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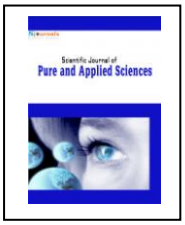

Original article

An analysis of the consequences of the phenomenon of urbanization, and pollution of the cities, using economic evaluation models

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ABSTRACT

Increasing concerns about global warming and climate change in recent is more serious. Weather problems, along with the accumulation of dirt on the economy and other aspects of human life, they affect. Urban growth and urbanization, the most striking feature of social change - the economy, has been in the last two centuries. Presently the growth of cities, especially in developing countries under led to urbanization, coupled with the loss of environmental and human ecology is. In this period, urbanization rate increased so, see a lot of opportunities for improving the quality of life is severely limited. High rates of population growth and the growth of cities and urbanization, and the more it increases the number of vehicles, some of which increase the energy consumption in this country. Of, the consequences of urbanization society, including its effects on air pollution-which is itself a factor in the reduced quality of life in cities and towns, is limited comfort range-necessity in field studies, geography, economics, urban planning and ecological environment can be. The effects of urban growth and urbanization-as is variable in modern times, especially in recent decades, cause large changes in the spatial structure of economic and Iran-In addition, variables such as energy consumption and emissions of air pollution on per capita income,, will be analyzed. The results

show that, with the growth of cities and urbanization in Iran has been a shift to increased energy consumption and more pollution.

1. Introduction

Increasing concerns about global warming and climate change in recent, has become more serious. Weather problems, along with the accumulation of dirt, economies have been affected. Providers warn Club of Rome report, in 1975, on ruin an nature of renewable resources, and environmental degradation environment, the emergence of the environmental movement -oriented canvas, or Ecologist (belief in the transformation of lifestyle, social and political life in order sustainable human flourishing), globally led. Expectations and developments arising from this movement, the next step in the concept of sustainable development were formed in 1980 by the World Commission on Environment and Development officially presented. Along with the economic development of the concept, attention to environmental sustainability indicators proposed and its central location and in development planning is emphasized. The late 20th century, concerns about population cities, especially in developing countries, is more like Iran. Over the past three decades, risks and environmental damage Biology, is more visible. For the damage caused by a combination of factors such as population growth, economic growth, energy consumption and industrial activity is. The environmental impacts of urbanization have been identified extensively in a number of studies, and the results have emphasized the importance of dealing with urbanization issues in discussions of environmental matters (Dincer, 1999). Urbanization is a phenomenon of social and economic modernization, and a structural transition from rural to urban areas is considered to be. During this process, the urban population of the world, 1.52 billion people in 1975, to 3.92 billion, reached in 2007 (UNDP, 2011). Pre is projected that by 2050 the urban population nearly doubled, and the 4.6 billion people expected. Sought to support such growth, urban infrastructure, will be added. The possible causes consume more resources, and undue pressure measure A will enter the ecosystem. In 2006, about two-thirds of the cities in the world energy consumption, and %70 of co2 emissions are also caused. But that is only half the world's population will live in cities (IEA, 2008). Two different views of the relationship between urban population growth and environmental pollution there. The first view implies that environmental impact of population growth on the environment is positive because, with increasing urbanization, for the use of infrastructure, transport and energy transport to increases, and the transition from agriculture to industry, be because increased pollution. But the second view stresses of urban culture makes that is, the energy consumption in urban areas than in rural areas, more efficiently and reduce pollution. As a result, the relationship between population growth and environmental pollution, you can be positive or negative. Existing studies have shown different consequences of urbanization on the environment, with plausible explanations of both positive and negative consequences. Taking transportation activities as an example, a positive interpretation of urbanization is that it increases the efficiency of the use of public transportation, resulting in a decreased environmental burden. On the other hand, a negative interpretation of urbanization is that it can increase the demand for freight transportation because the average distance between producing and consuming regions may increase, resulting in an increased environmental burden. Such plausible explanations could be given in a number of ways. The problem here is that the analytical framework used in most existing empirical studies on the environmental impacts of urbanization cannot provide evidence of these effects because human activities and urbanization are assumed not to interact with each other, though the interaction between human activities and urbanization itself have been widely discussed. You can urbanization; emissions have an influence on two aspects, first, the impact on economic development. Second, through the influence of urban structures - producing urban mobility and transport and freight, infrastructure and households. Energy consumption in urban areas, as a major emitter of pollution, which affects. In this paper, we consider the effects of urban growth and urbanization in the country, along with variables such as energy consumption and per capita income, on emissions, we are analyzing. None of the previous studies explored the relationship between energy consumption, CO2 emission, and urbanization in Iran. This motivated the researcher to explore the relationship between energy consumption, CO2 emission, and urbanization in Iran. Exploring the relationship between energy consumption, CO2 emission, and urbanization is important because from this study we can find out whether

