Alcamentos

Departamento de Economía

1901

THE LONG RUN WAGE-EMPLOYMENT ELASTICITY: EVIDENCE FROM COLOMBIA

Jhon James Mora[1] y Juan Muro[2]

[1]Universidad ICESI y Alcamétrica
[2]Universidad de Alcalá y Alcamétrica

DEPARTAMENTO DE ECONOMÍA
Plaza de la Victoria, 2
28802 Alcalá de Henares (Madrid)
Teléfono: 91 885 42 01
http://www.uah.es/centros_departamentos/departamentos

Universidad de Alcalá

Alcamentos

Nº: 1901

THE LONG RUN WAGE-EMPLOYMENT ELASTICITY: EVIDENCE FROM COLOMBIA

Jhon James Mora[1] y Juan Muro[2]

[1]Universidad ICESI y Alcamétrica

[2]Universidad de Alcalá y Alcamétrica

DEPARTAMENTO DE ECONOMÍA
Plaza de la Victoria, 2
28802 Alcalá de Henares (Madrid)
Teléfonos: 91 885 42 01
http://www.uah.es/centros_departamentos/departamentos

THE LONG RUN WAGE-EMPLOYMENT ELASTICITY: EVIDENCE FROM COLOMBIA

Jhon James Mora[1] and Juan Muro*[2]

[1]Universidad ICESI and Alcamétrica
[2]Universidad de Alcalá and Alcamétrica

August 2019

Abstract

Several years ago, many articles showed that the relationship between wage increases and unemployment rise is not clear in the USA. This USA evidence was important to determine the recommendation of Stiglitz that a 22% increase of the minimum wage in Spain will not reduce the employment in 2018. To our view, the USA evidence is insufficient to consider that this advice can be extended to all countries. Differences in regulations, institutions and welfare systems –mainly unemployment insurance-, among others, may produce around the world different results to the expected outcome in the USA that an increase of the real wages does not provoke an unemployment rise. Colombia as a developing country, with institutions that differ in design and practice from those of the USA, could be a good testing example. In this paper, we analyse the effect of a rise in wages on the demand for employment using Colombian data. Our meta-analysis shows that a 1% real wage increment causes an 0,11% employment fall in the long run. These results stand despite publication biases.

Keywords: Wage-employment elasticity, Meta-analysis, Publication bias.
JEL classification: J23, J31, C83

***Corresponding author.**
Facultad de Ciencias Económicas y Empresariales
Universidad de Alcalá
Plaza de la Victoria, 2
28802 Alcalá de Henares, Madrid (SPAIN)
e-mail: juan.muro@uah.es

---

[1] Jhon James Mora is Full Professor, Universidad Icesi, School of Management and Economics, Department of Economics. Calle 18 No. 122 -135, Cali, Colombia. Academic, Colombian Academy of Economic Sciences. Senior researcher at Colciencias. Director of the Ph.D. Business Economics Program at the Universidad Icesi and Coordinator of the Regional Labour Market Observatory of Valle del Cauca (ORMET). Juan Muro is Professor Emeritus, Departamento de Economía, Universidad de Alcalá, Plaza de la Victoria, 2, 28802 Alcalá de Henares, Madrid, España. The authors are members of Alcametrica at the Universidad de Alcalá and the Quantitative Methods Research group at Icesi University. We are grateful for the support of Icesi University through the "Análisis de Elasticidad Empleo-Demanda" research project and acknowledge the help of Diana Yaneth Herrera Duque (research assistant). All remaining errors are our own.

THE LONG RUN WAGE-EMPLOYMENT ELASTICITY: EVIDENCE FROM COLOMBIA

Jhon James Mora and Juan Muro

1. Introduction

Economic theory shows us that wage increases have a negative effect on employment. Complex discussions about this issue include the work of Card and Krueger (1995a), who (as corroborated by Doucouliagos and Stanley, 2009) created a 'schism within the economy by reporting quasi-experimental and econometric evidence that the increase in the minimum wage does not reduce unemployment.' (Card and Krueger, 1995a: 406). Card and Krueger (1995a) used meta-analysis, which drew conclusions from researchers' estimates. Doucouliagos and Stanley (2009) found that even when incorporating publication biases, 64 studies about the minimum wage and 1,474 estimates of employment elasticity concluded that minimum wage hikes did not increase unemployment.

This paper analyses the effect of a rise in wages on employment in the long run using Meta-Analysis. Our data come from previous research that estimated this effect in Colombia. Our results confirm that an increase in real wages cause a decline in labour demand in Colombia, even if corrected by publication biases. This article also contributes to the discussion about Colombian economic policy, especially regarding how a rise in real wages (including the minimum wage) could affect employment and informality.

