

## Post-pandemic Mexican labor market outlook: asymmetric recovery

Panorama del mercado laboral mexicano post-pandemia: Recuperación Asimétrica

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### Abstract

After the period of confinement to prevent the spread of the CoViD-19 virus, the reopening in the new normal poses the challenge of economic recovery, in that sense this paper analyzes the dynamics of the post-pandemic Mexican labor market through several econometric modeling including multivariate linear models and time series analysis. The main results show that the recovery of both formal and informal jobs is being faster than expected, however, it presents asymmetries that reveal the pre-existing structural uneven conditions. While the northern states would achieve this summer to reach the pre-pandemic level; the southern states would do so until the following year. At the end, intervention recommendations are proposed to reduce the gaps between north-south.

### Key Words (JEL)

E24 Employment, unemployment, and wages; E17 Prediction and Simulation; E61 Objectives of economic policy.

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## Introduction

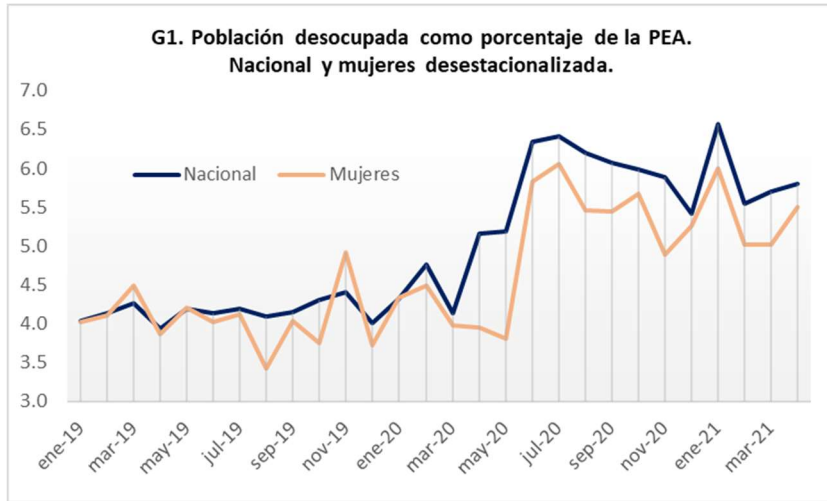
In March 2020, as a measure to mitigate the CoVid-19 pandemic, the National Healthy Distance Day was decreed, which forced the suspension of non-essential activities, which put upward pressure on the urban unemployment rate, which went from 4.3% in January to 6.4% in July. In the second half of 2020 the confinement began to relax and unemployment decreased to 5.4% in December; however, a second pandemic wave forced the closure again and in January unemployment reached 6.6% (INEGI, 2021a).

It is important to consider that the Mexican economy had been slowing down since 2017 due to several conjunctural and secular processes. On the one hand, the effect of the increase in energy prices in January 2017 and the end of the six-year term in 2018; on the other hand, a slow growth of the world economy dragged by the United States and China. But, in addition, it is noteworthy that the Mexican labor market was characterized by a marked deterioration throughout the neoliberal period (Jiménez-Bandala, Andrade and Flegl, 2019).

In that sense this paper analyzes the dynamics of the post-pandemic Mexican labor market through various econometric modeling including multivariate linear models and time series analysis in order to project the recovery times of the pre-confinement employment level. In the first part we show the labor outlook during the pandemic considering the conditions exposed in Jiménez-Bandala et. al., (2020); subsequently we discuss the incidence of the extraordinary minimum wage increase that the country has had since January 2019 on inflation and the level of employment; finally, we show the projections of labor market recovery dividing the states by regional delegation as the Mexican Institute of Social Security does.

## The Labor Market in the Pandemic

As the impact of the virus subsides and the vaccination campaign accelerates, employment also recovers, the rate reported as of April was 5.8%, which is at least one percentage point above the pre-pandemic level (**Graph 1**).



