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Long-term relationship and asymmetric effects of inflation and exchange rates shocks on the minimum wage in Iran: Nonlinear ARDL approach

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Extensive abstract:

Introduction:

Due to the vital role of the labor force in the process of economic growth and to prevent employers from paying unfair wages, governments implement the minimum wage policy based on Recommendation No. 135 of the International Labor Organization. However, how to apply this policy, despite the fact that it occupies a large volume of articles, academic discourses and the concerns of statesmen, may not have satisfactory results and sometimes if the government is unable to To control the prices, the profit of its implementation will go to the producers rather than the workers. In addition to the above, with the increasing expansion of international trade, understanding the effect of exchange rate fluctuations is very necessary and effective for all economies of societies (Goldberg and Tracy, 2000) and the role of the US dollar as the most common foreign currency on the economy of all countries. The countries of the world, especially oil exporting countries, have become much more than before. Considering the importance of the above, many studies have been conducted in the country regarding the effects of exchange rate deviation and exchange rate transition on the price of imported goods and the basket of consumer goods and the effect of the relationship between the minimum wage and other macroeconomic variables

such as inflation, employment and unemployment. but despite the severe and unpredictable shocks of inflation and exchange rate on the country's economy, no special study has been done regarding the impact of these shocks on the minimum wage.

For this purpose, the present study seeks to investigate the long-term relationship and asymmetric effects of inflation rate and exchange rate shocks on the minimum wage of the Iranian economy during the period of 2015-2017.

METHODOLOGY :

Here, before any article, in order to express the approach and introduce the variables, a brief reference is made to the method of estimating the variables in the research by Goldberg and Tracy. They assumed that equation 4a is a function of the worker's individual characteristics, including age, education, race, marital status, etc., as well as vector variables $\boldsymbol{V_t^{jr}}$, $\boldsymbol{V_t^{jr}}$ and $\boldsymbol{Y_t}$ which include the industry-specific exchange rate and a measure of the relative demand shock of the local labor market. is used, and $\boldsymbol{Y_t}$ also shows the entire business cycles by real GDP.

In addition to this, the model used in this research was based on the panel data approach, in which the error sentence was modeled using the structure of error components and individual error components, industry error and region-specific error, as well as industry-specific and individual-specific time trends respectively with $\mu_1^{\boldsymbol{i}}$ ، $\mu_1^{\boldsymbol{j}}$ ، $\mu_1^{\boldsymbol{r}}$ ، $\mu_2^{\boldsymbol{i}}.\boldsymbol{t}$ $\mu_2^{\boldsymbol{j}}.\boldsymbol{t}$ is shown.[1]

[1] Therefore, relation 4a is rewritten to express the logarithm of the wage of a worker who works in industry j and lives in region r at time t as the following relation:

$$W_t^{ijr} = Z_t^i\beta + V_t^{jr}\gamma + Y_t\delta + \mu_1^i + \mu_1^j + \mu_1^r + \mu_2^i t + \mu_2^j t + \varepsilon_t^i$$

Since the sum of real wages of the industry, exchange rates specific to each industry and real GDP tend to have a unit root, it will be problematic to use the exact features of relation (7) to estimate wage elasticity. To deal with this issue, the following panel structure has been used.

$$\Delta W_t^{ijr} = \Delta Z_t^i\beta + \Delta V_t^{jr}\gamma + \Delta Y_t\delta + \mu_2^i + \mu_2^j + \Delta\varepsilon_t^i$$

According to the above equation, all the error components are lost, but the specific time trends of each industry and each person, which create the individual and industry-specific error components, are included in the wage growth rate and using the component The industry fixed effects, industry-specific error residuals (μ_2^j) are controlled, but individual-specific error components (μ_2^i) remain as part of the combined specific error. This estimate provides information about the results of changes in exchange rate flows on the average wage and other variables in the model.

