



The relationship between resistive and knowledge-based economy

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ARTICLE INFO

Article history:

Received 17 February 2016

Received in revised form

25 April 2016

Accepted 25 April 2016

Keywords:

Knowledge-based economy

Resistive economy

Economic growth

ABSTRACT

Resistive Economy is the resistance to destructive actions. Thus, knowledge-based economy, the most important role in increasing productivity and therefore economic growth stems reach a possible solution to Iran's progress in terms of resistive economy. In this study are looking to obtain a relationship between knowledge-based economy and Resistive Economy. The main hypothesis of this study is the relationship of knowledge based Economy indicators on the realization of Resistive economy (represented by economic growth) in Iran. In this research, Bleaney model of development (1996), the Solow growth model developed by OLS for the economy, using data of 2001-2006 is estimated. The final model estimation results indicate that significant effects of the state of knowledge-based economy on the realization of resistive economy in Iran. Based on the findings, variable share of total exports of goods increased high-tech value added in manufacturing country in question has provided over the years, but the number of scientific articles published, positive impact on economic growth of Islamic Republic of Iran is not

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1. Introduction

Knowledge-based economy based on knowledge revolution has been developed which is influenced by several factors: increased knowledge of coding, increase data analysis, storage and transfer, development and deployment of new technologies, the increasing importance of knowledge and skills of the workforce, the increasing importance of innovation and efficiency and growth in competition, increasing intangible investment, globalization and severe competition and expansion of world trade (Dahlman and Anderson, 2001).

Extension of knowledge in Total Factor Productivity effects of research and development to improve production technology and increase productivity in all sectors of the economy.

1.1. Statement of the problem

Achieving scientific developments and knowledge-based economy through research produce profound changes in economic growth. That society and ultimately, achieving economic growth and sustainable development and realization of resistive economy, because the Asia-Pacific Economic Cooperation Committee, as defined in

(APEC, 2000) knowledge-based economy, an economy where production, distribution and application of knowledge, operating and economic growth, wealth creation and employment in all industries. According to this definition, in this economy investment in modern technologies and advanced growth, investment growth in the industries that use this kind of technology, skilled labor force growth and productivity gains are seeking to take advantage of it for create resistive economy (Eghtedarnasab and Dahmarde, 2015).

Based on the findings of economics is one of the most effective tools and approaches to develop economic independence knowledge and benefit from the competitive advantage of it. Therefore, recognition and knowledge-based economy factors and how they affect the resistive economy to achieve something that is now inevitable.

1.2. Research questions

The economic the knowledge-based economy has impact on the realization of resistive economy in Iran?

1.3. Hypothesis

The first hypothesis of the research: "Relationship between indices knowledge-based economy by achieving resistive economy

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(represented by economic growth) in Iran". The second hypothesis of the research: "knowledge-based on economy result in achieving economic growth and sustainable development".

2. Literature review

2.1. knowledge-based economy

The term knowledge-based on economy and the economics of information literature of the American economy is in the 1960s, but changes in the '90s, the term renewal and revival. Documents determine the status and performance of innovation in economic growth models. This decade after extensive efforts in the development, strengthening and integrating the concept of knowledge-based economy was and boundaries were clear knowledge-based economy with production-oriented economy (Smith, 2003).

The knowledge-based economy (OECD, 1996) economies are directly based on production, distribution and consumption of information and knowledge is located. In the knowledge-based economy, knowledge is the main driver of growth, wealth creation and employment in all branches of activity. Based on this definition, knowledge-based economy depends on only a few industries based on highly advanced technologies, but also in this type of economy, all economic activities are based on the knowledge to form (Dahlman and Anderson, 2001). The knowledge needed to build a knowledge-based economy, not just pure technology and knowledge of cultural, social and management will also be included.

Rostow is one of the first economists to formally consider the development of knowledge in production and put (Rostow, 1959). In the school of Keynesian economics also discussed about the role of knowledge in the economy. Including relevant theories, Domar growth theory and is Harwood growth theory (Brue and Grant, 2012).

