Original Research Article

The Effect of Exports on Employment in Iran's Economy

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Abstract

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Employment has been one of the key issues for countries in recent decades. Employment can have far-reaching effects on social, political and economic relations in any society, so the improvement of employment in a society can lead to growth and development, as well as solving current issues. Therefore, identifying influential factors on employment and the mechanism of the influence is of importance. Numerous factors such as export and wage level can influence employment and unemployment rate. An increase in export would increase demand, and this would lead to an increase in wage levels and employment. By encouraging export, domestic products would enter international competition for growth, and from this viewpoint, free trade through static and dynamic interests would lead to an increase in production and economic welfare. Therefore, this study analyses the effect of export on total employment in Iran via autoregressive-distributed lag modeling for 1976-2005. The results of the estimations reveal that in the studied period, export and wages had a positive and significant effect on Iran employment in long term and exchange rate and long term interest rate had negative effect on employment.

Keywords: Export, Employment, ARDL, Economy, Iran.
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INTRODUCTION

One of the key issues in economics is the appropriate mobilization of skills and talents of human resources in a society. Employment plays a crucial role in the dynamism of a person's life, and it can be viewed as the focal point of human and social relations. Every society seeks the maximization of social welfare, and social welfare is dependent on per capita income, fair distribution of income, improvement of education, health and welfare facilities and social, economic, cultural and political participation of men and women. A society with higher employment and economic opportunities would benefit from higher social welfare, because participation in the business market would increase production, per capita income and ultimately total social welfare, and accelerate economic development. On the contrary, unequal and limited access to employment and income opportunities in forms of unemployment and underemployment are

among main reasons of poverty. Developing countries should pay due attention to this matter should they seek the acceleration of development, because development comprises harmonious changes in the economy and social structures for the deployment of a just system and the improvement of quality of life for people (Aswicahyono and Brooks, 2011). Also, it should be noted that employment, in specific definition, means correspondence between human resources and job opportunities and the appropriateness of these resources with professions and existing activities in a society; also, geographical and job mobilization should always adapt workforce to changes in supply and demand, balance employment and prevent underemployment and unemployment. Thus, every citizen has the right to ask the government for the opportunity for a productive and beneficial employment to provide the needed products

and services to the society and instead, the government is bound to provide opportunities of participation and employment for the society according to supply and demand and individual skills and talents so that a person can reveal creativity and innovation and have a sense of usefulness in society. Hence, not having access to an appropriate job or the lack of job promotion would have negative effects on their position and income, as well as many social factors such as poverty and diseases. Therefore, considering employment and the influencing factors on employment is of extreme importance. Thus, the present paper seeks to study the effects of export on employment in Iran's economy.

Theoretical Background

As labour markets continue to be under intense strain across the world's main economies, policymakers take up ever greater interest in the role of trade and export in promoting job creation. While the relationship between trade and and employment is intricate and does not lend itself to be conveyed in simple terms, this analysis puts forward a number of elements to improve the communication of the positive impact of trade and export on the creation of new jobs opportunities(Sousa and others, 2012). Neoclassical economists argue that macroeconomic variables and labor market institutions - rather than trade policy - affect long run unemployment (Elshennawy and Said, 2010).Today, utilizing maximum active work force is a necessity to reach full employment. The exponents of the classic school of thought propose that lack of balance between supply and demand of work force in business markets is temporary due perfect and clear information, as well as the flexibility of prices and wages. Job supply is a function of purchasing power and real wages, and job demand is a function of real wages. Keynesians opposing this theory propose that because of unions and money illusion, whenever there is a decrease in wages, workers would react, but they are not sensitive to price increase when wages are fixed. Thus, there is never full employment because of the inflexibility of prices and wages and the involuntary unemployment occurring. Exponents of this school of thought emphasize on policies for managing demand and believe that demand would create due supply and emphasize that it is possible to increase employment and national product through creating increases in total demand level. Moreover, fluctuations in employment and unemployment are related to fluctuations in demand in a way that fluctuations in demand can change production levels, and consequently, would change employment. They believe that recession and the lack of adequate effective demand are the reasons for unemployment. By influencing demand, the government can create grounds for job creation and job creation is possible through bringing about increase in total demand (Branson, 1997).