urbanization is major source of the energy consumption and CO2 emission increase in Iran. In this study, we further investigate the relationships between variables, hypotheses testing, so Granger causality between variables, for Iran to be determined (Alem et al, 2007). The first set of hypotheses on the relationship between energy consumption and urbanization are focused. One hypothesis is that, due to urbanization, energy consumption is Granger. Holtedhal and Jouts (2004), argues that, urbanization, energy consumption will increase to residential two reasons. First, the move to urban households have access to electricity to more than. Second, households in rural areas, urban areas are, will increase your energy; they are able to take advantage of the more electric appliances. However, Lariviere and Lafarance (1999), in a Canadian study, to conclude that, in urban areas, per capita consumption of less energy. One explanation could be that, cause that is extremely high urbanization, low- density cities with less fuel than they consume more because traveling distance is less, and people are more accustomed of Transportation to use public transport. Against the hypothesis that energy consumption will lead to higher growth urban,, which can make it through GDP, and its effects on urban structures, such as urban production and consumption patterns of households explained. The second set of hypotheses that this study be examines the relationship between urbanization and per capita income. One hypothesis is that the per capita income of urban Granger. Economic development, which may include passing a state rural economy based on agriculture, industry and services an economy, is (Mishra et al, 2009). Another hypothesis is that the per capita income of urban Granger. The hypothesis of this study was to investigate how the relationship between urbanization and pollution. Section 2 deals with this problem. This study consists of four parts. Theoretical and experimental studies are reviewed in Section 2 are. Section 3, the method of estimating pays model. Conclusions and recommendations are presented in Section 4 results are.

2. Theoretical and experimental studies

2.1. Urbanization and energy consumption

For the urban population, there is no single definition. In accordance with Article 4 " the definitions and criteria of administrative divisions ", the city, the local (spatial), with regulatory limits on specific geographical area is located, and the building structure, employment and other factors, with a particular aspect of the character itself, so that the majority of residents in jobs, business, commerce, industry, services and activities of administrative employment and self-sufficiency in the field of urban services relative position. City trade center of social, economic, cultural and political spheres of their influence, and at least ten thousand populations. However, under the law adopted in March 2010, the village center districts, and villages with a population eligible if they had a population of 3,500, the town can also be converted. However, the incorporation of surrounding villages, towns, and villages become crowded, the city's population is urbanized with various definitions (Statistical Center of Iran, 2007). A number of studies have explored the relationship between urbanization, energy consumption and CO2 emission. Liu (2009), found that urbanization was one of the major factors that affected China and the United States energy consumption. Similar results in the United States by Clement and Schultz (2011), in 208 developed and developing countries by Jorgenson (2012). Donglan et al (2010) also found that the income and energy consumption in urban China had increased the level of CO2 emission. Poumanyvong and Kaneko (2010) use a stochastic Impact by regression on population, affluence and technology (STIRPAT) model to investigate the impact of urbanization on CO2 emissions in a panel of 99 countries over the period 1975 to 2005. A variety of panel regresstion techniques are used but the empirical approaches are all static in nature. They find that urbanization has a positive and significant on CO2 emission for each income group but its impact is greatest for the middle income group of countries. For all income groups, the estimated coefficient on urbanization varies between 0.35 and 0.5. For low income groups, the estimated coefficient on urbanization varies between 0.43 and 0.61. for middle income groups, the estimated coefficient on urbanization varies between 0.04 and 0.35. The same results were obtained by Poumanyvong et al (2012) who found that urbanization increases transportation energy consumption and the relationship get stronger the higher the income of the country is. York et al (2003) also found that urbanization had a significant impact in increasing both energy consumption and CO2 emission in the world. The same results were found in number of developing countries by Jones (1991). Neumayer & Cole, in their study to examine the impact of demographic factors on air pollution, 86 selected countries for years1998-1975 are explored. In this study, panel data techniques to examine the impact of demographic factors on air pollution, has been used. In this study, the variable growth rate of urban population, average household size and power

