Economic Impact of Energy Subsidy and Subsidy Reform Measures: New Evidence from Jordan

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ARTICLE INFO	ABSTRACT
	The objectives of the study are to shed light on the characteristics, policies and system of energy subsidy in Jordan; to identify the economic impact and the reform measures of the energy subsidy. The research methodology is descriptive and analytical based on a questionnaire to survey the viewpoints of a convenient sample of economic experts on the research questions. The study concludes that although the energy subsidy has a positive social impact on the poor, it has unfortunately negative impacts on governmental budget, distorted the energy pricing mechanism and led to inefficient utilization of the scarce economic and financial resources. The study recommends rationalizing the energy subsidy in the short run by directing it to the targeted underprivileged consumers and the removal of subsidy in the long-run.Such a step should be accompanied by social net programs to alleviate the burden of hiking energy prices on the poor.

Section I: Introduction

1-1: Preface

The Jordanian economy is a market economy based on free and open economy where prices are determined by the demand and supply mechanism and the Government only interferes when there is a marketfailure as in the case of energy subsidy. Jordan imports fuel and petroleum products at the international prices and sells it in the local market at lower prices to the consumers and producers which costs the public budget more than $1.5 billion annually.

Due to the pressure of the International Monetary Fund to get rid of energy subsidies and due to the high budget deficit, high public debt, high trade balance deficit, rising unemployment and poverty in the last decade, the Jordanian government decided to raise the prices of petroleum products to market prices followed by rising electricity prices by 15% in order to get rid of the burden of energy subsidies on public budget and in the same time the government created a system of cash transfers provided to the consumers with low income to compensate them for hiking prices.

The details and analysis of these developments are discussed in the following paragraphs:

1-2 Research Problem

There is a controversy in opinion among economists and governmental officials in Jordan on whether to continue subsidizing energy or to stop the current energy subsidy. Moreover, there is a debate among the parliamentarians and business people on the economic repercussions of energy subsidies in Jordan and on the measures taken by the government to reform and rationalize the subsidy system. The main research questions are: what is the economic impact of energy subsidy in Jordan? What are the reform measures to rationalize the energy subsidy in Jordan?

1-3 Research Objectives

This research aims at the following:
 i.   Shedding light on subsidy policy and system in Jordan.
 ii.   Identifying the economic impact of energy subsidy in Jordan.
 iii.   Investigating appropriate reform measures of energy subsidy

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1-4: Research Importance

The Research significance stems from the economic, and political and social impact of energy subsidies in Jordan besides the scarcity of empirical research on this very sensitive issue of energy subsidies. Such a significance is not limited to Jordan but also to other countries world-wide and to international organizations such as theInternational Energy organization, the World Bank and the IMF.

1-5 Research Hypotheses

Based on the research problem, objectives and literature review, the researcher has designed the following null hypotheses:

(1) There is no significant statistical economic impact of energy subsidy on fuel consumption in Jordan.
(2) There is no significant statistical economic impact of energy subsidy onelectricity consumption.
(3) There is no significant statistical economic impact of energy subsidy on industrial production.
(4) There is no significant statistical economic impact of energy subsidy on foreign investment.
(5) There is no significant statistical economic impact of energy subsidy on real per capita income.
(6) There is no significant statistical economic impact of energy subsidy on inflation.
(7) There is no significant statistical economic impact of energy subsidy on exports' competiveness.
(8) There is no significant statistical economic impact of energy subsidy on competiveness of Civil Aviation and Marine Companies.
(9) There is no significant statistical economic impact of energy subsidy oncost of internal transport.
(10) There is no significant statistical economic impact of energy subsidy on budget deficit.
(11) There is no significant statistical economic impact of energy subsidy on domestic investment in renewable energy.
(12) There is no significant statistical economic impact of energy subsidy on petrol smuggling.
(13) There is no significant statistical economic impact of energy subsidy on Jordan's borrowing from IMF & World Bank.

1-6 Research Model

The model explains relationship between independent and dependent variablesas in figure 1:

Figure(1) Research Model

Independent Variable	dependent Variables
	1- Fuel Consumption
	2- Electricity Consumption
	3-Industrial Production
	4-Foreign Investment
	5-Real Per Capita Income
	6- Inflation
Energy subsidy	7- Exports' Competiveness
	8-Competiveness of Civil Aviation and Marine Companies
	9- Cost of Internal Transport
	10-Budget Deficit
	11-Domistic investment in Renewable Energy
	12- Petrol Smuggling
	13-Borrowing from IMF & World Bank

Source: Researcher design Based on Literature Review.

