Renewable and Sustainable Energy Reviews xx (xxxx) xxxx–xxxx

Contents lists available at ScienceDirect

Renewable and Sustainable Energy Reviews

journal homepage: www.elsevier.com/locate/rser

Literature survey on the relationships between energy, environment and economic growth

Sofien Tiba[a], Anis Omri[b,c,*]

[a] Faculty of Economics and Management, University of Sfax, Tunisia
[b] Faculty of Economics and management of Nabeul, University of Carthage, Tunisia
[c] College of Business and Economics, Qassim University, KSA

ARTICLE INFO

Keywords:
Literature survey
Economic growth
Energy consumption
Environment

ABSTRACT

The aim of this study is to exhibit an exhaustive survey which is related to the great flight of the literature of energy- environment-growth nexus at the individual and regional scale studies covering the period from 1978 to 2014. The survey takes into consideration the sample (country, region, etc.), periods covering, econometric strategies, and conclusions. Our survey is based on the causality direction among (i) the energy use variables (electricity, nuclear, renewable and non-renewable) and output growth; (ii) between economic growth and environment; and between the three variables at the same time. Globally, these surveys provide paradoxical and not conclusive results which energy consumption can boost economic growth through the productivity enhancement and it can boost also the environmental damages through the enhancement of pollutant emissions. Our survey sheds more the lights on the energy-environment-growth literature by giving an extensive listing (1978–2014) of these causal linkages among the energy use variables, environment and economic growth for both individual and collective cases. There is a unanimous consensus about the importance of dealing with such dynamic relationship, which is seems to be a cornerstone element in setting any ambition strategies (energy, ecological and economics).

1. Introduction

For a several decades, economic growth is the ultimate aim for each and every policy makers which it considers the only tool for a sustainable development. Since the third millennium, precisely when the Kyoto protocol under the supervision of the United Nations in the background of climate change agreement on December 1997 which this protocol includes the environmental quality as a crucial variable to determine the sustainability of development consistent with the fifth generation of human rights. Indeed, the summit of Johannesburg and Rio de Janeiro are organized in the same field. However, economic growth can exert a pressure on environmental quality, through energy consumption as a transmission channel, which it seem to conflicting in terms of goals and may the economic growth policy adopted at odds to environmental aims who policy makers have a great challenging to arbitrate between growth and environment. In fact, the interaction between economic growth, energy consumption and environmental quality was the subject of significant academic debates that linked to the energy economics literature (e.g [22,26,161]) and thus revitalizing the long debate in both academic and policy spheres about their advantages and related costs caused by their interactions. There is an impressive body of literature which has as a subject the three-way linkages economic growth, environmental quality and energy consumption. This relationship has attracted the attention of many debates an academic research in different countries and for a long time. Indeed environmental quality may generate positive or negative externalities. Consequently it stimulates economic growth via the bias of human health which can potentially affected by the emissions. The linkage among energy variables, growth and environmental quality was the subject of conflicting and paradoxical aims wished by the policy makers. This postulates, understanding this dynamic linkage is crucial to understanding the current energy and environmental policy, is a cornerstone for new insight about energy and environmental policy, and this relationship is the basis for making sound economic policy, consistent with their objectives in terms of environmental and energy policy. The past empirical works on the three way linkage causality between energy-growth-environment can be categorized into three lines of research. The first line looks at the nexus between energy variables and economic growth. This relationship postulates that great economic performance needs great energy use level and efficient energy consumption requires a great economic growth. Based on the seminal survey of Kraft and Kraft [122], Granger causality test procedure has

* Corresponding author at: Faculty of Economics and management of Nabeul, University of Carthage, Tunisia.
E-mail addresses: sofienetiba@gmail.com (S. Tiba), elomrianis@gmail.com (A. Omri).

http://dx.doi.org/10.1016/j.rser.2016.09.113
Received 29 August 2015; Received in revised form 14 September 2016; Accepted 25 September 2016
Available online xxxx
1364-0321/

Table 1
Summary of the existing literature on energy consumption-growth nexus.