In the neoclassical growth model, which Solow's product research and ideas, after asserted function of two variables function, including variables such as the extent of capital and labor, part of the country's economic growth remains unexplained. He did not explain this section that the "Solow residual" was known, had higher Dynamics. After observing the behavior of the component unexplained systematic, non-random, there is another important factor in the production function of technical progress and productivity realized and it is called. Given the technical knowledge, that part of the reserve of capital per capita output growth does not explain it, is estimated to be equivalent to growth of technical progress.

In 1992, Romer suggested that, if human capital in the Solow model to be imported will be consistent with empirical evidence. For those of human capital, education, training and various skills endogenous growth theory was developed as the idea (Romer, 2005).

In general, the process of acquiring knowledge in a knowledge-based economy can be in four parts: "the production, acquisition, distribution, and utilization" examined (Table 1).

Table 1: Knowledge-based economy indices

| | | Indicators | evaluation criteria |
|----------------------------|--|--|---|
| Creating knowledge | | R and D share of GDP | The realization and development of the national economy |
| | | the researchers per capita | Access to human resources required for R and D |
| | | The share of license sales revenues, royalties of GDP | The quality and the fundamental status of national innovative system based on inputs (output) and output (input) created Science and Technology |
| To gain knowledge | | Gross capital formation percent of GDP | The investment made in the national economy (more on knowledge-based sectors) than the GDP of the country |
| | | Business ICT spending to GDP | The expenditure by the government to obtain the latest information and communication technologies |
| | | The share of payments to obtain licenses and royalties of GDP | The amount of payments made by the government and the private sector to obtain licenses and royalties of GDP |
| Dissemination of knowledge | | The per capita cost of ICT (information and communications technology) | The costs incurred for the benefit of the information and communication infrastructure |
| | | The per capita income than the cost of Internet access | The access to information via the Internet by any Internet user in a country with per capita income and the cost of Internet |
| | | The number of Internet users (out of 100) | The use of the Internet as a platform for the dissemination and spread of knowledge in society |
| Application of knowledge | | Percent of the workforce has a university degree | The ability of the workforce in the study, analysis and use of information, data and relevant knowledge |
| | | Export of hi-tech products in total exports of goods | Ability to export high-tech products, based on modern science and technology and its share of total exports of goods Ability to apply knowledge in facilitating business |
| | | The time required to start a business (days) | Ability to apply knowledge in facilitating business |

2.2. Resistive economy

2.2.1. Definition of resistive economy

Resistive economy means to identify areas of high pressure and efforts to control and ineffective it and under ideal conditions become such pressures to chance. To achieve economic resistance should reduce external dependencies and the gross domestic product and strive for self-reliance is

stressed. The resistive economy, resistance to rule out pressures and cross national work hard to achieve positive points is required. This method is defined in terms of economic austerity economics is different. Another resistive economy can be extracted definitions in Table 2.

Table 2: Summary definitions of resistive economy

| Definition | Type of economy |
|---|------------------------|
| Islamic Revolution of Iran according to their needs has started to establish revolutionary institutions, therefore, to ensure the revolution's goals need to create parallel institutions for this work. | Parallel economy |
| Following the economic retrofit, harms, damage prevention and repair of old and inefficient structures and institutions of the economy. | Reconstructive economy |
| Due to the economic and defense against invasion is invasion. | Defense Economics |
| Essentially resistive economy is not a short-term approach to the macro-economic. Outlook Islamic Republic of Iran and a long-term effort to be included. We are looking for the ideal Islamic economy and Islamic world for inspiration and efficient and is a precursor to the formation of great Islamic civilization. | Resistive economy |

2.2.2. Resistive economy requirements

According to Ayatollah Khamenei's remarks resistive economy, conditions and requirements are: - Use all the capacities of the government and people-Economy belongs to People- Changes in economic conditions through the implementation of policies of Article 44 of the Iranian constitution

- Empowering the private sector
- Reduce dependence on oil
- Replace oil revenues to non-oil revenues
- Founder of economic activities based on knowledge and knowledge based economy become the dominant economy
- The protection of national production
- Entrepreneurship
- Enable small and medium-sized production units
- Balancing the consumption and use of alternative and preferred domestic production with foreign goods
- The fight against economic corruption
- Proper management of financial resources
- Demand management and culture for the prevention of waste
- Maximum use of time and resources
- Gesture based applications and avoids ad hoc decisions or legislative change
- Safe guarding the unity and solidarity.