1-7 Research Methodology

The methodology of this study is descriptive and analytical for collection and analysis of the primary and secondary data. To collect primary data, the researcher selected a purposive convenient sample of 25 economic experts from the public and private sectors particularly from universities, professional syndicates, consumer protection society, business and governmental departments. The questionnaire included three parts. Part 1 includes questions relatingtopersonal information of respondents. Part II includes 13 paragraphs relating to economicimpact of energy subsidy in Jordan and part IIIincludes 10 paragraphs on reform measures of energy subsidies in Jordan (see the questionnaire in Appendix1). The questionnaire was distributed to several referees to check its soundness and accuracythen its reliability was tested by Cronbach Alpha Coefficient which was(0.823) which is good for this type of study.Respondents returned all distributed questionnaires fully filled.

The secondary data was collected from: annual reports of public and private sectorsinstitutions in Jordan, international organizations such as IMF, World Bank and International Energy Agency (IEA) and from articles in international journals.

The statistical tools of analysis used in this study are frequency distribution, percentages, mean, standard deviation and t-analysis for testing the researchhypotheses using SPSS.

1.8 Limitation of the Study
The scope of this research is limited to investigating the energy subsidy for the prices fuels and electricity in Jordan and it excludes covering the gas and other types of energy. The study is also covering the economic impact of energy subsidy excluding the coverage of the political repercussions of raising the prices of energy in Jordan.

1.9 Structure of the Study
The study includes five sections as follows:
Section I: Introduction
Section II: Theoretical Framework of Energy Subsidy and Previous Studies.
Section III: Characteristics and policies of Energy Subsidy in Jordan
Section IV: Analysis of the EmpiricalResults
       4.1Characteristics of Study Sample
       4.2 Testing Hypotheses on Economic Impact of Energy Subsidy in Jordan
       4-3 Analysis of Energy Subsidy's Reform Measures in Jordan.
Section V: Conclusions & Recommendations.
References and Appendix

Section II: Theoretical Framework of Energy Subsidy and Previous Studies.

Energy subsidy is defined as a governmental action in the pricing of energy in a certain country with the objective of reduction of prices of energy for consumers and producers below the market price which lead to a burden on public budget (UNEP:2008). Moreover, Energy subsidy may be defined as keeping the price of energy for consumers below the market price (http://en.wikipedia.org/wiki/energy_subsidies).

The economic implications of energy subsidies have received from economists, business people, policy makers and from international organizationsa great attention in the last decade due to the following considerations (Charap, Da Silva and Rodriguez: 2013):
 (1)Efficiency: subsidies tend to increase wastefully consumption of energy which is contrary to the efficient use of resources in the economy besides the increasing pollution and the emission of greenhouse gases.
 (2)Equity: Energy subsidies in general tend to benefit higher income groups of the population more than lower income groups.
 (3)Sustainability: energy subsidies create concern regarding fiscal sustainability in many countries in the world. Furthermore, economists and policy makers think that reforming energysubsidies could help countries to get sound options to solve the negative repercussions of energy subsidies such as wasteful consumption of energy, inequality of obtaining benefits of energy subsidies among various groups, increasing pollution and the emission of greenhouse effects, the high fiscal burden and diverting financial resources from necessary public services to energy subsidies.

The classical macro and micro economic theories,promoted by Adam Smith, David Ricardo, Malthus and John Steward Mill, have dealt with the issues of government intervention in pricing of goods and services outside the market mechanism of supply and demand and considered such an intervention an interference which leads to economic inefficiency and distortion of pricing mechanism that is decided by market economy.However, the Keynesian economic theory, promoted by John Maynard Keynes in the 1930s, called for government intervention through fiscal and monetary policies in order to stimulate the total effective demand in the economy in case of recession, unemployment and inflation (Samuelson &Nordhaus: 2001).

There are several types of governmental intervention in pricing energy for consumers and producers such as lowering the energy prices below the market price; reduction of taxes and custom duties and tariffs on the imported energy, determining a compulsory price-ceiling for the energy; or minimum price below the equilibrium market price, keeping control on of energy prices, regulating production and consumption of

energy, preventing monopoly and opening the economy for competition in importing energy.Furthermore, the agreements of World Trade Organization haveprevented subsidies of production and consumption of energy as they distort the free exchange of trade among countries (Abdelrahim:2009).