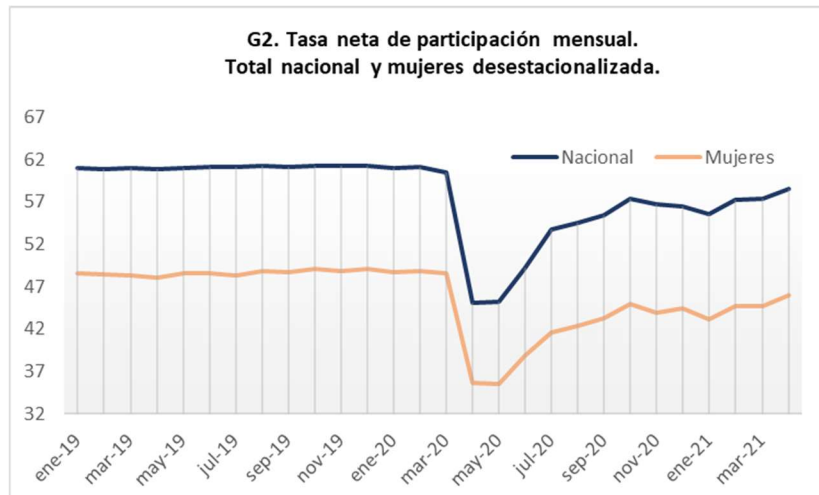
Own elaboration with data from INEGI, 2021a

Although the female unemployment rate has remained below the national rate and is also one percentage point above the pre-pandemic level, it is an illusion to say that female employment was the least affected. It should be remembered that the unemployment rate is the quotient between people without work and the population willing to work (EAP), what has been observed is that during the pandemic a large part of the EAP left the labor market (stopped looking for work) and in greater proportion were women.

**Graph 2** shows that female participation went from 48.6% in January 2020 to 35% in May, when it reached its lowest level. Gradually, the population has rejoined the labor market, although women have done so more slowly, while male participation is 2.5 points away from reaching the pre-pandemic level; in the case of women the distance is 2.7 points. This is congruent with the historical behavior of the female labor market, which always tends to retract more deeply in the face of crises (Abramo, 2004; Gamboa, 2005).

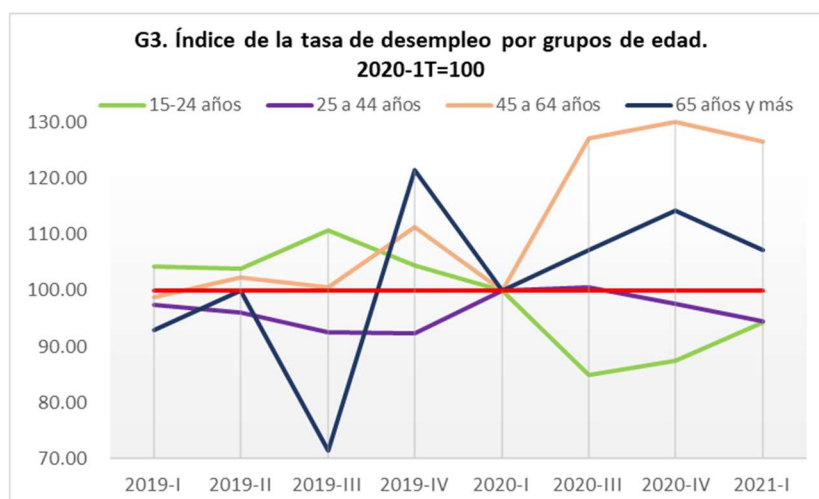
As can be seen, the labor market has been recovering satisfactorily, so it is expected that, as of June, when most of the national territory turned green, the data will show rates similar to those prior to the confinement.

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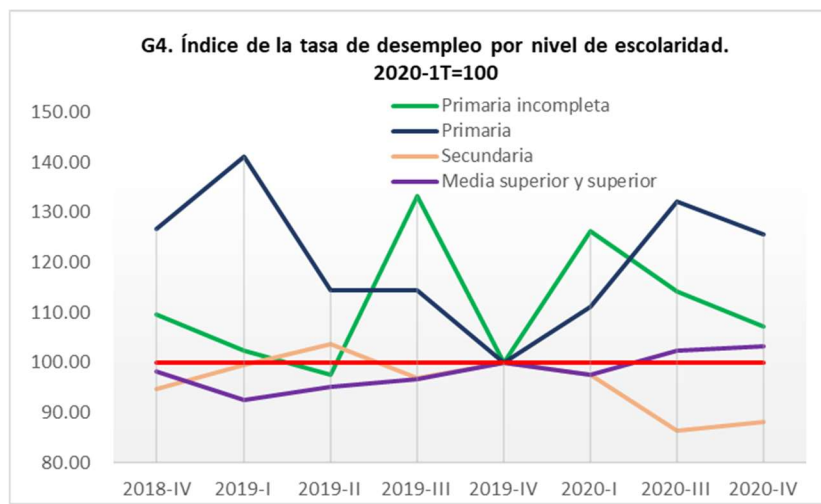
Own elaboration with data from INEGI, 2021a