consumption to assess the risk factors, the pollution is the use. The results indicate that, with increasing population, increased environmental pollution, and the increase in urban population and declining household size, environmental pollution is increased. Ie, an increase in production levels, increase energy, and pollution is increasing. Alam et al (2007) examined the impact of environmental pollution environmental factors, including population growth, economic growth, energy intensity, and population growth, urbanization, the environmental pollution in Pakistan for the years 2005 - 1971 are discussed. Such as, the same time, the impact of population growth, urbanization, population growth, energy consumption and environmental pollution, economic growth has been investigated. Model estimation results, the method Johansson - Yosilius, indicates that energy intensity coefficients, and carbon dioxide emissions in the model of economic growth as the dependent variable is, positive. The results suggest that the growth of the total population, urban population growth has had a positive impact on environmental pollution, but in the long run, this variable has a significant negative impact and meaning, economic growth have been.

2.2. Urbanization and pollution emissions

Environment environmental economics literature, population growth, pollution of one ecological environment of the. (Sadeghi and Saadat, 2004). High rates of population growth, the city and urban growth, and thereby increase the number of vehicles, some of which increase the energy consumption in developing countries to. It is believed that the car, one of the primary factors in the development of cities. Although the car to pull the margin not know. But marginal housing outcomes similar changes in economic structure - the social life of the city could consider, knew that it responds to car ownership (Wenger, 1996).

Some possible impacts of urbanization on ecological environment, part separately in three theories discussed is cognitive ecological modernization theory (ecological), urban environmental transition theory and the theory of bio ROMs (compact). One theory about the effects on the national level to discuss. While a discusses two theories to other cities. Ecological modernization theory, cognitive restructuring and modernization of the economy, the emphasis is not only on, but also the social and institutional modernization in the field of ecology, as well as, will be explained. In this theory, the process of urbanization and social change should consider the of the index is being renovated. Thus the theory, environmental problems, Environmental, at low levels of development, and to moderate stages of development, may rise. When communities are realizing the importance of sustainable environment, through innovation, technology, urban density and a shift towards services and knowledge based industries, seek to reduce the impact of economic growth on environment friendly, then refresh can minimize these problems (Mol and Spaargarn, 2000). Urban environmental transition theory, largely on a variety of environmental issues, urban environment, and evolution will be discussed. This theory states that, urban environmental issues, according to different stages of economic development (McGranahan et al, 2001). Resource constraints and the lower stages of development can often be with ecological and environmental problems we face. However, when the level of income will rise, these problems will gradually decrease. Increasing urban wealth, often associated with an increase in economic activity,,, which led to industrial pollution, such as air and water pollution can be. Although these problems in wealthy cities, thus improving the environmental laws, bio, process, technology and structural change in the economy will reduce. However, wealthy cities, thus taking the environmental issues created an environment that comes face. Consumption patterns and lifestyles in the big cities, because the intensity of resource use and other areas are poorer than urban. When cities are rich, and they develop, urban demand for infrastructure, transport and use of personal resources, will increase. As a result, consumer issues, such as energy consumption and emissions, more are highlighted. Compact city theory, the benefits of urban density will discuss. This theory states that, high density urban cities will allow, public infrastructure, such as transportation public transport, schools and water supply, take advantage of the economy. So that the people, from car less personal, and public transportation systems employ. Consequently, such measures reduce energy consumption and pollution emissions (Burton, 2000). Some critics argue that the increasing severity of urbanization, more dense traffic, overcrowding, and more air pollution leads to and they claim it costs more than the benefits of compact cities (Breheny, 2001). Instead, it may increase energy consumption and emissions. Without proper support, the urban infrastructure, more urban density can cause major problems in the urban environment is (Bargess, 2000). In recent years, the literature on the relationship between urbanization and environmental issues, eco, many scholars have tried to study the energy consumption and emissions. Many researchers have shown that urbanization, increasing energy demand and emissions are higher. Among these scholars Parikh and Shukla (1995), Neumayer (2004) and York (2007) are. Conversely, other