The Breton Wood institutions of World Bank and the International Monetary Fund, established in 1945, urged countries to get rid of energy subsidies if they want to borrow from these institutions which is called the conditionality term. The Structural Adjustment Programof the IMF is based on charging the market price of energy and adoption of austerity measures world-wide (Abdelrahim: 2000)

The value of energy subsidies world-wide reached $540 billion in 2012 and mostcountries including developed and developing practice some kind of energy subsidies as subsidies are not limited to developing countries (http://en.wikipedia.org/wiki/energy_subsidies)

The following is an overview of the previous studies:
1- The Study of UK Royal Institute for International Relations "Tshatham House"(2013) "Rescue of Petrol and Gas in the Gulf", based on empirical research in several Arab Petroleum Countries in the Gulf, concluded that the countries of the Gulf Cooperation Council (GCC) face the challenges of domestic misuse and waste of energy resourcesthrough the exaggeration in energy consumption at home and recommended the use of ESCOs model forimproving the efficiency of energy consumption. Saudi Arabia is in the process of using "Super ESCO" model for rationalizing fuel consumption.
2- The study of IMF (2013) "Energy Subsidies In the Middle East and North Africa (MENA)" Washington DC., Concluded that the MENA countries spend annually more than $120 billion on energy subsidies which constitute about 50% of the subsidies spent on total product subsidies and energy subsidies constitute 8.5% of GDP or 22% of governmental revenues in Middle East and North Africa. Such subsidies are used wastefully as they mostly go for the rich groups in the society and affect negatively their public budgets, exports and economic growth. The study recommends raising the prices of energy at home in order to rationalize domestic consumption
3- The IMF Report (2013) " Intention Memorandum on credit facility to Jordan" indicated the necessity for halting the energy subsidy by the Jordanian government and raising the prices of fuel to the level of market price besides   raising the electricity price by 15%, the gradual reduction of bread subsidy using cash transfer for needy Jordanian consumers and reduction of income tax exemption for Jordanians from 97% to 87% besides increasing the income tax on banks, communication and big industrial companies to 35%.
4- The Study of Ibrahim Khalil Elaian (2011) "Estimation of Demand Function of Diesel and Gasoline in the Palestinian Market" Economic and Administration Research, no.10, December , aimed at estimating the factors that affects the demand for Diesel and Gasoline in Palestine and the price elasticity of demand of these products. The study concluded that the factors affecting gasoline demand are population, gasoline car prices at level of significance of 5%, while other factors are not statistically significant. The factors that affect diesel demand are price of diesel cars, the disposable income and number of population. The study recommended that importing the raw diesel and gasoline to Palestine instead of ready oil derivatives; create more effective regulatory control system of fuel consumption and converting consumption trend from fuel to natural gas besides looking for alternative renewable sources of energy and amending Paris economic agreement with Israel.
5-The study of OECD (2011) "Phasing out Energy Subsidies", OECD Economic Surveys June 10, 2011, aimed at discussing the way the Indian government started reducing energy subsidies through regulating the gasoline and diesel in June 2010 as energy subsidy in India is very large and has enormous fiscal costs on the governmental budget and entails economic and environmental effects. The phasing out of energy subsidy will increase economic efficiency and greenhouse gas emissions in the long run, moving away from the current energy subsidy system to direct help in cash for people with income below poverty line. Even though cash transfers will help the poor in India to cope with
 the increasing oil prices, it is difficult to implement effectively.
6-The study of IMF (2013) on "Cost of Energy Subsides" Register Guard March 30 No. 10, Eugene, Or. USA, concluded that the direct cost of energy subsidies is estimated $ 480 billion world-wide in 2011, but the indirect cost that include the mispricing of energy which is considered as de facto subsidy reach $1.4 trillion . Developed countries account for 40% of energy subsidy while developing countries account for 60%. Such huge amounts of money spent on energy subsidies could be saved for improving the productivity, health, education and reducing carbon and greenhouse emission which cause pollution and climate damage.
7-The study of Roger H. Bezdek & Robert M. Wendling (2012) Energy subsidy Myths and Realities. Public Utilities Fortnightly, June No. 150, aimed at discussing the implications of energy subsidy in U.S.A on

environment, industries and budget deficit by conducting an empirical study on energy subsidies for the period 1950-2010. The study's finding of research analysis on energy subsidies in the USA are: little empirical data are available on the implication of energy subsidy, most of the incentives provided by the Federal USA Authorities benefit the oil energy industries, with little care and incentives to develop technologies of renewable Energy sources, most of the subsidies for energy were in form of tax concessions amounting to 47% of total incentives for energy, the incentives for promoting energy regulation was 19% and the incentives for R&D constitutes 18% of energy incentives. The study recommended that more empirical research on energy subsidies should be conducted to provide quantified data on the implications of energy subsidies in USA.