No.	Study	Periods	Country	Methodologies	Conclusions
1	Kraft and Kraft [122]	1947–1974	United States	Granger causality tests.	GDP = > EC.
2	[4])	1950–1970	United States	Sim's technique.	EC≠GDP.
3	Yu and Hwang [253]	1947–1979	United States	Sim's technique.	EC≠GDP.
4	Abosedra and Baghestani [1]	1947–1187	United States	Cointegration, Granger causality tests.	GDP = > EC.
5	Ramcharran [186]	1970–1986	Jamaica	Granger causality test.	ECC= > GDP.
6	Hwang and Gum [107]	1961–1990	Taiwan	Cointegration, ECM.	EC < = > GDP.
7	Yu and Jin [254]	1974–1990	United States	Cointegration, Granger causality tests.	EC≠GDP.
8	Stern [218]	1947–1990	United States	MVAR model.	EC= > GDP.
9	Cheng [51]	1947–1990	United States	Cointegration, Granger causality tests.	EC≠GDP.
10	Cheng and Lai [53]	1954–1993	Taiwan	Granger causality tests.	GDP= > EC.
11	Cheng [54]	1952–1995	Japan	Hsiao's version of Granger Causality.	GDP= > EC.
12	Cheng [55]	1952–1995	India	Cointegration, ECM Granger causality tests.	GDP= > EC.
13	Stern [219]	1948–1994	United States	Cointegration, Granger causality tests.	EC= > GDP.
14	Yang [243]	1954–1997	Taiwan	Hsiao's version of Granger Causality.	ECC⇔GDP.
15	Aqeel and Butt [28]	1955–1996	Pakistan	Hsiao's version of Granger Causality.	EC= > GDP.
16	Soytas et al. [214]	1960–1995	Turkey	Cointegration, Granger causality tests.	EC= > GDP.
17	Fatai et al. (2002)	1960–1999	New Zealand	Granger causality, ARDL bounds testing, Toda and Yamamoto procedure.	EC≠GDP.
18	Ghosh [87]	1950–1997	India	Granger causality test.	GDP= > ECC.
19	Glasure (2002)	1961–1990	South Korea	Vector Error Correction Model.	EC⇔GDP.
20	Hondroyiannis et al.[99]	1960–1996	Greece	Cointegration, ECM, Variance decomposition.	EC⇔GDP.
21	Oh and Lee (2004)	1970–1999	South Korea	VECM methodology.	EC⇔GDP.
22	Altinay and Karagol[17]	1950–2000	Turkey	Hsiao's version of Granger Causality.	EC≠GDP.
23	Ghali and El-Sakka (2004)	1961–1997	Canada	Hsiao's version of Granger causality.	EC≠GDP.
24	Jumbe[121]	1970–1999	Malawi	Granger causality, ECM.	ECC⇔GDP.
25	Morimoto	1960–1998	Sri Lanka	OLS regression model, Granger causality test.	ECC= > GDP.
26	Paul and Bhattacharya[178]	1950–1996	India	Granger causality tests, ECM.	EC= > GDP.
27	Shiu and Lam[211]	1971–2000	China	Cointegration, ECM.	GDP= > ECC.
28	Wolde-Rufael[237]	1952–1999	Shanghai	A modified version of Granger causality.	EC= > GDP.
29	Lee and Chang[129]	1954–2003	Taiwan	Johansen-Juselius procedure, Cointegration, VECM.	EC= > GDP.
30	Narayan and Smyth[154]	1966–1999	Australia	Cointegration, Granger causality ECM.	GDP= > ECC.
31	Yoo[249]	1970–2002	South Korea	VECM methoodology.	EC⇔GDP.
32	Yoo and Jung[247]	1972–2002	Korea	VECM methoodology.	NEC= > GDP.
33	Yoo and Kim[248]	1971–2002	Indonesia	Hsiao's version of Granger Causality.	GDP= > EC.
34	Halicioglu[95]	1968–2005	Turkey	Granger causality test.	GDP= > EC.
35	Jobert and Karanfil[120]	1960–2003	Turkey	Cointegration and Granger causality test.	EC≠GDP.
36	Lise and Montfort (2007)	1970–2003	Turkey	VECM methoodology.	GDP= > EC.
