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**AN ECONOMETRIC ANALYSIS OF  
THE DETERMINANTS OF GROWTH  
IN THE KINGDOM OF TONGA  
1970-1998**

**A Research Thesis submitted in partial requirement for the degree of  
Master of Applied and International Economics at Massey University**

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# STATEMENT OF SOURCES

The work presented in this study is the original and independent work of the author, except where otherwise stated or acknowledged. No part of this work has been previously submitted to this, or any other university, for the attainment of a formal qualification.



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SIOSAIA TUPOU FALETAU

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# ABSTRACT

The importance of determining the factors that contribute to economic growth is vital in the case of Tonga because of the benefits and advantages it provides for the people and their future development. The main objective of this study is to analyse and investigate empirically the macroeconomic factors that promote economic growth and development in Tonga. Economic theories and various studies have presented the variables that may affect growth. These include investment (domestic and foreign), labour force, exports and imports, fiscal policies, tourism receipts, private remittances, foreign aid and its various components. Foreign resources such as aid and private remittances play an important role in the development of small island economies and Tonga's heavy reliance on these factors may also explain their contribution to growth.

The study uses a neoclassical production function to examine the relationships between economic growth in Tonga and the proposed determinants listed above. The cointegration method of Auto-Regressive Distributed Lag is utilised in the analysis. The empirical evidence indicates that factors making a positive contribution to economic growth in Tonga are the growth in exports, tourism receipts, openness to trade, government consumption expenditure, bilateral aid, grant aid and imports. The loan aid, multilateral aid, technical co-operation grants and private remittances, while significant in most cases, show a decline over time. Natural disasters and external market shocks have a strong adverse effect on Tonga's growth rate.

The issue of macroeconomic management is stressed in this study as the key role to be played by the government in order for the available resources to be allocated to the productive sectors of the economy. This can be undertaken through setting stable macroeconomic environment, introducing and maintaining growth-oriented policies and structural reforms in some of the key sectors of the economy. Research should be concentrated on high value niche products and promoting technological development to support the diversification in the export and tourism sectors. Measures should also be adopted to monitor the effectiveness of utilising foreign aid projects, as current aid flows show a decline.

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# LIST OF ABBREVIATIONS

ADB	Asian Development Bank
AIDAB	Australian International Development Assistance Bureau
ARDL	Auto-Regressive Distributed Lag
BOP	Balance of Payment
CIF	Cost including Insurance and Freight
COLA	Cost of Living Allowance
CPI	Consumer Price Index
EIU	Economic Intelligence Unit
FID	Foreign Direct Investment
GDE	Gross Domestic Expenditure
GDP	Gross Domestic Product
GFCF	Gross Fixed Capital Formation
GNP	Gross National Product
HDI	Human Development Index
IMF	International Monetary Fund
ODA	Overseas Development Assistance
OECD	Organisation for Economic Co-operation and Development
R&D	Research & Development
SIC	Small Industry Centre
SPARTECA	South Pacific Regional Trade and Economic Agreement
UK	United Kingdom
UNDP	United Nations Development Programme
US	United States
WTTC	World Travel and Tourism Council

# CHAPTER 1: Introduction

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## 1.1 Aims and Objectives

The South Pacific Island nations have diverse physical environments and rich traditional cultures with overall aims and objectives of development growth policies and success for its population. They face a unique set of development challenges, which is reflected in their sluggish growth rates, despite high levels of per capita development assistance flowing into these island states. These problems are largely attributable to their small size, dependence on a narrow range of export commodities and vulnerability to external shocks. Natural disasters have also adversely affected growth in most of the island economies at one time or another (World Bank, 1996). Furthermore, the impact of political disturbances negatively affected growth. The two military coups in Fiji in 1987 provide an example of the detrimental effect that domestic political upheaval can have on economic performance (Gounder, 1999).

The Kingdom of Tonga is a small island nation in the South Pacific that shares most of the economic constraints faced by other Pacific Island countries. The economy is dependent on agriculture and fisheries although the tertiary sector has become more important in recent years. Tonga's level of development is relatively high compared to other South Pacific Island countries, except for Fiji (UNDP, 1994). Tonga has been classified by the World Bank as a lower middle-income country, which has an average per capita income of US\$1,909 in 1996/97 (Tonga Ministry of Finance, 1997) and a human development index (HDI) of 0.72 (UNDP, 1994).

Tonga's growth rate has been erratic over time. This is largely due to its dependence on a few agricultural products concentrated on one market, remittances from Tongans abroad

and foreign grants and loans used to finance its development projects and balance of payment deficits. Tonga also faces difficult socio-economic problems, due to its vulnerability to external market forces and natural disaster, geographic isolation and loss of skilled labour through emigration (ADB, 1996).