By age group (**Graph 3**) we observe that the youngest (15–44 years old) were the least affected by the suspension of activities; on the contrary, during the pandemic the population between 15 and 24 years old reached the lowest unemployment rate in the last 20 years. As of the first quarter of 2021, workers under 44 years of age maintain lower unemployment rates than in the previous period. On the other hand, workers aged 45 and older were the most affected, and although the trend is towards recovery, they still maintain high rates. This can be explained if we consider that older adults, as the first vulnerable, were the first to go into confinement; while many activities continued from teleworking, which due to its technological implications is mostly performed by young people (Moctezuma and Murguía, 2020).



Own elaboration with data from INEGI, 2021a

By level of schooling (**Graph 4**), unemployment during the pandemic affected the less educated population to a greater extent, although it should be noted that this trend was already observed before the confinement. Workers with high school and higher education had the lowest variations, and workers with secondary education have a lower unemployment rate in the first quarter of 2021 than in the period prior to the pandemic. This is also associated with the economic activities that were suspended, while low-skilled tasks had to be interrupted, higher-skilled tasks were able to continue in teleworking.



Own elaboration with data from INEGI, 2021a

## Materials and Methods.

The following hypotheses are tested in this paper:

H1: The inflation rate present since March 2021 and outside Banxico's range is not correlated with the extraordinary wage increase in January, but responds to other macroeconomic variables such as the increase in private consumption due to the effect of the recovery.

H2: The loss of jobs is not correlated with the extraordinary wage increases either, but responds to the confinement processes derived from the SARS-COV-2 pandemic.

H3: The recovery of the labor market will follow the structural conditions prior to the pandemic, so that regional inequalities and asymmetries will be reproduced.

For this purpose, data from the National Occupation and Employment Survey (ENOE), the National Consumer Price Index (INPC) and the Monthly Survey of the Manufacturing Industry, as well as data from the National Accounts System of the National Institute of Statistics and Geography (INEGI) were used. Likewise, the data of insured workers from the Mexican Institute of Labor and Social Security (Instituto Mexicanos del Seguro Social). In all cases, the period 2005 to 2021 was considered as shown in Table 1 and the way they were constructed.

Tabla 1. Variables propuestas

<i>Literal</i>	<i>Variable</i>	<i>Operationalization</i>
$\pi$	Inflation	Change in the quarterly price level of 2005-T1 to 2021-T1 $INPC_t - INPC_{t-3}$
$w$	Wage Mass	Multiplication of matrices where the rows $i$ represent the employed personnel by salary level and the column $j$ the minimum wage in force in the country of origin. 2005-T1 to 2021-T1.
$\mu$	Unemployment	Quarterly rate of unemployed population with respect to the total EAP during the period 2005-T1 to 2021-T1.
$C$	Consumption	Household consumption growth rate $\Delta C$ in the period 2005-T1 to 2021-T1.
$K$	Informality	Quarterly moving average of the labor informality rate by state during the period 2005-T1 to 2021-T1.
$Y_{t\lambda}$	Formal employment	IMSS-registered jobs by regional delegation ( $\lambda$ ) of the period 2005-T1 to 2021-T1.

Elaboración propia

From the above variables, the following linear regression models were proposed, where the unstated Greek letters in Table 1 represent the intercepts and  $\varepsilon$  the random variable:

$$\pi = \beta_0 - \beta_1 \Delta w + \varepsilon \quad (1)$$

$$\pi = \alpha_0 - \beta_2 \mu + \varepsilon \quad (2)$$

$$\pi = \gamma_0 - \beta_3 \Delta C + \varepsilon \quad (3)$$

$$\mu = \delta_0 - \beta_4 \Delta w + \varepsilon \quad (4)$$

$$C = \theta_0 - \beta_5 \Delta w + \varepsilon \quad (5)$$

$$\frac{\mu_{2020T1} - \mu_{2021T1}}{\mu_{2020T1}} = \rho_0 - \beta_5 K + \varepsilon \quad (6)$$

For the time series model, the following model was proposed to represent the trend (Tt), cycle (Ct), seasonality (St) and white noise ( $\varepsilon$ ) components:

$$Y_t = (Tt * Ct * St) + \varepsilon \quad (7)$$

where the trend is composed of a regression model with respect to time ( $X_1$ )

$$Tt = \beta_0 + \beta_1 X_1 + \varepsilon \quad (7a)$$

Of the models that proved to be significant and are presented in the following section, the following assumptions were checked: normality of residuals, non-heteroscedasticity, non-collinearity. In the same way, the time series proved to have a stationary process.

