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# The Environmental Kuznets Curve and Israel

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## Abstract

The purpose of this study was to examine the environmental Kuznets curve (EKC) for Israel. Grounded in the EKC framework, secondary data was used to estimate the relationship between the environment, economic growth, and government effectiveness. Results showed an EKC threshold of \$27,200 per capita, but no other statistically significant predictor variables. An exploration of Israel's environmental expenditures highlighted a deeply fragmented environmental policy climate. A key recommendation is to further explore the role of governance in the EKC, particularly for Israel. The implications for positive social change include the potential for policymakers to target development spending, reducing environmental damage.

## Problem

The main problem this study addressed was:

- a plethora of EKC studies have produced a diverse set of results (Sarkodie & Strezov, 2019).
- there is a gap within the literature related to comprehensive measures of the environment and government effectiveness (Wawrzyniak & Doryń, 2020).
- Israel was the only country out of the top 10 innovative economies to display a significant EKC (Gormus & Aydin, 2020).
- If an EKC or inverted U-shaped relationship exists between the environment and economic growth, policymakers targeting scarce resources towards economic growth may reduce environmental damage (Grossman & Krueger, 1991).

## Purpose

The purpose of this quantitative correlational study was to

- examine the relationship between the environment, economic growth, and government effectiveness through an EKC for Israel.

# Significance

The findings from this study could

- add to the literature on EKC. Only a few EKC studies include government effectiveness in the EKC estimation (Wawrzyniak & Doryń, 2020).
- increase and support the investigation of government effectiveness in the analysis of EKCs.
- provide estimates of the EKC using a more comprehensive measure of environmental quality. The majority of previous EKC studies measured environmental quality through carbon emissions.
- provide targeted information relevant to encouraging economic growth and reducing environmental damages.

# Theory or Framework

Grossman and Krueger (1991) applied Kuznet's framework and postulated an inverted U-shaped relationship between economic growth and the environment.

- There exists a turning point or threshold value in the relationship between economic growth and the environment.
- Economic growth below the turning point leads to diminished environmental quality.
- Economic growth beyond the turning point leads to improvements in the environment.

Oates and Portney (2003) provided critical components of the political economy of environmental policy.

- The central tenet is the importance of institutions and institutional settings in the development, implementation, and regulation of environmental policy.

## Relevant Scholarship

Sarkodie and Strezov (2019) performed a meta-analysis and found that collectively the empirical analyses of the EKC estimate a threshold at an average of US\$8,910 per capita income.

Effective environmental policies are necessary to improve the environment; therefore, government effectiveness and institutional quality are essential for improving the environment (Ibrahim & Law, 2015; Lau et al., 2014).

Recent studies explore with varying degrees of success, the impact of governance on carbon emissions for a wide variety of countries and periods (see Wawrzyniak & Doryń, 2020 for a review).

The measures of institutional quality and governance included political stability, absence of violence, government effectiveness, quality of regulations, corruption controls, democracy, the rule of law, and quality of democratic institutions (Wawrzyniak & Doryń, 2020).

Environmental policy setting and implementation in Israel is highly fragmented. Wawrzyniak and Doryń (2020) noted that enhancing institutional backgrounds could improve the environment. In Israel, the primary source of environmental policy setting and implementation occurs in the over 300 local and regional councils (Laster & Livney, 2020).

# Research Question

Test if an inverted U-shaped relationship exists between the environment and economic growth for Israel, controlling for the consumption of renewable energy, patents, and government effectiveness?

## Sources of Data

Variable	Abbreviation in Regression	Data Source	Years Available
Ecological footprint per capita	EF	GFN	1990 - 2015
GDP per capita (constant 2010 US dollars)	GDP, GDP <sup>2</sup>	World Bank	1990 - 2015
Percentage share of renewable energy consumption	Renew	World Bank	1990 - 2015
Patents per capita	Patents	World Bank	1990 - 2015
Government effectiveness	GE	Kaufmann et al. (2010)	1996, 1998, 2000, 2002 - 2015
Total environmental expenditures by operating sector		Central Bureau of Statistics	1995, 2000 - 2018

## Procedures & Analysis

The following regression equation is used to estimate the effect of the predictor variables on the dependent variable **ecological footprint (EF) per capita**.

$$EF_t = \beta_0 + \beta_1 GDP_t + \beta_2 GDP_t^2 + \beta_3 Renew_t + \beta_4 GE_t + \beta_5 Patents_t + \beta_6 Year_t + \varepsilon_t$$

- Each variable represents that value for Israel in a given year between 1996 and 2015 (t).
- The regression is used to estimate the coefficient values for each predictor variable (see Table 1).
- Standard reliability and validity tests ensure that the analysis results are consistent and accurate.

## Findings

The results showed:

- GDP per capita and GDP per capita<sup>2</sup> were statistically different from zero.
- a threshold of \$27,000 per capita (in 2010 constant dollars).
- all of the other predictor variables were statistically indistinguishable from zero.

