Concept of Scarcity in Islam; Natural vs. Manmade Resources

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Abstract

Based on the argument of scarcity in the traditional and Islamic economics, this study has used the data of common resources to see any evidence of scarcity. In this study, resources are analysed with the categorical feature of naturally available resource and man-made resource. Using ARDL cointegration approach, it was found that there is an absence of resource scarcity hypothesis for the case of a long run. The structural break dummy is significant for the case of rice, natural gas, oil and coal they are positive which shows that historical prices only jumped up once, especially for the case of oil prices. The slowest convergence can be seen for the case of oil prices, which is expected as oil prices are mostly regulated and managed by the OPEC. The results supported the idea of Islamic economics that resources are actually not scarce; it is Allah who has promised to provide sustenance.

Keywords: Resource Scarcity, ARDL, Islamic economics. JEL: Q32, P40

1. Introduction

The whole concept of present day economics is that people have to face tradeoffs which are because societies have limited resources as compared to its utilization. This scarcity has made humans greedy to access the dwindling resource for themselves as it because of this scarcity the resource is showing properties of rivalry.

All the theories in conventional economics are based on the idea that each and every

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individual has to factor in the probability that whether he will have sufficient resource to survive in the future or not. Because of this, he tends to work more than it is required for gaining access to resources which is necessary to survive.

This scarcity is advocating the system of perfect competition between the sellers and the buyers in the market system. The main crux of the perfect competition is that all sellers are rival to each other; similarly, all buyers are rivals to each other too. What this rivalry does is that it kicks benevolence and brotherhood out of the window and humans come in the mode of survival of the fittest.

The model of demand and supply works on the concept that because of scarcity the buyers tries to buy as cheap as possible and the seller tries to sell as expensive as possible so both agents tend to understate and overstate the sale price respectively when they are making an agreement for the transactions. So this agreed price depends on whosoever has the power to exploit the other agents. Like if the buyer is buying medicine, he is in dire need to recover from the ailment, in this situation, seller can state whatever the price he wish to depending on how many other options (other sellers) the buyer can access. This example can be understood more clearly when we study demand and supply of surgical doctors’ services, he as a seller is in a position where he can ask any price.

Opposing to the conventional model of demand and supply, Islamic economics propose that when entering into the agreement buyers and sellers should not understate or overstate the prices rather state one price which they agree upon irrespective of they successfully complete the transaction or not. One hadith narrated by Qailah Umm Bani Anmar R.A.:

“I came to the Messenger of Allah (S.W.T), during one of his ‘Umrah at Marwah and said: ‘O Messenger of Allah, I am a woman who buys and sells. When I want to buy something, I state a price less than I want to pay, then I raise it gradually until it reaches the price I want to pay. And when I want to sell something, I state a price more than I want, then I lower it until it reaches the price I want.’ The Messenger of Allah (S.W.T) said: ‘Do not do that, O Qailah. When you want to buy something, state the price you want, whether it is given or not. And when you want to sell something, state the price you want, whether it is given or not.’” (Sunan Ibn Majah, Chapters on Business Transactions Book 12 Volume 3 Hadith 224)

Now, as per the Hadith, there is still controversy that it will not enforce the seller to
sell at the fair price, he can still offer higher sale price. The answer to this, one hadith narrated by Abdullah bin Masud R.A.:

> Whoever buys a sheep which has not been milked for a long time, has the option of returning it along with one Sa’ of dates; and the Prophet (S.W.T) forbade going to meet the seller on the way (as he has no knowledge of the market price and he may sell his goods at a low price). (Sahih Bukhari, Book of Sales and Trade Book 34 Volume 3 Hadith 359)

Also, hadith narrated by Abdullah bin Masud R.A. that:

> The Messenger of Allah (S.W.T) forbade artificially inflating prices, meeting traders on the way and for a town-dweller to sell for a desert-dweller. (Sunan an-Nasai, The book of Financial Transactions, Book 44 Volume 5 Hadith 4502)

These hadiths advocate that Islam forbade any sort of transactions where there one agent can exploit the other on the basis of imperfect information. So Islam forbids the seller to sell at an artificially higher price.