The export of a country is an economic indicator which points out the amount of economic relations of a given country with the global economy. Export is the driving force for economic development of countries and has numerous benefits, among which are the creation of foreign currency income to support import needs of the country or implementing economic development programs, job creation or new job opportunities, improving the quality of products, reducing the cost of production due to full capacity production and gaining international reputation in order to strengthen economic ground .Also, increase in export capacity would increase domestic product and employment level in various fields (agriculture, industry, mining, etc.), improvement in quality and increase competition due to higher supply capacity and better products and the balance of payments for countries. Growth in the export of raw materials would also increase the growth of industries by increasing demand for domestic inputs and services, increasing workers' income and consequently, increasing their demand (Xu, 2000). Thus, export plays a crucial role in the selection of economic development strategy and therefore, any change in the amount of export would influence domestic products, and ultimately, growth, development and the advancement of employment.

Literature Review

Sousa and others (2012) studied the relation between EU export and employment in period 2000-2007. In addition study finds that that the exports of goods and services to the rest of the world supported around 25 million jobs in Europe in 2007 (an increase of 3 million since 2000). Two main additional insights stand out from this analysis: the importance of the complementary relation between the Single Market and external trade for job creation in Europe, and the servicification of the employment supported by exports.

Von Uexkull (2012) tries to analyze regional trade and employment in ECOWAS. It finds that both regional and global exporters are larger, have higher labour productivity, and pay higher wages compared to domestic firms, but are not significantly different from one another in these categories. This means that regional exporters create high quality jobs, but in the context of firm level trade models it also suggests that they continue to face high trade costs which may prevent less productive firms from entering the regional market.

Lapadre (2011) has studied the relation between trade and employment and wage levels in Italy via panel data for 1999-2008. He concluded that major implemented policies in Italy help the correspondence and compatibility of employment and wage levels against foreign shocks.

Compus and Rodriguez (2011) studied the effects of free trade on employment in Mexico after joining NAFTA for 1992-2009 and revealed that after joining NAFTA,

there are more jobs for unskilled labor but demand for skilled labor has not changed. On the other hand, the supply of skilled labor has shown an increase in the past 20 years.

Kiyota (2011) has studied relation between trade and employment in Japan in period 1975-2006.The major findings are threefold. First, the demand for worker-hours from exports increased but this is not large enough to offset the decreases in demand for worker hours from domestic final demand. As a result, total worker-hours in Japan have declined since1990. Second, the demand for employment from exports has increased since 1985 both in manufacturing and non-manufacturing. This result implies that the manufacturing exports affected indirectly non-manufacturing employment through inter-industry linkages .Finally, the overall demand for working-hours from exports and domestic final demand declined between 1980 and 2006 although it increased slightly in manufacturing after 1995.

Katz and Istrate (2011) has studied the relation between boosting exports, delivering jobs and economic growth in U.S. states. The results showed that state export efforts all too often ignore (and therefore duplicate and fail to leverage) the export-promoting work of other groups or the federal government.

Athanasoglou and Bardaka (2010) investigates the effects of export prices, domestic and competitors', as well as of non-price competitiveness approximated with capital stock, on export performance by Johansen maximum likelihood approach in the long run and a dynamic error-correction equation in the short run in Grecce in period 1962-1999. The estimated long-run and short-run relationships follow the economic theory and are remarkably stable.

Elshennawy and Said(2010) studied the impact of trade liberalization on manufacturing emplotment and wages in Egypt 1990-2007. Regression analysis showed that the reduction in tariffs and increasing export orientation has been associated with an increase in wages in manufacturing industries though the role of export orientation in influencing poor wages has not been significant

Goldar (2009) studied the effect of trade on employment in the production sector in India via the OLS model. This study was conducted for 2004-2008 and revealed that exports have positive and import has negative effects on employment in India.