Therefore, in the current study, inspired by the variables introduced in the Goldberg and Tracy model, as well as the existing and available data, the three variables of inflation, exchange rate, and gross domestic product are used as factors affecting the minimum wage. Therefore, this article is different from Goldberg and Tracy's article in terms of econometric approach. Since the purpose of this study is to investigate the long-term relationship and asymmetric effects of inflation and exchange rate shocks on the minimum wage in Iran, the autoregressive approach with non-linear distributional lag (NARDL) is used.Although, in past studies, several methods such as Engel Granger, Johanson, linear ARDL, etc. have been used to investigate the long-term relationship between variables. In addition to this, the studied time period was during the years 1365-1997, and the coefficients were estimated using Eviews software.

Due to the removal and addition of the GDP variable to the model and the non-significance of its coefficients and the lack of improvement in assumptions and the significant decrease of the model coefficients, the GDP variable (it had no additional and significant explanatory power in the model) has been removed from the model. To specify the model, Ramzi test has been used.

NARDL models

The NARDL method is a special form of the linear ARDL method (Posran et al., 2001), which provides the possibility of examining the asymmetry and nonlinear relationships between variables in the short-term and long-term. The advantage of this method is its use in observations with a small number (Narayan, 2004), which correctly calculates the asymmetric effects of the shocks of the explanatory variables on the dependent variable, regardless of whether the variables are I(0) or I(1). In this study, after specifying the model, the effect of the inflation rate and the unofficial rate of the US dollar on the minimum wage is investigated in the following regression model:

$$LMW_t=\beta_0+\beta_1 Inf_t+\beta_2 LDoller_t+\varepsilon_t$$

LMW: Logarithm of the minimum wage rate
Inf: inflation rate and : LDoller is the logarithm of the unofficial rate of the US dollar.

The data in this study are annual and have been collected using the library method by referring to the website of Central Bank of Iran. By using the Hodrick-Prescott filter, the time trend of the inflation rate and the unofficial dollar rate have been separated, and after deducting them from the relevant data, the annual values of the inflation and exchange rate shocks have been compiled.

Regression equation number (9) is a long-term model and the estimated regression coefficients show the long-term effects of the explanatory variables on the dependent variable without considering positive and negative shocks. To examine the short-term effects of these variables, the short-term dynamic adjustment process of the above equation should be corrected in the form of the following equation:

$$\Delta LMW_t = \alpha_0 + \alpha_1 LMW_{t-1} + \alpha_2 Inf_{t-1} + \alpha_3 LDoller_{t-1} + \sum_{i=0}^{n} \gamma_{1i}\, \Delta Inf^{+}_{t-i} + \sum_{i=0}^{n} \gamma_{2i}\, \Delta Inf^{-}_{t-i} + \sum_{i=0}^{n} \gamma_{3i}\, \Delta LDoller^{+}_{t-i} + \sum_{i=0}^{n} \gamma_{4i}\, \Delta LDoller^{-}_{t-i} + U_t$$

Using Hodrick-Prescott filter, the size of the time trend (predictable shocks) of both explanatory variables are calculated and are called HP INF and HP LDOLLER, respectively. By subtracting these variables from the main variables, their unexpected shocks are obtained. Now considering that:

$$S\,Inf_t = Inf_t - HP\,Inf \quad ,$$

$$S\,LDollar_t = LDollar - HP\,LDollar$$

Now, each of the explanatory variables are divided into positive and negative shocks based on the following relations according to their positive and negative fluctuations:

$$POS\,Inf = Inf^{+} = \sum_{i=1}^{t} \Delta Inf^{+} = \sum_{i=1}^{t} max(S\,Inf_i, 0)$$

$$NEG\ Inf = Inf^{-} = \sum_{i=1}^{t} \Delta Inf^{-} = \sum_{i=1}^{t} min(S\ Inf_i, 0)$$

$$POS\ LDollar = LDollar^{+} = \sum_{i=1}^{t} \Delta LDollar^{+} = \sum_{i=1}^{t} max(S\ LDollar_i, 0)$$

$$NEG\ LDollar{=}LDollar^{-} = \sum_{i=1}^{t} \Delta LDollar^{-} = \sum_{i=1}^{t} min(S\ LDollar_i, 0)$$