The paper is organized into six sections. In the second section, we review different approaches to study the long run wage-employment elasticity in Colombia. We use the third section to introduce the Meta-Analysis methodology. In the fourth section, we describe the database and present some preliminary but relevant results on the long run wage-employment elasticity. We outline our estimation results in the fifth section. We present our conclusions in the final section.

2. The long run wage-employment elasticity in Colombia

Hamermesh's (1993) review showed that different published wage-employment elasticities are within the range of [−0.15, −0.75], which gives −0.3 on average as an initial estimate of wage employment elasticity. As noted by Isaza (2004), Hamermesh (1986) indicated that a CES function could be used to estimate the elasticity of employment and wages as

$$lnL = a_0 + \sigma lnw_L + a_1 lnY \quad (1)$$

In equation (1) α_1 is product-employment elasticity and σ is the wage-employment elasticity. Equation (1) can be estimated in different ways, as a time series regression, with cross-sectional data, panel data or worldwide dynamic panel data.

With Colombian data, Henao and Lora (1995) used a specification in short-term differences to estimate the value of employment-output and employment-labour cost elasticities for 1980–89 and 1990–94, with Colombia Monthly Manufacturing survey data.

Roberts and Skoufias (1997) estimated long-term demand for skilled and unskilled labour, using 1981-87 panel data for the Colombian manufacturing industry with Colombia Annual

Manufacturing survey data. Econometric specifications of qualified and unqualified labour demand include proxy variables for the cost of capital and technology, as well as temporary, sectoral and regional dummy variables.

Zerda (1997) used a short-term difference model to identify the value of employment-output and employment-wages elasticities for 1974–96, using data from the Colombia Annual Manufacturing Survey. This work differs from that of Henao and Lora (1995) in the model specification that in Zerda's model includes growth in the price of capital.

Cárdenas, Bernal and Gutiérrez (1998) calculated short-term and long-term skilled and unskilled labour demand to measure employment-product and employment-wages elasticities in seven Colombian metropolitan areas. They also carried out an econometric exercise, including a dummy variable that represented labour reform in the early 1990s (the 1990 Law #50), concluding that this law did not cause structural changes in elasticity. In addition to their partial adjustment estimates, the authors also included results based on panel data from the Colombia Annual Manufacturing survey.

Vivas, Farné and Urbano (1998), using VEC methodology, estimated employment-product and employment-wages elasticities for Colombian industries and, through the MCO, estimated elasticities for certain industry sectors, from 1984–96. In their specifications, these authors included a significant dummy variable, corresponding to Colombia's open economic period (beginning in 1991). With reforms from the early 1990s, this suggested a structural change in the demand for industrial work.

Using panel data estimators and a sample from 1974 to 1991, Ruiz (1998) specified a linear quadratic model and estimated employment-product and employment-salary elasticities with Annual Manufacturing survey data. He applied data from Colombia Monthly Manufacturing survey to estimate a Generalised Method of Moments model with data between January 1990 and August 1997.

Farné and Nupia (1999), using the VEC method and data from the Monthly Manufacturing survey and the National Household Survey, estimated labour demand functions by economic sector (industry, services, commerce, transportation and finance) and labour force qualification level (skilled versus unskilled) in Colombia's seven main urban areas for 1984–97.

Núñez and Ramírez (2000) analysed a panel data model and estimated the short-term elasticity of employment with respect to real wages and the product for 1978–95. As part of its econometric specification, the authors included a dummy variable for 1991–94 that captured the possible effects of trade and labour reforms carried out at the beginning of the 1990s.

Maloney and Fanjzylver (2002) used the GMM system, proposed by Blundell and Bond (1998), to estimate employment-salary and employment-product elasticities for workers and employees of several Latin American countries, for 1980–2011.

Arango and Rojas (2003) estimated a dynamic model of industrial labour demand in Colombia based on panel data at the establishment level for 1977–99, using data from the Annual Manufacturing survey. They included in their specifications a set of dummies that reflected part of a firm's heterogeneity, its propensity to export, its import of raw materials and its first year in business, as well as dummies of time to capture the effect of technical progress on the demand for work.

Cárdenas and Bernal (2003) estimated standard work demand equations, using time series data for 1976–96. The estimation emphasis was on the measurement of employment-salary elasticities and the elasticities of substitution between different factors of production. This exercise is virtually identical to the previously commented by Cárdenas, Bernal and Gutiérrez (1998), whose results showed no differences for Colombia's seven metropolitan areas.

Isaza and Meza (2004), using cointegration methodology and 1984-2000 data, estimated long-term coefficients of employment elasticity with respect to output and real wages, for total, qualified and unqualified employment.

Arango, Gómez and Posada (2009) discuss uncovered qualified and unqualified job demand functions from the cost minimisation process of firms, which are representative of the formal, non-governmental urban sector, for 1986–2006.