Ernst (2005) investigates relation between Trade liberalization, export orientation and employment in Argentina, Brazil and Mexico in 1995-2000. The resultsshowed that economic opening in Argentina, Brazil and Mexico did not lead to export dynamism and had a disappointing impact on employment, even though trade liberalization and regional integration caused a strong increase in trade and led to a better integration into the world economy. Only Mexico experienced an export surge in manufacturing production and employment

during the second half of the 1990s, mainly due to the booming maquiladora sector.

Falk and Wolfmayr (2005) studied the effects of employment on trade of intermediary inputs for 7 EU countries for 1950-2000 and concluded that the effect of materials import on total employment is negative and significant for countries with low wage levels.

DATA AND RESEARCH METHOD

In this study, the effect of exports on employment in Iran's economy is studied via Microsoft software for 1976-2005 and data have been collected from different sources and reports issued by the Central Bank of the Islamic Republic of Iran.

Autoregressive-distributed lag modeling (ARDL)

In this study, autoregressive-distributed lag modeling approach is utilized, which is presented by Pesaran and as well as Pesaran and Shin:

$$\alpha(L, P)y_t = \alpha_0 \sum_{i=0}^{k} \beta_i (L, q_i)x_{it} + u_t \qquad i = 1,2,\dots,k$$

(1) In which L is the lag factor, α_0 is Y-intercept y_t is the dependent variable, and for L (lag factor) we have:

$$L^j y_t = y_{t-j} \qquad (2)$$

Therefore:

$$\alpha(L, P) = 1 - \alpha_1 L^1 - \cdots, -\alpha_p L^p \quad (3)$$

$$\beta_i(L, q_i) = \beta_{i0} + \beta_{i1}L + \beta_{i2}L^2 + \dots + \beta_{iqi}L_i^q$$

In order to use ARDL, Microsoft software would estimate all of the above equations for possible combinations. Equation selection is based on Hannan- Quinn (HQ), Schwartz Bayesian (SBC), Akaike Information criterion (AIC) . Long term explanatory coefficients are deduced as below:

$$\tilde{\theta}_i = \frac{\tilde{\beta}_{i0} + \tilde{\beta}_{i1} + \cdots + \tilde{\beta}_{iq}}{1 - \tilde{\alpha}_1 - \tilde{\alpha}_2 - \cdots - \tilde{\alpha}_p} \qquad (4)$$

If the sum of variables' coefficients with the corresponding lag is less than one, the dynamic pattern has a tendency towards long-term equilibrium. Therefore, for tests of co-integration, it is necessary to conduct the following hypothesis test:

$$H_0: \sum \alpha_i - 1 \geq 0 \qquad (5)$$

$$H_1: \sum \alpha_i - 1 < 0$$

We calculate the following statistic to conduct the hypothesis test:

Table 1. The ADF stagnation test of model variables in the first difference

Variable	Statistic	Critical Value
LN	-3.99	-2.97
LX	-4.08	-2.97
LE	-5.13	-2.97
LW	-6.50	-2.97
LS	-4.63	-2.97

Source: Research findings

$$t = \frac{\sum \beta_j - 1}{\sum \sigma_{\beta_j}} \qquad (6)$$

If the absolute value of t is greater than the critical absolute value, presented by Banerjee, Dolado and Master the null hypothesis is then rejected, and long-term relation is accepted.

The Error Correction Model (ECM)

When x and y are co-integrated, there is an equilibrium relation between them. Yet, in short-term there might be some disequilibrium. In this case, the following error line could be assumed as equilibrium error.

$$y_t = \beta x_t + u_t \qquad (7)$$

Now this error could be used to link the short-term behavior of y with its value for long-term equilibrium. For this matter, the following is proposed:

$$\Delta y_t = \alpha_0 + \alpha_1 \Delta x_t + \alpha_2 \tilde{u}_{t-1} + \varepsilon_t \qquad (8)$$

In equation (8), $\tilde{u}_{t-1}$ is the part for error of the previous regression estimation with a lag. This pattern is known as the error correction pattern.