## Results and discussion

### *Wages, Inflation and Unemployment*

The Phillips curve represents the negative correlation between the inflation rate and the unemployment rate and highlights a dilemma of macroeconomic objectives as it establishes the impossibility of increasing employment while reducing inflation (Mankiw, 2020). Therefore, it suggests that there must be a certain level of inflation to minimize unemployment, since a policy directed exclusively towards price stability may promote unemployment and vice versa (Hossfeld, 2010).

This relationship described by the Phillips curve loses validity in the long term, since the incidence of the economic cycle influences to a greater extent, on the other hand, in the short term the relationship could be verified (Chang, 1997).

Since January 2019, the current government's policy has promoted the recovery of the purchasing power of wages, in this way the general minimum wage has increased 60.3% with respect to 2018 and a minimum wage was established for border municipalities that is 141.5% higher than the wage they received in the same period. With this, the purchasing power recovered 30 years and is at the 1991 level. From the beginning, this policy has faced the detractors of the neoclassical school who pointed out that wage increases are inflationary; empirical evidence has demolished their arguments (Jiménez-Bandala et.al., 2019; Jiménez-Bandala, et.al., 2020).

In that sense, in the proposed model (1) no significance level was verified, neither as wage bill in nominal values, real values, using natural logarithm, nor as growth rate; therefore, it is proved that wage increases are not influencing the growth of the employment level. Neither were the monetary variables interest rate and variation of the money supply significant. On the contrary, other influencing factors were identified, one of them responding to a shock in international

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markets and the other due to the increase in the level of employment in the stage of the lifting of the confinement.

During the pandemic, the inflation rate fell to 2.15% in April, mainly due to the abrupt contraction of demand and international oil prices, which pushed down local gasoline prices. However, as the containment eased and demand began to recover, inflation also increased; in April the reported rate was 6.08%, which is outside the central bank's target (3% +/-1%), but showed moderating trends in the first two weeks of May (**Graph 5**).



Own elaboration with data from INEGI, 2021b

Inflationary increases should not, for now, be a cause for concern as they are responding to the pulse of employment recovery following the Phillips Curve and to a faster recovery of employment than of the pre-pandemic level of production, so it is to be expected that inflation will remain outside of Banco de México's targets at least during the second half of this year.

While we cannot point out that wage increases were statistically significant in explaining inflation ( $\pi$ ); instead, the rates of change of unemployment ( $\mu$ ) and consumption (C), respectively, were significant at 90% confidence as shown in models (2) y (3).

$$\begin{aligned} \pi &= 0.542 - 0.006\mu \\ p &= (0.09) \end{aligned} \quad (2)$$

$$\begin{aligned} \pi &= -24.461 + 1.082C \\ p &= (0.08) \end{aligned} \quad (3)$$

The negative sign in equation (2) implies that the reduction in unemployment is driving inflation up; on the other hand, in (3) the increase in consumption increases inflation.



This implies that as employment and household consumption recover, inflation will maintain a transitory upward pressure, which should be monitored, but without involving restrictive monetary policies that inhibit employment or consumption.

It should also be noted that, within the components, it is non-core inflation that is driving the increase in the price level, with energy having the greatest impact. As we import up to 60% of the fuels we consume, we will inevitably continue to be affected by external shocks.

### *Wages and Aggregate Demand*

The econometric models also showed no significant relationship between wage growth and job losses, as expected by neoclassical theory. The jobs lost are explained by the effects of the pandemic, therefore, their recovery follows the pace of deconfinement experienced by the country. On the other hand, wage increases ( $w$ ) have allowed a faster recovery of the economy, as shown in equation (5) which correlates the wage bill with household consumption ( $C$ ) as a component of Aggregate Demand with a significance of 95% reliability.