studies, such as Chen et al (2008) argue that, urbanization and degree of urbanization, the use of public infrastructure, improve, and causes lower energy consumption and less pollution are more is. Liu (2009), in a study concluded that urbanization has a positive effect on energy consumption, but its effect is to reduce finder. He reduced the influence of urbanization on energy consumption, to improve the industrial structure and technology and the efficient use of resources than.

2.3. Urban structures

To understand the impact of urbanization on energy consumption and emissions from the urban sector, and their interaction with the energy we briefly review.

2.3.1. Urban Production

Urbanization, economic development is one of the main dimensions, and includes many of the structural changes that have important implications for energy use to follow. Urbanization, changes in energy use has been followed. Urbanization, economic activity and population, that is, the transfer of labor from the agricultural, service industry, as well as transfer of manufacturing processes, production processes with lower energy intensity, energy intensity further comprises be. Rural households, the general in the productive activities of urban households are involved. Urban households, a greater share of goods and services than rural households to purchase and producers of goods and services, the more energy they consume. Thus, migration from rural to urban areas is associated with structural changes. Because of the structure of agricultural production with less energy intensity, industrial and chemical products with higher energy intensity change is. Consequently, these factors lead to an increase in energy demand is. Increasing energy supply due to population growth, economic development pressure on land resources and increasing scarcity available, the need for innovation in production, along with the replacement of traditional energy sources, new energy sources, flexible and is reliable. (Jones, 1998). With the increasing number of urban households, emissions from two directions continues to grow, direct and indirect. Direct emissions, thus energy such as electricity, heating fuel, and gasoline is gasoline. Indirect emissions from the industrial area. Households as final consumers, such as clothing, appliances, and food service and household use (Munksgaard and Pedersen, 2000). Thus, a city of three-way focus on labor, energy restructuring and replacing traditional with Renewable Energy on energy demand and consumption will affect.

2.3.2. Mobility and Transport

Population density and economic activity, new demands for transport services and resources to develop (city as a place, the more products it done to Freight transport by road have implications far). Increasing population density, and the labor force in urban areas, transportation needs will increase. An important factor of influence on energy demand in cities in developed countries, and also under Development, Mobility car and personal motor vehicles. If urban growth and rural-urban migration continues, personal transport, will increase substantially. Transportation and increasing urbanization continues, because he was and will increase in frequency (Jones, 2004). This increase in private transport, because that the increase in energy consumption and emissions implications.

2.3.3. under construction and urban density

Urban growth, demand for production energy intensity gives rise to. In general, the development of urban construction, construction of roads, bridges, buildings, offices, sewage networks, power plants and the like require a lot of energy. Attractive features of compact (dense), the urban heat island effect. Made surfaces, such as roads and buildings, etc, the sun's rays are absorbed and retains. Logging and handling, the natural cooling effect reduces, and because more emissions. As a consequence of, the urban heat island effect, urban air temperature 1 to 2 degrees higher than the surrounding areas to (Madlener and Sunak, 2011).