The introduced model for analyzing export effects on employment in this study is as follows:

$$L_n = \beta_0 + \beta_1 LX + \beta_2 LE + \beta_3 LW + \beta_4 LS \qquad (9)$$

L_n: total employment logarithm
L_x: export logarithm
L_E: currency rate logarithm
L_W: minimum wage logarithm
L_S: 5-year long term interest rate logarithm

THE RESULTS FOR MODEL ESTIMATION

Augmented Dicky Fuller Unit Root Test (ADF)

In the estimation of regression models by time series, studying the stagnation of the series is crucial. According to ADF statistic values and its comparison to critical values, null hypothesis for the existence of unit roots for all variables is not rejected. In other words, all of the variables of the model are not at stagnating level. Based on the first difference test for the variables, all of them have rejected stagnation hypothesis after differencing. In other words, all of the variables are stagnated with the same difference. (Table 1)

The analysis of the Short-term ARDL model and results

According to Pesaran et al. (2001), for applying ADRL and assigning appropriate lags, long-term compatibility coefficients between the variables of the model can be deduced. The major difference between the ADRL methods with Johansen's is that in ADRL, the optimized lag for each variable is selected by Schwartz Bayesian (SBC), Akaike Information (AIC) and Hannan- Quinn criterion (HQC); on the other hand, in Johansen's model, there is a single lag for all variables. The major advantage of ADRL is its capability in estimating long-term and short-term relations where stagnated variables are zero order and stagnated ones are of order one, and it would result in more effective and compatible estimations. The results of the employment model are presented in Table 2.

As can be seen, export and wage levels have positive effects on employment, but exchange rate and long-term interest rates have negative effects. Increases in exports have led to increases in trade, which consequently led to increases in income and improvement of social welfare and increases in employment. Export growth leads to higher competition among production units, which in turn has positive effects on the employment level and labor productivity, and results in quality improvement and product diversification, which increases production, because the more the increase in production and domestic products consumption and export, the more the increase in employment occurs. With the increase in production, the interest for investment in various sectors such as agriculture, industry and services among investors will also rise. This leads to higher investment rates. Furthermore, increases in investment in various sectors would bring higher employment. Exchange rate has negative effects on employment. This is due to the

Table 2. Short-term estimation results ,ARDL (1, 0, 0, 1, 2)

Regressor	Coefficient	Standard Error	T-Ratio(Prob)
LN(-1)	0.99	0.001	242.39 [0.000]
LX	0.13	0.01	7.68 [0.000]
LE	-0.03	0.01	-2.71 [0.012]
LW	0.04	0.01	3.50 [0.002]
LW(-1)	-0.03	0.01	-2.99 [0.007]
LS	0.01	0.01	0.79 [0.436]
LS(-1)	-0.04	0.01	-2.69 [0.013]
LS(-2)	-0.07	0.02	-3.69 [0.002]
R^2=0.9989	$\bar{R}^2$=0.9986	D-W=2.07	

Source: Research findings

Table 3. The results of the cognition test

Test statistics	LM Version	F.Version
Serial Correlation	CHSQ(1)= 0.170 [0.679]	F(1, 18)= 0.114 [0.739]
Functional form	CHSQ(1)= 0.272 [0.602]	F(1, 18)= 0.183 [0.673]
Heteroskedasticity	CHSQ(1)= 1.269 [0.260]	F(1, 25)= 1.233 [0.277]