Medina, Posso, Tamayo and Monsalve (2012) estimated dynamic demand functions using standard methodologies and VAR panel models, for workers and non-workers, for 1993–2009 and 2000–09.

Rodríguez (2013) discuss the determinants of employment demand for professional, administrative and labour personnel in the Colombian manufacturing sector, using information from the Annual Manufacturing survey, for 2000–10. The author included time dummies in their Generalised Method of Moments' estimates, both in difference and systematic.

Finally, Arango, Catellani and Obando (2016), with Colombia Annual Manufacturing survey data, analysed the existence of heterogeneity in labour demand in the Colombian industrial sector, for 2000–13. Their estimates considered differences in workforce qualifications (i.e. qualified versus unskilled) and the type of contract (i.e. permanent versus temporary). In addition, they analysed heterogeneity based on plant size, industrial sector and region.

3. The meta-analysis methodology

Using meta-analysis, Card and Krueger (1995a, 1995b) made the controversial statement that the minimum wage did not reduce unemployment in the United States. This conclusion was so controversial that many delegitimised its results because it ignored publication bias. However, Doucouliagos and Stanley (2009) showed, with a 1474 elasticity estimates sample, that even controlling by publication bias, no evidence existed that the minimum wage reduced employment. 'Once this publication selection is corrected, little or no evidence of a negative association between minimum wages and employment remains' (p. 406). Moreover, after corroborating in different ways and reviewing the empirical evidence, the authors conclude that 'This article re-evaluates the empirical evidence of a minimum-wage effect on employment. Several meta-regression tests corroborate C-K's overall finding of an insignificant employment effect (both practically and statistically) from minimum-wage raises. (p. 426).

In order to discuss publication bias, Stanley (2005) posited three sources of publication bias:

1–'Reviewers and editors may be predisposed to accept papers consistent with the conventional view'.

2–'Researchers may use the presence of a conventionally expected result as a model selection test'.

3–'Everyone may possess a predisposition to treat 'statistically significant' results more favourably' (Stanley, 2005, 310–11).

To analyse the existence of such publication biases, the papers suggest a test based on the following regression:

$$\sigma_i = \beta_0 + \beta_1 SD_i + e_i \qquad (2)$$

In equation (2) σ_i is an estimate of the elasticity in i-studies, SD_i is an estimated standard deviation of each study, and e_i is the random error term. In the absence of selection bias, the true effect of elasticity will be β_0. However, due to the presence of heteroscedasticity in equation (2), it must be reestimated dividing by the standard deviation. Thus, (2) becomes

$$t_i = \tau_0 + \tau_1 (1 / Sd)_i + e_i \qquad (3)$$

In (3), Egger, et al. (1997) showed that the statistical significance of τ_0 is a test of biases that also indicates the bias direction. Stanley (2008), in turn, showed that a test on τ_1 is a test of the true effect of wages on employment, beyond a systematic contamination that arises from the existence of publication biases. That is, τ_1 will be the true effect of wage elasticity on employment.

4. The data

The Studies' search and coding processes follow MAER-NET protocols (Stanley, et al. 2013). Thus, the search for articles and studies began in JSTOR, SCOPUS, ISI-Web, EBSCO and GOOGLE. These websites were used as keywords, even though the terms 'employment-wage elasticity' and 'employment response to wages' were not limited, and we also search for representative authors who have worked on the subject, such as Luis Eduardo Arango. Because of the importance of certain working documents, such as those of the Banco de la República, other unpublished meta-analysis estimations, such as those of Mora and Muro (2015), were not excluded. Additionally, we consult several authors to obtain the true values of the standard deviation. As a result of this search, 28 estimates of long run employment-wages elasticity were recovered. These estimates were derived directly from 1 (along with their standard errors) and from estimates of partial elasticities or systems of dynamic elasticities. Data descriptive statistics are in Table 1 below.

[Insert Table 1]

Average long run wage-employment elasticity (EWLP) is −0.37, with a standard deviation of 0.28. However, with a confidence interval of 95%, the values oscillate between −0.31 and −0.43 for wage-employment elasticity. The value of Ewlp is close to the estimates reported by Hamermesh (2004) for Latin America (including Colombia). 'Taking all the estimated elasticities together, one must infer that they reinforce the consensus estimate, −0.30, which I identified from the many studies covering mainly industrialised economies and based mainly on more highly aggregated data. That we obtain a set of estimates whose central tendency is around −0.30 is also consistent with the observation that labour's share of output is around 2/3 in a Cobb-Douglas two-factor world' (Hamermesh, 1993: 555).

The average long run standard deviation (Ewlpstd) is 0.08, with a standard deviation of 0.06. On the other hand, 32% of the estimates were published, 35% of the estimates dealt with total employment, and 64% used panel data methodology. Next, we estimate the kernel of elasticity distribution and its standard deviation, see Figure 1 below.