The production and export of agricultural products has contributed significantly to Tonga's economic growth. However, the volatility observed in this sector over the last three decades has had serious consequences and major changes on the performance of agricultural production and consequently economic growth. For example, the massive 50 percent decline in the price of copra caused the proportion of total export earnings accounted for by the coconut industry to fall from 70 percent in the 1960s and 1970s to 20 percent by the end of 1980s (Sturton, 1992). The production of bananas, which was Tonga's second biggest export earner, has virtually ceased during the late 1980s due to natural disasters and quarantine restrictions. The recovery of the economy in the early 1990s was due to the emergence of squash and the vanilla bean, contributing to the high growth of the economy.

This study is an inquiry into the causes of economic growth, and contains a country-specific econometric analysis of macroeconomic variables, using time series data from 1970-1998 to determine the key factors that promote economic growth and development in Tonga. The literature review examines those macroeconomic variables influencing growth, including investment (domestic and foreign), labour force, exports and imports, government consumption and revenue, tourism receipts, private remittances, foreign aid and its various components. The features and implications of the neoclassical and endogenous growth models will also be examined to determine the existence of short-term and/or long-term relationships to explain Tonga's growth pattern.

The results obtained from this study should provide empirical and policy implications about the effectiveness of macroeconomic variables on economic growth in Tonga. This will assist the Tongan government to allocate its resources more efficiently by setting

development strategies for the economy, and adopting monetary and fiscal policies that will promote macroeconomic stability and long run economic growth.

Section 1.2 introduces the methodology utilised in this study and the sources of the data employed in the analysis. Section 1.3 lists the chapter outlines of this study.

## **1.2 Data and Methodology**

The growth models utilised in this study are based on the Solow-type neoclassical growth model. This is further extended to incorporate tourism receipts, fiscal variables, foreign aid and its various components, and private remittances. Time series data have been employed to estimate these growth models, and so this analysis uses the finite Auto-Regressive Distributed Lag (ARDL) methodology, which applies time series procedures to avoid spurious correlation in the regression analysis. The ARDL procedure has an advantage over other methodologies in that it avoids the pre-testing requirement of the classification of the order of integration.

The data employed in this study are obtained from four different sources. They are from the Tonga Statistics Department, Tonga Ministry of Finance, Asian Development Bank (ADB) and Organisation for Economic Co-operation and Development (OECD). The lack of a longer, consistent and reliable time series pertaining to the Tongan economy makes any empirical macroeconomic analysis difficult. Therefore these sources have been used simultaneously in order to acquire a complete data set for the analysis undertaken here, i.e. for the period 1970 to 1998.

Data provided by the Tonga Statistics Department were collected from their Provisional National Account (1999), Balance of Payment (BOP) Account report (various years), Population Census reports (1966, 1976, 1986, and provisional 1996 census), Consumer Price Indices Report (various years), Labour Force Survey Report (1990, 1993) and Tonga Statistical Abstract (various years). The data from Tonga's Ministry of Finance,

on the other hand, were obtained from the Budget Statement (1997/98) and the Audited Public Accounts (various years). The ADB data were acquired from the *Key Indicators for Asia and Pacific Countries* (various editions). Data on foreign aid and its various components: multilateral, bilateral, loan, grant and technical co-operation is obtained from OECD's *Geographical Distribution of Financial Flow to Development Countries* (various years).

### **1.3 Chapter Outline**

This thesis contains six chapters. The first chapter introduces the aims and objectives of this study, and describes the structure of the thesis. Chapter 2 reviews the literature on economic growth. The first part of Chapter 2 focuses on the theory of growth models, especially the features and implications of the neoclassical and endogenous growth theories, and the empirical testing of them. The second part surveys the literature on the impact of foreign aid on Pacific Island economies and examines foreign aid's contribution to economic development and growth. Chapter 3 provides an overview of the Tongan economy, with a description of its historical background, and an analysis of its macroeconomic performance. An emphasis is placed on the proposed factors contributing to economic growth in Tonga, examining their respective impact on the economy. Chapter 4 presents the methodologies utilised in the econometric analysis and is divided into three parts. The first part develops the growth models based on the Solow-type neoclassical growth model. The second part explores the estimation method where the finite cointegration method of ARDL estimation was selected. The third part addresses the sources and the data employed in this study. Chapter 5 is devoted to the empirical results of the study. An investigation of the policy implications of the results is added to assist policy makers in promoting long-term economic growth for Tonga. Chapter 6 is the conclusion and discusses future research possibilities arising from this research work.