



NORTH-HOLLAND

Economic Growth and Energy Import Requirements: An Energy Balance Model of Thailand

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This paper develops an energy balance model for Thailand, makes projection of future energy needs, and tests various alternative strategies to deal with energy dependence. We show that rapid economic development may have large negative impacts on the balance of payments of energy deficient economies like Thailand. Fortunately, East Asian growth is based on export promotion so that foreign earnings tend to offset the cost of imported fuel. © 2000 Society for Policy Modeling. Published by Elsevier Science Inc.

1. INTRODUCTION

Energy consumption increases very rapidly during economic development. For a developing country lacking in domestic energy resources, projection of the energy balance will show the need to import growing quantities of fuel, causing fear of significant burdens on the balance of payments.¹

For the world economy, the burgeoning energy import requirements of the high growth economies in East Asia may or may

¹While some experts concerned with the energy economy emphasize problems associated with deficiencies of domestic energy supply, particularly from the perspective of national security, from an economic perspective, the balance of payments implications are the most important.

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This paper is part of a collaboration between the International Centre for the Study of East Asian Development (ICSEAD), Kitakyushu, Japan and the University of Pennsylvania, Philadelphia, PA. This study was completed prior to the 1997 crisis. However, recent signs of rapid recovery in Thailand suggest that the long run projections and alternative simulations will not be far off track.

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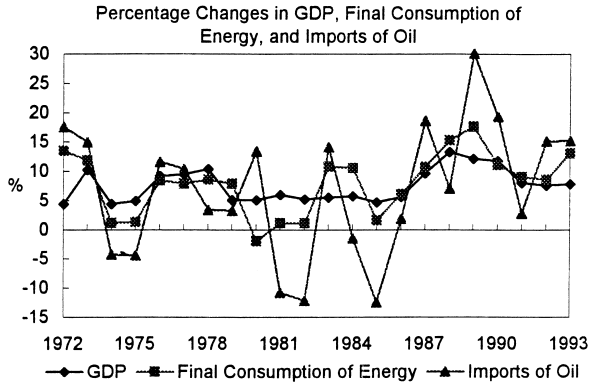


Figure 1. GDP, energy consumption, and imports of oil.

not pose a challenge. This article considers the linkage between energy imports and economic development. Using an “energy balance” model of Thailand, we simulate the effects of growth, domestic resource expansion, and improvements in energy use efficiency on the growth of energy requirements.

In this paper we develop an energy balance model for Thailand, make projection of future developments and test various alternative strategies to deal with energy dependence. We proceed as follows: Section 2 contains the theoretical structure of our model. Section 3 talks about model estimation and sample period solutions. Section 4 develops the forecast and alternative policy analyses. Section 5 draws conclusions.

Thailand’s economy is a good example of the link between energy demand and development. The energy needs and imports of oil of Thailand have grown very rapidly. Figure 1 shows the growth rate of GDP and total final consumption of energy for Thailand in the period 1972–93.

On average, over the past 10 years (1984–93), GDP grew at an annual rate of 8.6 percent, and energy consumption grew at 10.3 percent, with an energy elasticity of 1.2 percent. The graph illustrates this relationship and also shows the sharp cyclical sensitivity of energy consumption and petroleum imports. This relationship, which is characteristic of a rapidly developing economy (Zilberfarb and Adams, 1981; and Adams and Chen, 1996) reflects increasing industrialization and rising living standards, particularly the rapid motorization observed in recent years.

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