[Insert Figure 1]

Figure 1 shows that the distribution of wage-employment elasticity has a single mode, while the kernel of the standard deviation has at least two modes. Results of the kernel show the importance to discuss if the variance between studies is real or spurious. To accomplish that we use Forest plot.

[Insert Figure 2]

Figure 2 shows the Higgins test of heterogeneity; together with values whose null hypothesis is that the true effect is the same in all the annual studies. Higgins. et al. (2003) used an index that identified to what extent the variance is spurious and to what extent it is real. Their index is a relative scale, independent of the number of studies, ranging from zero to 100. If the index is close to zero, the observed variance is largely spurious, but if the index is close to 100, it makes sense to draw conjectures about the variance and the factors that could explain it. The value of the test was 99.4%. That is, we do not reject the null hypothesis that the effect is the same in all years.

Finally, we estimate the Funnel Plot. The Funnel plot is a weighted average, using the precision of each estimate as the weight in these cases over estimates of elasticity. Lack of symmetry in the Funnel Plot is consistent with publication bias. However, this is an informal test.

[Insert Figure 3]

Although the Funnel Plot (Figure 3) clearly shows that with no symmetries and, therefore, that, publication biases likely exist.

5. Estimation results

In estimating meta-regressions, it is first important to detect the existence of publication biases. In the presence of publication biases, any meta-regression estimates will be biased and it is important to estimate the equation (3).

Paldman (2018, 2; 2015:3 and 2018: 2) established an informal rule to obtain an approximation of the effect. It can be found by dividing the elasticity in half. Because Figure 2 shows an average wage-employment elasticity of −0.3788, the value of wage-employment elasticity is around −0.1894. That is, a 1% increase in real wages could reduce employment by 0.19%. However, given the informality of this rule, we estimated (3) using different methods to know its true value. Table 2 contains the estimation results.

[Insert Table 2]

The dependent variable in all estimates is the t of the wage-employment elasticity estimate. The second column estimates the equation robustly, while the third column estimates the effect of using an author as a cluster (Doucouliagos and Stanley, 2009: 414), to assess the dependence on the author. The fourth column estimates (2) using a random-effects, multi-level model (REML), which incorporates intra-studies dependence. The sixth column uses an empirical Bayes, and the last column is an instrumental variables estimation, where the instrument used is the inverse of the elasticity's square root of the sample size for each i-estimate.

Our results show that the constant is statistically significant and negative. That is, population biases exist and increase the value of elasticity (given that it is negative). Elasticity, regardless of the estimation method, equals about 0.112%. In other words, if real wages increase by one percentage point, then employment falls by 0.112 percentage points.[2]

Finally, a regression was estimated between t-elasticity, the standard error and the inverse of the standard error, known as the 'precision-effect estimate with standard error', or PEESE (Stanley and Doucouliagos, 2007; Doucouliagos and Stanley, 2009; Costa-i-Font, et al. 2011; Havranek, 2010). The value, calculated as −0.1330698, with a standard error of 0.0202878, is significant at 99.9%. This last value signifies that if real wages increase by 1%, then employment falls by 0.133%.

To analyse the estimation's predictive accuracy, we computed the average absolute percentage error (MAPE). MAPE is commonly used in forecasting and meta-analysis (Makridakis, Wheelwright and McGee, 1978; Rosenberger and Stanley, 2006; Doucouliagos, Paldam and Stanley, 2018). The formula of MAPE is

[2] The Egger test, which analyzes the effect of small studies, shows that the null hypothesis cannot be rejected because there are no small effects at 5%.

$$MAPE = \sum_{i=1}^{n} \left| \frac{Estimate\ Effect - |True\ Effect|}{|True\ Effect|} \right| * \frac{100}{n}$$

The results are in Table 3 below.

[Insert Table 3]

As can be seen from the percentage error, there are no significant changes, regardless of how publication bias is estimated.

5. Conclusions

One of the main questions in labour analyses is whether employment is reduced by higher real wages. In Colombia, research devoted to response to this question has resulted in the use of different methodologies, such as panel data, partial adjustment, cointegration and non-linear least squares, among others. Estimates in Colombia also incorporate industry, formal urban sectors, government services and transportation. Both qualified and unskilled workers are included.

After so many estimates, the obvious question for Colombia is: what is the wage-employment elasticity value? The estimates' average value is −0.37%. That is, using only a descriptive measure if real wages rise by 1%, then employment falls by 0.37%. However, since estimates may be skewed by publication biases, this approach may be imprecise and even biased. When corrected for publication bias, a wage gain causes an 0.11% reduction in employment. The value of this elasticity does not vary substantially with different estimation methodologies. In addition, the absolute percentage error also shows little variation.