This scarcity is forcing prices in the market to raise causing people whose incomes are at the lower echelons to leave the market dejected as they cannot afford the product. If we look at the poverty indicators by the World Bank consider a person to be not poor if he earns $2 a day, still there is about half of the world which is not fortunate to have that much income. So, half of the world cannot access resources just because sellers are selling the scarce resource with a premium price. Economists in conventional economics advocate that the major reason for this issue is the rising population, and propose that humans need to manage and reduce the number of children they want to bring in this world. In response to this behaviour of humans, Allah says in Quran in following verses that have faith in Allah, he has taken the responsibility to provide provision of resources, so humans need not to indulge in competition and nor in overspending.

> And do not keep your hand tied to your neck, nor spread it out fully, lest you end up liable and regretful (Al Quran 17:29)

> And do not kill your children for fear of poverty. We provide for them and for you. Indeed, their killing is ever a great sin. (Al Quran 17:31)

> And enjoin prayer upon your family [and people] and be steadfast therein. We ask you not for provision; We provide for you, and the [best] outcome is for [those of] righteousness. (Al Quran 20:132)
Based on the controversy between the conventional and Islamic economics concept regarding the scarcity of resources, this study will use data of common resources to see if empirically the data show signs of scarcity. This study will acquire two types of resources first the naturally available resource and another is the man-made resource and the pattern of their real prices using ARDL cointegrating approach. If the hypothesis of resource scarcity is true, then we will expect the real resource price to rise in time.

2. Literature Review

The concept of natural resource scarcity got attention in 1798 when Thomas Malthus presented his pessimistic approach regarding natural resource scarcity in “An Essay on the Principles of Population” by arguing that the geometric increase in the people cannot be fed by an arithmetic increase if the resource, a time will come when limits of natural resources are met then societies will be characterized by misery, starvation and a subsistence level of wages. In that situation, the rich people will drive the prices upward by hoarding the scarce resource with them.

This pessimistic approach of Malthus faced a hit when experimentation in crop production using high yielding varieties of seed and better crop management techniques led to the green revolution in Mexico in 1943. For the case of Pakistan, the era of the green revolution started in the second development plan 1960-1971. During this period the food crops experience 4% per annum growth, whereas fiber crops experienced 9% per annum growth. (Zaidi, 2008)

All this apparent shortage of the resources necessitates the people have faith in Allah and devote their knowledge in improving resource exploration and production techniques. Islam promotes brotherhood and harmony to be created among the people. Islam first of all advise us to indulge in trade rather than usury based financial transactions.

Those who consume interest cannot stand [on the Day of Resurrection] except as one stands who is being beaten by Satan into insanity. That is because they say, “Trade is [just] like interest.” But Allah has permitted trade and has forbidden interest. So whoever has received an admonition from his Lord and desists may have what is past, and his affair rests with Allah. But whoever returns to [dealing in interest or usury] - those are the companions of the Fire; they will abide eternally therein. (Al Quran 2:275)

For the nations who continue the usurious model of business, Allah has warned us that continued participation in these unjustly usurious transactions will be considered as a declaration of war will Allah and his Prophet (S.W.T).
And if you do not, then be informed of a war [against you] from Allah and His Messenger. But if you repent, you may have your principal - [thus] you do no wrong, nor are you wronged. (Al Quran 2:279)

Here this war also means that this unjust activity will lead countries to have hostile relations which its neighbors over the resources which could have been sorted if there is benevolence and brotherhood.

The Islamic perspective is that there is no scarcity at the level of necessities. There are sufficient assets for everyone, except issues emerge in light of the fact that the well-off don’t recognize the privilege of the poor to an offer of their riches (Zaman, 2008).

