Foreign Aid and Development

The case of Vietnam

by

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Submitted in fulfillment of the requirements for the degree of
Doctor of Philosophy
of the Australian National University

The Crawford School of Economics and Government
The Australian National University
July 2008
Declaration

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university. To the best of the author’s knowledge, it contains no material previously published or written by another person, except where due reference is made in the text.

[Signature]

NGUYEN TUONG VAN

26.02

2009
Acknowledgements

First of all, I would like to express my special thanks to Associate Professor Satish Chand, my principal supervisor, for his invaluable guidance, support and encouragement throughout the course of PhD program. I am indebted him for giving me insightful suggestions on my research and the dissertation proposal in the beginning stage of my study. He provided me detailed and constructive comments quickly on my draft chapters.

I would like to extend my appreciation to Professor Trevor Breusch, Mr. Harry Samios and Mrs. Anne Patching. Professor Trevor Breusch gave me useful advice on econometric methodology and explanation of the results. Mr. Harry Samios and Mrs. Anne Patching helped me develop my academic skills, particularly writing skills over the study period. I would also like to thank my fellow graduate students at the Crawford School for their comments and suggestions in my different seminars and informal meetings. My special thanks go to the Ministry of Training and Education (MOET) for my scholarship during the study.

Finally, I am grateful and indebted to my wife, Bui Thu Ha and my son, Nguyen Tuong Huy for being there for me through both the difficult and easy times, for their love, understanding and support. My deep appreciation is also extended to my father, brothers and sister for their support in every aspect of my life. Dedication of this thesis is to my mother who was here when I started it but could not see its completion.

Thanks, to all of them.
Abstract

Foreign aid is considered a decisive tool which the Vietnamese government has been using to shape socio-economic development and affect its performance. The purpose of this dissertation is to examine the macroeconomic effects of foreign aid on development in Vietnam, focusing on the relationship between foreign aid and economic growth, and government expenditure and poverty reduction during the period 1986-2006.

To analyze the impact of foreign aid on economic growth, the study extends Barro’s traditional growth model and Burnside and Dollar’s aid-growth model to estimate provincial economic growth during the period 2001-2004. Econometric results from the ordinary least squares (OLS) and two-stage least squares (2SLS) techniques suggest that aid spurs provincial growth with diminishing returns. As for disaggregated aid, aid in the production sector shows the highest effect on growth, whereas grants and bilateral aid appear to make a higher contribution to growth than loans and multilateral aid. These results, based on the generated regressors technique, lend strong support to the hypothesis that aid exerts a positive impact on growth by contributing to an increase in capital accumulation. With respect to the conditions under which aid influences growth, the study indicates how better education facilitates economic growth.

Assessing the effects of aid on the government’s spending behaviors, the Feyzioglu et al. (1998) model is employed using national time-series and cross-province data. The findings suggest that the government spends all foreign aid on designated purposes at aggregate level. However, foreign aid appears to be fungible in the three sectors examined and in fiscal transfers from national to provincial level. In these cases, a better approach to aid delivery, namely budget support, is a panacea for aid fungibility in Vietnam.

Concerning the role of foreign aid as a way out of rural poverty, a simultaneous equation model is used to examine how aid reduces poverty through higher agricultural production, increased rural wages and improved non-farm employment opportunities. The results indicate that foreign aid in education has the largest poverty-reduction impact, followed by agriculture, roads and water. There is also evidence of sizable differences in poverty-
reduction impacts across geographical regions of Vietnam with respect to defined aid. The findings suggest that reprioritizing foreign aid distribution can produce larger gains for the poor.

The thesis concludes with three main policy recommendations: (i) aid in the education and production sectors should be mobilized for economic growth and poverty reduction; (ii) budget support is the most appropriate approach for increasing aid effectiveness; and (iii) the poorer regions of Vietnam should be given higher priority for foreign aid distribution.
CONTENTS

Declaration .................................................................................................................. ii
Acknowledgements .................................................................................................... iii
Abstract .................................................................................................................... iv
Contents ...................................................................................................................... vi
List of Tables............................................................................................................... x
List of Figures ............................................................................................................ xi
List of Diagrams .......................................................................................................... xi
List of Acronyms and Abbreviations .......................................................................... xii

CHAPTER 1 INTRODUCTION ...................................................................................... 1

CHAPTER 2 SOCIO-ECONOMIC REFORM AND FOREIGN AID ............................... 7

  2.1 Overview of socio-economic development in Vietnam ..................................... 8

  2.2 Institutional framework for foreign aid .............................................................. 11

  2.3 Foreign aid in Vietnam, 1993-2005 ................................................................ 12

    2.3.1 History of foreign aid to Vietnam .............................................................. 12
    2.3.2 Foreign aid by commitment and disbursement .......................................... 13
    2.3.3 Foreign aid by sector ................................................................................ 14
    2.3.4 Grants and loans ...................................................................................... 15
    2.3.5 Foreign aid by type of assistance .............................................................. 16
    2.3.6 Foreign aid by region ............................................................................... 18
    2.3.7 Foreign aid by donor .............................................................................. 18

  2.4 Impacts of foreign aid in Vietnam: comparative and descriptive analysis ........ 20

    2.4.1 Macroeconomic impacts of foreign aid .................................................... 20
    2.4.2 Contribution of aid to infrastructure development .................................... 23
    2.4.3 Contribution of aid to institutions and policies ........................................ 24
    2.4.4 Contribution of aid to human development .............................................. 26
    2.4.5 Contribution of aid to poverty reduction ................................................ 27

  2.5 Conclusions ........................................................................................................ 28
List of Tables

Table 2.1 Foreign aid disbursement by sector, 1993-2005 ........................................... 33
Table 2.2. Foreign aid by type of assistance, 1993-2005 ............................................... 34
Table 2.3 Regional distribution of foreign aid to provinces and urban authorities ............ 34
Table 2.4 Top ten donors by disbursement, 1993-2005 .................................................. 35
Table 2.5 Import, export and foreign aid, 1995-2005 ..................................................... 35
Table 3.1 List of some studies on conditions of aid effectiveness .................................. 64
Table 3.2 Total aid and growth regressions ...................................................................... 65
Table 3.3 Disaggregated aid and growth regressions ....................................................... 66
Table 3.4 Investment and foreign aid ................................................................................ 67
Table 3.5 Summary of disaggregated aid-investment-growth regressions ....................... 68
Table 3.6 Conditions of effectiveness of aid ..................................................................... 69
Table 3.7 Summary of t value of interaction terms in the regressions on aid, provincial government policy and growth ................................................................. 70
Table 4.1 Government spending (as % of GDP) .............................................................. 112
Table 4.2 Test for unit root and cointegration ................................................................. 113
Table 4.3 Effects of total aid on government expenditure .............................................. 114
Table 4.4 Effects of disaggregated aid on government expenditure ............................... 114
Table 4.5 Impact of foreign aid on total, current and capital expenditure .................... 115
Table 4.6 Foreign aid effects on sectors of provincial expenditure ............................... 116
Table 4.7 Aid effects on inter-governmental fiscal transfers ........................................ 117
Table 4.8 Correlation between explanatory variables .................................................. 118
Table 4.9 Government budget share by sector, 1994-2003 ........................................... 119
Table 4.10 Share of sectoral aid in total government budget, 1994-2003 ...................... 119
Table 5.1 Poverty rate, 1993-2006 .................................................................................. 157
Table 5.2 Regional poverty rates (headcount index in %), 1993-2006 .......................... 157
Table 5.3 Social indicators 1993-2004 .......................................................................... 158
Table 5.4 Poverty by occupation for people who have a job the past 12 months ............. 159
Table 5.5 Causes of rural poverty in Vietnam in 2001 (percentage of poor household saying major cause) .......................................................... 159
Table 5.6 Estimates of system equations ....................................................................... 160
Table 5.7 Estimated foreign aid investment equations .................................................. 161
Table 5.8 Impact on poverty and agricultural productivity of additional foreign aid ....... 161
Table 5.9 Regional impact on poverty and agricultural productivity of foreign aid ......... 162
List of Figures

Figure 2.1 Historical trend in foreign aid commitments, 1975-2005 .................. 30
Figure 2.2 Foreign aid disbursements and commitments in Vietnam, 1993-2005 .......... 30
Figure 2.3 Aid disbursement by grants and loans ........................................ 31
Figure 2.4 Foreign aid, savings and investment, 1993-2005 (% GDP) .................... 31
Figure 2.5 Aid and tax revenue, 1993-2005 .................................................... 32
Figure 4.1 Vietnam’s sub-national budget, 1992-2002 .................................. 110
Figure 4.2 Central government share in budget expenditure 1997-2004 ............... 110
Figure 4.3 Changes in aid flows as a percentage of GDP .............................. 111
Figure 4.4 Aid fungibility ............................................................................. 111
Figure 5.1 Three ways Foreign Aid can impact on Poverty Reduction ............... 124

List of Diagrams

Diagram 5.1 Effects on poverty of foreign aid to the agriculture sector ............... 153
Diagram 5.2 Effects on poverty of foreign aid to the education sector ................ 154
Diagram 5.3 Effects on poverty of foreign aid to the roads sector ..................... 155
Diagram 5.4 Effects on poverty of foreign aid to the water sector .................... 156
### List of Acronyms and Abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
</tr>
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<tbody>
<tr>
<td>ADB</td>
<td>Asian Development Bank</td>
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<td>AFD</td>
<td>French Development Agency</td>
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<td>AFTA</td>
<td>Asian Free Trade Area</td>
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<td>APEC</td>
<td>Asia-Pacific Economic Cooperation Forum</td>
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<td>CIEM</td>
<td>Central Institute for Economic Management</td>
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<td>DAC</td>
<td>Development Assistance Committee</td>
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<td>DAD</td>
<td>Development Assistance Database in Vietnam</td>
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<td>DCAS</td>
<td>UNDP Development Cooperation Analysis System</td>
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<td>DFID</td>
<td>Department for International Development</td>
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<td>FDI</td>
<td>Foreign Direct Investment</td>
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<td>GSO</td>
<td>General Statistics Office</td>
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<td>HDI</td>
<td>Human Development Index</td>
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<tr>
<td>IMF</td>
<td>International Monetary Fund</td>
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<tr>
<td>JBIC</td>
<td>Japan Bank for International Cooperation</td>
</tr>
<tr>
<td>MARD</td>
<td>Ministry of Agriculture and Rural Development</td>
</tr>
<tr>
<td>MOF</td>
<td>Ministry of Finance</td>
</tr>
<tr>
<td>MOLISA</td>
<td>Ministry of Labour, Invalids and Social Affairs</td>
</tr>
<tr>
<td>MPI</td>
<td>Ministry of Planning and Department</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-government Organization</td>
</tr>
<tr>
<td>NTF</td>
<td>National Targeted Programs</td>
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<tr>
<td>ODA</td>
<td>Official Development Assistance</td>
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<tr>
<td>OECD</td>
<td>Organization for Economic Cooperation and Development</td>
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<td>PCI</td>
<td>Provincial Competitiveness Index</td>
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<td>PER</td>
<td>Public Expenditure Review</td>
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<td>PRSC</td>
<td>Project Reduction Support Credit</td>
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<td>SMEs</td>
<td>Small and Medium Enterprises</td>
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<td>SOEs</td>
<td>State-Owned Enterprises</td>
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<td>SWApS</td>
<td>Sector- Wide Approaches</td>
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<td>TA</td>
<td>Technical Assistance</td>
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<tr>
<td>UNDP</td>
<td>United Nations Development Program</td>
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<tr>
<td>VCCI</td>
<td>Vietnam Chamber of Commerce and Industry</td>
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<td>VHLLS</td>
<td>Vietnam Household Living Standard Survey</td>
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<td>VLSS</td>
<td>Vietnam Living Standard Survey</td>
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<tr>
<td>VNCI</td>
<td>The USAID-funded Vietnam Competitiveness Initiatives</td>
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<td>VND</td>
<td>Vietnam dong</td>
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<tr>
<td>WB</td>
<td>World Bank</td>
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<td>WTO</td>
<td>World Trade Organization</td>
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CHAPTER 1
INTRODUCTION

The development of today's oil and gas industry has been shaped by several factors. Initially, the discovery of oil in the late 19th century and the subsequent development of extraction and refining processes by major oil companies allowed for a rapid spread of oil to many developing regions worldwide. This spread not only transformed the economies of these regions, but also posed significant challenges for both developed and developing countries. Inter-state differences in opportunities and vulnerabilities have contributed to the uneven distribution of oil wealth among nations. This has led to a variety of geopolitical and economic implications, affecting global trade and investment patterns.