2.2.3. Resistive economy indicators

Resistive economy is less affected by economic shocks to the economy and is receptive; the ability to have rapid reconstruction after the shock. The multiple natures' robust economy, which makes it cannot be demonstrated with an index should be, noted multiple indicators. These indicators include:

1. Low unemployment rate and underemployment
2. The high productivity of labor
3. Bipolar lack of community
4. High social capital
5. The diversity of the country's export revenues
6. Economic independence
7. The high growth rate (Mombini, 2012)

3. Materials and methods

This research is based on objective, of applied research and development is considered. And based on the nature of the work of research is descriptive and analytical.

In the present study to collect theoretical subjects, research library method has been used; also to collect data to test hypotheses of Database World Bank (2014) and the Statistical Center of Iran were used.

Of econometric methods for evaluation of knowledge-based economic indicators on economic growth (as an indicator of resistive economy) based on ordinary least squares (OLS) is used. In this study the statistics on the state of economic knowledge and the resistive economy during the period (2001-2006 AD) has been used in Iran.

3.1. Analysis model

In most studies that have been done recently in terms of economic growth, a generalized form of the Solow growth model, which includes non-conventional factors affecting productivity and growth, is used. In this study, the growth model Bleaney (1996) utilizes the method of Barro (1991), which is the more comprehensive than other studies, to analyze the relationship between knowledge-based economic indicators and economic growth will be used. The general form of the model is as follow:

$$g = \alpha + \beta M + \gamma Z + u$$

g: Average annual growth in real GDPM: shows the standard explanatory variables include variables such as investments, demographics, etc. Z: a vector of variables that are introduced in this research. U: including residuals.

3.2. Specifies the model and variables used

The following model, the final model examined in this study.

$$GY = C + \alpha INV + \beta SL + \beta_1 HT + \beta_2 SJ + \epsilon_t$$

1- The real gross domestic product (GDP), (GY) 2- physical capital (INV: formerly gross domestic fixed investment) 3- share of active population of the total population of (SL: Active population share of total population) 4- (N) 5- active population (L: labor) 6- number of scientific papers published (SJ: Scientific and technical journal articles. High-technology exports (% of manufactured exports)) 7- The high-tech exports, total exports (HT: High-technology exports (% of manufactured exports))

3.3. The model estimate

The estimation of parameters in the model using time series econometric time series is based on the assumption of static variables. Accordingly, most of the time assumes that the mean and variance are constant over time. And the covariance between two series variable amount of time, only depends on the

distance between them. But given that during the period examined in this study is less than 15, need to persistent and test data, it is not lasting. Why econometric knowledge-based, data retention for long periods of time such as 15 courses and more happens. And the problem of unit root variable data series for a short time, you will not need.

4. Results

4.1 normality test data

One of the classical hypotheses of normal distribution of the error terms (u_t) that the Jarque-Bera statistic was used to check those that conform to the shape of a statistic is equal to 0.29 and 0.86 chance and a reason for the rejection of the normal distribution there was no such error (Fig. 1).