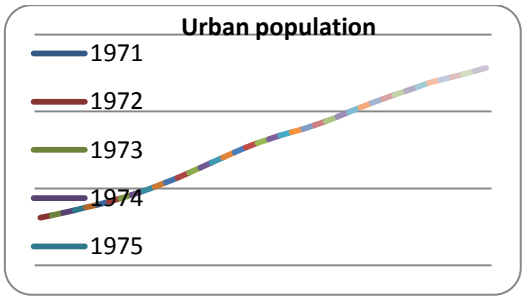
2.3.4. Private households

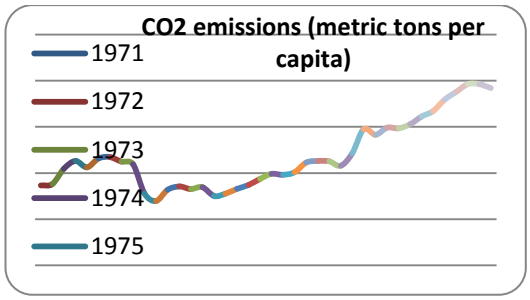
Urbanization, consumer needs and lifestyles households will change. Specifically, changes in consumer needs and behavior, will impact on urban energy demand. In general, urban households, the proportion of rural population to urban goods and services are dependent on. Rural households are able to produce some of their consumer needs. Thus, commercial production, relative to domestic production, more energy is consumed (Munksgaard and Jones, 1989). Parallel to urbanization, economic development, primarily on consumer behavior

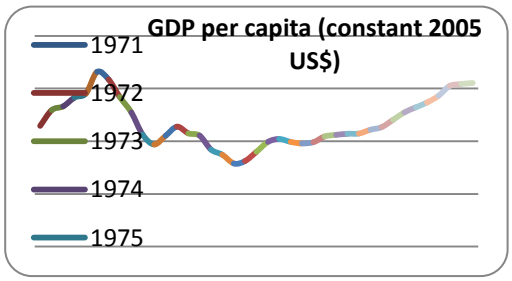
has an effect. Population growth, increased energy consumption is only irritating, but also increase the per capita consumption, and changes in behavior and lifestyle needs and be individuals. Urbanization, coupled with the rise in income, changing consumer needs will lead, and resulting in energy consumption will increase by. In order to reduce the energy consumption of households, policy makers have tried of which is energy efficiency (e.g. electronics) improve (Madlener and Sunak, 2011). With increasing energy efficiency and reducing energy costs, men tends to consume more goods and energy are, therefore increasing the disposable income.

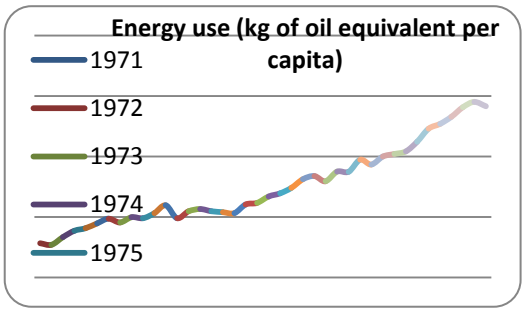
3. Research Methodology

In this study, based on a model of the Vector (VAR), the impact of urban growth, energy consumption and per capita income on pollution emissions, for Iran to be checked. Before estimating the model, and the relevant test overview and general description of the behavior of the variables used, GDP per capita, per capita energy consumption, urbanization and per capita gas emissions de carbon is offered. The move, in the period 1971-2010, are shown in Figures 3 is shown. In the period under review, and the special years after the revolution, the growth rate of energy consumption, surpassing the rate of economic growth. The average efficiency of the plant, in recent years, about 37 percent, and electricity losses in electricity transmission and distribution is more than 20 percent. Also, about %1.3 of the polluting emissions of co2 world of Iran. While its share of production and territories in the world, %1, and its share in world trade, less than half a percent. Above facts indicate that, despite the oscillatory growth of GDP per capita, energy use, emissions co2 and urban population, has had a significant increase (Figures 3). So that the value carbon dioxide emissions from all sectors consumer of energy in 86 years, from 492 million tons exceeded, and respectively the share of domestic, commercial and public 28.91 percent, transportation 46.23 percent, plants to 24.41 percent, industry 16.13 percent and agriculture 2.48 percent (energy balance, 2011). As can be seen from Figure 3 as well as, urban population in recent decades, so has the process completely.