In recent years, the rapid growth of oil prices has raised concerns about the sustainability of the current oil trajectory. The increasing dependence on oil has led to a series of geopolitical conflicts and economic imbalances. This chapter aims to explore the historical context of oil and gas development, the current challenges faced by the industry, and the potential future scenarios. It will also discuss the role of technology in mitigating the environmental impacts of oil extraction and the importance of diversifying energy sources.

Vietnam, like many other countries, has experienced rapid economic growth in recent years, partly driven by its abundant natural resources. This chapter will focus on Vietnam's case study, examining its oil and gas sector, the challenges it faces, and the potential strategies for sustainable development. The chapter will also highlight the importance of international cooperation in addressing global energy issues.

Vietnam's oil and gas sector has seen significant developments in recent years, with increasing exploration efforts and the discovery of new oil fields. However, the sector faces numerous challenges, including environmental concerns, technological limitations, and geopolitical risks. The chapter will analyze these challenges and discuss potential solutions for sustainable development.

The chapter will also delve into the future of oil and gas technologies, including renewable energy sources and alternative fuels. It will explore the potential impacts of these technologies on the global energy landscape and the role of Vietnam in shaping this future.
The issue of foreign aid and development has been of interest for a long time, with varied emphases placed on how development assistance can be used most effectively in promoting economic development and reducing poverty. Although foreign aid seems to provide hope and prospects for a better future for many less-developed countries, research into aid suggests that it will also raise many challenges for both donor communities and recipient countries. Several examples of successful aid recipients are: Botswana and the Republic of Korea in the 1960s, Indonesia in the 1970s, Bolivia and Ghana in the 1980s and Uganda in the 1990s; these countries went from crisis to rapid development. On the other hand, the Republic of Congo, Tanzania and several countries in sub-Saharan Africa are examples of failed aid recipients where a steady flow of aid failed to reduce poverty. In its report assessing aid, the World Bank (1998: 2) stated that “Foreign aid in different times and difference places has thus been highly effective, totally ineffective, and everything in between”. As the report stressed, the success of foreign aid depends on the efforts of both donors and recipients. This thesis assesses, from the recipient’s perspective, the relationship between aid and development in Vietnam since the start of Doi Moi (Vietnam’s economic reform program) which began in 1986.

Doi Moi was introduced at a difficult time in Vietnam’s history. It followed many decades of struggle for national independence and economic crisis resulting from a centrally planned economy. The crisis exposed structural weaknesses in the economy, notably the poor performance of the government budget, the inefficiency of state-owned enterprises, dwindling savings and low productivity of investment. In addition, domestic and foreign private investors did not want to address the obstacles due to market failure and the lack of incentives for business to invest (Le et al. 2004). This situation motivated the Vietnamese government to acknowledge the importance of foreign aid and to regard it as a key part of Doi Moi. Prior to Doi Moi, Vietnam had received aid mainly from former communist countries in Europe and was a typical aid-dependent economy. In the early 1990s, the collapse of the communist block dried up these sources of aid and drove the Vietnamese economy into a crisis. Since 1993, with a foreign policy of diversification and multilateralism, Vietnam has embarked on a new era of substantial aid inflow. Aid commitments doubled, from USD 1.8 billion to USD 3.7 billion in 1993 and 2005, respectively, which highlights the successful mobilization of foreign aid in Vietnam.
Twenty years after the introduction of *Doi Moi*, Vietnam is now regarded as a potential new Asian “tiger”, combining a high rate of economic growth and success in poverty reduction. Vietnam is also one of the world’s top 10 destinations for development assistance with a total commitment of aid of over USD 32.2 billion over the period 1993-2005. This raises the question of how much foreign aid has contributed to the country’s development success. This question has attracted much attention from donors and from the Vietnamese government. However, most studies focus on the policy environment (Bartholomew and Lister 2002; MOF 2004) or emphasise the effects of specific aid projects (AusAid 2003; JBIC 2003; Mekong Economics Ltd. et al. 2003; Van de Walle and Cratty 2005), using mainly comparative and descriptive methodology. Little attention has been given to accessing the macroeconomic effects of aid on the development of Vietnam using quantitative analyses. This is partly due to the unavailability of relevant data. For example, Le and Winters (2001) use the pattern of aid allocation to examine the effectiveness of aid on poverty alleviation. Le et al. (2004) investigate the role of aid in mobilizing investment for development, covering the period 1993-2003. Phuong (2006) uses a growth accounting framework to overcome the problem of data span for studying the aid-growth relationship in Vietnam during the period 1986-2006.

Therefore, this dissertation is the first attempt to analyse the macroeconomic effects of foreign aid on development in Vietnam analytically and empirically, focusing on the relationship between foreign aid and government expenditure, and economic growth and poverty reduction. The thesis is motivated by (i) the important role of government expenditure on economic growth and poverty reduction; and (ii) a high rate of economic growth is not in itself the objective of development, but a means to improve living standards and reduce poverty. Exploring the impact of aid on economic growth, government expenditure and poverty reduction gives a comprehensive insight into the role of foreign aid in Vietnam’s development.

Moreover, as aid given for different purposes will probably have different impacts on development, this research uses both total and disaggregated aid. The adoption of this approach allows quantification of the impacts of aid. This leads the thesis to suggest policy implications concerning the effect of each component of aid rather than assuming that all components have the same effects.
Although the effectiveness of aid has been investigated empirically for many years, the definition of foreign aid is still ambiguous (Clements et al. 2004). This thesis uses a conventional definition of foreign aid, which is official development assistance (ODA), introduced by the Development Assistance Committee (DAC) of the Organization for Economic Cooperation and Development (OECD) in the 1970s. According to this definition, ODA is defined as the sum of official grants and concessional loans from bilateral or multilateral donors to developing countries, with the aim of promoting economic development and welfare. The ODA is characterized by concessional financial terms and contains a grant element of at least 25 per cent (OECD 2001).

Another important aid related issue is how to measure aid flows: whether to look at aid commitments or disbursements. According to the OECD¹, a commitment is defined as a firm obligation expressed in writing, whereas disbursements are actual international transfers of financial resources. For the purposes of analysing aid effectiveness in this study, disbursements are more appropriate to measure aid flows since they record the actual aid volume received by recipient countries.

The data used to analyse the relationship of foreign aid and development in Vietnam come from several sources. Data on the disbursements of aid are collected from the website of the Development Assistance Database of Vietnam (DAD Vietnam)² launched in 2005 by the Ministry of Planning and Investment of Vietnam (MPI). This website is considered to be the most comprehensive aid data source in Vietnam since it can classify data into sector, type and form of aid using the standard code of the United Nations Development Program (UNDP). The general data on the socio-economic development of Vietnam come from official publications including the General Statistics Office of Vietnam (GSO), the Ministry of Finance (MOF), the Ministry of Labour, Invalids and Social Affairs (MOLISA), the World Bank, the International Money Fund (IMF), the Asian Development Bank (ADB), and the UNDP. Such data have been obtained through annual surveys at both national and provincial levels.

¹ http://www.oecd.org/glossary/
² http://www.dad.mpi.gov.vn/
This thesis contributes to the literature as the first attempt to use these data to provide insights into the operation and contribution of foreign aid in Vietnam's development. In particular, the thesis addresses the channels through which aid affects economic growth and poverty reduction using qualitative and quantitative approaches. The results confirm the positive contribution of aid and its components to the whole country in general and the poor in particular. This thesis also finds evidence of the conditions under which aid influences growth and for which aid modalities are appropriate for Vietnam. Finally, in broader terms, it is hoped that this thesis will contribute to the global debate on the role of foreign aid in socio-economic development and to the discussion on the role of recipient governments in mobilizing and utilizing such development assistance.

The thesis is organized in six chapters, as follows. Chapter 2 sets the context by reviewing the social-economic development of Vietnam since Doi Moi began in 1986; it reviews the volume and structure of foreign aid flows during the period 1993-2005. It also develops the institutional framework for foreign aid mobilization and utilization in Vietnam in the same period. The relationship between foreign aid and Vietnam's development is also examined using comparative and descriptive analysis. This is of interest because it suggests several perspectives which are investigated empirically on how aid works in Vietnam in subsequent chapters.

Chapter 3 deals with foreign aid and economic growth using cross-province data in Vietnam. The objective is to examine the questions of whether or not, how and under what circumstances aid influences growth. As different aid categories may have different effects on growth, this chapter examines the aid-growth relationship using both total aid and disaggregated aid by type and sector. To address the way in which aid influences growth, this chapter adopts the generated regressors technique and also tests for different aid categories. The conditions for effective foreign aid are investigated using education level and the provincial competitiveness index 2006 (called PCI). The PCI reflects the different implementations of government regulations and macro policies at provincial level in creating a policy environment to stimulate economic growth.

The results of Chapter 3 show that foreign aid and its components play a significant role in provincial economic growth, but with diminishing returns during the study period.
Although different components of aid result in different levels of performance, most aid affects economic growth by contributing to an increase in capital accumulation. Differing from PCI, better education is found to be the favored condition for effective foreign aid, implying that the Vietnamese government may increase the economic benefits of foreign aid through policies that promote education and training.

It is widely recognized that aid effectiveness is based in part on how recipient governments utilize foreign aid. As a result, how aid affects different levels, components and sectors of government expenditure is the subject of Chapter 4. Since the limitations of most single country studies are that they rely on time-series data, the relationship between aid and the Vietnam government expenditure is examined by using both time series and panel data. Time-series data from 1986 to 2006 help estimate the effects of aid on total and a composition of the national government budgets. Panel data across 61 provinces over the period 2000-04 are used to test the linkages of foreign aid and local government expenditure. Moreover, the main innovation in this chapter is to further investigate impacts of aid on fiscal transfers from central to provincial governments. It is found that foreign aid is spent on the designated purposes at aggregate level, yet aid appears to be fungible in case of sectors and levels of government expenditure. The findings imply that moving toward more budget support is necessary for increased aid effectiveness in Vietnam.

Chapter 5 explores how foreign aid impacts on rural poverty in Vietnam. This chapter focuses on the impacts of a variety of sectoral aid on rural areas that can be expected to make a significant contribution to poverty alleviation. Based on the assumption that the level of poverty declines with higher agricultural production, increased rural wages and improved non-farm employment opportunities, the effects of sectoral aid on all three areas are investigated. By estimating a simultaneous equations system, the approach allows marginal returns in poverty reduction to different sectors of foreign aid to be calculated and ranked. The results suggest that reprioritizing foreign aid distribution can produce larger gains for the poor.

Finally, Chapter 6 summarizes the principal findings and policy implications of this dissertation. The policy implications can be used to maximize the mobilization and utilization of foreign aid in Vietnam.
CHAPTER 2
SOCIO-ECONOMIC REFORM AND FOREIGN AID
2.1 Overview of socio-economic development in Vietnam

The socialist Republic of Vietnam is located in Southeast Asia, stretching from China in the North to the Gulf of Siam in the South. Vietnam has over 60 provinces and cities dispersed over seven regions: Northern Uplands, Red River Delta (including Hanoi), North Central Coast, South Central Coast, Central Highlands, South East (including the main economic centre Ho Chi Minh City-Saigon) and Mekong River Delta. The country’s area is 331,400 square kilometers and the population is 83.1 million inhabitants (GSO 2005b). Vietnam is a multiethnic country with the majority belonging to the Kinh group. Over 70 per cent of its population resides in rural areas.