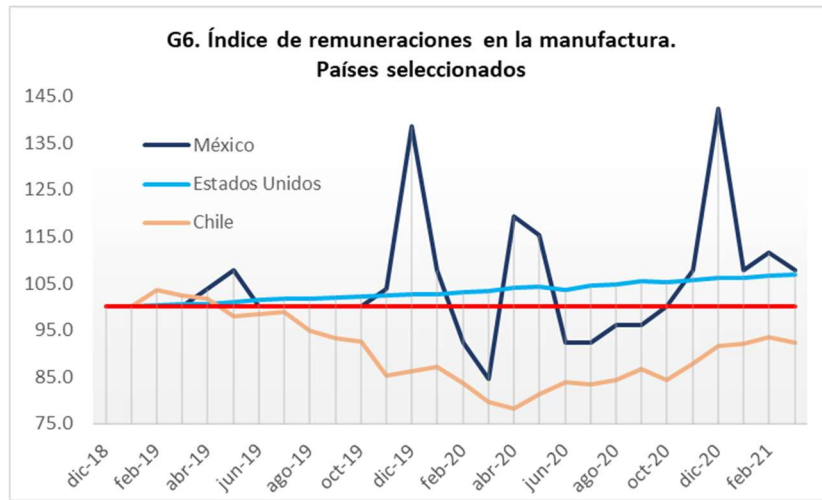
$$\begin{array}{l} C = 16.59 + 0.28w \\ p = \quad \quad (0.00) \end{array} \quad (5)$$

If we consider the wage bill as a form of disposable income of working families, the marginal propensity represents more than a quarter, so that the Keynesian multiplier would be close to 3.6. In other words, for every peso added to workers' wages, aggregate demand is multiplied 3.6 times. The marginal propensity to consume measures how much a family's consumption increases when its disposable income increases by one monetary unit. If it is high, it means that the person is willing to spend most of what his income has increased, and if it is low, he prefers to save (Mankiw, 2020).

Keynesian theory, unlike neoclassical theory, argues that the level of employment is a function of the level of income (Mankiw, 2020). Therefore, in order to recover jobs, expansionary fiscal policy should be oriented towards boosting the level of consumption as a component of aggregate demand. Equation (5) demonstrates this empirically.

It is noteworthy that despite the pandemic, labor compensation did not fall significantly. **Graph 6** shows an index of manufacturing wages and compares Mexico with the United States and Chile; it is observed that during the months of March, April and from June to September, wages were below the benchmark (January 2019=100), subsequently they have recovered and are

growing faster than in the United States; in Chile the situation is not encouraging because the wage drop was evident since 2019, deepened with the pandemic and has remained below the benchmark level.

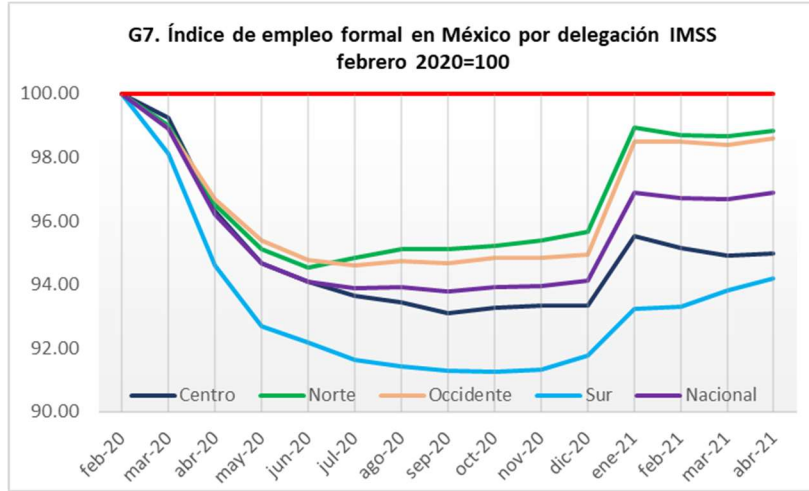


Own elaboration with data from INEGI, 2021c

Maintaining wages that ensure the purchasing power of workers will considerably increase economic recovery by boosting the domestic market, considering that consumer confidence has recovered to its pre-pandemic level (42.7 points), expansionary policies, both fiscal and monetary, are recommended to increase aggregate demand.