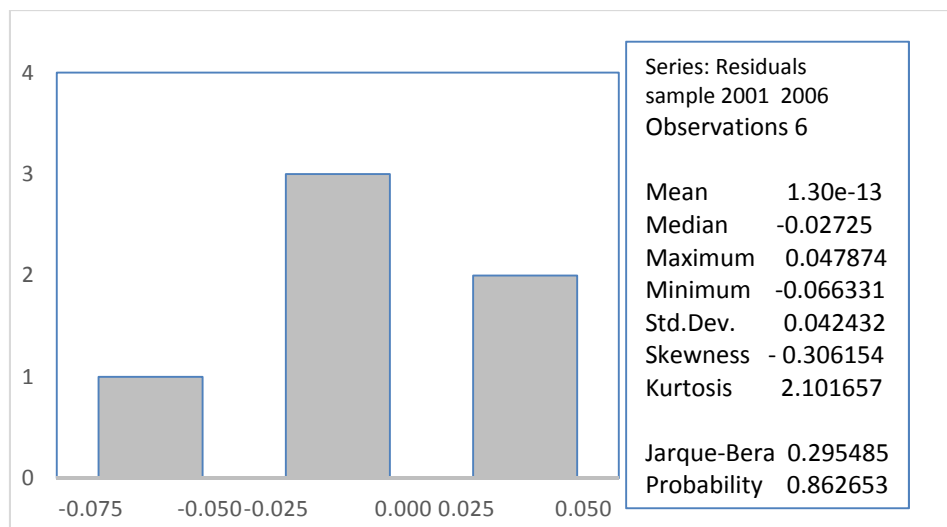


Fig. 1: Normality test

4.2. Homogeneity of variance test

If there is Dissimilarity Variance model estimation of the consequences is that in this case the OLS estimators have minimum variance unbiased, but it is not. A Dissimilarity Variance test of white test is used to determine the variance. According to Table 3, the amount of F (3.83) and nR2 (5.63) and the corresponding probabilities (0.36 and 0.22), there isn't Dissimilarity Variance on select models (Table 3).

4.3. Linearity tests

If a regression equation, correlation coefficients between the explanatory variables is greater than the square root of R2, there is linearity in Table 4; the linear model is not severe.

4.4. Model explanatory Test

Estimators are inefficient if irrelevant variables entering the model, although other factors remain consistent and unbiased. This will be the standard

deviation estimators are great. Findings in Tables 5, 6, 7 and 8 it shows that remove any variables that contain SJ, HT, SL, INV in each case has a significant effect on the model's explanatory. Thus the need for the presence of these variables in the final estimation model has insisted (Tables 4 to 8).

4.5. The estimation results of the model

The final estimate of the average coefficient is statistically significant. According to statistics probability F, estimated at 95% of the overall model is significant. The final details are calculated as shown in Table 9.

5. Conclusion

All variables in the final estimation model are statistically significant 95%. Physical capital is a positive factor. The positive effect of increasing the share of gross fixed capital formation to gross domestic product promotion, Reflects the impact of these variables on resistance and resistive economy is realized. The positive sign indicates that the

improvement of the population's demographic structure factor of the increase in the labor force can be a significant positive impact on the economy and boost economic growth have resistant. Variable

export share of total exports of goods, high-tech knowledge-based economy is one of the features that provide increased value added in manufacturing country.

Table 3: ANOVA Homology test - White

| Heteroskedasticity Test: White | | | | |
|---|-------------|-----------------------|-------------|--------|
| F- statistic | 3.839728 | Prob. F(4,1) | 0.3633 | |
| Obs*R-squared | 5.633227 | Prob.Chi-Square(4) | 0.2283 | |
| Scaled explained SS | 0.086193 | Prob.Chi-Square(4) | 0.9991 | |
| Test Equation: Dependent Variable: RESID^2, Method: Least Squares, Date: 01/28/15 Time: 15:18, Sample: 2001 2006, Included observations: 6 | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| C | -0.122153 | 0.056624 | -2.157263 | 0.2763 |
| INV^2 | 8.26E-05 | 2.81E-05 | 2.940709 | 0.2087 |
| SL^2 | 0.006366 | 0.004016 | 1.585404 | 0.3582 |
| HT^2 | 0.000361 | 0.000221 | 1.633349 | 0.3497 |
| SJ^2 | -1.73E-09 | 1.24E-09 | -1.388944 | 0.3973 |
| R-squared | 0.938871 | Mean dependent var | 0.001500 | |
| Adjusted R-squared | 0.694356 | S.D. dependent var | 0.001725 | |
| S.E. of regression | 0.000954 | Akaika info criterion | -11.19748 | |
| Sum squared resid | 9.10E-07 | Schwarz criterion | -11.37102 | |
| Log likelihood | 38.59244 | Hannan-Quinn criter | -11.89215 | |
| F-statistic | 3.839728 | Durbin-Watson stat | 3.562106 | |
| Prob(F-statistic) | 0.363307 | | | |