Barnett and Morse (1963) measured the incidence of natural resource scarcity for the first time after collecting price and cost time series data from 1870-1957 in the US of renewable resources, minerals and agriculture. The results were quite surprising as the price and production cost of agriculture and minerals had fallen or remained constant within the time period that was under consideration while the price level of forestry shown an upward trend. It was further explained that substitutes and technological advancement actually are the main reasons of decrease in extraction cost of minerals. But this outcome was contradicted by (Slade. 1982; Mozazzami & Anderson, 1994), they proved that the real resource prices initially fall, which it then followed by depletion of the resource and leading to increase in the real price.

Studies by Halvorsen and Smith (1984, 1991) indicated, if the resource is scarce then its shadow price tend to rise; using this idea in the Canadian metal mining industry they revealed that the shadow price has decreased over the time. Smith (1978) uses the Barnett Morse methodology to check the scarcity of natural resources. His empirical analysis indicated that there is no sufficient evidence that scarcity of natural resources is deepening.

Watkins (2006) advocated that over the past 30 years, it was predicted that there is an oil shortage, but at present, there is enough oil present if we consider oil as an economic commodity. Also, if we look at the oil prices at present they are as low as 15-year-old prices. Which indicates that the earlier rise in prices was temporary and artificial based on the greed of the oil sellers to extract the maximum benefit.

Berck and Roberts (1996) explain that it is the effect of the technology of resource extraction that pushes the prices downward hinting resource not to be scarce. But if we apply the trend stationary methodology we will see a strong indication of rising
resource price, meaning that there is an increase in the people who are utilizing the resource. Stier (1980) investigated the scarcity of lumber in the USA for the year of 1950-1974, confirmed that there is scarcity and the main reason for it is the negligible contribution of labor-saving technology development.

Johnson, Bell and Bennett (1980) defended the unit cost approach to measure scarcity as it has fewer deficiencies as compared to other indices. The empirical results revealed that it is not justifiable to make public policies on the basis of resource scarcity.

So concluding the studies on scarcity, we can say that actually the apparent scarcity is because of inefficient technology in the resource extraction and production or it is because of excessive utilization of resources without any accountability of wasting the resource. Conventional economics proposes that increase in the price of the resource will discourage the people who waste the resource, but it fails to acknowledge that increase in price will make poor to go out of the market. For this Islam makes it a moral obligation that resources should not be wasted.

O children of Adam, take your adornment at every masjid, and eat and drink, but be not excessive. Indeed, He likes not those who commit excess. (Al Quran 7:31)

Previous empirical studies whether they are propounding or opposing the scarcity of resources; failed to use the regime change or structural break variable in the long run estimate. It is expected that changes in government policy or international agreements can influence the course of resource price.

**3. Objective of the study**

The objective of this study is to shed light on the controversy of scarcity using 5 resources for the case of Pakistan. Out of 5 resources, 3 are naturally available and 2 of them are man-made, so the study will check if there is any difference in the incidence of scarcity between these too.

**4. Methodology**

Mozazzami and Anderson (1994) proposed that natural resources are scarce as their real prices are following increasing or U-shaped trend using error correction approach. This study will use three of the natural resources such as Natural Gas, Oil, and Coal and compare it with the man-made natural resources like rice, and wheat and using Pesaran, Shin and Smith (2001) ARDL cointegrating bounds approach based on the equation below
Here if $\delta_1$ and $\delta_2$ are significant and positive will confirm the presence of scarcity. And in the below equation the significance and negative sign of $\varphi$ will confirm the convergence to this scarcity hypothesis.

$$\Delta P_{r_t} = \alpha + \beta_{11} \Delta P_{r_{t-1}} + \cdots + \beta_{20} \Delta P_t + \beta_{21} \Delta P_{t-1} + \cdots + \delta_{10} \Delta T + \delta_{20} \Delta T^2 + \varphi \varepsilon_{t-1} + \nu_t$$

### 4.1. Sample and Data Sources

The data source used to extract the prices of the resources is International Energy Agency, Food, Agriculture Organization of United Nations and Pakistan Bureau of Statistics.

