# Box 2
# Estimated effects of the minimum wage on inflation in Colombia

**Nicolás Martínez-Cortés**
**Sergio Restrepo-Ángel***

Several studies have pointed to the influence of the minimum legal wage (SM for its Spanish acronym) on the labor market and the observed distribution of wages and prices in the economy, among other effects. In 2022, *Banco de la República* conducted a comprehensive study on the macroeconomic effects of the legal minimum wage in Colombia (Arango et al., 2022). In this Box, we summarize some of their findings and other relevant results from related literature, particularly its effects on inflation.

As pointed out by Arango et al. (2022), increases in the minimum wage can affect prices via various conduits. One is labor costs, defined as increased labor costs as a factor of production cost that can lead to a higher sale price. Another is aggregate demand, where higher worker income places upward pressure on prices through increased consumption. A third factor is inflation expectations, whereby agents may expect higher price adjustments as a consequence of the behavior of the previous conduits.

We study various methodologies to assess the impact of minimum wage increases on prices, analyzing both aggregate and microdata. In the case of aggregate data, two methodologies find similar results. An accounting exercise using an input-output matrix concludes that, on average, a 100-basis point (bp) increase in the minimum wage results in a 14 bp increase in total consumer inflation. On the other hand, an instrumental variable approach suggests that an increase of the same magnitude in the minimum wage is associated with a 14 bp increase in core inflation (measured as CPI excluding food or regulated items), that through its weight on total CPI, translates into a 10 bp increase in headline inflation. However, it should be noted that these estimates only cover a period characterized by relatively low inflation and increases in the minimum wage that do not deviate far from the total previous year's inflation and labor productivity gains. Moreover, they do not consider possible non-linearities in the response of prices to different magnitudes of minimum wage increases or consecutive increases above observed inflation plus some measure of productivity. Consequently, we suggest a cautionary approach when directly applying the results of these estimates when different conditions are present.

As for the microdata exercise, the results suggest considerable heterogeneity in the transmission of the legal minimum wage to prices across different baskets of items, with food away from home exhibiting the strongest transference. In the aggregate, excluding some regulated items and services, the median price increase following a 100 bp increase in the minimum wage is 16 bp, a pass-through that primarily happens during the four months following the minimum wage increase.

Arango et al. (2022) also analyze some macroeconomic variables' adjustments to unanticipated minimum wage shocks using a dynamic stochastic general equilibrium model. This model assumes price rigidities, incomplete financial markets, a segmented labor market including formal and informal sectors, and a central bank acting to stabilize prices. In this model, an unanticipated 100 bp increase in the minimum wage generates a rearrangement of the labor market in favor of informal employment, as well as placing downward pressures on gross domestic product (GDP), investment, and consumption, the latter especially for unskilled workers. The GDP reduction is more noticeable in the short term than the long term and generates a negative output gap compared to the baseline scenario. Concerning prices, in general equilibrium, the cost shock produced by the minimum wage increase dominates the impact

* Mr. Martínez-Cortés is a Specialized Analyst and Mr. Restrepo-Angel is a Leading Analyst at the Programming and Inflation Department. The views and opinions expressed herein do not necessarily reflect those of *Banco de la República* or its Board of Directors.

on the output gap, increasing headline inflation by 8 bp. Table B2.1 summarizes the findings of Arango et al. (2022) and those of two other benchmark studies.

Table B2.1
Literature results for Colombia: estimated effect on total CPI of a 100-basis point (bp) increase in the legal minimum wage

| Study | Methodology | Period Analyzed | Total CPI effect (bp) |
|---|---|---|---|
| Lasso (2010) | Dynamic panel | 1994-2009 | 6 |
| Posso-Suárez (2010) | Input-output matrix | 2006 | 14 |
| | Microdata and regression | 2008-2019 | 16 |
| Arango et al. (2022) | Instrumental variable | 2003-2019 | 10 |
| | Input-output matrix | 2010-2019 | 14 |
| | DSGE[a/] model | 2008-2019 | 8 |

a/ Dynamic Stochastic General Equilibrium model.
Source: Prepared by the authors with information from various studies. The reader should reference the documents listed for additional details.