*Table 1. Regression Analysis Summary for the EKC with Government Effectiveness*

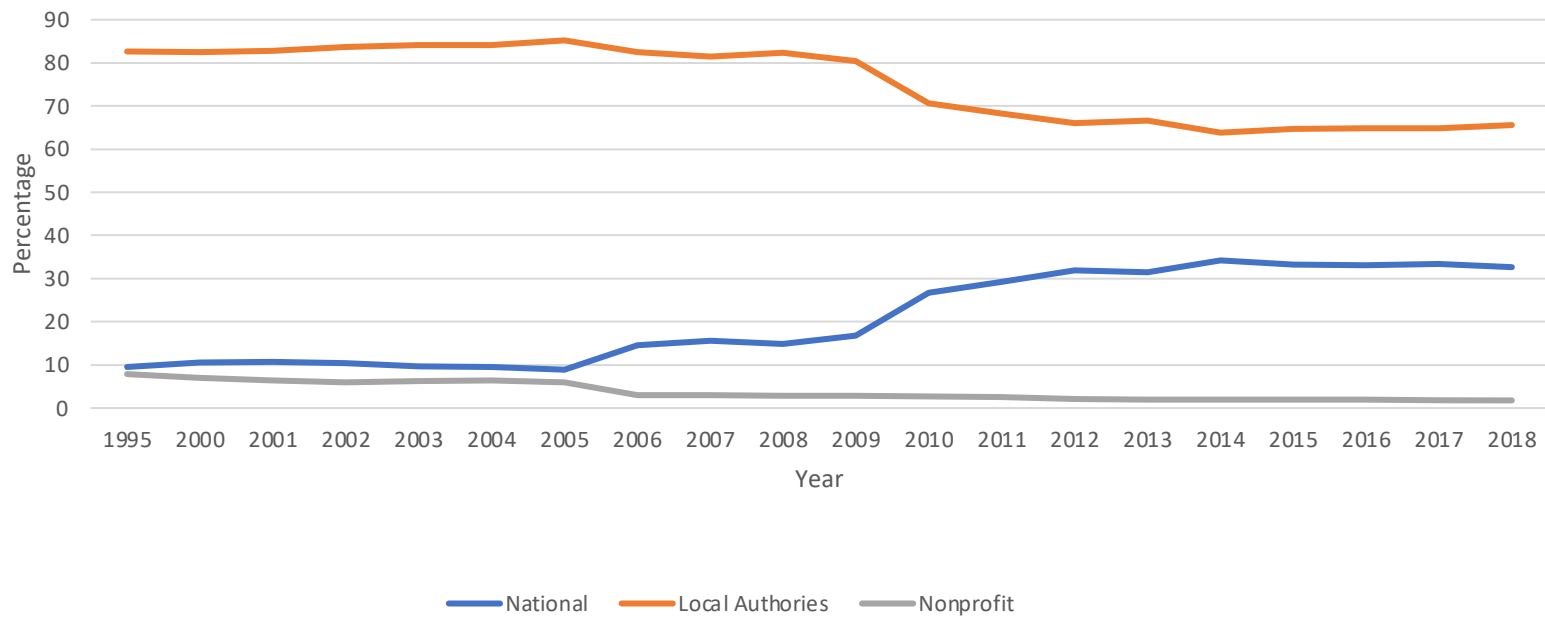
<i>Predictors</i>	<i><math>\beta</math></i>	<i>p</i>
GDP per capita	1.306	0.02
GDP per capita <sup>2</sup>	-0.024	0.013
Renewable Energy	-0.035	0.145
Government Effectiveness	0.650	0.196
Patents	-1.941	0.127
Year	-0.012	0.564

*footnote: GDP and GDP<sup>2</sup> are 2-year averages*

# Findings

An evaluation of Israel's government expenditures shows notable reliance on local authorities and, to a lesser extent, nonprofit institutes relative to the national government to supply environmental protection (see Figure 1).

Figure 1. Percentage of Total Environmental Expenditure





## Interpretation

Government effectiveness and innovation did not have an individual statistically significant effect on environmental quality, although this is most likely due to data limitations. Therefore the results of this study did not reduce the EKC research gap.

The fragmented Israeli environmental policy system may lead to a unique investigation into why the EKC for Israel exists relative to other innovative economies.

## Limitations

The main limitation is the size of the dataset. There is limited data available on government effectiveness for Israel over an extended period.

The EKC may be a purely empirical construct, so there is no reason for the existence of a threshold value.

The quality of the data may be inconsistent. The reported values may not reflect the intended measure.

## Recommendations

Future studies should expand the dataset to include other innovative economies.

Construct a panel data set for the top 10 innovative economies to estimate the impact of government effectiveness and other governance variables on the EKC. This procedure should introduce more robust results.

Explore environmental policymaking in Israel relative to other innovative countries. The political process is fragmented and decentralized, with a heavy emphasis on local authorities and nonprofit institutes.

Compare the Israeli environmental structure to other developed countries and explore the impact on environmental policymaking.

## Social Change Implications

The implications for positive social change could relate to the existence of an EKC and how this may impact developing countries that have yet to reach EKC thresholds.

Targeted development spending could reduce the time and environmental damage necessary to reach a threshold value and therefore improve environmental quality. Thus more fully preserving the environment for current and future generations.

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