Following are the graphs of the natural logarithm real resource price, with quadratic approximate passed through it. Here we can see that all the resources are forming a U shape, especially it is prominent for the Coal, Rice and Natural Gas while others are showing a negative trend. For the case of resources which are following U shape, we can notice that the decreasing portion is longer than the increasing portion which gives preliminary hint that these resources are not scarce for the provided time periods for the case of Pakistan.

**Figure 1 Quadratic Approximation on Real Rice Price**
Figure 2 Quadratic Approximation on Real Coal Price

Figure 3 Quadratic Approximation on Real Gas Price

Figure 4 Quadratic Approximation on Real Oil Price
5. Estimation and results

First of all, there is a need to confirm whether this data can be used for analysis using OLS, for time series data OLS requires that each observation of each variable must be fixed in repeated sampling, which means that the variable should be stationary. Below table shows the ADF unit root tests which indicate that the variables are non-stationary in nature. Under this situations, Pesaran et al, (2001) proposed ARDL cointegration based model which can provide reliable estimates irrespective of stationary or non-stationary variables.

**Table - 1: ADF Unit Root Test**

<table>
<thead>
<tr>
<th>Variable</th>
<th>ADF statistic</th>
<th>Decision</th>
<th>Variables</th>
<th>ADF Statistic</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice Price</td>
<td>-1.24</td>
<td>Non stationary</td>
<td>Δ Rice Price</td>
<td>-4.66</td>
<td>Stationary</td>
</tr>
<tr>
<td>Wheat Price</td>
<td>-1.04</td>
<td>Non stationary</td>
<td>Δ Wheat Price</td>
<td>-5.59</td>
<td>Stationary</td>
</tr>
<tr>
<td>Oil Price</td>
<td>-2.18</td>
<td>Non stationary</td>
<td>Δ Oil Price</td>
<td>-6.44</td>
<td>Stationary</td>
</tr>
<tr>
<td>Gas Price</td>
<td>-0.63</td>
<td>Non stationary</td>
<td>Δ Gas Price</td>
<td>-4.72</td>
<td>Stationary</td>
</tr>
<tr>
<td>Coal Price</td>
<td>-1.81</td>
<td>Non stationary</td>
<td>Δ Coal Price</td>
<td>-6.27</td>
<td>Stationary</td>
</tr>
<tr>
<td>General Prices</td>
<td>-2.61</td>
<td>Non stationary</td>
<td>Δ General Prices</td>
<td>-3.55</td>
<td>Stationary</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Long Run Estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1% Level -3.67</td>
</tr>
<tr>
<td>5% Level -2.96</td>
</tr>
<tr>
<td>10% Level -2.62</td>
</tr>
</tbody>
</table>

Pesaran et al. (2001) ARDL cointegrating model has been used to estimate the long run and short run estimates for the resource prices. According to the Resource Scarcity Hypothesis (RSH), if the resource is scarce, then it will follow a U-shaped pattern with respect to a quadratic trend equation. As per the long run results of 5 resources, none
of them showed any positive impact of time on the prices, it means that the square trend term is not significant for any of the cases. Also for the case of wheat, natural gas and coal where the coefficient of the trend is positive, it needed to be significant to justify the presence of scarcity for that resource. These results show the absence of resource scarcity hypothesis for the case of a long run. The structural break dummy is significant for the case of rice, natural gas, oil and coal they are positive which shows that historical prices only jumped up once, it is very high for the case of oil prices but it does not show that it is consistent rise.

Following short run estimates show that, the long run model is stable and converging as the value of ECM(-1) is significant and negative for all 5 models. The slowest convergence can be seen for the case of oil prices, which is expected as oil prices are mostly regulated and managed by the OPEC. Here we can see only gas prices show rise consequently scarcity in the short run, also oil prices show U-shaped relation indicating scarcity as very weak one in the short run. Here the short run structural break only indicates the long run significant impact of a structural break.