Data source from: http//Wordbank.org/data/onlinedatabases/onlinedatabases.html

3.1. Empirical model

This model, derived from the environmental Kuznets hypothesis is that. With respect to the variables in previous studies for developing countries, including Iran, quadratic equation, associated with EKC hypothesis is not. Therefore, the model theory of first-degree bio Kuznets, adding variable capita energy consumption, and growing urbanization have been used. Using the accumulation Johansson-Yvsilius impact of energy consumption on economic growth and urbanization on environmental pollution is checked. Therefore, the model is as follows:

(1) CO2 = f (GDPP, EUP, RUP)

(2) LNCO2t = β0t + β1tLNGDPP + β2tLNEUP + β3tLNRUP + εt

CO2: Carbon emissions per capita di (metric tons per capita).

GDPP: Real GDP (per capita constant (2000) US dollars)

EUP: per capita energy consumption (kg of oil equivalent).

RUP: urban population

3.2. Data used

Annual data for this study was collected from Word Development Indicators (WDI) for Iran based on its availability for all the series. CO2 emissions are measured as million metric tons per capita. Real GDP is per capita constant (2000) US dollars. Energy consumption per capita is measured as kg of oil equivalent. While urban population is applied here as a reliable proxy for urbanization. The data are obtained from the Word Bank (2014) World Development Indicators online data base.

The data relating to, urban population, GDP and CO2 emission, WDI, and data related to energy consumption of they are the Statistical Center of Iran. In order to better avoid statistical problems, the form logarithms are used. The data relate to the years 1971 to 2007 can be.

3.3. Unit root test

Unit root test, which are used in this paper are: Exam Dickey - Fuller (ADF) test and Phillips - Perron (PP). Unit root model variables in Table 1 are shown below. The results show that all variables in the model are no stationary in levels, and Persistent are making a difference, be.

Table 1

Unit root results.

Phillips-perron(PP)		**Augmented Dikey-Fuller(ADF)**		**Variable name**
First difference With intercept	**Level, Intercept, And trend**	**First difference With intercept**	**Level, intercept And trend**	
*-6.47	-1.61	-6.48	-1.57	LNCO2
*-7.28	-2.94	*-7.36	-3.071	LNEUP
**-3.45	-0.68	**-3.69	-0.926	LNGDPP
*-5.75	-2.17	*-5.75	-2.17	LNRUP

Significant at 1% level. * Significant at the 5% level

Source: Calculations research.

Then, the VAR model to determine the optimum degree or order, and the presence or absence of long-term vector, the collective variables method Johansson - Yusilius, be checked. According to the sample size in this study is 38 years, therefore, to determine the optimal order of the VAR model of Schwartz benchmark - Bayesian, have been used. According to this criterion, the optimal model order VAR, one was set. Table (2), the order determined by the VAR model, according to Schwartz benchmark - Bayesian showing that.

Table 2

Determination of the optimal lag VAR model

Lags	**The Schwartz - Bayesian (SBC)**
0	-3.4
1	*-9.54
2	-8.96
3	-8.07

Source: Calculations research.

3.4. Check the orientation vector

As can be seen from Table 1 to all variables are no stationary in levels, and with a difference can Persistent are making. Therefore, in this section, for the extraction of co-integration vectors, the method of Johansson - Yusilius be used. In this procedure, to obtain long term relationship variables, the first two eigenvalues and trace test statistics, there are also collective, and the collective vectors, will be examined." collective, be quiz. If the test statistic associated with these variables, the critical values at %5 levels is higher, the opposite hypothesis is accepted, and is obtained based on the number of co-integration vectors:

Table 3
Johansen's trace test and maximum eigenvalue results.

Critical value at %95	Critical value at %95	The test statistic	Against the hypothesis	The null hypothesis
Trace Test (λtrace)				
0.005	47.85	59.21	$r \geq 1$	r=0
0.47	29.79	19.19	$r \geq 2$	$r \leq 1$
0.62	15.49	6.59	$r \geq 3$	$r \leq 2$
maximum eigenvalue (λmax)				
0.0008	27.58	40.01	r=1	r=0
0.48	21.13	12.6	r=2	r=1
0.9	14.26	6.58	r=3	r=2

Source: Calculations research.

According to the results, table (3) test statistic, and the maximum eigenvalues of matrix effects, a vector of model variables for integration between Iran confirms to. phrase to another, According to the above statistics, the null hypothesis that there is no vector accumulation or long-run relationship between the variables in the model was rejected at a significance level of %5, and against a hypothesis, or a vector integration between variables was rejected. Then the long-run relationships between the variables in the model were estimated, and the normal vector relative to the variable CSP can be selected. Optimized vectors selected in this study (Table 4) have been reported.