Our results are very important although their extension to other developing countries is far from straightforward. They can throw some light not only regarding the relevant discussion on the minimum wage levels in Colombia, but also to illustrate the relationship between minimum wages, inflation and unemployment, as well as the effect of wages on the size and persistence of informality (Mora and Muro, 2017).

References

Arango, L., F. Castellani and N. Obando (2016). "It is mainly about where you work! Labor demand in the Colombian manufacturing sector," IDB working paper series No. IDB-WP-712, Inter-American Development Bank.

Arango, L., M. Gómez and C. Posada (2009), "La demanda de trabajo formal en Colombia: determinantes e implicaciones de política," Borradores de Economía No. 563, Banco de la Republica de Colombia.

Arango, C. and A. Rojas (2003), "Demanda laboral en el sector manufacturero colombiano: 1977-1999," Borradores de Economía No. 24 7, Bogotá, D. C., Banco de La República.

Card, D. and A. B. Krueger (1995a). "Time-series minimum-wage studies: a meta-analysis," *American Economic Review*, 85: 238-43.

Card, D. and A. Krueger (1995b). *Myth and measurement: The new economics of the minimum wage*. Princeton: Princeton University Press.

Cárdenas, M. and R. Bernal (2003), "Determinants of Labor Demand in Colombia: 1976-1996," NBER Working Paper No. w10077, National Bureau of Economic Research.

Cárdenas, M., R. Bernal and C. Gutiérrez (1998), "Demanda de trabajo, impuestos a la nómina y desempleo en Colombia," Fedesarrollo.

Costa-i-Font, J., F. De-Albuquerque and H. Doucouliagos (2011). "How significant are fiscal interactions in federations?: a meta-regression analysis," LSE Research Online Documents on Economics 37536, London School of Economics and Political Science, LSE Library.

Doucouliagos, H., M. Paldam and T.D. Stanley (2018). "Skating on thin evidence: Implications for public policy," *European Journal of Political Economy*, 54, 16-25.

Doucouliagos, H. and T. Stanley (2009). "Publication Selection Bias in Minimum-Wage Research? A Meta-Regression Analysis," *British Journal of Industrial Relations*, London School of Economics, 47(2): 406-28.

Egger, M., G. Davey Smith, M. Schneider and C. Minder (1997). "Bias in meta-analysis detected by a simple, graphical test," *BMJ*, 315: 629-34.

Fajnzylber, P. and W. Maloney (2001). "How comparable are labor demand elasticities across countries?" Policy Research Working Paper Series 2658, The World Bank.

Farné, S. and O. Nupía (1999), "Costos laborales, productividad, competitividad y empleo," Organización Internacional del Trabajo-Equipo Técnico Multidisciplinario para los Países Andinos-Empleo. Un desafío para Colombia, Capítulo 5, Lima, OIT.

Hamermesh, D. (1986). "The demand for labor in the long-run". In *Handbook of labour economics*, vol. 1, ed. O. Ashenfelter and R. Layard. Princeton, N.J.: North Holland.

Hamermesh, D. (1993). "Labor Demand and the Source of Adjustment Costs," NBER Working Papers 4394, National Bureau of Economic Research, Inc.

Havranek, T. and Z. Irsova (2010). "Which Foreigners are Worth Wooing? A Meta-Analysis of Vertical Spillovers from FDI," William Davidson Institute Working Papers Series wp996, William Davidson Institute at the University of Michigan.

Henao, M. and E. Lora (1995), "La estrategia de empleo de El Salto Social," *El Salto Social en Discusión*, Bogotá, Fedesarrollo-TM Editores, 165-80.

Isaza J., and C. Meza (2004), "Cambios estructurales de la demanda de trabajo en Colombia," Observatorio de la Economía Latinoamericana, 36.

Makridakis, S., S. Wheelwright and V. McGee (1978). *Forecasting: methods and applications*, Wiley, Santa Barbara, Calif.

Maloney, W. and P. Fajnzylber (2002), "Labor Demand and Trade Reform in Latin America," World Bank, Poverty Reduction and Economic Management Unit, Latin America and

Caribbean Region, Policy Research Working Paper Series No. 2491. Washington, The World Bank.

Medina, C., C. Posso, J. Tamayo and E. Monsalve (2012). "Dinámica de la Demanda Laboral en la Industria Manufacturera Colombiana 1993-2009: una Estimación Panel VAR," Borradores de Economía No. 694, Banco de la Republica de Colombia.

Mora, J. J. and J. Muro (2015). “On the Size of Sheepskin Effects: A Meta-Analysis,” *Economics: The Open-Access, Open-Assessment E-Journal*, 9(2015-37):1–18.

Mora, J. J. and J. Muro (2017), “Dynamic effects of the minimum wage on informality in Colombia,” *Labour*, 31:59-72.

Núñez, L. and J. Ramírez (2000), "Reformas, crecimiento, progreso técnico y empleo en Colombia,” Serie Reformas Económicas No. 59, CEPAL.