Vietnam was reunified in 1975 after many years of war with Japan, France and the United States.

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3 Since 2000, Vietnam’s renovation of administrative organizations has increased the number of provinces from 61 to 64 with three provinces being organized into six new ones.
From unification in 1975 until 1986, the economy of Vietnam was a highly concentrated planned economy with two key institutions: agricultural co-operatives and state-owned enterprises (SOEs). Under this system, the private sector was not encouraged, whereas SOEs were autonomous and played a dominant role. SOEs were predominant users of state resources and were characterized by high inefficiency (Arkadie and Mallon 2003). By the mid-1980s, with the long period of war and international embargo, the planned economy left Vietnam one of the world’s poorest countries with severe socio-economic conditions: highly populated, poor, subsistence agriculture (Akram-Lodhi 2004). The population was growing at an annual rate of 2.3 per cent whereas GDP growth increased by 0.5 per cent during the period 1976-80 (GSO 2004). Vietnam was a food importer and had to appeal for food aid. As a result, Vietnam’s economy relied heavily on aid-financed imports from the socialist countries of Eastern Europe, especially the former Soviet Union. With the stagnation and collapse of the centrally planned economies of Eastern Europe and the former Soviet Union, the termination of Soviet aid led to a crisis in Vietnam’s economy. GDP growth was slow whereas inflation rose to more than 700 per cent in 1986 (Arkadie and Mallon 2003). Agricultural output was insufficient to meet domestic demand, causing widespread hunger in the country.

This situation motivated the government of Vietnam to carry out a comprehensive reform agenda under the name of Doi Moi (renovation). However, the success of Doi Moi required the lengthy process of trying, falling, learning and adjusting, in a hope of seeing the appropriate solutions. In fact, it was very complex process, starting with a number of “fence-breaking” activities at local levels, the failure of attempts to correct the price and wage at central level and the building of consensus among top leaders. Since 1990, Doi Moi recognized the essential role of multi-ownership structures and of moving a highly concentrated planned regime towards a market-oriented economy. In particular, the reform agenda has been implemented widely in many economic sectors. For example, in the trade sector, the liberalization process has been encouraged with many commodities being freely traded, based on a market determined on prices. In the industrial sector, the government has steadily abolished its subsidies for state-owned enterprises and has encouraged and promoted private small and medium size enterprises. In the agricultural sector, agricultural cooperatives were substituted by farm households and land use rights were given to farmers in order to increase productivity (Fforde and Vylder 1996). Importantly, Vietnam also
implemented an open door policy, encouraging external economic cooperation with all countries to attract foreign capital and technology to support socio-economic development.

As a result of these reforms, Vietnam has experienced a period of success in socio-economic development. With average annual GDP growth rates being 7 per cent during the 1990s and nearly 8 per cent for the last five years, Vietnam has been one of the fastest growing economies in the region and in the world. Industrial and agricultural productivity has increased rapidly. Vietnam has moved from being a rice importer before 1996 to being one of the dominant global suppliers of rice, coffee and garments. Exports and imports have remained at high levels and are regarded as a major driver of growth. Inflation has fallen from 3 digits in 1986 to single digits in 1996 (Arkadie and Mallon 2003), which has been maintained so far. Most importantly, the process of reducing poverty driven by high economic growth has also achieved remarkable results. With approximately 35 million people escaping from poverty, the poverty rate in Vietnam has dropped from 58 per cent in 1993 to 16 per cent in 2006.

To achieve the success in socio-economic development, Vietnam has pursued a strategy of active integration with the world economy as a key policy in the process of Vietnam’s Doi Moi. The government attracted large external capital sources in Foreign Direct Investment (FDI) and Foreign Aid for development throughout the study period. In addition to the Vietnam’s competitive advantages of low labour costs, geographical location, the other most important factors driving inflows of FDI and foreign aid have been: the introduction FDI law in 1987 and regulations for aid management in 1993; the normalization of relations with the United States (US) in 1993, then the US–Vietnam Bilateral Trade Agreement Vietnam signed in 2001; joining the ASEAN free trade area (AFTA) in 1995; becoming a full member of the Asia-Pacific Economic Cooperation Forum (APEC) in 1998; and becoming the World Trade Organization (WTO)’s 150th member in January 2007. After two decades of reform, Vietnam’s economic growth was driven by an unprecedented level of investment in general and foreign capital in particular, has been able to catch up with most of its more advanced economy neighbouring countries.
2.2 Institutional framework for foreign aid

The open door policy did not bring the expected substantial amounts of foreign aid due to unfavourable international conditions before the 1990s. After the normalization of relations with the United States (US) in 1993, Vietnam became a new recipient of western aid and, in response, the Vietnamese government promulgated legislation for aid management in 1993. Decree 20-CP, issued in 1993, laid the foundation for the roles and responsibilities of government agencies in foreign aid management. The main responsibility for aid coordination was the Ministry of Planning and Investment (MPI), with additional roles for the Ministry of Finance (MOF) and the Office of the Government. Nevertheless, Decree 20-CP (1993) was criticized by donor community as being too complex in its arrangements set down for decision making related to foreign aid, and as lacking understanding of donor requirements, resulting in major delays in project approval and implementation, and consequently low foreign aid disbursement.

Major changes in the institutional framework for foreign aid were introduced gradually in 1997 (Decree 87-CP) and in 2001 (Decree 17-CP). Decree 17-CP was regarded as a milestone for the government since it laid the foundations for all harmonization efforts. To harmonize national procedures with international standards and individual aid agency operational guidelines is a challenge faced by most recipients. The government’s Consultative Group report in 2001 stressed the importance of Decree 17-CP establishing the common framework for ODA-related procedures and regulations by: (i) regulating the management and utilization of all types of foreign aid such as grants and loans, budget support and project aid, and technical assistance; (ii) clarifying the roles and responsibilities of foreign aid management at all levels; (iii) and, revising the procedures and regulations governing all periods from project identification to monitoring and evaluation. According to Degree 17-CP, the MPI still has the overall coordination role, with the MOF being responsible for disbursement of aid and the Office of Government approving new foreign aid inflows. The State Bank of Vietnam coordinates and is responsible for General Budget Support. With more than 60 provinces and cities in Vietnam, the decentralization process has given provincial bodies an important role in the coordination and implementation of aid projects at a local level.
As a response to the rapid growth in aid, and especially after Vietnam became the 150th member of the WTO, the government issued Decree 131/2006/ND-CP in November 2006 to consolidate the policies and institutions to manage foreign aid. Aligned to this Decree, the government also promulgated the Strategy Framework for Foreign Aid Mobilization and Utilization 2006-2010 to provide a clear orientation for government bodies and donors in attracting and utilizing foreign aid. In comparison with the previous regulation, the amended Decree is important in several ways. First, the decentralization process has been strengthened in all aspects of foreign aid. Pursuant to Decree 131, four levels participating in the ODA management and implementation process: Project Management Unit, Project Owner, Line Agency and ODA National management Agency, are functioned and appointed with concrete responsibilities. Second, there has been an increase in transparency with the publication of foreign aid information and the procedures for implementing foreign aid. Third, the Decree has strengthened harmonization of foreign aid procedures and regulations between government and sponsors. Finally, this Decree enhances the legal framework which is expected to improve overall performance, including the adoption of the Procurement Law (2005) and the amendment of Environment Law (2005) and development of the Public Investment Law (World Bank 2007a).

Developing and strengthening Vietnam’s institutional framework related to foreign aid has been the driving force of Vietnam’s influence on the international aid effectiveness agenda. For example, Vietnam has been selected for one UN Initiative that piloted a breakthrough institutional reform supported by the Government of Vietnam and bilateral donors (Partnership Group for Aid Effectiveness 2006). In reality, the success of foreign aid institutions in Vietnam reflects the large commitments and disbursements since 1993, as described in the next section.

2.3 Foreign aid in Vietnam, 1993-2005

2.3.1 History of foreign aid to Vietnam

Prior to the Doi Moi processes, Vietnam was one of the world’s poorest countries and received foreign aid from the former Soviet Union, former Eastern European countries and China. Although foreign aid amounted to 10 per cent of GNP in this period, there was no progress in poverty reduction or economic growth (World Bank 1998). Vietnam became an
aid-dependent economy since aid accounted for over half of imports, nearly three-quarters of investment and over two-thirds of government expenditure during the 1980s (Izumi 2004). In the early 1990s, the collapse of the communist block dried up the main sources of aid, leaving Vietnam with limited foreign assistance from the UNDP and Sweden. Vietnam’s foreign aid fell to less than 1 per cent of GDP, mostly in the form of technical assistance relating to economic reform during the period 1989-93.

Since 1993, following the Paris meeting of donors in November 1993, Vietnam has embarked on an era of substantial foreign aid inflow. With a diversification and multilateralism foreign policy, Vietnam re-established relationships with multilateral financial institutions and many DAC countries by holding annual and semi-annual donor conferences to exchange views on socio-economic policy and attract foreign aid inflows. Figure 2.1 (page 30) illustrates how foreign aid took off in the period 1975-2005.

2.3.2 Foreign aid by commitment and disbursement

Figure 2.2 (page 30) shows foreign aid commitments and disbursements in the period 1993-2005. It indicates that the inflow of foreign aid was gradually trending upwards, with some fluctuations. The slight decline in commitment in the years 1998 and 1999 was a reflection of the Asian financial crisis. However, the commitment increased from USD 2.4 billion to USD 3.7 billion, highlighting the successful mobilization of foreign aid in Vietnam during 2000-05. The increasing commitments in the last five years indicate a confidence in Vietnam’s development record by the donor community.

In terms of disbursements, there was a different trend because they decreased slightly in 2001 and 2002. That can be explained by the reappearance of projects with disbursements larger than USD 100 million1 and the depreciation of the USD against the Euro and the Japanese yen during the early 2000s (UNDP 2004). Importantly, although the foreign aid disbursement rate in Vietnam improved in 2005, it is still lower than the commitment rate and lower than the average disbursement rate achieved by other countries in the region. For example, the Vietnam’s disbursement rate of WB projects in 2005 is 13.3 per cent while the region average is 19.3 per cent and of ADB projects it is 5.9 per cent while the regional

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1 In 2002, there were no projects larger than 100 million USD, the first time this has occurred since 1999.
average is 7.29 per cent (MPI 2006). Four factors have hindered the disbursement of foreign aid including: (i) different donors have different procedures and conditions, so government takes time to harmonize national procedures and practices; (ii) there are time lags between project commitment, formulation, approvals and implementation; (iii) ineffective response to the rapid growth of foreign aid, as the ability of the government to manage and coordinate is weak; and, (iv) there seems to be slow progress in improvement of the disbursements since they are related to a complex procedure of government approval and the expectation of continued reform of many donor agencies.

2.3.3 Foreign aid by sector

Table 2.1 (page 33) illustrates the historical evolution of the top 10 foreign aid disbursements from 1993 to 2005, divided into three periods. In general, foreign aid has been allocated in line with the priority the government places on socio-economic development for each period.

Table 2.1 shows that most aid goes to infrastructure, of which 18.97 per cent was allocated to transport, 16.36 per cent to energy generation and supply and another 6.81 per cent to water supply and sanitation. The transport sector accounts for the largest share of total disbursement aid from 1993 to 2005 and has increased over this time period. A big part of the aid to transportation has been distributed to rehabilitate highways and build bridges. The energy sector occupied the largest sector, receiving aid from 1996 to 2000, but ranked second in the period 1993-2005. A large amount of aid to energy has been invested to expand the power generation capacity, with the remainder being used for institutional reform in the power market. From 1993 to 1995, the water and sanitation sectors were dominant recipients of infrastructure-related aid. Since 1996, this sector has maintained a relatively constant share of 6.5 per cent of total disbursements. Overall, foreign aid has played an important role in improving infrastructure conditions in Vietnam. In particular, three quarters of the volume of public investment for these sectors was financed from foreign aid over the period 1996-2000 (Larsen et al. 2004).

