <https://es.statista.com/estadisticas/614294/tipo-de-cambio-promedio-mxn-usd-mexico/>
- Statista. (2022a). *Evolución anual de la tasa de inflación en México desde 2015 hasta 2027*. Statista Research Department, 18 mayo. Recuperado de: <https://es.statista.com/estadisticas/608330/tasa-de-inflacion-mexico/>
- Zemania Global Group. (2022). *La mujer en el mundo laboral*. Recuperado de: <https://zemsaniaglobalgroup.com/la-mujer-en-el-mundo-laboral/#:~:text=Aunque-tiene-mas-dificultades-para-como-esta-estructurada-la-sociedad.>