

**Report for the Sustainable Cities Program at the University of
Southern California**

2001 French Summer Program

By

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August, 2001

Background Information

During my summer study in France, I worked under the direction of Dr. Barraque from the Laboratoire Techniques, Territoires et Societies at the Ecole National Des Ponts et Chaussess. The original goal was only to collect data and refine the economic model in my current research relating to issues on government subsidies in the water supply sector. The knowledge I obtained this summer has increased my interest in working on issues in measuring sustainable development and understanding the relationship between sustainable development and democracy.

Government Subsidies in the Water Supply Sector

The purpose of my research on government subsidies in the water supply sector is to introduce a dynamic partial equilibrium model that captures the path of change in prices and quantities under various subsidy schemes and levels of resource endowment. The model will also incorporate the impact of water subsidies in the current period on supply elasticity in the next period. Without actual detailed historical data, the alternative strategy is to use a simulation method. My current research provides quantitative assessments only through a simulation method due to an inaccessibility of historical data. The original goal for my summer study in France was to collect data to provide quantitative

assessment through actual historical data and to further refine the economic model that I have already developed.

Methodology

To search for the appropriate data that fit my current model, I began the data collection process through interviews with various institutions. The interview process started with me contacting individuals who were referred to me by Dr. Barraque. I first send out emails to the different officials at the various agencies to introduce myself, the purpose of my research in France and to ask for the possibility of arranging an appointment with the official. For the institutions that I did not hear from after approximately 10 days, I then followed up with a telephone call to confirm that the various individuals received the email I sent out. To start the meeting, I always gave a brief presentation of my current research. After my presentation, I then asked the officials about current research at their institute and whether they thought my research was of any interest for the institutes. Furthermore, I inquired whether they had any comments with regards to my current model and any possible match of data I was searching for.

Results

One of the major developments with regards to my research in France is the realization that it is necessary to incorporate the impact of various water quality

requirements on price when government adjusts the subsidy levels. The reason is, from my interviews with the various institutes, the overall conclusion is to have the model more relevant to the existing conditions in many countries within the EU. Many developed countries within the EU, such as France and Germany, do not consider shortages of rainfall a problem, however, the higher standard of water quality required by the EU recently has sparked concern with regards to the possibility of a higher price of water in the near future.

The second major development of my research is that I have collected data related to water pricing for the basin Seine Normandie in France. This data provides the possibility for understanding how the different communities within the same basin may require different pricing and taxing schemes due to the different industries that dominate within the community. For instance, many communities that are located near the seaside have a higher water demand in the summer period due to an increase in the number of tourists that visit the area.

A third development can be considered as an extension to my original research on government subsidies in the water supply sector. The realization of the importance to incorporate the impact of various water quality requirements on price when government adjusts the subsidy levels has furthered my interest in working on issues in measuring sustainable development and understanding the relationship between sustainable development and democracy.

Extension: Measuring Sustainable Development and its Relationship with Democracy

Statement of Problem

Although the concept of sustainable development has been widely studied across various disciplines, there is no common consensus on its definition. Much of the relevant literature criticizes economists who have inappropriately handled the issue of sustainable development. These authors argue that economists often oversimplify, such as assuming "artificial capital can be substituted for natural resources" (Renn, 1995). Economists defend themselves by pointing out that the definition for sustainable development their opponents propose lacks precision and is unclear (Tisdell, 1993).

To incorporate the concerns of the various perspectives, as well as to provide precision and avoid oversimplification when examining sustainable development, the United Nations and the Organisation for Economic Co-operation and Development, OECD, constructed numerous sets of indicators for measuring sustainable development. The United Nations categorizes indicators collected from various organizations such as the World Health Organization into four different categories. There are approximately thirty-nine indicators under the category titled "Social", twenty-two under "Economic", fifty-five under "Environmental" and fifteen under "Institution" (United Nation, 2000). The

OECD uses a system of three categories; indicators are divided into social, economic or environmental groups (OECD, 1999).

The sizable number of indicators not only makes it difficult to compare overall sustainable development among countries but also create barriers to examine relationships between sustainable development and determinants for sustainable development. Barro provides empirical evidence to support the existence of a non-linear relationship between democracy and economic growth. The results indicate that a moderate amount of democracy promotes economic growth but further expansion produces a counter effect (1997). Sen suggested that developing and strengthening a democratic system is an essential component to achieve sustainable development (1999). Does the non-linear association between democracy and economic growth also apply to the relationship between democracy and sustainable development?

Purpose

The purpose of my study is to compile an index that measures sustainable development and to use the index to examine the current global condition with regards to sustainable development. In addition, this study will investigate the relationship between sustainable development and democracy and will provide empirical evidence to support the results.

Further Research

First, I will provide a rationale and methodology to compile an index to measure sustainable development that incorporate a human development indicator, the level of natural resource endowment, a change in biodiversity, as well as the degree of pollution. Secondly, I would like to build a theoretical model that captures the relationship between democracy and sustainable development. Finally, is to apply an econometric method to examine the relationship between democracy and sustainable development using historical data. Various variables were used in current literature to capture the level of democracy such as the Gastile's indicator of political right (1989, 1991), and Bollen's democracy measure (1990). All of these variables will be examined.

Bibliography

Aron, J., "Growth and Institutions: A Review of the Evidence," *The World Bank Research Observer*, Vol. 15, No. 1, (2000): 99-135.

Barro, R., *Determinants of Economic Growth: A Cross Country Empirical Study*, Cambridge, MA: MIT Press, (1998).

Campos, N. and J. Nugent, "Who is Afraid of Political Instability?," *The Davidson Institute Working Paper Series, Working Paper Number 326*, (2000).

Organisation for Economic Co-operation and Development, *Frameworks to Measure Sustainable Development*, Paris, France: Organisation for Economic Co-operation and Development, 1999.

Organisation for Economic Co-operation and Development, *Towards Sustainable Development: Environmental Indicators*, Paris, France: Organisation for Economic Co-operation and Development, 1998.

Renn, O., "A Regional Concept of Qualitative Growth and Sustainability," Germany

Sen, A., *Development as Freedom*, New York, Alfred A. Knopf, Inc. (1999).

Tisdell, C., *Environmental Economics*, Brookfield, VT: Edward Elgar Publishing Company, (1993).

UNIDO, "Environmental Policy Framework,"
[<http://www.unido.org/doc/50361.htmls>].

Unite Nations, "Sustainable Development,"
[<http://www.un.org/esa/sustdev/indisd/english/forward.htm>].