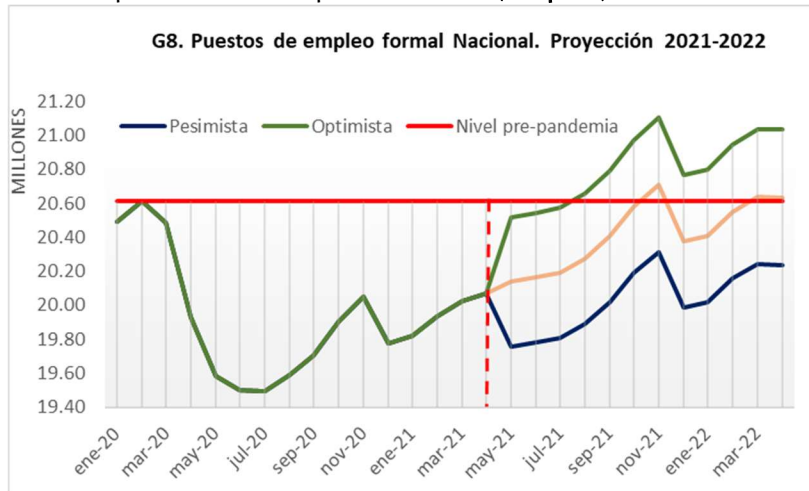
#### *Asymmetric and uneven recovery*

For its part, formal employment, like overall employment, is recovering faster than expected; however, regional inequality is playing an important role and the asymmetries that existed before the pandemic are being reproduced. With seasonally adjusted data, **Graph 7** shows the behavior of employment by IMSS delegation from an index where the base is February 2020, the month prior to the confinement. It is clear that the north and west are about to recover their pre-pandemic employment level (February 2020) which means 1.2 and 1.4% difference, respectively; on the contrary, the center and south are farther away, between 5.0 and 5.8% respectively. It is notable that it was the southern states that fell the deepest, while the rest of the states fell the slowest.



Own elaboration with data from IMSS, 2021

Using an econometric time series analysis model (7), the cyclical, seasonal and trend components of each regional delegation were identified and projections of formal employment recovery were constructed. Each series showed between 88 and 92% predictive capacity and the projections are shown with a 95% confidence interval for the pessimistic and optimistic levels (Graph 8).



Own elaboration

At the national level, the level of 20.6 million jobs could be reached during the summer between July and August in an optimistic scenario, while within the average it would be until the month of October. In contrast, in a negative scenario, the pre-pandemic employment level would not be reached until the summer of 2022 (Table 2).

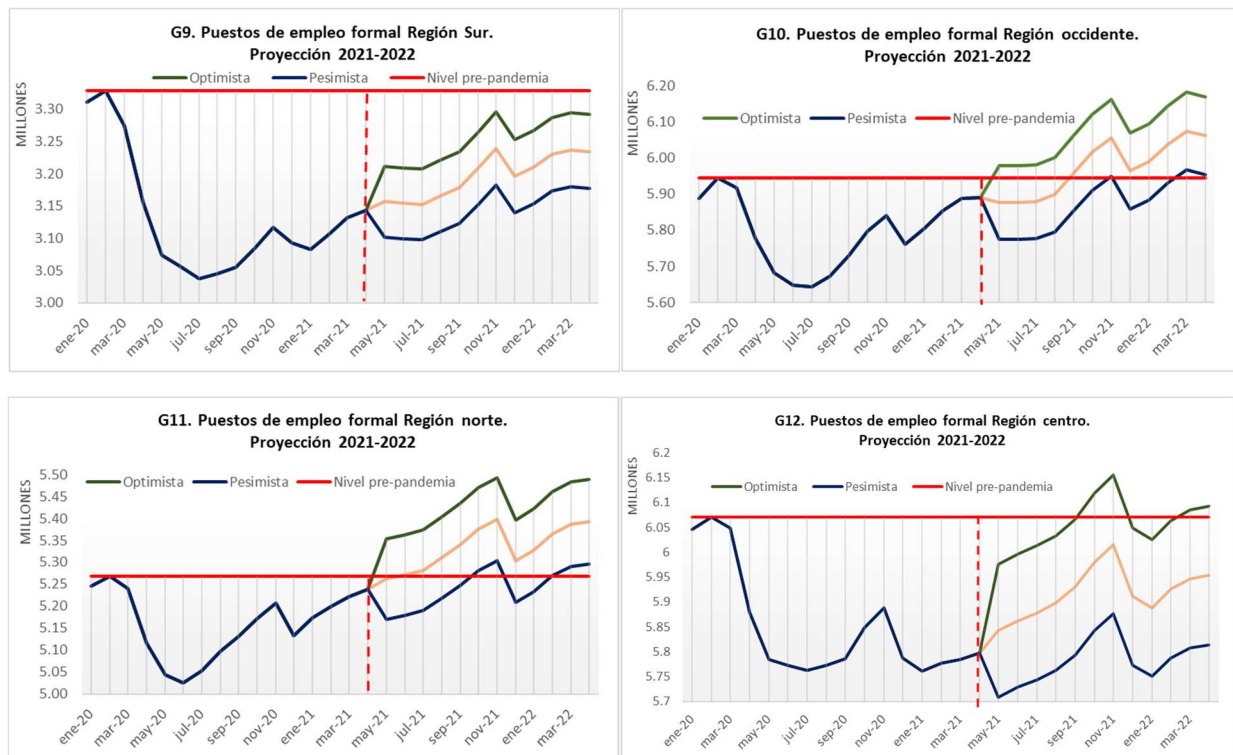
The north would have the best conditions (Figure 11), the data reported by IMSS in May could already reflect a recovery to the pre-pandemic level, in the most pessimistic scenario this would happen until October. In