Paldam, M. (2015). "Meta-analysis in a nutshell: Techniques and general findings,” Economics Discussion Papers 2015-3, Kiel Institute for the World Economy (IfW).

Roberts, M. and E. Skoufias (1997), “The Long-Run Demand for Skilled and Unskilled Labor in Colombian Manufacturing Plants,” *Review of Economics and Statistics*, 79(2):330-4.

Rodríguez, J. (2013) "Determinantes de la Demanda de empleo en el sector Manufacturero Colombiano: 2000-2010," *Lecturas de Economía* No. 79, Universidad de Antioquia.

Rosenberger, R. and T. Stanley (2006). “Measurement, generalization, and publication: Sources of error in benefit transfers and their management,” *Ecological Economics*, 60(2):372-8.

Ruiz, D. (1998). “Costos de ajuste en la demanda de mano de obra colombiana,” *Desarrollo y Sociedad*, 42, 81-113.

Stanley, T. (2005). “Beyond publication bias,” *Journal of Economic Surveys*, 19(3), 309-345.

Stanley, T. (2008). “Meta-regression methods for detecting and estimating empirical effects in the presence of publication selection,” *Oxford Bulletin of Economics and Statistics*, 70(1), 103-27.

Stanley, T. D., H. Doucouliagos, M. Giles, J. H. Heckemeyer, R. J. Johnston, P. Laroche, J. P. Nelson, M. Paldam, J. Poot, G. Pugh, R. Rosenberger, and S. R, Katja. (2013), "Meta-Analysis of Economics Research Reporting Guidelines," *Journal of Economic Surveys*, 27(2), 390-4.

Vivas, A., S. Farné and D. Urbano (1998), "Estimaciones de Funciones de Demanda de Trabajo Dinámicas para la Economía Colombiana," Archivos de Economía No. 92, Bogotá, Departamento Nacional de Planeación.

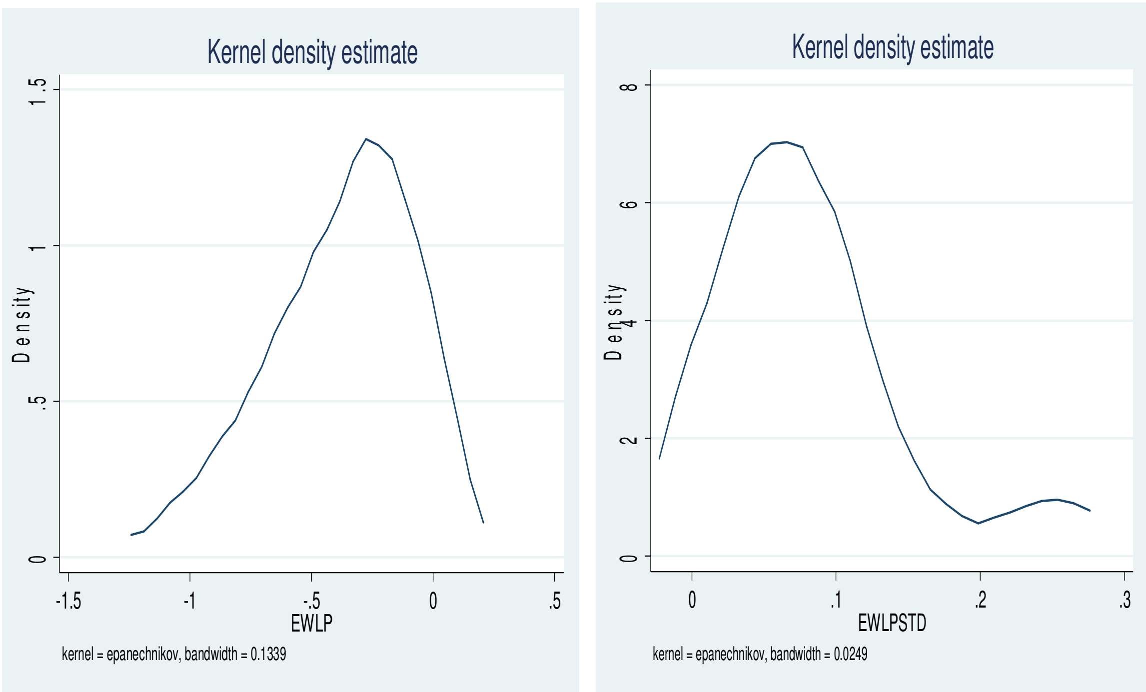
Zerda, A. (1997), Diagnostico y perspectivas del empleo industrial (Octubre). Multicopiado.