Now, by replacing the positive and negative components of the inflation rate shocks and the unofficial dollar rate in the relevant relationship, the following model is obtained according to the NARDL approach introduced by Shin in 2013:

$$\begin{aligned}\Delta LMW_t = {} & \alpha_0 + \alpha_1 LMW_{t-1} + \alpha_2 Inf^{+}_{t-1} + \alpha_3 Inf^{-}_{t-1} + \alpha_4 LDoller^{+}_{t-1} \\ & + \alpha_5 LDoller^{-}_{t-1} \\ & + \sum_{i=0}^{n} \gamma_{1i} \Delta Inf^{+}_{t-i} \\ & + \sum_{i=0}^{n} \gamma_{2i} \Delta Inf^{-}_{t-i} \\ & + \sum_{i=0}^{n} \gamma_{3i} \Delta LDoller^{+}_{t-i} + \sum_{i=o}^{n} \gamma_{4i} \Delta LDoller^{-}_{t-i} + U_t\end{aligned}$$

The above-mentioned error correction model, including the separation of variables into positive and negative components, is called the NARDL or non-linear ARDL method. Considering these variables, it is possible to examine the asymmetry of inflationary shocks and changes in the dollar rate on the minimum wage. Based on the method suggested by Pesaran et al. (2001), the F test is used for intermittent variables as a reason for the existence of a long-term relationship (collinearity), and based on this argument, the bound test is presented. It is noteworthy that the F statistic in this test has different critical values, the table of which was prepared and presented by the boys. Shin (2013) proved and used Son's limit test in equations like above equation.

FINDINGS :

The obtained results show that in the long run, there is a significant relationship between the positive shock of inflation and the negative shock of the unofficial dollar rate with the minimum wage in Iran, so that every one percent change in the positive shock of inflation causes an increase. .5 percent in the daily minimum wage rate and every one percent change in the negative shock of the unofficial dollar rate has caused it to decrease by 9.73 percent. In addition, due to the rejection of the hypothesis $\mathbf{H_0}$ in the Wald test for each of the variables of inflation and unofficial dollar rate, the effect of positive and negative shocks of these variables on the daily minimum wage is asymmetric.

CONCLUSION :

According to the note of Article 41 of the Labor Law, the inflation rate announced by the Central Bank is one of the basic things in determining the minimum wage. The positive and significant coefficient of positive inflation rate shocks in Table No. 6 also confirms this. On the other hand, the impact of the negative shocks of the unofficial dollar rate is also negative and significant, but considering that less negative shocks (caused by the unofficial dollar rate) have entered the country's economy, the negative impact of these shocks is due to The wide changes of the positive inflationary shocks have been neutralized and the upward trend of the daily minimum wage rate in the time period under investigation confirms this issue.

Since the increase in wages, without raising the productivity of the labor force, based on the price-wage spiral theory, has been one of the influential factors in the inflation in the society; Therefore, in order to motivate the workforce as much as possible to improve their skills, it is suggested that the implementation of the job classification plan in workshops with a workforce of less than 50 people be made mandatory and a part of the subsidies that are considered to support production In order to increase the technical knowledge of workers, especially in industries with low labor productivity, it should be spent.

The government should also effectively prevent extreme fluctuations in the exchange rate with the cooperation and continuous supervision of the central bank in order to reduce the purchasing power of the labor force and subsequently reduce the expectations of the wage increase of the working communities. In addition, considering the different costs of living in the cities and regions of the country, as well as the different productivity rates in various industries, in order to achieve a fairer distribution of income at the

community level and support production and employment, it is suggested as which is foreseen in Article 41 of the Labor Law and has been implemented in some years, the Supreme Labor Council can set different wage rates for different regions and industries.
In areas with higher unemployment rates, the government can provide support policies such as paying a part of the labor force's wages for a certain period, accepting a part of insurance costs, various tax discounts, etc. Encouraging people to invest in these areas.