DAD website classified foreign aid flows according to 25 sectors and more than 100 sub-sectors based on the information supplied by the donor community.
As Table 2.1 (page 33) shows, the main variations are in the share of commodity aid and general program assistance during the period 1993 – 2005, which ranges between 19.2 per cent and 7.81 per cent. This sector financed general budget support, food support and import support. The largest share of this sector during 1993-95, nearly 20 per cent, reflected the fact that donor just stated their assistance activities in Vietnam so aid would be more of commodity and general assistance; Investment activities usually take longer to prepare. After falling in the period 1996-2000, the substantial increase in this sector, up to over 11 per cent, has come from the large disbursements of the Project Reduction Support Credits (PRSC) I to IV. Disbursement of rural development projects, recorded under the Multisector/Cross-cutting sector, ranked fourth largest in the period 1993-2005. Since 1996, the disbursement share of this sector has increased, against the worldwide trend of declining ODA spending on rural development (OECD 2004).

Among the other recipient areas, agriculture ranked fifth in disbursement, receiving 6.5 per cent of the total within the period 1993-2005. Aid to agriculture was allocated to building and rehabilitating irrigation systems and food crops and in creating secondary jobs. As a share of total disbursements, aid to education received 5.38 per cent and another 4.9 per cent went to the health sector. All other sectors were around 20 per cent of total disbursements.

2.3.4 Grants and loans

With respect to financial terms, grant aid does not need to be reimbursed by recipients, whereas loan aid is subject to interest and repayment requirements. The distinction between grants and loans is relevant when assessing the foreign capital transfer through aid, and when forecasting the debt trap and aid dependency.

In Vietnam, the grant commitments over the period 1993-2004 accounted for USD 4.2 billion, with the remaining USD 16.9 billion corresponding to loans (World Bank 2004).

PRSC takes place under the form of General Budget Support and are combination of both grants and loans. There has been four phases and the number of donors participating in the PRSCs has increased over time. Disbursements of PRSC I to VI are 301 US$ million, 131 million, 186 million and 145 million from 2001-05, respectively (MPI 2007).
Most loans in Vietnam are in highly concessional terms with the average interest rate fluctuating between one to two per cent per year and the average grace period being around 10 years. These figures suggest that foreign aid-related debt remains manageable.

With respect to disbursement, the share of loan aid has increased since 1996 (Figure 2.3, page 31). That can be explained by the fact that most aid resources for the infrastructure sector are loans and have increased significantly in the period 1996-2005. For example, in 2003 loans accounted for 67 per cent of total aid. Of this, 53 per cent of loans were channeled into infrastructure and 28 per cent into policy support mainly through the loans for Poverty Reduction Support Credit (PRSC) (UNDP 2004). In 2005, the share of loans decreased slightly due to there being disbursements of several large grant projects in the form of program support or budget support. However, loan disbursements are expected to increase in coming years for developing infrastructure systems. After 2010, Vietnam will move to less concessional terms, so the country should now begin to ensure sufficient access to loan aid over the longer term.

2.3.5 Foreign aid by type of assistance

The development assistance database in Vietnam classifies foreign aid into six categories as shown in Table 2.2 (page 34). The overview of foreign aid by type of assistance highlights three trends in distribution of aid disbursements. First, investment projects with or without a technical cooperation component have occupied the vast majority of total disbursements. Second, Programme/Budgetary Aid or Balance of Payments Support (BPS) accounted for 23 per cent in the period 1993-95, decreased to 12.8 per cent over the period 1996-2000 and then increased again in the last five years. Third, Emergency and Relief Assistance and Food Aid are the smallest category and dried up gradually in the early 2000s.

As shown in Table 2.2 (page 34), almost three quarters of foreign aid disbursement has been in the form of Project aid during the period 1993-2005. The largest share recorded for Investment Project Assistance (IPA), is characterized by a small number of large projects in the following sectors: transport, energy, agriculture and integrated rural development. As expected, most of these projects are in the form of concessional loans. In contrast, Free-standing Technical Cooperation (FTC) is mainly grants and its targeted sectors relate to
poverty reduction. During the review period, FTC remained the second largest total disbursement with a number of small projects. For example, FTC represented roughly 72 per cent of the total number of projects in 2003 (UNDP 2004). As a result, FTC relates to many donors and is a key in terms of the harmonization process.

Programme/ Budgetary aid or Balance of Payments Support, known as budget support, has risen gradually in absolute terms and as a proportion of total aid disbursement. In particular, it ranked as the second largest category of disbursement of aid by type of assistance in 2003 and 2005 (MPI 2007). This increase is partly due to the timing of the World Bank’s Project Reduction Support Credits (PRSCs) and other large projects were provided in the form of budget support during the period. Note that the PRSCs and budget support are usually a combination of loans and grants by one or several donors.

As the previous observations suggest, there is a growing tendency to move from a project aid approach towards budget support in Vietnam. This raises the question of whether budget support or project aid is preferable for socio-economic development. The two aid approaches have different impacts on development and have been analysed in the literature (World Bank 1998; Tarp 2000; Tito and Giovanni 2003; World Bank 2004). Budget support and project aid both have benefits and shortcomings. Project aid finances specific activities with limited objectives, budgets and timeframes to achieve specific results, so they have a large development impact, not only in direct output, but also capacity building. However, disbursements of project aid may be slow due to having to follow government and donor procedures. Budget support finances aid directly to the recipient government’s budget, using the government’s own allocation and accounting systems. As a result, budget support leads to faster disbursement. Nevertheless, budget support is criticized for aid fungibility due to bypassing donor supervision and lack of transparency and accountability in recipient government expenditure. Recently, the donor community has emphasised the link between accountability and the prospect of foreign aid modalities (World Bank 1998). Therefore, the details of the relationship between project aid, budget support and Vietnam government’s expenditure are discussed in the next chapter.
2.3.6 Foreign aid by region

Table 2.3 (page 34) shows that the regional distribution of foreign aid per capita has increased in all regions in the period 1995-2003. This is due to the consistent growth of total disbursements in the country and the extension of decentralized implementation of foreign aid. In principle, the government and donors agree that people all over the country should have the same opportunities to benefit from foreign aid. However, large amounts of foreign aid were given to the more prosperous regions and urban centres rather than to the rural and mountainous regions, where the poverty rate is high. According to the Ministry of Planning and Investment (MPI 2007), this trend of aid distribution is consistent with the lower absorption capacity of poorer provinces and the high demand for large scale infrastructure to support the development.

As shown in Table 2.3 (page 34), the South Central Coast region has received a substantial increase in aid disbursements and had the second largest disbursement per capita in 2003. Vietnam’s capital, Hanoi, was the top aid receiving area per capita for all years between 1995 and 2003. That may be explained by a high level of aid in the technical assistance, capacity development, budget support and infrastructure investments surrounding a big economic hub of the country. Among three poor regions in Vietnam, the North Uplands received a remarkable share of foreign aid per capita in many years in the period 1993-2005. The Central Highlands has also gained relatively high foreign aid per capita since 2000 whereas the North Central Coast did not.

The Ministry of Planning and Investment (MPI 2007), summarizing the top five sectors by aid disbursement in each region, suggests that most aid disbursement has been devoted to promoting growth and reducing poverty. For example, Transport and Storage, an important sector for economic growth, appears among the leading sectors in all regions. Furthermore, Multisector/Crosscutting, covering Rural Development, Health and Education is given high priority across the three poor regions.

2.3.7 Foreign aid by donor

With a consistent foreign policy “Vietnam is willing to be a creditable counterpart to all countries in the international community and make efforts for peace, independence and
development” (MPI 2006: 1), Vietnam has been able to establish foreign relationships with about 50 bilateral and multilateral donors and 350 international non-government organizations.

Table 2.4 (page 35) presents the top ten sources of foreign aid to Vietnam in the period 1993–2005. With roughly USD 5 billion in disbursements, Japan emerged as the largest donor, followed by the World Bank with about USD 3.5 billion, and the Asian Development Bank (ADB) with USD 2 billion (including loans and grants). These three donors have recorded the top three disbursements since 1996 and have accounted for nearly 60 per cent of total disbursement in the whole period 1993-2006. Specifically, Japan was the largest donor for three consecutive periods, 1993-1995, 1996-2000 and 2000-2005, representing around 30 per cent of total foreign aid disbursements.

Different donors have different sector goals. More than half of the Japanese foreign aid disbursements were used in the transport and energy sectors. The World Bank concentrated on power generation projects, highway upgrades and irrigation systems in agriculture. The ADB also maintained large disbursements for infrastructure, focusing on water supply and sanitation, and helping economic management and rural credits. France was the second largest bilateral donor and the fourth largest overall, concentrating on rural and human development as well as the transport sector. UN aid was disbursed mainly to human resources and institutional capacity development (MOF 2004).

Although a large number of donors have contributed to Vietnam’s development, their regulations and procedures related to giving aid differ markedly, presenting significant challenges for the government in mobilizing and utilizing foreign aid. The government usually makes the effort to implement a large number of discrete projects, each with specific objectives and reporting requirements. Roodman (2006) suggests that Vietnam is one of eight countries having the largest individual aid activity commitments. This impacts negatively on the effectiveness of aid because the government uses more time and effort to implement the different aid projects. As a result, the government has been consistently strengthening cooperation with all donors in harmonizing foreign aid regulations and procedures, laying the foundations for sustainable development of aid resources in the future.
2.4 Impacts of foreign aid in Vietnam: comparative and descriptive analysis

2.4.1 Macroeconomic impacts of foreign aid

To assess the macroeconomic impacts of foreign aid in Vietnam, this section specifies a three-gap model of growth along the lines suggested by Bacha (1990). In allowing for simplification, the equation is written:

\[ C + I + G + X - M = Y + T \]  

(2.1)

where \( C \) is consumption; \( I \) is investment; \( G \) is government consumption; \( X \) is exports of goods; \( M \) is imports of goods; \( Y \) is domestic output (GDP); \( T \) is tax; and \( S \) is savings.

From (1), we can derive:

\[ [(Y - C) - I + (T - G)] = X - M \]

(2.2)

\[ (S - I) + (T - G) = (X - M) \]

(i) (ii) (iii)

A three-gap model specifies that foreign capital is required to: (i) close the gap between investment and domestic savings (\( S-I \)); (ii) fill the foreign trade gap that appears where export earnings are insufficient to cover needed imports of goods that can not be manufactured domestically (\( X-M \)); and (iii) balance the government budget of recipient countries (\( T-G \)). As a result, the macro impact of foreign aid is analysed and examined by the influence of aid on: (i) investment and savings; (ii) exports and imports; (iii) the government budget; and (iv) foreign direct investment (FDI) - the other form of foreign capital. Next, a qualitative approach is used to examine these impacts.

Investment and savings

Following the savings-gap assumption, debate on the role of aid arose from the hypothesis that aid substitutes rather than complements investment. Griffin and Enos (1970) argue that aid may be used to increase consumption and therefore reduce domestic savings rather than being a supplement to domestic resources. In Vietnam, most foreign aid inflows have been in the form of investment projects (including free standing assistance) that in turn finance domestic investment. Figure 2.4 (page 31) shows that domestic savings have rapidly
increased and they cannot be substituted for aid flows. Hence, aid is expected to complement investment. Aid disbursement accounted for 13 per cent of total investment over the period 1995-2002 (Le et al. 2004). Between 2001 and 2005, aid disbursement also increased and represented 17 per cent of public investment and 11 per cent of total investment (Government of Vietnam 2006b).