Table - 2: ARDL Cointegrating bounds Long Run Estimates

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Rice Price</th>
<th>Wheat Price</th>
<th>Gas Price</th>
<th>Oil Price</th>
<th>Coal Price</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Independent variables</strong></td>
<td><strong>Coefficient</strong> [<strong>P value</strong>]</td>
<td><strong>Coefficient</strong> [<strong>P value</strong>]</td>
<td><strong>Coefficient</strong> [<strong>P value</strong>]</td>
<td><strong>Coefficient</strong> [<strong>P value</strong>]</td>
<td><strong>Coefficient</strong> [<strong>P value</strong>]</td>
</tr>
<tr>
<td>General Prices</td>
<td>0.73 [0.08]</td>
<td>-0.18 [0.83]</td>
<td>-1.64 [0.15]</td>
<td>2.15 [0.41]</td>
<td>-0.29 [0.72]</td>
</tr>
<tr>
<td>Trend</td>
<td>-0.13 [0.11]</td>
<td>0.02 [0.88]</td>
<td>0.37 [0.13]</td>
<td>-0.56 [0.27]</td>
<td>0.07 [0.65]</td>
</tr>
<tr>
<td>Trend Sq.</td>
<td>0.002 [0.20]</td>
<td>0.0004 [0.83]</td>
<td>-0.01 [0.18]</td>
<td>0.01 [0.18]</td>
<td>-0.001 [0.63]</td>
</tr>
<tr>
<td>Break</td>
<td>0.72 [0.00]</td>
<td>0.37 [0.35]</td>
<td>0.63 [0.02]</td>
<td>3.44 [0.02]</td>
<td>0.79 [0.00]</td>
</tr>
<tr>
<td>C</td>
<td>4.04 [0.00]</td>
<td>5.05 [0.00]</td>
<td>3.21 [0.09]</td>
<td>3.75 [0.00]</td>
<td>4.05 [0.05]</td>
</tr>
</tbody>
</table>

Bolded parameters are significant at 10%

Table - 3: ECM-Based Short Run Estimates

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Δ Rice Price</th>
<th>Δ Wheat Price</th>
<th>Δ Gas Price</th>
<th>Δ Oil Price</th>
<th>Δ Coal Price</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Independent variables</strong></td>
<td><strong>Coefficient</strong> [<strong>P value</strong>]</td>
<td><strong>Coefficient</strong> [<strong>P value</strong>]</td>
<td><strong>Coefficient</strong> [<strong>P value</strong>]</td>
<td><strong>Coefficient</strong> [<strong>P value</strong>]</td>
<td><strong>Coefficient</strong> [<strong>P value</strong>]</td>
</tr>
<tr>
<td>Δ General Prices</td>
<td>0.69 [0.13]</td>
<td>-0.11 [0.82]</td>
<td>1.02 [0.28]</td>
<td>2.98 [0.00]</td>
<td>1.40 [0.15]</td>
</tr>
<tr>
<td>Δ Trend</td>
<td>-0.12 [0.16]</td>
<td>0.012 [0.88]</td>
<td>0.22 [0.08]</td>
<td>-0.14 [0.08]</td>
<td>0.05 [0.63]</td>
</tr>
<tr>
<td>Δ Trend Sq.</td>
<td>0.002 [0.24]</td>
<td>0.0002 [0.83]</td>
<td>-0.003 [0.10]</td>
<td>0.001 [0.03]</td>
<td>-0.001 [0.60]</td>
</tr>
<tr>
<td>Δ Break</td>
<td>0.67 [0.00]</td>
<td>0.23 [0.26]</td>
<td>0.37 [0.04]</td>
<td>0.84 [0.00]</td>
<td>0.58 [0.02]</td>
</tr>
<tr>
<td>ECM(-1)</td>
<td>-0.93 [0.00]</td>
<td>-0.63 [0.01]</td>
<td>-0.60 [0.00]</td>
<td>-0.24 [0.04]</td>
<td>-0.74 [0.00]</td>
</tr>
</tbody>
</table>