Table 4
Estimated accumulation vector.

The test statistic	Standard deviation	Coefficient	Variable name
---	----	1	LnCO2
-9.06	0.15	-0.71	LNEUP
-8.79	0.11	-1.02	LNGDPP
-9.06	0.15	-1.37	LNRUP

Accumulation vector is normalized with respect to LNCO2.
Source: Calculations research .

According to the results in Table 4, it can be stated that, GDP per capita, energy consumption and urban growth has a positive effect on per capita emissions of carbon di, and they are statistically significant. In other words, the elasticity of gas per carbon emissions relative to GDP per capita is positive and equal to 1.02. Tension of gas per carbon emissions relative to per capita consumption of energy, and urban growth, respectively, 0.71 and 1.37 is percent. Accumulation vector mathematical form a, can be written as follows:

LCO2 =1.02LGDPPt + 0.71LEUPt + 1.37LRUPt

3.5. Granger causality

Thus tables 3, the minimum mass of a relationship there, but the above test for causation could not assign. The following table shows the results of causality from energy consumption to carbon emissions is. Meanwhile, causality between carbon emissions, and there is no income, the result of fierce and the Haqqani (2009), is adapted in the case of Iran. The national income, not alternative way to prevent the spread of contamination. The

results show that Granger causality, CO emissions, with no relation to any one of the variables. The other hand, energy consumption and urbanization, with the release of carbon co2 have a causal relationship. The results show that, the energy consumption and urbanization, a one -way causal relationship to carbon emissions, there dioxide. Also, the results indicate that there is a causal relationship between a way of growing urbanization, energy consumption, and bilateral causal relationship between urbanization and per capita income that is. However, the causal relationship between carbon emissions and per capita income absent. In other words, the increase in national income, not cause carbon emissions in Iran. On the other hand, there are no causal relation carbon emissions, per capita income does not exist.

Table 5
Results of Granger causality test.

Independent Variables	LNCO2	LNGDPP	LNRUP	LNEU
LNCO2	-	1.52	0.54	1.14
LNGDPP	1.43	-	3/94c	4.06c
LNRUP	2.57c	5.01b	-	8.28a
LNEUP	5.72b	2.62	0.87	-

a, B and c, respectively, meaning at 1, 5 and 10 percent, showing that.
Source: Calculations research.

3.6. Generalized variance analysis

The analysis of the dynamic effects of momentum created in the model, using analysis of variance is carried. Way analysis of variance, the relative strength of the Granger causality chain, or the degree Extraversion variables beyond the sample period as the-making. So, be Granger causality test can be termed off-course. In this method, the share of imported momentum, the variables model, the variance of the error term and long see a variable in the short term, is characterized. For example, if the variable values only based on its own lags, the optimal forecast foreseeable, then error variance estimates only based on its momentum variable, is described. Forecast error variance decomposition contribution of each variable to fluctuations in response to impulses inserted into the template, be divide. Thus, we will be able, on the contribution of each variable changes over time, we measured the size of.

Table 6
Results of the generalized variance analysis for variable emissions carbon dioxide.

Variable Period	LNCO2	LNGDPP	LNRUP	LNEU
1	100	0	0	0
2	89.34	1.02	4.31	3.31
5	75.11	4.12	14.6	10.12
10	69.21	1.39	19.53	10.07

Source: Calculations research.

Table 6 Analysis of variance for CO2 in the short term (first year), the-term (two years), and long term (fifth and tenth years) show that. Analysis of variance, so that defined in the first period, usually the volatility of each variable is explained by its own momentum, is. But in the long term time horizon, the contribution of other variables, in order of importance will increase. The results show that, in the short term of more than 89 percent, in over 75 percent, and in the long run, more than 69 percent, the per capita emission of co2, can be explained by the variable. The largest, in explaining changes in carbon emissions, growing urbanization, with so in the short term, 4.31 percent in the medium term 14.6 percent, and in the long term more than 19/5 percent, the change in per capita emissions of the co2, explains that. Also, per capita energy consumption, 10.07 percent change in Iran's carbon emissions in long to explain. GDP per capita, the small (less than half a percent), the volatility of per capita emissions Co2 to play. These results indicate that, in Iran, growing urbanization, the largest contribution in explaining variations in per capita emissions co2 there.