8-The study of Jacobs Austin (2013) "The Long Road to Energy Subsidy Reform"Petroleum Economist, Issue of May 2013, aimed at investigating the long road reform of energy subsidies which cost $1.9 trillion in 2011 or 2.7% of GDP which constitutes 8% of governments revenues worldwide. A road map for escaping the energy subsidy trap through phasing out fossil fuel subsidies as energy subsidies do far more harm than good, are draining government budgets to spend on infrastructure, education, health care and social safety net and discourage investment in new energy products. The IEA, OECD, IMF and World Bank have called for energy subsidy reform particularly in developing and emerging countries.

9- The study of Enterprise (2012) "Need for Energy Subsidies" February no.19 issue 2., aimed at investigating the need for energy subsidies in Pakistan which cost more than RS 1 trillion or $ 950 million in term of subsidy and losses of the State in the last four years. The energy subsidy in Pakistan reduces the price of energy for consumers and producers The simplest way of reform of subsidy system is through cash payments to the consumers and producers and to raise in the same time the energy prices to cover the actual cost of energy. Until now the subsidy policy of the Government was not efficient as the rich and big companies are the most beneficiaries from fuel subsidies with little benefits go to the poor classes. It is suggested to reform the system of energy subsidy in Pakistan in order to resolve the energy crisis which includes: improving corporate governance, devising an ideal fuel mix, improve tariff structure, and encouraging public-private partnership to face energy crisis.

10-The Study of Orange County Register (2013) "Cut Energy Subsidies: Reduced Subsidies will create A More Efficient, Fairer Energy Market" Santa Ana, Calif. 8 April.USA, aimed at discussing reduction in subsidies which help energy markets including to be more efficient and more equitable as energy subsidy create economic problems, create crowd out investment, skewed resource allocation, increase energy consumption and pollution and benefit the affluent rich people more than low-income group. The study recommended having a transparent and gradual reduction of energy subsidy besides, using cash and near cash transfers as the best approach to avoid harming low income people.

11-The Study of South Asian Times (2013) "Reform Energy Subsidies" on March 28, HT Media ltd, Washington, concluded that energy subsidies aim at protecting consumers by keeping prices low but cause adverse effects on crowding effect on public spending, depress private investment, encourage excess energy consumption, artificially promoting capital-intensive industries and encourages accelerating natural resource depletion. While keeping energy prices down as a way to protect the poor, the 20% of the richest households have captured six times more in fuel subsidies than the poor households. Hence, when having a reform for energy subsidies, there is a need to be mindful of possible adverse effects on the poor and to take mitigating measures to protect the poor to be built in any reform of energy subsidies.

12- The Study of Dominique Guillaume, Roman Zytek, and Mohammad Reza Farzin (2011) "Iran: the Chronicles of the Subsidy Reform" IMF Working Paper no. WP/11/167. Washington, concluded that Iran increased energy prices by 20 times in 2010 in order to reduce substantially the energy subsidies and implementing a subsidy reform including cash and semi-cash transfers to the poor households accompanied by conducting public relation campaign to convince the Iranian citizens by the new reform. The energy reform plan included the following steps: choosing the timing consideration, the price adjustment, the identification of beneficiaries, the public relations campaign to sell the reform, the cash transfers for poor households through national Iranian banks. The study also discussed the main challenges facing the reform of energy subsidy in Iran which include macroeconomic stability, political and social unrest and corporate restructuring.

13-The Study of Joshua Charap, Arthuid Ribeiro da Silva, and Pedro Fodriguez (2013) "Energy Subsidies and Energy Consumption: A Cross Country Analysis" IMF Working Paper no. WP/13/112, Washington, aimed at analyzing energy subsidies and energy consumption in cross-countries. The study concluded that there is a significant uncertainty regarding the impact of energy subsidy on energy consumption and the response of energy consumption to changes in energy prices was affected by the long-term elasticity of energy demand between -0.3 and -0.5 which indicates that countries can reap significant long-term benefits from the reform of energy subsidies and the need for either a gradual approach to subsidy reform or for more generous safety nets in short run.