Bolded coefficients are significant at 10%
The F bound test in the diagnostic table shows that for all 5 cases there is cointegration between the proposed variables. Further diagnostics reveal that at the 5% level, none of the models has issues of autocorrelation, heteroskedasticity and misspecification. Only the model of coal prices shows non-normal residuals, because of this model cannot be used for inference, since all the relevant variables are insignificant anyways showing no scarcity hence the model is not used for inference anyways.

Table - 4: Post Regression Diagnostics

<table>
<thead>
<tr>
<th>Diagnostics</th>
<th>Rice Price</th>
<th>Wheat Price</th>
<th>Gas Price</th>
<th>Oil Price</th>
<th>Coal Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>F Bound Test</td>
<td>8.76</td>
<td>6.96</td>
<td>5.81</td>
<td>8.79</td>
<td>8.45</td>
</tr>
</tbody>
</table>
| Critical values  
[LL, UL]              | 5% [4.94,5.73] | 5% [4.94,5.73] | 5% [4.94,5.73] | 5% [4.94,5.73] | 5% [4.94,5.73] |
| Sample               | 28         | 29          | 28        | 42        | 27         |
| Jarque Bera          | 0.76(0.68) | 2.37(0.30)  | 0.33(0.85) | 0.65(0.72) | 5.88(0.05) |
| BG Serial Correlation LM test | 3.70 (0.10) | 0.67 (0.71) | 2.94(0.08) | 0.83(0.65) | 1.87(0.39) |
| BPG Heteroskedasticity test | 9.84 (0.19) | 11.38(0.08) | 7.20(0.71) | 4.52(0.87) | 7.95(0.24) |
| Ramsey RESET test    | 3.10 (0.10) | 1.86 (0.18) | 1.15(0.29) | 0.92(0.34) | 2.97(0.24) |
| Probability values in ( ) |            |             |           |           |            |

6. Conclusion and Policy Implications

Islamic economics provides a contradicting view as the commonly known conventional economics concept of the resource being scarce. According to Islamic economics, the apparent shortage of the resource is because of the working of the market system and use of usurious financial methods. Islam promotes trade and prohibits interest-based methods, and provides guidelines for how the transactions can be done which is welfare promoting.

This study has used the data of 5 commonly available resources, including rice, wheat, gas, oil and coal. The empirical data for the case of Pakistan is used and the real resource prices are checked for the presence of positive trend or inverted U shape using ARDL bounds testing cointegrating approach.

The idea is that if the resource price shows a positive trend or inverted U shape in the short run or long run then, it will indicate the presence of scarcity which is advocated by the conventional economics. The objective of this study was to check if there is the intensity of scarcity between natural and man-made resources.
The results show that none of the resources indicated the presence of scarcity in the long run while in a short run gas show positive trend and oil show inverted U shape, indicating short run scarcity. These results reiterate the ideology proposed by Islamic economics that resources are actually not scarce the apparent scarcity, we observe is because of the flaws in our economic system as they are not following the rules set by sharia law. Allah has guaranteed the provision of sustenance to the people who follow the rules set by Islam.

This study gives guidance for the people that, instead of using unjust means like hoarding or artificially inflating prices in order to take the responsibility of the provision of sustenance in own hands. People should take one day at a time to ensure our actions bring us success in after life. Islam promotes that resources should be used efficiently, avoid over and underspending. We should spend our knowledge to improve our production techniques which ensure an increase in production to feed the increasing population.

References
Al-Quran

Sahih Bukhari, Book of Sales and Trade Book 34 Volume 3


Sunan Ibn Majah, the Chapters on Business Transactions Book 12 Volume 3