4. Discussion and conclusions

The present study was to investigate the relationship between energy consumption and emissions per capita income, with emphasis on the role of urbanization in Iran is discussed. To this end, our econometric approach vector regression, VAR, and co-integration Johansson -Yusilius are used. With the deployment pattern VECM, and analysis of variance, in a multivariate system, including urbanization, was to examine the relationships between variables. Regression results show that, stretching emissions towards urbanization is positive and greater than one, i.e., with growing urbanization, emissions are higher. In other words, according to these results, the urbanization of a percentage increase emissions 1.37 percent increase is. Stretch emissions than positive energy, and less than one. Thus, during this period, energy consumption, emissions have increased. According to the results of the estimation vector accumulation, if one percent increases in energy consumption, emissions, 0.71 percentage will increase. Elasticity of emissions relative to per capita income is positive and is less than unity. That is, the increase in per capita income, emissions will further. Thus, a one percent increases in per capita income, pollution 1.02 percent increase.

In the long term, the main factor carbon emissions, the development is urbanized. In Iran, most environmental vulnerability, urbanization ratio has fluctuated. In Iran, recent decades, we have witnessed a large migration of people from rural to urban areas have. This can be through changes in the consumption patterns of household's structure of urban mobility and transport, urban infrastructure, urban energy demand, influence, and de carbon emissions increase. The forecast error variance decomposition, This is demonstrated, in both the short term and in the long run, these variables explained the largest variation carbon emissions and environmental damage biodegradability's. Because, relationships showed that energy consumption is a stimulus for economic development, so that policymakers can No worries about slowing economic growth, policies for energy conservation and reduced consumption necessary to apply it. To summarize, reducing energy demand, energy supply investment capital, and energy efficiency can be precursors to economic growth, and help to reduce emissions. Urbanization is negatively correlated with emissions, as well as a causal relationship, the growth in emissions is urbanization. I.e. with increasing urbanization, for the infrastructure, transport and energy has increased. Means you can, in the cities, does not use energy efficiently be. Due to the compact city theory, is public infrastructure, such as transport and schools, etc., to be exploited economically. This, if it is possible, so people familiar with its benefits, and a regular and continuous information, as well as environmental hazards, eco warned them. According to the theoretical discussion, the structural changes that can influence on economic growth. On the other hand, economic growth on emissions is effective. On the other hand, urbanization, to variable that causes structural changes that affects the emissions. Therefore, we can conclude that, indirectly to structural changes, and different channels, such as economic and demographic factors, have an impact on emissions. Therefore, special attention to urban structures, especially in the transport sector, which is among the most pollution, can be an acceptable solution to urban pollution and emissions is. Also, it can be analyzed that, urban structures, the possible relationship between economic growth and energy conservation. Economic growth, urban structures towards greater use of energy, and the use of equipment with more energy intensity is headed to. Thus, urbanization, long as it can, through changes in energy demand of urban structures, will occur, emissions explain. Most workers in the economy, the agricultural sector belongs, therefore, to prevent the villagers migrate to the cities, and the transfer of the agricultural sector to other sectors and a result of all this, the increase in urban population and growth plan cities, agricultural sector to improve infrastructure, and pay more attention to the agricultural sector. Strengthening small and medium-sized cities will cause the trajectories of rural migrants, rather than in large cities, and the growth of town's procedures, of rural migration to the cities and small and medium - shift increases, and the density in the cities, the urban heat island phenomenon such as avoid that. Consequently, the act of creation heavy Traffic, will prevent energy waste and emissions.

From the results of this study it is important for the urban planners and policy makers in the Iran to slow the rapid increase in urbanization. Slowing down the urbanization level can help reduce the level of energy consumption and pollution. In addition, this will lead to more energy efficiency and economic growth

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