Table 1. Descriptive statistics of Elasticity estimates**.**

Variable	**Observations**	**Mean**	**Std. Dev.**
LRWEE	**28**	**−0.3788857**	**0.2897036**
LRWEEstd	**28**	**0.0805204**	**0.0641743**
Published	**28**	**0.3214286**	**0.4755949**
Total employment	**28**	**0.3571429**	**0.48795**
Panel	**28**	**0.6428571**	**0.48795**
Methodology			

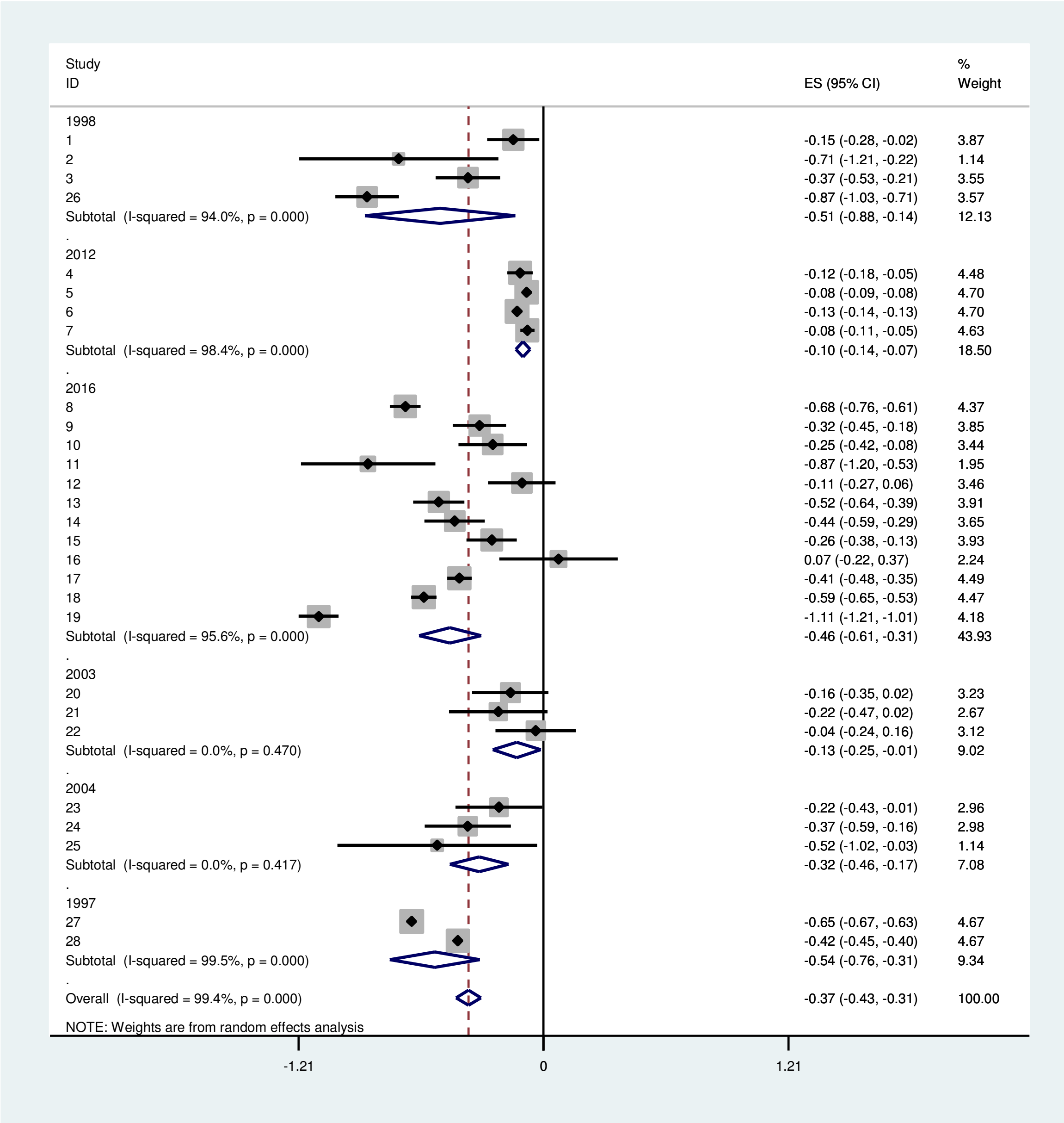
Source: Authors' computation.