**Exports and Imports**
Vietnam’s global integration has resulted in rapidly increasing exports and imports since 1986. Imports have been slightly larger than exports. However, as a percentage of GDP, the gap between imports and exports was only 5.0 and 1.6 in 2004 and 2005, respectively (Table 5, page 35). This gap has been filled by foreign aid, FDI and remittances.

White (1992) argues that aid may reduce exports through Dutch disease effects. Aid increases the price of non-tradable goods relative to tradable ones. This results in an appreciation of the exchange rate and, therefore, reduces the competitiveness of the recipient nation. However, in Vietnam, the ratio of exports to GDP has sharply increased, from 26 per cent to 62 per cent between 1995 and 2005, associated with stable real exchange rate (Table 5, page 35).

**Government budget**
Many papers have argued that recipient governments can use aid for tax relief, to balance their budget, and to increase current or capital spending. This section examines these effects of aid on the government budget of Vietnam.

From Figure 2.5 (page 32) which illustrates the relationship between aid and tax revenue, it appears that aid has not reduced tax revenue. In the period 2000-05, for example, the main sources of tax revenue were: taxes on corporations (annual average 30 per cent in total taxes); taxes on imports and exports (annual average 20 per cent); value-added tax (annual average 25 per cent) and special consumption tax (average 10 per cent) (World Bank 2006b). The government’s revenue depends heavily on tax collection and, therefore, aid seems to be less important for formalizing government revenue. In terms of government

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7 See Chapter 3 on “Foreign aid and government expenditure: A case study of Vietnam”
expenditure, a significant increase in government spending was observed in transportation, agriculture, education and health. These sectors have also been given the highest priority by donor communities, hence aid is expected to increase government expenditure.

**Foreign Direct Investment (FDI)**

Both foreign aid and FDI are important official and private foreign capital resources for Vietnam’s development, so their relationship underlines the major issues of foreign capital effectiveness and economic growth. A relevant question is whether or not aid creates sufficient positive effects in Vietnam to attract more FDI, which in turn affects economic growth. In the Red River Delta and the South East, a strong correlation seems to exist between FDI and foreign aid. These regions have the highest number of new FDI enterprise registrations per capita and emerge as those regions with the largest amount of foreign aid commitments and disbursements. In particular, some provinces with a high disbursement of foreign aid such as Ho Chi Minh, Ha Noi city, Dong Nai, Ba Ria-Vung Tau, Hai Phong, Hai Duong have attracted large amounts of FDI per capita (Le et al. 2004).

Understanding that an important factor for attracting FDI is a developed infrastructure, Hien (2007) sees the impacts of foreign aid in infrastructure as one of the most important determinants of FDI inflows. Using Vietnam provincial data between 2002 and 2004, this study gives empirical evidence for the positive long-term impacts of foreign aid in infrastructure on FDI inflows. The results provide a strong argument for persuading donors to allocate foreign aid to infrastructure sectors. In general, an important implication from the studies of Le et al. (2004) and Hien (2007) is that foreign aid seems to be tied to FDI, at least in terms of aid in infrastructure.

**Summary**

The macroeconomic impacts of foreign aid can be summarized as follows: (i) aid is not substituted for domestic savings, but complements investment and promotes FDI in the long term; (ii) aid contributes to balancing the foreign exchange gap, but does not reduce exports through Dutch disease effects; (iii) aid is expected to increase government expenditure, but does not impact on government revenue. Importantly, compared to the size of the Vietnamese economy, foreign aid represented an annual average of 5 per cent of
GDP, 20 per cent of government expenditure and 8 per cent of imports over the period 2001-05. These indicators suggest that Vietnam is not heavily aid-dependent.

2.4.2 Contribution of aid to infrastructure development

In the context of Vietnam, a low-income transition economy, reconstruction of infrastructure damaged by war is needed to reinforce the role of public goods for sustainable growth. Moreover, because the short-term private benefit of public investment is usually low, private investors are unwilling to provide this investment. The government understands this and has attracted more foreign aid co-jointly with state budget funds for the infrastructure sectors. Since 1993, major Vietnam’s infrastructure, including transport, water supply and sanitation, energy and telecommunications, has received the largest portion of foreign aid. Foreign aid currently finances 37 per cent of central transport expenditure and 85 per cent of past investment in water and sanitation. As a result, the road network has more than doubled in length since 1990. Access by people to clean water grew from 26 per cent of the population to 57 per cent during the period 1993-2004. All urban areas and 88 per cent of rural households can access electricity. The number of phones per 100 people increased nine-fold from 1995 to 2004 (World Bank 2006a).

By contributing to impressive growth in terms of access to public services, foreign aid infrastructure projects have successfully attracted FDI and domestic investment. Research by Mitsui (2003) on two aid-funded transport projects, Highway No.5 Upgrade and Haiphong Harbor Rehabilitation, identifies several impacts of aid: (i) FDI registered in these provinces increased from 12.5 per cent in 1996 to 27.8 per cent during 1998-2001, allocated mainly in four industrial zones around Hanoi and Haiphong; (ii) roughly 40,000 jobs were generated by new investment along Highway No.5 by 2003; (iii) in 2001, FDI in Hanoi and Haiphong contributed 32 per cent and 45 per cent, respectively, to industrial growth output and; (iv) micro business in these areas increased as well, reflecting that the number of private enterprises obtaining bank loans grew from 2 per cent in 2000 to 13 per cent in 2003.

JBIC provided ODA loans, amounting to US$175 million to Highway No 5 and US$33 million to the Haiphong Port. The investments were carried out between 1994 and 2000.
Foreign aid to infrastructure sectors initially promoted economic growth by stimulating investment or trade, contributing to poverty reduction. The projects Upgrade Highway No.5 and Rehabilitate Haiphong Port were recorded as the expansion of high-value agricultural production for urban markets and improved access to higher education and medical services. In particular, the growth rates of fishery production in the Hung Yen and Hai Duong⁹ were 312 and 200 per cent, respectively, between 1995 and 2000, compared to a national average of 110 per cent. As a result, the source of income for households of these provinces has greatly improved. In the period 1997-2002, income from livestock and fishery increased by 204 per cent and 314 per cent, respectively (Mitsui 2003). Moreover, the Vietnam household surveys in 1998 and 2002 show that three of the five provinces that reduced their poverty rate by more than 75 per cent have good access to Hanoi and Haiphong Port via either Highway No.5 or Highway No.18.

Similarly, benefits from water supply and sanitation projects in Vietnam include: (i) lower rate of death and sickness and savings to health costs; (ii) higher worker productivity; (iii) low cost for goods and services due to lower cost of water (Planning and Statistics Department 2002). In Vietnam, property prices are high for many potential investors since there is a shortage of suitable land with electricity, water supply and road access. Where new infrastructure is available, investment has been observed to increase quickly (Report of Hanoi management board of industry zones, cited in Le et al. 2004).

Infrastructure projects in Vietnam have contributed greatly to economic growth and poverty reduction, as can be observed in the transportation, electricity, water supply and sanitation sectors. Given that foreign aid accounted for roughly three quarters of public investment over the period 1996-2000 (Larsen et al. 2004), foreign aid seems to have played an important role in economic development.

### 2.4.3 Contribution of aid to institutions and policies

Most donors agree that more than providing money, foreign aid must contribute ideas about development policies and institutions. Ideas are more important than money when recipient policies are poor (World Bank 1998). Understanding that the challenges of Vietnam’s

⁹ Hung Yen and Hai Duong are two provinces located along Highway No 5.
The reform process involved a shift from state control to a reliance on mechanisms for economic management, the donor community is willing to provide not only grants for training and technical assistance, but also program loans and credits for structured adjustment. During the review period, aid in policies and institutional support has ranged between 12 and 26 per cent of total disbursement and covers many areas including development administration, economic management, international trade and domestic trade. Laws have been drafted or revised with the assistance of donors, such as the Enterprise Law (2000), the State-owned Enterprise Law (2002), the Trade Law (1998), the Law on Investment (2006), and the State Budget Law (2002).

The Enterprise Law came into effect in January 2000 and emerged as a milestone in the reform achieved in Vietnam over the past 20 years. This Law, prepared under project VIE/97/016, was funded by UNDP and AusAID at a relatively small cost – about USD 2.3 million over four years. Through simplification of the registration procedure for new private enterprises, the law created better opportunities for business, particularly for small enterprises. Over the period 2000-03, more than 72,000 enterprises were established, growing by 160 per cent compared to the number of enterprises registered in the previous nine-year period. Importantly, private investment spread to all regions and created 400,000 jobs in 2000 and 500,000 and 800,000 in the following two years. In terms of contribution to total industrial output, growth of the private sector increased by 20 per cent in 1999 and around 30 per cent in 2001 and 2002. Project VIE/97/016 is considered as a good example of project aid well-spent because using small money funds has brought remarkable success for the economy (Le et al. 2004).

In encouraging development of private enterprise, the reform of state-owned enterprises (SOEs) has also attracted the attention of donor communities. The ADB provided a loan for transforming SOEs into corporations, and large funds from Denmark, Japan, Australia, Germany, the UNDP and World Bank covered a wide range of processes of SOE reform, such as data collection and monitoring, diagnostic audits to assess financial situations, implementing equalization plans. As a result, almost 900 SOEs were transformed into limited companies between 1998 and September 2002. Around 70 per cent of SOEs sold two thirds or more of their equity to non-state shareholders between January 2001 and September 2002 (Le et al. 2004).
Trade reform is regarded as the most important component of Vietnam’s economic reform strategy. Under a centrally planned economy, Vietnam’s trade policies were simple since trade was mostly decided by the government. Therefore, changing the trade policy toward integration into the global economy has been a challenge for the government and needs support from donors. Foreign aid in this area had included assisting trade policy reform, building trade capacity, working toward the solution of trade disputes and facilitating WTO accession. The EU provided the largest technical assistance for trade reform, namely the Multilateral Trade Policy Assistance Program (MUTRAP). The United States assisted Vietnam in implementing the project called Support for Trade Adjustment and Reform (STAR). Among the remaining donors, the World Bank, Japan, Australia and Canada provided funding for many projects in the areas of WTO trade facilitation negotiations. As a result, Vietnam joined ASEAN and the WTO in 1996 and in 2007, respectively. The openness\(^{10}\) of Vietnam’s economy, doubled from 61 per cent in 1994 to 124 per cent in 2005 (Table 2.5, page 35), can be regarded as an indicator of improved trade policy.

### 2.4.4 Contribution of aid to human development

In line with the government’s priority, foreign aid in education, training and health ranks among the top 10 foreign aid disbursements from 1993 to 2005 (Table 2.1, page 33). Foreign aid to education concentrating on higher education, primary education, secondary education and vocational training was sponsored by the main donors: the World Bank, ADB, Japan, Australia and the United Kingdom. In the period 2001-05, based on the government’s priority of expanding its high-skilled labour workforce needed for industrialization, half the foreign aid was spent on higher education. Primary education ranked second, followed by secondary education and vocational training. The health sector included 250 aid projects supported by 36 donors spread across Vietnam’s regions. This aid helped in strengthening infrastructure for medical examinations and treatment at both national and sub-national levels; supplying vaccines against infectious diseases; and training medical cadres to improve health system management and policy. Following the Millennium Development Goals 4, 5 and 6, aid to the health sector focused on covering

\(^{10}\) Openness is defined as total percentage of export and import to GDP.
expenditure on reproductive health and funded 30 projects in the area of controlling HIV/AIDS in the period 2001-05 (MPI 2007).