The current study is different from previous studies in term of its coverage of the energy subsidy in Jordan and in term of methodology, conclusions and recommendation which
are distinguished from previous studies.

Section III: Characteristics and Policies of Energy Subsidy in Jordan

The economy of Jordan is a market oriented based on free and open economy where prices are mostly determined by demand and supply. The Government interferes in pricing of goods and services only when there is a market failure as in the case of energy where prices are extremely high that the Jordanian with average income cannot afford to accommodate with. Jordan imports 90% of its fuel and petroleum products from Saudi Arabia and 10% from Iraq. Moreover,Jordan imports 100 million feet daily from Egypt and the liquid gas is imported from Qatar. The refinery in Jordan is refining 90% of the raw imported oil. In the time being, a pipe line project from Iraq to Aqaba is under consideration which will cost around $18 billion. The value of imported petroleum products at the international prices reached around JD 4.4 billion annually in 2012 compared to JD3.8 billion in 2011 with annual growth of 14.9% as shown in Table1:

Table (1) Value of Jordan Imports of Petroleum Products (2011-2012)

Value in Jordanian Dinar

Percentage of total Imports	Change %	2012	2011	Petroleum Products
%42.2	%0.9	1872601300	1856338700	Raw Petrol
%31.0	%50.8	1376556700	913099900	Kerosene
%9.7	%28.8	431914900	335331000	Fuel Oil
%4.8	%12.3	213808600	190355200	Oil Gas
8.3	%17.7	367993900	312609100	Benzene
%2.0	%40.2	87858300	62673600	Natural Gas
%2.1	%52.7-	91986000	194675100	Electric Energy
%100.0	%14.9	4442779700	3865082600	Energy Bill

Source :http://www. static.dot.jo/uploads/repository/c8b9bc070604c

The daily consumption of fuel products reached 130000 barrel daily mostly produced by the only refinery in Zarqa, north of Amman the capital. Jordan has onefield producing gas near the border with Iraq called "Al-Risha" which produces 30 million feet of gas mostly used for generating electricity (http://menafn.com.arabic/1093645028)

The government had a policy to subsidize the prices of the petroleum products and electricity for consumers and producers at lower prices less than their cost. The total amount of subsidies reached more than $2 billion annually which constitutes 10% of GDPwhile the percentage in other Arab countries is 5% of GDP (Economist:2013).

Electricity in Jordan depends on importing 40 million cubic feetof gas from Egypt which was disrupted several times due to the conflict in Sinai which caused a daily loss of JD 1.2 million. The accumulating total losses of Jordan Electricity Company are JD 3.4 billion(Kanakriah:2013).Electricity indicators of production, consumption and prices are shown in Table 2:

Table 2: Electricity Indicators of Production, Consumption and Price

No	Indicator	Quantity and Average
1	Average consumption of Individual	2610 kilo watt hour
2	Maximum load in 2012	2800 megawatt
3	Percentage of houses provided by electricity	%99.9
4	Quantity of consumption of raw petrol	7.9 million ton
5	Invoice of imported petrol Annually	4.6 billion Dinar in 2012.
6	Value of energy subsidy	JD1.9 billion
7	Price of kilo watt hour	84 fils
8	Cost of kilo watt hour	168 fils
9	Average loss of Electricity Company per kilo watt	84 fils
10	Losses of Electricity Tariff	JD 1.2 billion annually
11	Expected revenue of Electricity Company due to raising the price by 15%	JD 277 million during 3 years

Source: http://www.alarabalyawm.net/public _news? ID=85025

Jordan policy of subsidizing fuel prices put a heavy burden on Jordan'sScarcefinancial resources in term of increasing budget deficit to reach $1.5 billion, increase the public debt up to $20 billion, trade deficit was extremely high besides the increasingfuel consumption and the reverse effects on environment.