Table 4: linearity test

| | INV | SL | HT | SJ |
|-----|-----------|-----------|-----------|-----------|
| INV | 1.000000 | -0.816270 | -0.823760 | -0.772577 |
| SL | -0.816270 | 1.000000 | 0.730187 | 0.926497 |
| HT | -0.823760 | 0.730187 | 1.000000 | 0.889105 |
| SJ | -0.772577 | 0.926497 | 0.889105 | 1.000000 |

Table 5: Eliminating variables INV Test

| Redundant Variables Test | | | |
|--|----------|-------|-------------|
| Equation: EQ01, Specification: GR C INV SL HT SJ, Redundant Variables: INV | | | |
| | Value | df | Probability |
| t- statistic | 33.42148 | 1 | 0.0190 |
| F- statistic | 1116.995 | (1,1) | 0.0190 |
| Likelihood ratio | 42.11576 | 1 | 0.0000 |

Table 6: Eliminating variables SL Test

| Redundant Variables Test | | | |
|---|----------|-------|-------------|
| Equation: EQ01, Specification: GR C INV SL HT SJ, Redundant Variables: SL | | | |
| | Value | df | Probability |
| t- statistic | 27.22832 | 1 | 0.0234 |
| F- statistic | 741.3816 | (1,1) | 0.0234 |
| Likelihood ratio | 39.65918 | 1 | 0.0000 |

Table 7: Eliminating variables HT Test

| Redundant Variables Test | | | |
|---|----------|-------|-------------|
| Equation: EQ01, Specification: GR C INV SL HT SJ, Redundant Variables: HT | | | |
| | Value | df | Probability |
| t- statistic | 30.95371 | 1 | 0.0206 |
| F- statistic | 958.1323 | (1,1) | 0.0206 |
| Likelihood ratio | 41.19617 | 1 | 0.0000 |

Table 8: Eliminating variables SJ Test

| Redundant Variables Test | | | |
|---|----------|-------|-------------|
| Equation: EQ01, Specification: GR C INV SL HT SJ, Redundant Variables: SJ | | | |
| | Value | df | Probability |
| t- statistic | 27.01099 | 1 | 0.0236 |
| F- statistic | 729.5937 | (1,1) | 0.0236 |
| Likelihood ratio | 39.56315 | 1 | 0.0000 |

Table 9: Results the final estimate model

| SJ | HT | SL | INV | C | Variable | Physical capital | INV |
|-------|--------|--------------------|------|---------|--------------------|--|-----|
| -0.01 | 4.49 | 69.30 | 6.52 | -381.63 | coefficient | The structure of workforce | SL |
| 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | probability | The share of high-tech goods of total export | HT |
| | 304.70 | F-statistic | | 0.999 | R-squared | The number of scientific | SJ |
| | 0.04 | Prob (F-statistic) | | 0.995 | Adjusted R-squared | | |

The positive and significant coefficients in accordance with theory was obtained in this study indicate a significant and positive impact on the realization of economic fulfillment of resistance in the country's knowledge-based economy. The number of scientific papers published as an index component to assess knowledge-based economy is known. The negative and significant coefficient for this variable in this study could be due to publish articles in the field of non-efficient and simply to expand the research. This reflects that the published literature and science in Iran should be targeted and planned to help in the realization of resistive economy. The coefficient of determination (R²), which represents the explanatory power of the model or models are good coefficient is equal to 99% which means that the model is able to explain about 99.5% growth changes in Iran. However, the adjusted coefficient of determination equal to 99.5% per cent.

Study proved that the first and second study confirmed the hypothesis. Hypothesis: the relationship between the realization of the resistive economy by deploying knowledge and technology in the economy. According to the findings, there are significant coefficients for the variables number of scientific papers published (SJ) and the share of total exports of goods with high technology (HT), is approved. Number of scientific papers published (SJ) with a negative coefficient (-0.01) and probability (0.02) and producer of high-tech exports with a positive coefficient (4.49) and probability (0.02), 0.95. And significant economic growth associated with resistive economy is as effective components.

The second hypothesis of the research: knowledge-based economy and achieve economic growth and sustainable development of the resistance. Increasing employment (SL) with a positive coefficient (6.52) and probability (0.02) and increased investment (INV) with a positive coefficient (69.30) and probability (0.02) is continuous economic growth. Thus, the second hypothesis is confirmed.

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