With the assistance of international donors, the efforts of the government have led to substantial progress in Vietnam. The enrolment rate for higher education has gone up significantly, from 7.2 per cent in 1993 to 63 per cent in 2004. The rate of enrolment in upper secondary school has also increased by a factor of four in the same period. Importantly, one quarter of the country’s total provinces reached the goal of universal lower secondary education by the end of 2002. With regard to health care services, the percentage of households which have health insurance or free healthcare cards more than doubled, from 16 per cent in 1998 to 38 per cent in 2004. Moreover, school and hospital facilities have also been upgraded significantly (Le et al. 2004). According to the UNDP *Human Development Report* (2007/2008), Vietnam ranks 105 out of 177 countries based on the Human Development Index (HDI) value in 2005. This report identifies that: (i) life expectancy at birth is 73.7 years in 2005, compared to 67 years 1998; (ii) literacy rate is 90.3 per cent, equal to the most economically advanced neighbour countries (Indonesia 90.4 per cent and Myanmar 89.9 per cent); (iii) infant mortality has been reduced dramatically, from 55 deaths to 16 deaths per 1,000 live births over the period 1970 – 2005.

Vietnam deserves high marks regarding the outcomes of investment in education and healthcare. However, the World Bank (2001) indicated that the quality of education and the inequality in the healthcare system still needed to be considered. For example, the curriculum and style of learning has been described as outdated and Vietnam’s higher education is far from meeting the demands of the international labour market. Similarly, infant mortality has fallen faster in rich areas and remained high in others. As a result, the government should revise its strategies on education and health, and regards them as priorities for foreign aid mobilization and utilization in the coming years.

2.4.5 Contribution of aid to poverty reduction

Poverty reduction can be implemented by a range of channels including: providing education and healthcare services; improving local access to public goods and markets through development of infrastructure (roads, electricity, irrigation, water supply and
sanitation); creating job opportunities and economic growth in rural areas. As seen in the above analyses, foreign aid supports the government in building up policy and institutions, providing public goods as well as improving human development. All have contributed to the process of reducing poverty in Vietnam.

From the perspective of aid allocation, however, foreign aid is not biased toward the poor areas of the country. Most of the poor reside in rural areas, but total disbursements targeted to these areas have remained relatively stable at 15 per cent over the long term. Since 1997, foreign aid in rural development has increased based on the government’s policy priorities. Rural infrastructure and rural credit have emerged as important sectors for rural development and have attracted many donors. In the period 2001-05, Japan and the World Bank provided rural energy projects and rural transport projects with over USD 500 million. During the same period, the World Bank, ADB, JBIC, Denmark and the EC have financed Poverty Reduction Support Credits (PRSCs) I to IV, ranking among the top 10 foreign aid disbursements from 2001 to 2005. Understanding that rural areas are usually limited in their ability to absorb aid inflows, most projects tend to integrate a local capacity building component. Against the worldwide trend towards diminishing aid for rural development (OECD 2004), foreign aid in Vietnam continued to grow in this area, indicating that the government is making a strong effort in poverty reduction.

2.5 Conclusions

Since the introduction of market-oriented reforms and the opening of the economy in the mid 1980s, Vietnam has achieved much success: high economic growth, inflation control and rapid poverty reduction. This success has been gained through the coordinated efforts of Vietnam and the important assistance of international donors. Since the early 1990s, foreign aid has been regarded by the government as an important means of driving the economy forward and at the same time helping reduce poverty. As a part of policy “diversification and multilateralism”, the government has developed institutional frameworks for mobilization and utilization of foreign aid. Aligned to the government’s development priorities, aid resources have been increasingly disbursed in terms of sector, form and source of assistance. This chapter, using comparative and descriptive statistics, has initially assessed the impacts of aid on some macroeconomic indicators, the
contribution of aid to institutional reforms, infrastructure renovation, human development and poverty reduction. Digging deeper, subsequent chapters elaborate on the impacts of foreign aid on Vietnam’s economic growth, government expenditure and poverty alleviation.
Appendix 2.1

Figures

Figure 2.1 **Historical trend in foreign aid commitments, 1975-2005**

Source: *Transaction cost study, Annex 9 (UNDP and DFID 2000) and MPI(2007)*

Figure 2.2 **Foreign aid disbursements and commitments in Vietnam, 1993-2005**

Figure 2.3 Aid disbursement by grants and loans

Sources: DAD Website and Author’s calculation.

Figure 2.4 Foreign aid, savings and investment, 1993-2005 (% GDP)

Figure 2.5 Aid and tax revenue, 1993-2005

Source: ADB Key Indicators (2006), and Author’s calculation.
### Table 2.1 Foreign aid disbursement by sector, 1993-2005

<table>
<thead>
<tr>
<th>Sectors</th>
<th>Disbursement (Million USD)</th>
<th>% of Total Disbursement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>93-95</td>
<td>96-00</td>
</tr>
<tr>
<td>Transport and Storage</td>
<td>80.96</td>
<td>1051.75</td>
</tr>
<tr>
<td>Energy Generation and Supply</td>
<td>30.04</td>
<td>1593.99</td>
</tr>
<tr>
<td>Commodity Aid and General Program Assistance</td>
<td>292.78</td>
<td>500.13</td>
</tr>
<tr>
<td>Multisector / Cross-cutting</td>
<td>67.11</td>
<td>574.00</td>
</tr>
<tr>
<td>Water Supply and Sanitation</td>
<td>143.21</td>
<td>428.05</td>
</tr>
<tr>
<td>Agriculture</td>
<td>201.20</td>
<td>397.95</td>
</tr>
<tr>
<td>Education</td>
<td>97.48</td>
<td>333.31</td>
</tr>
<tr>
<td>Health</td>
<td>139.00</td>
<td>301.59</td>
</tr>
<tr>
<td>Banking and Financial Services</td>
<td>7.59</td>
<td>136.09</td>
</tr>
<tr>
<td>Industry</td>
<td>49.46</td>
<td>182.07</td>
</tr>
</tbody>
</table>

**Source:** DAD Website and Author’s calculation.
### Table 2.2. Foreign aid by type of assistance, 1993-2005

<table>
<thead>
<tr>
<th>Type of Assistance</th>
<th>Percentage of Total Disbursement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free-standing Technical Cooperation</td>
<td>29.91</td>
</tr>
<tr>
<td>Investment Project Assistance</td>
<td>17.83</td>
</tr>
<tr>
<td>Investment Project Assistance with a TC Component</td>
<td>19.05</td>
</tr>
<tr>
<td>Investment-related Technical Cooperation</td>
<td>2.01</td>
</tr>
<tr>
<td>Programme/Budgetary Aid or Balance of Payments Support</td>
<td>23.02</td>
</tr>
<tr>
<td>Emergency and Relief Assistance and Food aid</td>
<td>5.78</td>
</tr>
<tr>
<td>To be Defined†</td>
<td>2.40</td>
</tr>
</tbody>
</table>

**Source:** DAD Website and Author’s calculation.

### Table 2.3 Regional distribution of foreign aid to provinces and urban authorities

<table>
<thead>
<tr>
<th>Regions</th>
<th>Foreign Aid Disbursement per capita (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern Uplands</td>
<td>3.65</td>
</tr>
<tr>
<td>Red River Delta</td>
<td>4.86</td>
</tr>
<tr>
<td>of which, Hanoi</td>
<td>16.95</td>
</tr>
<tr>
<td>North Central Coast</td>
<td>2.82</td>
</tr>
<tr>
<td>South Central Coast</td>
<td>0.69</td>
</tr>
<tr>
<td>Central Highlands</td>
<td>3.78</td>
</tr>
<tr>
<td>South East</td>
<td>2.98</td>
</tr>
<tr>
<td>of which, HCM city</td>
<td>2.41</td>
</tr>
<tr>
<td>Mekong River Delta</td>
<td>1.74</td>
</tr>
<tr>
<td><strong>WHOLE COUNTRY</strong></td>
<td>3.20</td>
</tr>
</tbody>
</table>


† “To be Defined” is an option for those donor agencies that were either unsure of their appropriate category or were not able to specify the type of aid that applies to a particular project.
Table 2.4 Top ten donors by disbursement, 1993-2005

<table>
<thead>
<tr>
<th>Funding Source</th>
<th>Disbursement (Million USD)</th>
<th>% Of Total Disbursement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>93-95</td>
<td>96-00</td>
</tr>
<tr>
<td>Japan</td>
<td>167</td>
<td>2196</td>
</tr>
<tr>
<td>WB</td>
<td>377</td>
<td>1062</td>
</tr>
<tr>
<td>ADB</td>
<td>58</td>
<td>761</td>
</tr>
<tr>
<td>France</td>
<td>100</td>
<td>329</td>
</tr>
<tr>
<td>UN</td>
<td>196</td>
<td>266</td>
</tr>
<tr>
<td>Denmark</td>
<td>26</td>
<td>205</td>
</tr>
<tr>
<td>IMF</td>
<td>178</td>
<td>175</td>
</tr>
<tr>
<td>Australia</td>
<td>87</td>
<td>185</td>
</tr>
<tr>
<td>Sweden</td>
<td>70</td>
<td>210</td>
</tr>
<tr>
<td>Germany</td>
<td>54</td>
<td>162</td>
</tr>
</tbody>
</table>

Source: DAD Website and Author's calculation.

Table 2.5 Import, export and foreign aid, 1995-2005

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Import (%GDP)</td>
<td>36.4</td>
<td>40.7</td>
<td>38.9</td>
<td>38.0</td>
<td>36.8</td>
<td>45.1</td>
<td>44.5</td>
<td>50.7</td>
<td>57.5</td>
<td>63.3</td>
<td>63.0</td>
</tr>
<tr>
<td>Export (%GDP)</td>
<td>25.1</td>
<td>29.4</td>
<td>34.2</td>
<td>34.4</td>
<td>40.2</td>
<td>46.3</td>
<td>46.0</td>
<td>47.6</td>
<td>50.9</td>
<td>58.3</td>
<td>61.4</td>
</tr>
<tr>
<td>Real Exchange</td>
<td>11,015</td>
<td>11,149</td>
<td>12,292</td>
<td>13,890</td>
<td>14,028</td>
<td>14,514</td>
<td>15,084</td>
<td>15,403</td>
<td>15,646</td>
<td>15,777</td>
<td>15,900</td>
</tr>
</tbody>
</table>

Source: ADB Key Indicators 2006, GSO Statistical Yearbook (Various years) and Author's calculation

(*) Real exchange rates are measured as VND per USD at end of each year.
CHAPTER 3
FOREIGN AID AND ECONOMIC GROWTH

In this chapter, the macroeconomic impacts of foreign aid are analyzed. The impact is explained through assessing the relationship between the growth of real GDP, gross capital formation, human capital, the agricultural sector, and foreign trade. The focus is on foreign aid, as it is evident that studies include Vietnam and how foreign aid supports development. This chapter discusses the factors which affect the growth of GDP, the impact of foreign aid on economic growth and productivity. The source of aid is assessed at the Ministry of Planning and Investment (MPI).

The chapter is structured as follows: Section 3.1 presents the introduction and overview of the study. Section 3.2 focuses on the economic models. In Section 3.3, the analysis methodology is described. Sections 3.4 and 3.5, respectively, detail the data and the empirical results of the effect of foreign aid on growth. Conclusions and policy recommendations are drawn in Section 3.6.
3.1 Introduction

Most developing countries view foreign aid as a flow of external financial resources into an economy and argue that foreign aid accelerates economic growth. In addition to its effects on the investment climate, aid impacts on the level of domestic investment and demand, foreign trade, government budgets as well as having an effect on the economic policies of recipient countries. Moreover, different aid components may bring different consequences for economic development. Maximizing the effectiveness of foreign aid, therefore, is considered to be a key objective of recipient countries.

There is considerable literature on the effects of aid on economic growth in general and on specific channels of economic development such as savings, investment, trade and policy. However, the literature on foreign aid focuses on data on pooled cross-sections of different countries. Hence, to draw any valid conclusions about a single country from such data may be questionable. Vietnam is one of Asia’s foremost recipients of foreign aid (Le et al. 2004), yet there is little research on aid and economic growth. The purpose of this chapter is to fill this gap through a case study of Vietnam.