Reference

Abbasian, E., Moradpour Auladi, M., & Mehregan, N.(2012).The effects of real exchange rate uncertainty on economic growth in Iran.*Journal of Economic Research (Tahghighat-e-Eghtesadi)*, 47(1), 153–169.https://doi.org/10.22059/jte.2012.24677 (in Persian)

Abbasinejad, H., Tashkini, A., Rahmani, T., & Setayesh, H.(2013).The interactions between minimum wage and inflation in Iran's economy.*Journal of Economic Research (Tahghighat-e-Eghtesadi)*, 48(2), 65–86.https://doi.org/10.22059/jte.2013.35168 (in Persian)

Abdoli, G., & Gholami, A.(2011).Game theory approach on determining exchange and wage rate: Empirical study in Iran.*Journal of Economic Research (Tahghighat-e-Eghtesadi)*, 46(4), 85–117.Retrieved from https://jte.ut.ac.ir/article_24319_65d9c15c250ac2ad69f2334b375ab7e3.pdf (in Persian)

Ansarinasab, M., & Pas, P.(2022).Investigating the rate of transfer of regime in the asymmetric effect of exchange rate on Iran's non-oil exports.*Quarterly Journal of Quantitative Economics (JQE)*, 18(4), 93–124. (in Persian)

Anvari, E. , moradi, P. and Arman, S. A. (2024). The Effect of cross-over effect of positive and negative monetary regimes on the incomplete and asymmetric Degree of Exchange Rate Pass-Through with: NARDL and Markov-switching Method. *Quarterly Journal of Quantitative*

Economics (JQE), 21(2), 127-159. doi: 10.22055/jqe.2021.36717.2351 (in Persian).

Arman, S.A., Kafili, V., & Ghornabn Nehjad, M.(2015).Bilateral relationship between the minimum wage and unemployment.*Journal of Applied Economics Studies in Iran*, 3(12), 221–236.Retrieved from https://aes.basu.ac.ir/article_1008_9c3fcb426b355d53802792937b5caafd.pdf (in Persian)

Babaie, M., Tavakolian, H., & Shakeri, A.(2018).Determinants of inflation forecast: A dynamic model averaging approach.*Economics Research*, 18(71), 261–311.https://doi.org/10.22054/joer.2018.9835 (in Persian)

Bastos, P., & Wright, P.W.(2010).Exchange rates and wages in unionised labour markets.*SSRN Electronic Journal*.https://doi.org/10.2139/ssrn.1621699

Branson, W.H.(2011).*Theories and policies of macroeconomics* (A.Shakeri, Trans., 16th ed.).Tehran: Nashr-e Shakeri.(Original work published in English) (in Persian)

Brito, A.S., & Kerstenetzky, C.L.(2019).Has the minimum wage policy been important for reducing poverty in Brazil? A decomposition analysis for the period from 2002 to 2013.*EconomiA*, 20(1), 27–43.https://doi.org/10.1016/j.econ.2019.01.001

Demir, F.(2010).Exchange rate volatility and employment growth in developing countries: Evidence from Turkey.*World Development*, 38(8), 1127–1140.https://doi.org/10.1016/j.worlddev.2010.02.006

Dustmann, C., Lindner, A., Schönberg, U., Umkehrer, M., & Vom Berge, P.(2022).Reallocation effects of the minimum wage.*The Quarterly Journal of Economics*, 137(1), 267–328.https://doi.org/10.1093/qje/qjab029

Ebadi, J., & Pasebani Someeh, A.(2013).The main factors affecting the fair wage in Akerlof's theory test.*Journal of Economic Research*

(Tahghighat-e-Eghtesadi), 48(4), 91–117.https://doi.org/10.22059/jte.2013.50576 (in Persian)

Ebrahimi, M., & Chakarzehy, A.(2015).The relationship between inflation, unemployment and crime rates in Iran.*Strategic Research on Social Problems in Iran*, 4(2), 113–127.Retrieved from https://ssoss.ui.ac.ir/article_17129_a5d9c2291bf7671136f275505a9b4103.pdf (in Persian)