It is expected that the cost of generating electricity will be equal to its revenues in Jordan in 2017 after raising the price of electricity by 15%. However, consumers with electricity bill less than JD 50 monthly and small industries with electricity bill less than JD 1000 monthly are exempted from this price increase. Furthermore, the 75% exemption of the workers of Electricity Company was removed.The consumption of electricity in Jordan reached 13534.9 gaga watt hour. The family sector has the highest consumption followed by the industrial sector as shown in Table 3:

Table 3: Distribution of Electricity Consumption by Economic Sector
(gaga watt hour)

2011	2010	2009	2008	Sectors
4.3445	3258.4	3005.5	3128	Industrial
5547.5	5219.7	4888.3	4459	Family
2269.4	2183.7	1979.7	1925	Commercial
1938.8	1866.9	1772.5	1713	Water Pumping
333.8	314.6	310.2	284	Street Lights
13534.9	128843.2	11956.3	11509	Total
1574000	1498000	1426000	1352000	Number of Subscribers

Source: Statistical Department (2011) Jordan in Figures.Amman.

Although the imports of oil products are exempted from custom tariffs, a 24% sales tax and a special tax are imposed on benzene 90 and 40% sales and special tax are imposed on benzene 95 as shown in Table 4:

Table 4: Taxes on Benzene and Methane gas

Total Tax (%)	Special Tax	Custom Duties	Sales Tax	Petroleum Products
%24	%8	-	%16	Benzene 90
%40	%24	-	%16	Benzene 95
-	-	N/A	-	Methane gas

Source: Izzedean Kanakria (2012) Taxes on Energy in Jordan. Ministry of Finance. Amman

It is noticed that the tax burden on Jordan citizen is 44% which is considered highcompared with other countries.Due to the declining economy and the IMF pressure on the Jordaniangovernment to get rid of the energy subsidies and to commit itself with a program of austerity measures as a pre-condition to provide Jordan with $2 billion loan, the Jordanian government cancelled the energy subsidies and decided to raise the prices of petroleum products to the market prices followed by rising electricity prices by 15%, but in the same time the Government created a system of cash transfers provided to the consumers with low income to compensate them for the hiking prices. The expected rise of inflation in Jordan due to the 15% increase of

electricity prices was 2% annually besides the annual rise in inflation due to raising the prices of the fuel products which was implemented several months ago.The government decision of cancelling the fuel subsidy and raising electricity prices were unpopular to the politicians, parliamentarians and business people particularly in the industry as it hurts its competitiveness. Such a decisionwas met by demonstrations in Jordan.

Section IV: Analysis and Discussion of the Empirical Results

a) The Sample characteristics
Analysis of the sample characteristics shows that they work in universities (40%); in professional unions (40%) and in private sector enterprises (20%). The respondents work mostly as senior economists (40%), as economic researcher (32%) and as professors (28%).In term of experience, 40% of the respondents have experience (5-10) years, 36% of them have experience less than 5 years followed by 24% of them have experience more than 10 years. In term of education, 40% of the respondents have Ph.D degree, 32% of them have M.A degree, 8% of them have high diploma and 20% of them have bachelor degree as in Table 5:

Table 5: Characteristics of Sample's Respondents

Variable	Category	Frequency	Percentage
1-Place of Work	University	10	40%
	Professional Unions	10	40%
	Private enterprise	5	20%
	Total	25	100%
2- Position	Professor	7	28%
	Economic Researcher	8	32%
	Senior Economist	10	40%
	Total	25	100%
3-Experience	Less than 5year	*9*	36%
	5-10	*10*	40%
	More than 10	*6*	24%
	Total	*25*	100%
4-Education	Ph.D	10	40%
	M.A	8	32%
	High Diploma	2	8%
	B.A	5	20%
	Total	25	100%

Source: Researcher Computation

b) Economic Impact of Energy Subsidy
The analysis shows the following results:

1-Energy subsidy increases the fuel consumption in Jordan which has the respondents' approval (mean=4.538) with statistical significance (t=3.650).

2- Energy subsidy increases electricity consumption in Jordan which has strong respondents' approval (mean=4.106) with statistical significance (t-=4.923).

3-Energy subsidy has positive impact on industrial production which is approved by respondents (mean=3.310) but it is not statistically significant (t=1.691).

4-Energy subsidy has positive impact on foreign investment in Jordan as it is approved by the respondents (mean=3.855) with statistical significance (t=2.641)

5- Energy subsidy has positive impact on real in Jordan as it has strongrespondents' approved (mean=4.367) with statistical significance (t=6.843).

6-Energy subsidy has decreased inflation in Jordan as indicated by strong respondent approval (mean=4.50) which is statistically significant (t=2.806).