Source: Research findings

lack of Marshal-Learner provision in developing countries such as Iran. When the value of money decreases, or in other words the exchange rate increases, according to the Marshal-Learner provision, this leads to improvement in the balance of payments. The Marshal-Learner provision states that if the sum of the absolute values of export and import demand elasticity is greater than one, then the currency market is stable and the decrease of the value of money leads to better balances of payments. In this situation, the value of exports increases and the value of imports decreases. However, developing countries are not able to harness such situations and therefore the exchange rate has negative a correlation with employment. Minimum wages also have positive effects on employment; thus, increase in wages increases employment. But as results have revealed, the effect of wages has a negative lag which can be due to the negative illusion among workers. Long-term interest rate influences employment negatively with a lag. This shows that increases in long-term interest rates, decreases investment in various sectors which brings about lower employment rates. Overall, the results of estimation reveal the existence of short-term dynamic and significant relations of the model so that the estimated model has high R^2 which indicates the high explanatory power of the independent values and the Durbin-Watson is 2.07 which mean the lack of autocorrelation in the model. Table 3 shows the results of the cognition test.

As seen in Table 3, based on estimates, there is no issue of variance heteroskedasticity, normality and subdominant form in this model and the model specification is acceptable. Next, in order to study the

existence of long-term correlation among variables, by calculating t values, which is calculated by dividing the subtraction of the sum of coefficients of lagged dependent variables from one by variances of corresponding coefficients, the existence of long-term relation among variables is assured. By this test, the calculated t is 6.25, which is higher than the absolute value of the corresponding t value in Banerjee, Dolado and Master (3.64 in 90% level); therefore, the null hypothesis stating the lack of long-term correlation is rejected and the existence of long-term relation among model variables is accepted.

The Analysis of the Estimation of the Long-term ARDL

The results of the long-term effects of variables on employment have been presented in Table 4. Also, because of the logarithmic nature of this model, the coefficients of variables denote elasticity.

According to Table 4, long-term export elasticity to employment is 1.16. This means that a 1% increase (decrease) in long-term export would cause a 1.16-percent increase (decrease) in employment, which is in accordance with economic theories in term of signs; also, it is statistically significant and it could be concluded that on the long run, export will result in effects on employment. Also, the elasticity of exchange rate to employment has a negative sign. This means that a 1% increase (decrease) in exchange rate would cause a 0.01 percent decrease (increase) in employment. This signifies the lack of Marshal-Learner provision in Iran's

Table 4. The results of the long-term effects of variables on employment

Regressor	Coefficient	Standard Error	T-Ratio(Prob)
LX	1.164	0.432	2.693 [0.014]
LE	-0.013	0.002	-5.359 [0.000]
LW	2.280	0.655	3.480[0.002]
LS	-0.0405	0.0150	-2.699 [0.013]

Source: Research findings

Table 5. ECM estimation results

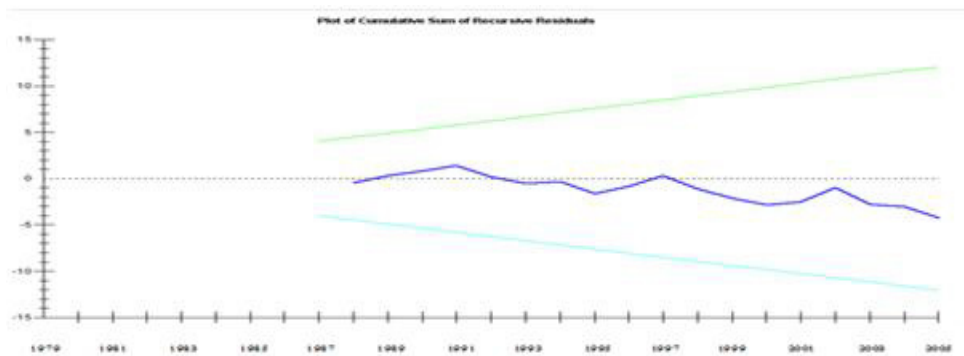| Regressor	Coefficient	Standard Error	T-Ratio(Prob)
dLX	0.017	0.005	3.153 [0.005]
dLE	-0.03	0.003	-1.029 [0.015]
dLW	0.04	0.012	3.505 [0.002]
dLS	0.013	0.016	0.795 [0.035]
dLS1	0.079	0.021	3.696 [0.001]
ecm(-1)	-0.761	0.018	-4.021 [0.001]