Ezzati Shourgholi, A., & Khodavaisi, H.(2019).Investigating the asymmetric exchange rate pass-through to domestic prices.*Economic Strategy*, 8(30), 161–200.Retrieved from http://econrahbord.csr.ir/article_105761_8c2a4fd15c769013161f2aed9ffa6ac7.pdf (in Persian)

Feldmann, H.(2011).The unemployment effect of exchange rate volatility in industrial countries.*Economics Letters*, 111(3), 268–271.https://doi.org/10.1016/j.econlet.2011.02.015

Goldberg, L.S., & Tracy, J.(2001).Exchange rates and wages.*NBER Working Paper Series*.https://doi.org/10.3386/w8137

Grigorian, D., Sargsyan, G., & Khachatryan, A.(2004).*Exchange rate, money, and wages: What is driving prices in Armenia?* Washington, DC: International Monetary Fund.

Gujarati, D.N.(2011).*Fundamentals of econometrics* (H.Silk, Trans., 7th ed.).Tehran: University of Tehran Publishing Institute.(Original work published in English) (in Persian)

Harasztosi, P., & Lindner, A.(2019).Who pays for the minimum wage? *American Economic Review*, 109(8), 2693–2727.https://doi.org/10.1257/aer.20171445

Harrison, A., & Leamer, E.(1997).Labor markets in developing countries: An agenda for research.*Journal of Labor Economics*, 15(3), S1–S9.https://doi.org/10.1086/209855

Isazadeh, S., & Mohammadi, A.(2013).Study of the relation of minimum wage on poverty in Iran.*Journal of Applied Economics Studies in Iran*, 2(5), 121–143.Retrieved from https://aes.basu.ac.ir/article_394_909d201a88a921d081d30ea3ed1c0c6a.pdf (in Persian)

Kazerooni, A., & Solaimani Alvang, F.(2015).Degree of exchange rate pass-through on consumer prices under exchange rate misalignment: The case study of Iran.*Journal of Economic Research (Tahghighat-e-Eghtesadi)*, 50(1), 169–192.https://doi.org/10.22059/jte.2015.54101 (in Persian)

Kiliç, R.(2016).Regime-dependent exchange-rate pass-through to import prices.*International Review of Economics & Finance*, 41, 295–308.https://doi.org/10.1016/j.iref.2015.08.005

Lastrapes, W.D.(1992).Sources of fluctuations in real and nominal exchange rates.*The Review of Economics and Statistics*, 74(3), 530–539.https://doi.org/10.2307/2109493

Lin, P.C., & Wu, C.S.(2012).Exchange rate pass-through in deflation: The case of Taiwan.*International Review of Economics & Finance*, 22(1), 101–111.https://doi.org/10.1016/j.iref.2011.09.001

López-Villavicencio, A., & Mignon, V.(2017).Exchange rate pass-through in emerging countries: Do the inflation environment, monetary policy regime and central bank behavior matter? *Journal of International Money and Finance*, 79, 20–38.https://doi.org/10.1016/j.jimonfin.2017.09.001

Mahdiloo, A., & Asgharpur, H.(2020).Nonlinear transmission mechanism of monetary policy from exchange rate channel in Iran: (MS-VAR) approach.*Quarterly Journal of Quantitative Economics (JQE)*, 17(1), 121–153.(in Persian)

Manzoor, D., & Bahaulluh Hore, M.(2015).Analyzing the impact of increasing minimum wage on skilled and unskilled labor in Iran: A

CGE approach.*Quarterly Journal of Quantitative Economics*, 12(3), 69–93.https://doi.org/10.22055/jqe.2015.11894 (in Persian)

Mehregan, N., & Rezaee, R.(2010).Does minimum wage cause inflation? *Journal of Economic Research (Tahghighat-e-Eghtesadi)*, 44(1).Retrieved from https://jte.ut.ac.ir/article_19982_022411eefc6c551d1f777f9682345908.pdf (in Persian)