7- Energy subsidy has increased the comparative advantage of exports in Jordan as indicated by the respondent approval (mean=3.556) which is statistically significant (t=6.612).

8- Energy subsidy has increased the comparative advantage of civil aviation in Jordan as
Indicated by respondent approval (mean=3.227) but it is not statistically significant (t=1.723).

9- Energy subsidy has decreased the cost of transport in Jordan as indicated by the respondent approval (mean=3.796) but it is not statistically significant (t=1.119).

10- Energy subsidy has increased budget deficit in Jordan as indicated by the respondent approval (mean=3.379) but it is not statistically significant (t=1.589).

11- Energy subsidy has negative impact on domestic investment in renewable energy in Jordan as indicated by the respondent approval (mean=3.516) but it is not statistically significant (t=1.752).

12- Energy subsidy increased smuggling fuel oil in Jordan as indicated by the respondent approval (mean=3.150) but it is not statistically significant (t=1.789).

13- Energy subsidy has negative impact on having new IMF loans for Jordan as indicated by the respondent approval (mean=3.875) but it is not statistically significant (t=2.135).

These empirical results are shown in Table 6:

Table 6: Descriptive Analysis of Economic Impact of Energy Subsidy

No.	Questionnaire Paragraphs	Mean	STD	t-test
1	Energy subsidy increasesfuel consumption.	4.538	.1253	3.650*
2	Energy subsidy increases Electricity Consumption.	4.106	.1208	4..923*
3	Energy subsidy has positive impact on Industrial production.	3.310	.0964	1.691
4	Energy subsidy has positive Impact on foreign investment	3.855	1.369	2.641*
5	Energy subsidy has positive impact on real Income	4.367	0.675	6.843*
6	Energy subsidy has a negativerelation with Inflation	4.250	0.795	2.806*
7	Energy subsidy improves comparative advantage of exports.	3.556	1.417	6.612*
8	Energy subsidy improves comparative advantage of civil aviation	3.227	0.829	1.723
9	Energy subsidy has made cost of transport much less.	3. 796	0.685	1.119
10	Energy subsidy has increased budget deficit in Jordan	3.379	1.190	1.598
11	Energy subsidy has negative impact on investment in renewable energy	3.516	1.541	1.752
12	Energy subsidy increases smuggling of fuel oil	3.150	1.210	1.789
13	Energy subsidy have negative impact on having new IMF loans	3.875	0.789	2.135*
	Total Average	3.763		

Notes: Five Scale Likert is used as follows: Strongly agree (5)   Agree (4) Neutral (3) Disagree (2) Strongly disagree. STD = Standard Deviation.* =significant t-test at 5%

Source: Researcher computation

C) Reform Measures of Energy Subsidy

The analysis shows the following results:

1- The respondents strongly approved replacing energy subsidy by coupons for the poorconsumers (mean=4.450) which is statistically significance (t=2.475).

2- The respondents approved replacing energy subsidy by aid to producers (mean=3.175) but the result is not statistically significant (t=1.645).

3-The respondents strongly approved replacing subsidy by cash transfers to thedeprived consumers (4.245) which is statistically significant (t=9.175).

4- The respondents approved replacing energy subsidy by lowering the fees on fuel products (mean=3.940), which is statically significant (t=9.457).

5- The respondents approved replacing energy subsidy by lowering sales tax on fuel products (mean=3.795), which is statically significant (t=2.651).

6- The respondents approved replacing energy subsidy by increasing minimum wage (mean=3.245), which is not statically significant (t=1.840).

7- The respondents approved replacing energy subsidy by ceiling price for fuel products (mean=3.174), which is statically significant (t=5.241).

8- The respondents did not approve replacing energy subsidy by floor price for fuel (mean=2.759) which is statically significant (t=2.236).

9- The respondents strongly approved replacing energy subsidy by gradual decrease in energy subsidies (mean=4.151), which is not statically significant (t=1.862).

10- The respondents approved replacing energy subsidy by safety nets for the poor (mean=3.164), which is not statically significant (t=1.078).