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that lower range, the end of the year could be complicated and return to levels below pre-pandemic employment, however, the level would be exceeded again by February 2022 (**Table 2**).

The west (graph 10) also shows positive behavior, since the May report would also show a full recovery, only in the most pessimistic scenario would the employment level recover until November, fall at the end of the year and return to the pre-pandemic level in February (**Table 2**).

The center has a more complicated situation (**graph 12**), only in the best scenario, the previous employment would be reached in September, in the rest of the interval, it is observed that the recovery will not arrive until after April 2022. While the south (graph 9) faces more worrisome conditions, as according to our results, the pre-pandemic employment level will not recover until after May 2022 (**Table 2**).



Own elaboration

To verify the causes of the asymmetric behavior of employment recovery, structural variables were considered to reveal the dynamics of the labor market prior to the pandemic. To this end, we sought to correlate the speed of employment recovery by state with variables such as the rate of informality, critical conditions of employment occupation and the rate of labor pressure. The variables were found to be significant at 80% and 85% reliability; the informality rate variable was constructed as a moving average of the 3 quarters prior to the pandemic and the results are shown in (6).

$$\frac{\mu_{2020T1} - \mu_{2021T1}}{\mu_{2020T1}} = 3.77 - 0.25K \quad (6)$$

$p = \quad (0.02)$

This proves that structural conditions have an important influence on employment recovery. For each percentage point increase in informal employment, the speed of employment recovery decreases by a quarter of a percentage point. Therefore, states with more precarious working conditions will have greater obstacles in reaching the pre-pandemic level.

In other words, the asymmetries we are observing in the dynamics of the labor market reproduce the pre-pandemic precariousness, so that corrective actions could have little influence if the underlying problems that originated in the neoliberal period are not addressed.

**Table 2. Projections of IMSS-registered employment by regional delegation**

<i>Period</i>	<i>National</i>			<i>North</i>			<i>North West</i>			<i>Central</i>			<i>South</i>		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
may-21	20137465	19758675	20516255	5261933	5170445	5353420	5877892	5775695	5980089	5842297	5708630	5975965	3157112	3102220	3212003
jun-21	20164996	19784822	20545170	5271953	5180090	5363816	5877178	5774769	5979587	5862332	5727886	5996778	3154668	3099698	3209638
jul-21	20191067	19809537	20572596	5281919	5189681	5374157	5878947	5776283	5981611	5878139	5743011	6013267	3152750	3097694	3207806
ago-21	20272794	19888857	20656730	5310371	5217435	5403307	5898989	5795752	6002227	5897446	5761555	6033337	3166369	3110955	3221783
sep-21	20407517	20020164	20794870	5341213	5247536	5434890	5959117	5854603	6063631	5929965	5793005	6066925	3178928	3123175	3234682
oct-21	20580307	20188807	20971807	5375606	5281124	5470088	6017116	5911359	6122873	5980456	5842009	6118902	3208503	3152111	3264896
nov-21	20709655	20314825	21104485	5398101	5303022	5493180	6057287	5950597	6163976	6015585	5876004	6155166	3239101	3182049	3296152
dic-21	20375412	19986103	20764722	5303125	5209522	5396728	5964766	5859484	6070047	5910624	5773164	6048084	3196764	3140340	3253189
ene-22	20409031	20018230	20799831	5328088	5233848	5422329	5989917	5883970	6095864	5887932	5750688	6025176	3210188	3153408	3266969
feb-22	20552079	20157688	20946469	5365530	5270429	5460630	6037842	5930825	6144859	5925445	5787015	6063876	3230594	3173334	3287854
mar-22	20638434	20241536	21035332	5387075	5291395	5482755	6075414	5967508	6183319	5946720	5807480	6085959	3237449	3179949	3294949
abr-22	20635655	20237963	21033346	5392247	5296279	5488216	6062595	5954696	6170494	5953455	5813747	6093163	3234722	3177152	3292291