Figure 1. Kernel of Elasticity and the Standard Deviation



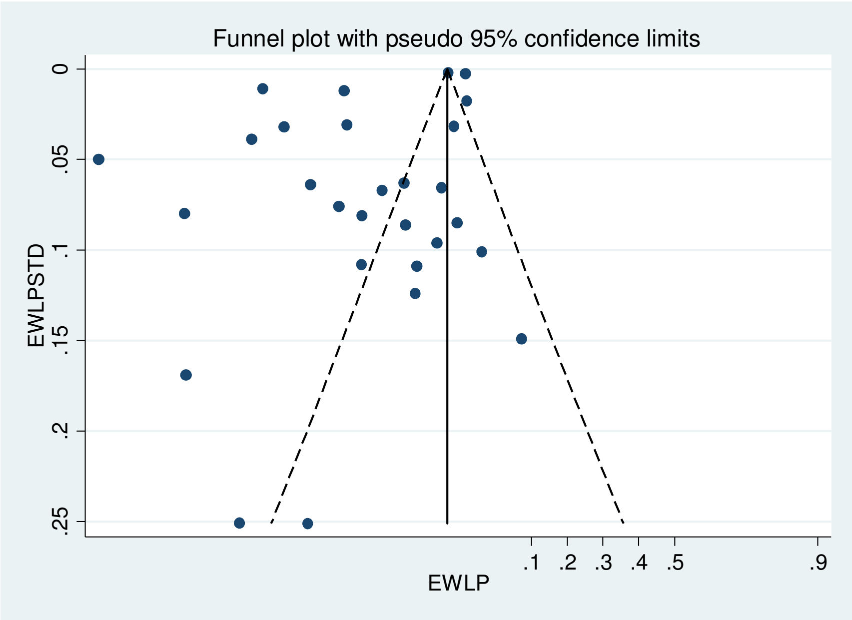
Source: Authors' computation.

Figure 2. Forest Plot.



Source: Authors' computation.

Figure 3. Funnel Plot.



Source: Authors' computation.

Table 2. Estimated Publication Biases and the True Values of Elasticity.

Variable	Publ. Bias	Publ. Bias [Robust]	Publ. Bias [Clustered Authors]	Publ. Bias [REML]	Publ. Bias [EB]	Publ. Bias [IV Robust]
(Wage-Employment Elasticity)	−0.112080***	−0.112080***	−0.112080***	−0.112078***	−0.112078***	−0.11208***
	(0.02032)	(0.019846)	(0.0179546)	(0.0203259)	(0.0203252)	(0.01912)
Constant	−6.1701**	−6.1701***	−6.1701***	−6.1705***	−6.1705***	−6.1701***
	(2.36903)	(1.901917)	(2.386904)	(2.369203)	(2.369122)	(1.8327)
Adj. R^2	0.5391	0.5391	0.5391	0.5213	0.5213	0.5391
Number of Cases	28	28	28	28	28	28

Source: Authors' computation. Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 3. MAPE.

Variable	Observations	Mean	Std. Dev.
MAPEPB	28	104.4644	145.7278
MAPEPBR	28	104.4644	145.7278
MAPECA	28	104.4644	145.7278
MAPEREML	28	104.4644	145.7278
MAPEEB	28	104.4656	145.7294
MAPEIV	28	104.4644	145.7278

Source: Authors' computation.

Relación de títulos publicados en la colección ALCAMENTOS.

Nº	Autor/es	Título
0801	Juan Muro Cristina Suárez Maria del Mar Zamora	The impact of e-commerce on the tourist purchase decision: An empirical micro analysis
0802	Jhon James Mora Juan Muro	Diploma earning differences by gender in Colombia
0803	José Mª Arranz Ana I. Gil	Alcoholic beverages as determinants of traffic fatalities
0804	Juan Muro Cristina Suárez María del Mar Zamora	A note on computing Murphy-Topel corrected variances in a heckprobit model with endogeneity in Stata
0805	Elena López Rigoberto A. López	Demand for differentiated milk products: Implications for price competition
0806	Pablo Alonso González Irene Albarrán Lozano	Long term care in Spain: Extent, costs and challenges
0901	Rigoberto A. López Elena López Carmen Liron-Espana	When is concentration beneficial? Evidence from U.S. manufacturing
0902	Pablo Alonso González Irene Albarrán Lozano	Private long term care insurance: Theoretical approach and results applied to the Spanish case
0903	Cecilia Albert Verdú María A. Davia Rodríguez	Monetary poverty, education exclusion and material deprivation amongst youth in Spain
1001	Jhon James Mora Juan Muro	A cohort-based analysis of the influence of minimum wages levels on labor force participation in the informal sector: quantitative and substitution effects
1002	Ana Karina Alfaro José Javier Núñez	The Spanish technical change: A regional and a dynamic analysis (1994-2007)
1101	Juan Muro	Dual Farrell measures of efficiency
1201	José Mª Arranz Carlos García-Serrano Virginia Hernanz	How do we pursue labormetrics? An application using the MCVL
1301	Juan Muro Joaquín Vera	Homotheticity, duality and efficiency measures
1401	Jhon James Mora Juan Muro	On the size of sheepskin effects: A meta-analysis
1402	Carlos Giovanni González Espitia Natalia Serna Borrero	A discrete choice model approximation to the consumer’s choice among television displays