These empirical results are shown in Table 7:

Table 7: Descriptive Analysis of Energy Subsidy Reform Measures

No.	Questionnaire Paragraphs	Mean	STD	t-test
14	Replacing energy subsidy by coupons for needy consumers	4..450	0.872	2.475*
15	Replacing energy subsidy by aid to producers.	3.175	1.123	1.645
16	Replacing energy subsidy by cash transfers for the poor.	4.254	1.124	9.175*
17	Replacing energy subsidy by lowering fees on fuel products	3.940	2.674	9.457*
18	Replacing energy subsidy by lowering sales tax on fuel products	3.795	1.134	2.651*
19	Replacing energy subsidy by increasing minimum wages	3.245	0.956	1.840
20	Replacing energy subsidy by imposing ceiling prices of energy	3.174	0.643	5.241*
21	Replacing energy subsidy by imposing floor prices of energy	2.759	1.095	2.236*
22	Replacing energy subsidy by gradual decrease in energy subsidies.	4.151	0.986	1.862
23	Replacing energy subsidy by safety nets for the poor.	3.164	1.652	1.078
	Total Average	3.610		

Notes: Five Scale Likert is used as follows: Strongly agree (5)   Agree (4) Neutral (3) Disagree (2)Strongly disagree. STD = Standard Deviation.* =significant t-test at 5%

Source: Researcher Computation

Section V: Conclusions & Recommendations

The study sheds light on the characteristics, policies and system of energy subsidy in Jordan; identifies the economic impact and the reform measures of the energy subsidy in Jordan. The research methodology is descriptive and analytical based on a questionnaire to recognize the viewpoints of a convenient sample of economic experts on the impact and reform measures of the energy subsidy in Jordan.

The study concludes that although the energy subsidy has positive social impact on the poor besides the positive economic impact on the enterprises' profitability and competitiveness, it has negative impacts on the public budget, distorted energy market pricing, led to inefficient use of the scarce economic and financial resources of Jordan and reduced the accessibility of Jordan to the credit facilities of IMF and World Bank.

The energy reform measures include replacing the subsidy by cash transfers, tax exemptions, reduction of the fees and sales tax on fuel products, increasing the minimum wages, controlling energy prices through floorand ceiling prices, gradual elimination of subsidy and the provision of social net programs to the needy consumers.

The study recommends rationalizing the energy subsidy in the short run, directing the subsidy to the targeted disadvantaged consumers and the removal of subsidy in the long-run. Such a step should be accompanied by social net programs to alleviate the burden of hiking energy prices on the poor.

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Appendix 1:Questionnaire

Economic Impact and Reform Measures of Energy Subsidy:
Empirical Evidence fromJordan

I. Personal Information

Please put the mark √ on the right answer
1-Eduaction
  OBachelor Degree OHigh Diploma OMA OPh.D
2- Experience
O less than 5 years O 5-10 years O More than 10 years
3- Occupational Position
 O Economic ResearcherO Senior Economist O Professor

II. Paragraphs on Economic Impact of Energy Subsidy

No.	Paragraphs	Extremely Agree 5	Agree 4	Neutral 3	Disagree 2	Extremely Disagree 1
1	Energy subsidy increased Energy consumption					
2	Energy subsidy increases Electricity Consumption					
3	Energy subsidy has positive impact on Industrial production					
4	Energy subsidy has positive Impact on foreign investment					
5	Energy subsidy has positive impact on real Income					
6	There is positive relation between Energy Subsidy and Inflation					
7	Energy subsidy improve comparative advantage of exports.					
8	Energy subsidy improve comparative advantage of civil aviation and marine companies.					
9	Energy subsidy has negative impact on internal cost of transport.					
10	Energy subsidy has negative impact on public budget in Jordan causing its deficit.					
11	Energy subsidy has negative impact on national investment in renewable energy					
12	Energy subsidy increases smuggling of fuel oil					
13	Energy subsidy is an obstacle in having new loans from IMF and World Bank					

III.Paragraphs on Energy Subsidy Reform Measure

No.	Paragraphs	Extremely Agree 5	Agree 4	Neutral 3	Disagree 2	Extremely Disagree 1
14	Replacing energy subsidy by coupons for needy consumers					
15	Replacing energy subsidy by producers aid.					
16	Replacing energy subsidy by cash transfers for the poor.					
17	Replacing energy subsidy by lowering fees on imported fuel products					
18	Replacing energy subsidy by lowering sales tax on fuel products					
19	Replacing energy subsidy by increasing minimum wages					
20	Replacing energy subsidy by mandatory ceiling prices of energy					
21	Replacing energy subsidy by mandatory minimum prices of energy					
22	Replacing energy subsidy by gradual decrease in energy subsidies.					
23	Replacing energy subsidy by general safety nets for the poor.					