37	Soytas et al.[216]	1972–2004	United States	GMM	EC≠GDP.
38	Ang[21]	1960–2000	France	Cointegration, VECM methodology.	EC= > GDP.
39	Ho and Siu[102]	1966–2002	Hong Kong	Cointegration, VECM methodology.	EC= > GDP.
40	Ewing et al.[75]	2001–2005	United States	VAR and forecast error variance decomposition.	GDP= > EC.
41	Mozumder Marathe[150]	1971–1999	Bangladeh	Cointegration, VECM methodology..	GDP= > ECC.
42	Narayan and Smyth (2007)	1966–1999	Australia	Multivariate Granger causality test.	GDP= > ECC.
43	Narayan and Singh[155]	1971–2002	Fiji Islands	Cointegration, Granger causality test.	ECC= > GDP.
44	Yuan et al.[255]	1978–2004	China	Cointegration techniques.	ECC= > GDP.
45	Zachariadis and Pashouortidou[259]	1960–2004	Cyprus	Cointegration, Granger causality, VEC.	EC⇔GDP.
46	Zamani[260]	1967–2003	Iran	Granger causality, Cointegration, VECM methodology.	GDP= > EC.
47	Ang[22]	1971–1999	Malaysia	Johansen cointegration, VECM.	GDP= > EC.
48	Erdal et al.[73]	1970–2006	Turkey	Granger causality test.	EC⇔GDP.
49	Hu and Lin[106]	1982–2006	Taiwan	Hansen-Seo threshold cointegration, VEC.	GDP= > ECC.
50	Sari et al.[197]	2001–2005	United States	ARDL bounds testing approach	GDP= > REC.
51	Tang[224]	1972–2003	Malaysia	ARDL approach, ECM, Granger causality	ECC < = > GDP.
52	Yuan et al.[256]	1963–2005	China	Johansen cointegration, VEC.	ECC= > GDP.
53	Abosedra et al.[2]	1995–2005	Lebanon	Granger cauality.	ECC= > GDP.
54	Akinlo[10]	1980–2006	Nigeria	Johansen-Juselius, cointegration, VEC.	ECC= > GDP.
55	Ghosh[88]	1985–2005	India	ARDL bounds testing approach, cointegration Granger causality.	GDP= > ECC.
56	Odhiambo[160]	1971–2006	South Africa	Granger causality test	EC⇔GDP
57	Tang[223]	1970–2005	Malaysia	ARDLbonds test; Granger causality	EC⇔GDP.
58	Ziramba[264]	1980–2005	South Africa	ARDL bounds testing approach	EC⇔GDP.
59	Payne[179]	1949–2006	United States	Toda-Yamamoto procedure	EC≠GDP.
60	Belloumi[39]	1971–2004	Tunisia	Granger causality tests	EC⇔GDP.
61	Bowden and Payne[43]	1949–2006	United States	Toda-Yamamoto procedure.	EC= > GDP.
62	Halicioglu[96]	1960–2005	Turkey	Granger causality, ARDL, Cointegration.	EC≠GDP.
63	Odhiambo[160]	1971–2006	Tanzania	ARDLbonds test; Granger causality-VECM.	EC= > GDP.
64	Soytas and Sari[217]	1960–2000	Turkey	Toda-Yamamoto procedure.	EC≠GDP.
65	Zhang and Cheng[257]	1960–2007	China	Granger causality test.	GDP= > EC.
66	Acaravci[3]	1968–2005	Turkey	Cointegration, VECM methodology.	EC⇔GDP.
67	Bartleet and Gounder[36]	1960–2004	NewZealand	Granger causality test.	GDP= > EC.
68	Chang[48]	1981–2006	China	Multivariate causality test based on VECM methodology.	EC= > GDP.
69	Chandran et al.[49]	1971–2003	Malaysia	ARDL bonds test.	ECC= > GDP.
70	Ighodaro[110]	1970–2005	Nigeria	Cointegration, Granger causality.	ECC= > GDP.
71	Jamil and Ahmad[115]	1960–2008	Pakistan	Vector Error Correction Model	GDP= > EC.
72	Lorde et al.[136]	1960–2004	Barbados	VAR models, Granger causality.	ECC⇔GDP.

(continued on next page)