(1) (1) Point estimate

(2) (2) Lower interval (95% confidence)

(3) (3) Upper interval (95% confidence)

Own elaboration

## Conclusions

The above results show that minimum wage increases have not affected the inflation and unemployment variables. Inflation is outside Banxico's target range, this is explained as an effect of the recovery of employment and the level of consumption after the contraction in the confinement period, so we can assume that it will be transitory and will remain on the rise at least for the rest of the year.

Wage increases did not affect the level of employment either; the historical drop since the first quarter of 2020 was due to the suspension of non-essential activities to mitigate CoViD-19 contagions; however, the labor market is showing clear signs of recovery.

Wage increases are indeed impacting the speed of recovery as there is evidence of a positive correlation between the increase in the wage bill and the level of consumption, which will help a shift in aggregate demand.

However, it should be noted that the recovery process is marked by asymmetries that reproduce the conditions of inequality prior to the pandemic. Thus, while the northern states would reach a level of formal employment prior to the pandemic in the summer, the central and southern states of the country could do so until the following year. For this reason, it is necessary to focus actions that contribute to economic stimulus in the most disadvantaged regions, accelerate infrastructure projects and even establish special wage zones similar to the municipalities of the northern border. Likewise, we should not abandon the policy of recovering purchasing power, which at this time has been a useful buffer to contain the increase in extreme poverty.

## References

- Abramo, L. (2004). ¿Inserción laboral de las mujeres en América Latina: Una fuerza de trabajo secundaria? *Revista Estudios Feministas*, 12(2): 224-235.
- Chang, R. (1997). Is Low Unemployment Inflationary? *Federal Reserve Bank of Atlanta Economic Review* 1Q(97): 4-13.
- Gamboa, I. (2005). Subempleo y desempleo, un lugar para el trabajo de las mujeres, *Revista Espiga*, 12: 101-108.
- Hossfeld, O. (2010). US Money Demand, Monetary Overhang, and Inflation Prediction, *International Network for Economic Research*, working paper no. 2010.4.

- IMSS (2021) *Puestos de trabajo, Consulta dinámica CUBOS*, México: Instituto Mexicano del Seguro Social.
- INEGI (2021a) *Encuesta Nacional de Ocupación y Empleo*, México: Instituto Nacional de Estadística y Geografía.
- INEGI (2021a) *Índice Nacional de Precios al Consumidor*, México: Instituto Nacional de Estadística y Geografía.
- INEGI (2021c) *Encuesta Mensual de la Industria Manufacturera*, México: Instituto Nacional de Estadística y Geografía.
- Jiménez-Bandala, C.A., C., Peralta, J., Sánchez, E., Andrade, L., Chiatchoua, C., Guadarrama, A., Meneses, M., Matus, E., Arellano, D., y Márquez, I. (2019). Efecto del aumento al Salario Mínimo sobre el nivel de empleo. *Revista Internacional de Salarios Dignos*, 1(01): 1-9.
- Jiménez-Bandala, C.A.; Andrade, L. A. y Flegl, M. (2019) Why Does Not Education Have A Positive Impact On Labor Markets In Developing Countries?, *Conference: 16th International conference on Efficiency and Responsibility in Education*, Prague, Czech Republic.
- Jiménez-Bandala, C., Peralta, J., Sánchez, E., Márquez Olvera, I. y Arellano Aceves, D. (2020). La situación del mercado laboral en México antes y durante la COVID-19, *Revista Internacional de Salarios Dignos*, 2(2): 1-14.
- Mankiw, G. (2020). *Principios de Macroeconomía*, México: Mc Graw Hill.
- Moctezuma, S. y Murguía, V. (2021). Una aproximación hacia el contexto del mercado laboral de la población joven en contextos de pandemia (Covid-19). *Intersticios Sociales*, (21): 399-424.