Source: Research findings
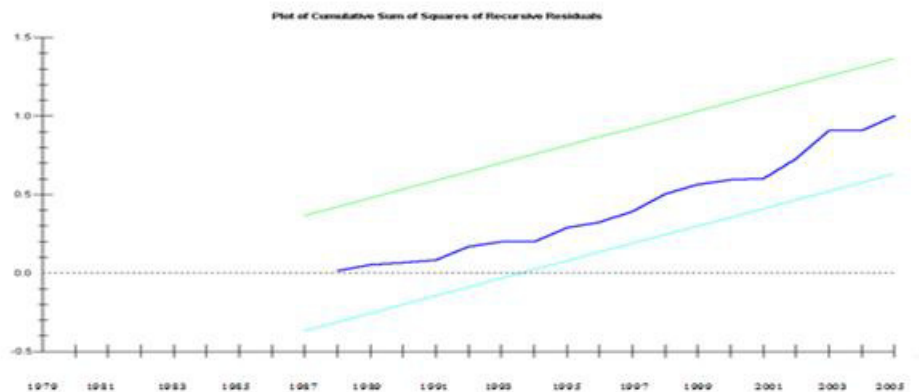

Figure 1. The CUSUM cognition test

Figure 2. The CUSUM Q cognition test

economy; therefore, an increase in exchange rate lowers employment. The long-term elasticity of wages to employment is 2.28. This signifies a positive correlation between wages and employment which is in line with economic theories in terms of sign and is also statistically significant. Thus, in long term, wages have an effect on

employment. Long-term interest rate has a negative correlation with employment; therefore, increases in interest rate would decrease investment and demand for labor, as well as employment.

ECM test results

Table 5 shows the results of the error correction model for the current model. According to the results, the ECM coefficient in the model is statistically significant; it is shown to be -0.761, and denotes the balancing pace of the short term towards the long term. It means that 76% of employment's deviations from its long-term path are corrected in the next course.

Stability and cognition tests

Cognition tests are used to determine model stability and structural stability. In this study, CUSUM and CUSUMQ are applied. If the statistical graph crosses on one of the side lines at a 5% level, the model is thus not stable. In Figures 1 and 2, CUSUM and CUSUMQ are the middle lines, and none of them crosses the side lines. Therefore, permanent long-term stability for the model is acceptable.

CONCLUSION AND SUGGESTIONS

The issue of employment and unemployment and people's having access to desired jobs is one of the most important needs in a society. Thus, employment is one the key concerns of social planners because societal development in any country is ultimately dependent on human resources. For this matter, the perfect and appropriate mobilization of human resources in a country should be considered as one of strategic development goals. Increase in workforce due to population boom and low job capacities in a country has led to high unemployment rate. Therefore, devoting special attention to employment and its contributing factors are of importance.

In this study, by utilizing autoregressive-distributed lag modeling (ARDL) in short term and long term, the effect of export on employment in Iran's economy was studied. The estimated long-term and short-term models are reliable in both terms of explanatory power and significance of regression. The results of this study revealed that the elasticity of export to total employment for 1976-2005 was positive and significant. Also, the variables of exchange rate and long-term interest rate have significant and negative effects on employment. The elasticity of employment to wage levels is positive. Also, the following items are proposed to increase employment rates in Iran:

1. Increases in production and export in order to increase the employment level in Iran;
2. Implementing stabilizing policies for exchange rates to expand trade with other countries;
3. Implementing appropriate policies for trade and foreign sectors to support the increase of exports;
4. Encouraging more investment in various sectors of the economy by providing loans, banking facilities and incentives and tax relief for manufacturers that provide employment.

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