Mohammadi, M., & Mahdavi, G.(2013).Economic-juridical analysis on the legitimacy of compensation of devaluation in purchasing power of money.*Iranian Journal of Economic Research*, 18(55), 119–139.Retrieved from https://ijer.atu.ac.ir/article_2517_38e25a90d05c286e718abb7fcb20bb64.pdf (in Persian)

Mozayani, A.H., & Ghorbani, S.(2019).Study of trend and nature of real exchange rate deviation in Iran economy.*Journal of Economic Research (Tahghighat-e-Eghtesadi)*, 54(1), 173–207.https://doi.org/10.22059/jte.2019.247119.1007776 (in Persian)

Najafi Kajabad, Q.(2011).A look at the methods of determining the minimum wage and its implementation methods in some countries and Iran.*Journal of Labor and Society Research*, 137, 58–68.Retrieved from http://ensani.ir/fa/article/302442 (in Persian)

Narayan, P.(2004).Reformulating critical values for the bounds F-statistics approach to cointegration: An application to the tourism demand model for Fiji.Monash University, Australia.

Nasirifar, E., Hojabr Kiani, K., Hosseini, S.S., & Ghafari, F.(2019).Investigating asymmetric effects of monetary shocks on the production and employment in automotive industry: Non-linear ARDL approach.*Journal of Econometric Modelling*, 4(4), 9–29.https://doi.org/10.22075/jem.2019.18648.1372 (in Persian)

Nasrallahi, K., & Shajari, H.(2002).Theory of equality of purchasing power and the structure of the foreign exchange market in Iran.*Research on*

Sustainable Growth and Development (The Economic Research), 5–6(2), 169–208.Retrieved from https://www.sid.ir/paper/419824/fa (in Persian)

Ozkan, I., & Erden, L.(2015).Time-varying nature and macroeconomic determinants of exchange rate pass-through.*International Review of Economics & Finance*, 38, 56–66.https://doi.org/10.1016/j.iref.2015.01.011

Pérez, J.P.(2020).The minimum wage in formal and informal sectors: Evidence from an inflation shock.*World Development*, 133, 104999.https://doi.org/10.1016/j.worlddev.2020.104999

Pesaran, M.H., Shin, Y., & Smith, R.J.(2001).Bounds testing approaches to the analysis of level relationships.*Journal of Applied Econometrics*, 16(3), 289–326.https://doi.org/10.1002/jae.616

Pordel, P. & Esfandiari, M. (2024). The Effect of Economic Policy Uncertainty on Oil Prices (Case Study: OPEC Countries). *Quarterly Journal of Quantitative Economics (JQE), 21*(1), 63-85. doi: 10.22055/jqe.2022.39326.2441 (in Persian).

Rasooli, R.(2011).*Human resource management* (Vol.4).Tehran: Payame Noor University Press.(in Persian)

Seok, B.H., & You, H.M.(2022).Macroeconomic impacts of increasing the minimum wage: The case of Korea.*Economic Modelling*, 113, 105880.https://doi.org/10.1016/j.econmod.2022.105880

Shakeri, A.(2010).*Microeconomics 2* (Vol.5).Tehran: Ney Press.(in Persian)

Snowdon, B., Vane, H.R., & Wynarczyk, P.(1994).*A modern guide to macroeconomics*.Cheltenham: Edward Elgar.

Volscho Jr, T.W.(2005).Minimum wages and income inequality in the American states, 1960–2000.*Research in Social Stratification and Mobility*, 23, 343–368.https://doi.org/10.1016/S0276-5624(05)23010-5

Wadsworth, J.(2010).Did the national minimum wage affect UK prices? *Fiscal Studies*, 31(1), 81–120.https://doi.org/10.1111/j.1475-5890.2010.00107.x

Wang, T.(2004).*China: Sources of real exchange rate fluctuations*.Washington, DC: International Monetary Fund.