In this chapter, the macroeconomic impact of foreign aid on economic growth is analysed for Vietnam using cross-province level data. This impact is explored through examining the relationship between the growth rate of real GDP per capita and foreign aid, investment, human capital, trade openness index, inflation and local government policy. The term foreign aid, as it is used in this study, includes bilateral and multilateral concessional, development loans and grants. In terms of sector, the focus is on three categories that are believed to be growth oriented: social infrastructure and services, economic infrastructure and production sectors. The sectors of aid are based on classifications of the UNDP in Vietnam and the Ministry of Planning and Investment (MPI).

The chapter is structured as follows. Section 3.1 presents the introduction and purpose of the study. Section 3.2 briefly reviews previous studies. In Section 3.3, the research methodology is analysed. Sections 3.4 and 3.5, respectively, describe the data and the empirical results of the effect of foreign aid on growth. Conclusions and policy implications are drawn in Section 3.6.
3.2 Previous studies

The studies on the impact of aid on economic growth examine how aid has contributed to economic growth (controlling for other factors) in Vietnam. Somewhat in contrast to this present study, most researchers have focused on cross-country evidence of the relationship between foreign aid and growth. This study reviews briefly some of the key conclusions of this literature.

Through the 1970s and 1980s the two-gap model (Chenery and Strout 1966) provided the main framework used to convey links between foreign aid and economic growth. In the 1990s, Bacha (1990) included government fiscal behaviour and extended the analysis to a three-gap model. Developing countries often lack resources to close the savings gap, trade gap and government budget gap, so foreign aid is required to fill those that are most pressing. So far, the popular view has been that developing countries suffer more from a policy and institution gap than a financing gap. In the 2000s, many empirical frameworks have tested the aid-growth relationship in the presence of the policy, institutions and even political stability (Burnside and Dollar 2000; Clements et al. 2004).

Hansen and Tarp (2000) classify the empirical cross-country work on aid effectiveness into three generations. The first generation studies (up to the early 1970s) were motivated by the savings-investment gap idea where aid-induced savings would accelerate investment. As a consequence, the first generation papers focus on testing the impact of aid on savings. However, the impact of aid on investment and more importantly on growth was ignored in that literature. The second-generation papers (the 1970s to the early 1990s) recognize that aid could substitute or complement investment and therefore, focus directly on the aid-investment-growth relationship. The third generation papers address the role of macro policies, the influence of new growth theory, potential endogeneity in aid and policy, non-linearity in the aid-growth relationship and conditions of aid effectiveness (Hansen and Tarp 2000).

Among the earlier papers, Rahman (1968) selects 31 developing countries for his empirical study and argues that an increase in foreign aid causes a relaxation of the recipient government’s saving effort and thus a reduction of average saving rate by the government.
Griffin and Enos (1970) obtain similar results and even find negative effects of aid on growth. Nonetheless, Papanek (1973), in one of the second-generation studies, discomposes capital flows into foreign aid, private capital and others inflows, and finds a positive relationship between aid and growth. Gupta (1975) and Stoneman (1975) report a similar result for a larger sample of developing countries. However, the first two generations of studies usually show more pessimistic results because they are using simple regressions with few degrees of freedom. These studies, therefore, gain disproportionate attention in the literature (Hansen and Tarp 2000).

Third generation studies present a large number of observations (panel data are used for a number of years and countries), new growth theories (Solow-Swan neoclassical growth model and endogenous growth models), the non-linear aid-growth relationship and endogeneity of aid (Hansen and Tarp 2000). The studies by Boone (1996) and Burnside and Dollar (1997) have attracted much attention from other studies on the effectiveness of aid.

Boone (1996) investigates the impact of aid on a variety of macroeconomic variables using 96 country samples in the 1971-90 period. Based on both OLS and IV estimators controlling for endogeneity of aid, he concludes that aid does not have an impact on growth associated with increased consumption. Using interaction terms of aid with a proxy for the political system in recipient countries, he also suggests that different types of political regimes should differ in their use of aid (Harms and Lutz 2004).

On the other hand, Burnside and Dollar (2000) examine whether macro polices matter for aid effectiveness and find that aid has a positive impact on growth only in the presence of good economic policy. Their results show that the interaction term (aid*policy) is consistently significant, whereas the policy index is generated by taking a linear combination of three policy variables in the growth literature (budget deficit, openness and inflation). Collier and Dehn (2001), using different specifications and data, support the Burnside and Dollar (2000) conclusion. Hansen and Tarp (2000) address the issue of non-linearity in aid by including an aid squared term, and find that aid squared drives out the

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12 Burnside and Dollar construct a policy index by first running a regression of growth with this term plus some control variables. They then form a linear combination of the three using their coefficients as weights.
significance of the aid*policy term. They conclude that aid has positive effects on growth, but with diminishing returns. Roodman (2004) performs a series of robustness checks and concludes that the results of Hansen and Tarp (2001) are reasonably robust and that the aid-policy link is relatively weak once alternative control variables are used.

Besides raising controversy over the sensitivity of the key result of Burnside and Dollar, the second strand of third generation studies questions whether good policy is the only condition of aid effectiveness. By capturing interaction terms of aid with several sets of control variables in the growth models, conditions of effective foreign aid have been proposed, such as institutions including democracy (Svensson 1999; Kosack 2003), political instability and external vulnerability (Chauvet and Guillaumont 2002), policy and warfare (Collier and Hoeffler 2002), and trade openness (Teboul and Moustier 2001) and so on.

A large number of empirical studies have been conducted on the aid-growth relationship. This chapter is not an attempt to analyse all the debates found in the literature. Rather, its intention is to investigate or qualify the current literature in several directions.

### 3.2.1 Disaggregate foreign aid

The literature on the effectiveness of aid shows that most studies use aggregate aid data; this approach can be criticized from two perspectives. First, different categories of aid have different impacts on growth. For example, food aid is likely to have different effects on growth compared with economic infrastructure aid. Second, total aid contains categories whose effects on growth may not be evaluated within a four-year period, the length of time considered in most aid-growth regressions. For instance, aid related to health and education may have a longer time span compared to infrastructure projects. Therefore, when the different sectors of aid are put together the aggregate effect on growth may be distorted, especially if there is considerable emergency aid. Emergency relief is not given for the purpose of growth. Hence, using aggregate aid that includes emergency relief may produce a negative bias in the growth model.
The empirical aid-growth literature has disaggregated aid into different forms. Ram (2003), for example, disaggregates aid into bilateral and multilateral components based on the differences in donor motivations for aid-giving, types of conditionalities related to aid and the relationship between donor and recipient. Therefore, adding bilateral aid to multilateral aid may make little sense and does not allow for an assessment of the positive or negative impacts of each component. By introducing bilateral and multilateral components in the growth model, Ram concludes that the former parameter is positive and sizable whereas the parameter for the latter is negative and large in the growth model.

Clements et al. (2004) argue that aid disaggregation should be based on the expected number of years in which each aid category is likely to affect growth. They divide aid into three categories: short-term impact aid (economic infrastructure, production sector and budget support programs); long-term impact aid (social infrastructure such as education, health, population control and technical assistance) and humanitarian aid. They use the usual four-year average data in testing only the growth effect of short-term impact. They exclude the long-term impacts of aid because its effects may not be realized in the four-year regression. Also, they do not examine humanitarian aid since it is given in the event of disaster, famine or drought and therefore may not be correlated with growth. Their results attribute effects of short-term impact aid, but do not test any of its categories’ impacts on growth. Another limitation of Clements et al. is that, by definition, all aid given in the form of budget support is regarded as short-term impact whereas all aid given as technical assistance is considered a long-term impact. In reality, budget support programs may cover social infrastructure projects, and on the other hand, economic infrastructure may account for a relatively large portion of technical assistance.

In general, Ram (2003) finds significantly different effects of bilateral and multilateral aid on growth. Clements et al. (2004) pinpoint a strong, positive and robust relationship between short-term impact aid and growth, using four-year regressions. Their studies shed light on the important assessment of aid effectiveness by disaggregating it. This present study uses a similar approach. The details of the methodology adopted are discussed in the next section.
3.2.2 Modeling how aid acts on growth

Effectiveness of aid in most papers has been measured by the significance and sign of the aid coefficient in the growth model. This result may measure the direct effects of aid, but does not explain how aid acts on growth. In other words, most studies fail to specify the mechanism through which aid should affect growth. However, this shortcoming is perceived by a few papers and examined using: (i) simultaneous equations; (ii) residual generated regressors; and (iii) interaction terms between aid and other variables in the growth model.

**Simultaneous Equation Approach.** Some studies acknowledge the fact that the single equation approach is inappropriate if dependent variables form a simultaneous system with any independent variables. Gupta and Islam (1983) account for the simultaneity between growth and savings in a cross-country study and propose nine equations with nine endogenous and eight exogenous variables in their simultaneous system. Their motivation is to investigate the aid-savings-growth relationship in which both the savings rate and the growth rate affect each other. Their finding is that savings and aid make a significant contribution to growth, but their study does not capture the indirect impacts of aid on growth via domestic savings.

Mosley et al. (1987) also examine the aid-growth relationship by estimating a simultaneous system of equations using three-stage least squares, based on data of 63 countries in the period 1970-80. The authors’ motivation is the incorporation of indirect effects of aid on growth through two channels: the spending patterns of the public sector and a change in relative prices. Their results show that there is no significant correlation between aid and growth since aid may contribute to non-productive expenditure in the public sector. Hudson and Mosley (2001) propose a model of aid-policy-growth interaction including a simultaneous system of five equations and argue that this system would tackle the direct and indirect effects of aid, aid endogeneity and linkages between aid, growth, poverty and good policy. However, in terms of econometric technique, despite the advantage of using two-stage least squares or weighted-least squares, this study has been criticized as suffering from sensitivity to model specifications.
**Residual Generated Regressors.** Gomanee et al. (2002) contribute to the aid-growth literature by focusing on transmission mechanisms in determining the effect of aid on growth. Using residual generated regressors with pooled panel data from sub Saharan Africa in the period 1970-97, they estimate the total effect of aid via three channels: government spending, imports and investment. The residual generated regressor is based on Pagan’s (1984) method in which generated regressors use predicted residuals from a supplementary regression. Results from Gomanee et al. (2002) confirm that investment is the most significant channel. Detailed techniques are presented in the section 3.3 on analytical framework.

**Interaction terms.** Bowen (1998) suggests that an appropriate model of the aid-growth relationship should investigate both the direct and indirect effects of aid. The direct effect is measured by the sign of the aid coefficient whereas the indirect effects should be tested by the sign of interaction terms between aid and other independent variables in the growth model. Bowen (1998) tests the indirect effects of aid on growth through all interaction terms of aid with savings and investment as well as trade. He argues that these interaction terms show the impact of aid on economic growth through effects of aid on other variables that in turn affect growth. However, his argument does not provide further clarification on the technique and is confusing because most other research regards interaction terms as the effect of foreign aid’s determinants. His main findings suggest that aid does significantly and negatively modify the relationship between savings and growth.

**3.2.3 Conditions of aid effectiveness**

The most influential contribution of third generation models is that aid raises growth: (i) in countries where economic policies are good (Bumside and Dollar 2000); (ii) in countries with political stability and external vulnerability (Chauvet and Guillaumont 2002); (iii) in countries outside the tropics (Dalgaard et al. 2004); (iv) in countries where a civil war has recently ended (Collier and Hoeffler 2002); (v) in countries with a high level of human capital (Kosack and Jennifer 2006); and (vi) in countries with stronger institutions and longer life expectancy (Clements et al. 2004). In all stories, aid-growth is allowed to be non-linear through incorporation of repressors of aid squared and interaction terms of aid together with some control variables. The sign and significance of these interaction terms
provide evidence on which conditions directly promote aid effectiveness (see Table 3.1: List of studies on conditions of aid effectiveness, page 64).