By surveying businesses, other studies have explored some microeconomic characteristics of the wage-setting process and its possible relationship with prices in Colombia. For example, Iregui et al. (2012) document that businesses adjust wages less frequently than prices and generally do not reduce the former, suggesting downward wage rigidity. The authors also mention evidence of considerable heterogeneity in the transmission of wages to prices across different sectors, particularly in those where the share of labor cost is high.[1] The literature also indicates that transmission is measured by industry-level criteria, such as sectoral aggregate labor productivity (Iregui et al., 2012) or market concentration (Heise et al., 2021). Consistent with this finding, in a more recent study, Pulido et al. (2023) focus on examining the role of wages during the sharp post-pandemic inflation increase in Colombia, finding that the minimum wage is very binding compared to other economies, concluding that substantial increases in the real minimum wage, relative to productivity, have adverse macroeconomic effects.

## References

Arango, Luis E., and Luz A. Flórez. "Regional Labour Informality in Colombia and a Proposal for a Differential Minimum Wage." *The Journal of Development Studies* 57, no. 6 (December 21, 2020): 1016–37. https://doi.org/10.1080/00220388.2020.1841170.

Arango, Luis E., Luz A. Flórez, and Laura Guerrero. "Minimum Wage Effects on Informality across Demographic Groups in Colombia." *Borradores de Economía*, no. 1104 *Banco de la República* de Colombia. (February 14, 2020). https://doi.org/10.32468/be.1104.

Arango, Luis E., Oscar Iván Ávila–Montealegre, Leonardo Bonilla-Mejía, Jesús Alonso Botero García, Edgar Caicedo-García, Eleonora Dávalos Álvarez, Luz A. Flórez, Javier G. Gómez-Pineda, Anderson Graj. "Efectos macroeconómicos del salario mínimo en Colombia," *Revista ESPE - Ensayos Sobre Política Económica*, *Banco de la República*, issue 103: 1-117, (September 2022).

Heise, Sebastian, Fatih Karahan, and Ayşegül Şahin. "The Missing Inflation Puzzle: The Role of the Wage-price Pass-through." *Journal of Money, Credit and Banking* 54, no. S1 (December 29, 2021): 7–51. https://doi.org/10.1111/jmcb.12896.

Irregui, Ana María, Luis Melo, and María Ramírez. "Wage Adjustment Practices and the Link between Price and Wages: Survey Evidence from Colombian Firms." *Lecturas de Economía*, no. 76: 17–53. (2012)

1 For example, wage increases are very important in setting prices for approximately 60% of the companies surveyed in the education and health sector and in other services.

Lasso V., F. “Incrementos del SM legal: ¿cuál es el impacto redistributivo del cambio en los precios relativos al consumidor?” *Borradores de Economía*, no. 598, *Banco de la República* de Colombia. (2010).

Mora, J. J, Juna Muro. “lnformality and MWs by cohort in Colombia”. *Cuadernos de Economia*. 33(63): 469-486. (2014).

Mondragón, C., Ximena Peña, Daniel Wills. “Labor rigidities and wages in the formal and informal sectors in Colombia”, in L. E. Arango and Franz Hamann (eds.), *El mercado de trabajo en Colombia: hechos, tendencias e institucione*s, *Banco de la República* de Colombia: 631-675. (2013).

Posso-Suárez, C. M. “Increases in the legal minimum wage: an analysis of the costs and benefits on Colombian households in 2006,” *Borradores de Economía*, no. 595, *Banco de la República* de Colombia. (2010).

Pulido, José, Hernando Vargas-Herrera, Juan J. Ospina-Tejeiro. “The Labor Market in Colombia: Structural Features and the Role of Wages in the Post-pandemic Inflationary Surge,” *Borradores de Economía*, no. 1232, *Banco de la República* de Colombia. (2023).