Though knowledge of the determinants of aid effectiveness has been developed in many more recent studies, there controversy still exists over the aid-policy-growth relationship. Burnside and Dollar (2000) start the debate over aid effectiveness by arguing that aid works only in a good policy environment. Other researchers, including Hansen and Tarp (2001), Hudson and Mosley (2001), Dalgaard et al. (2004), and Easterly et al. (2004) criticize Burnside and Dollar’s results from numerous statistical perspectives: regressors, instruments, selection of outliers and changes in data. They also employ different estimation methods and find that their results are different to Burnside and Dollar’s.

The lesson here seems to be that policy is an important and sensitive condition of aid effectiveness. Furthermore, the effects of aid on policy are complex and depend on specific, immeasurable features of the recipient. Aid may affect some policies and not others, and even vary over time spans. Hence, it is not easy for cross-country studies to analyze the mechanism by which aid affects growth through its interaction with policy variables. Aid-policy-growth studies, despite their advantage of controlling some factors in cross-country analysis, have been criticized as suffering from sensitivity to policy construction, period selection and model specification.

This study offers a quantitative assessment of the effects of aid through its interaction with policy variables in a case study of Vietnam. Most variables are measured at provincial level and therefore the policy variable reflects provincial government policy. In the next section, a Provincial Competitiveness Index (PCI) is introduced as a proxy for the policy variable. Using cross-province data limits the examination of all conditions of aid effectiveness highlighted in the cross-country literature. In the context of Vietnam’s data, whether human capital is a condition of aid effectiveness is tested, as suggested by the research of Kosack and Jennifer (2006).
3.2.4 Aid and growth in Vietnam

There is a lack of in-depth studies on foreign aid in Vietnam; most papers are sponsored by donors, using mainly statistical methods to study the effects of aid and how to improve aid management in Vietnam. On the topic of aid and growth, only two papers have used econometric techniques to analyse the role of aid and the linkage between foreign aid and economic growth. Le et al. (2004), using data for ODA and investment covering the period 1993-2003, investigate the role of ODA in mobilizing investment for development. They find that ODA has been a factor in mobilizing domestic investment and has had a significant impact on inward FDI as well. Based on the OLS regression of FDI and ODA using provincial data from 1995-2000, they test the correlation of provincial per capita ODA and FDI. The limitation of this study is that it does not include an analytical model of the linkage between ODA, investment, GDP growth rate and other macro variables, which is important for critical appraisal of ODA effectiveness. Although Le et al. (2004) try to explore the effectiveness of foreign aid, the direct contribution of foreign aid to economic growth is still neglected in terms of an empirical approach.

Phuong (2006) uses national level data to empirically examine the effects of foreign aid on growth in Vietnam since the reform process was implemented in 1986. Overcoming the problem of the data span not being long enough for the application of time series regression, he proposes using the growth accounting framework for a case study of Vietnam. His approach follows two steps: (i) the contribution of capital input to growth is estimated and (ii) the contribution of capital is then disaggregated into various sources such as contribution of aid, domestic investment and total factor productivity. Moreover, based on the regression results on foreign aid with domestic investment, savings and growth for a sample of 23 countries in Asia, he assumes that the marginal effects of foreign aid and domestic investment on economic growth are the same in the case of Vietnam. He concludes that aid has played an important role in growth of output with an average contribution of 6.5 per cent for the period 1993-2006. He also emphasises that the estimated contribution of aid to growth of output only reflects the short-run contribution on capital accumulation and growth. This contribution comes mainly from education, infrastructure development and healthcare sectors since these sectors accounted for the majority of foreign aid inflows into Vietnam during the period studied.
3.3 Analytical framework

In this chapter, three questions are addressed: Is the impact of aid on Vietnam’s economic growth, effective, ineffective or even harmful? What is the mechanism through which aid affects growth? Which terms of aid and sectors of aid make greater contributions to growth? This chapter examines Burnside and Dollar’s hypothesis on the relationship of aid-policy-growth and seeks other conditions of aid effectiveness in Vietnam. These questions are examined based on provincial data for Vietnam and several econometric steps, as described below.

3.3.1 Empirical growth model

The literature on the effectiveness of aid relies on empirical work and has produced all results possible: aid is effective, ineffective or even harmful for growth. The literature has argued that aid effectiveness depends on certain conditions, but it disagrees about what these conditions are (Doucouliagos and Paldam 2005). The majority of studies use Barro-type empirical growth regression\(^{13}\) and the literature on aid effectiveness is divided into two kinds of empirical models:

(3.1) Model of the direct impact of aid on growth, using the reduced form:

\[
g_{it} = \alpha + \mu a_{it} + \gamma_j x_{jit} + u_{it}
\]

(3.2) Model of the effect of aid on growth might depend on a set of conditions:

\[
g_{it} = \alpha + \mu a_{it} + \delta z_{it} + \lambda \alpha /a_{it} z_{it} + \gamma_j x_{jit} + u_{it}
\]

where as: 
- \(g_{it}\) real growth rate
- \(a_{it}\) aid as share of GDP/ or GNI
- \(z_{it}\) conditional variable
- \(x_{jit}\) vectors of \(j\) control variables

The idea of conditional aid effectiveness based on the effect of aid on growth depends on a third factor \(z\) (for example, \(z\) may be policies, institutions, trade openness, human capital and so on), so that if \(z\) is favourable, the result is growth, and vice versa if \(z\) is unfavourable. It is worth noting that model (2) turns out to be model (1) if \(\delta = \lambda = 0\).

Similar to the methods used in most cross-country analysis, a Barro-type growth model is employed here. Most variables are defined with the same cross-country analysis, but they are measured at provincial level instead of country level. A base specification is thus

\(^{13}\) This has been published in various versions since 1991. The newest is Barro and Sala-i-Martin (2004).
constructed with a full list of growth determinants selected from both the growth literature and aid literature, then the model is reduced by removing insignificant variables.

### 3.3.2 Estimation methodology

The OLS estimation is employed based on equation (1) and (2) because the methodology allows an empirical analysis to be carried out which is comparable to other important studies such as Barro’s growth model and Burnside and Dollar’s aid-growth model.

However, a critical assumption of OLS is that there is zero correlation between the error term and any independent variable. If this is violated, the instrument variable estimation (IV) will be used since OLS estimates is not consistent. The issue of endogeneity and appropriate choice of instrument questions the results of Burnside and Dollar (2000) and Hansen and Tarp (2000; 2001). Both studies posit that aid is an endogenous variable, but they choose different sets of instruments. Burnside and Dollar propose a set of exogenous variables that may affect the allocation of aid with the assumption that these exogenous variables are not determinants of growth. Hansen and Tarp, on the other hand, use lags of aid and lags of control variables to take care of possible endogeneity. Therefore, the results are different. To address this issue in the present study, a Hausman test for endogeneity is conducted for aid in the cross-province regression. In the case of rejection of the null hypothesis of exogeneity, the IV estimation will be used and the lags of aid and lags of other control variables work as instruments as recommended by Hansen and Tarp.

Another econometric problem of cross-section OLS is not to control for potential heterogeneity that is the result of a heterogeneous group of provinces in terms of size, population and level of GDP. To overcome the problem, White’s tests are conducted for heteroskedasticity and the report is presented with White heteroskedasticity-consistent standard error.

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14 Burnside and Dollar (2000) propose two equations, in one of which growth is a function of aid, aid*policy, and a vector of policy and other variables, and in the other aid itself is a function of policy and other exogenous variables.
Turning to the nonlinear regression on the aid-growth model, the literature suggests that aid interaction terms capture the effects of foreign aid's determinants. Basically, including these interaction terms allows the effect on growth of the change in the aid variable to depend on the value of the control variable (equation 3.3) and, conversely, allows the effect of change in these control variables to depend on the value of aid (equation 3.4). Therefore, the interaction may be interpreted in at least two ways: (i) control variable $z_i$ is a condition of aid effectiveness; and (ii) there is a selection effect, whereby aid flows are distributed to observations with a high/low level of control variable $z_i$.

$$\frac{\Delta g_{i}}{\Delta a_{i}} = \mu + \lambda z_{i}$$ (3.3)  
$$\frac{\Delta \lambda}{\Delta z_{i}} = \delta + \lambda a_{i}$$ (3.4)

To test this possibility, the interaction terms of aid is examined with some control variables. In line with the literature and based on Vietnamese provincial data, the hypothesis on aid interaction terms includes aid with human capital, and aid with provincial government policy.

Turning to the key conclusions of the first and second generation studies on the aid-growth relationship, that for aid to be effective it must increase capital accumulation, whether aid works through the investment link is analysed. To examine this hypothesis, it is necessary to show that: (i) investment affects growth and (ii) aid increases investment. Investment therefore is captured directly in the growth model. However, aid is also retained as a regressor because not all aid is intended for investment. For example, aid may be given in the form of technical assistance to improve human capital or technology that in turn affects growth. Therefore, one potential problem of including aid and investment in the growth model is multicolinearity (a significant proportion of aid is used for investment), or at least the coefficient of aid is biased downwards because there is double counting (some aid finances investment) in the model. To address this problem, the residual generated regressors technique is proposed (Pagan 1984).

**Residual Generated Regressors Technique.** Pagan (1984) presented econometric issues in the analysis of regressions with generated regressors. This approach estimates the regression equation in which variables are constructed by using predicted values or
residuals from a supplementary regression. The general model of residual generated regressors is:

\begin{align*}
(3.5) \quad Y &= \delta Z^* + \lambda(Z - Z^*) + e \\
(3.6) \quad Z &= Z^* + \eta = wX + \eta
\end{align*}

Equation (3.6) shows the effects of X on Z. Therefore, \((Z-Z^*)\) in equation (3.5) presents that part of Z which is explained by factors other than X. Pagan (1984) finds that a two-step procedure gives asymptotically efficient estimates and also provides the correct value for the standard error of \(\hat{\lambda}\).

Gomanee et al. (2002) apply this methodology to analyze the aid-investment-growth relationship of Saharan African countries. They first generated the variable (INVRES) by using residuals from an aid-investment bivariate regression. INVRES expresses the part of investment that is not financed by aid.

\begin{equation}
(3.7) \quad INV = wAid + INVRES
\end{equation}

They substitute INVRES for INV in the growth regression as:

\begin{align*}
(3.8) \quad g &= \beta_1 INV + \beta_2 Aid + \beta_3 Z + \epsilon \\
(3.9) \quad g &= \beta_1 (wAid + INVRES) + \beta_2 Aid + \beta_3 Z + \epsilon = \beta_1 INVRES + (\beta_2 + \beta_1 w)Aid + \beta_3 Z + \epsilon
\end{align*}

It is clear that only the coefficient of the aid variable is altered. By comparing models (3.8) and (3.9), there are three hypotheses:

H1. Aid has a positive effect on investment (\(w\): positive sign); investment and aid also have positive effects on growth (\(\beta_1, \beta_2\): positive sign). This method provides for a bigger coefficient of aid (\(\beta_2 + \beta_1 w > \beta_2\)).

H2. Aid does not affect investment (\(w=0\)). There is no difference between the coefficient of aid of equations (3.8) and (3.9) and the method is not used (\(\beta_2 + \beta_1 w = \beta_2\)).

H3. In other cases, the coefficient of aid in equation 3.9 is reduced (\(\beta_2 + \beta_1 w < \beta_2\) because \(\beta_2, \beta_1, and w\) do not have the same sign).

In line with the literature on growth and aid, it is expected that hypothesis (1) is true; aid increases capital accumulation and that in turn affects growth.
3.3.3 Disaggregated aid data

Based on the argument that the different categories of aid do not have the same effect on growth, the link between aid and growth is examined here by disaggregating aid into two broad categories: those that are growth oriented and those that are not. Following UNDP categories, foreign aid in Vietnam is disaggregated at the three-digit sector level.

a. Social infrastructure and services (education, health, population programs, water supply and sanitation, government and civil society; other social and infrastructure and services).
b. Economic infrastructure (transport and storage, communication, energy, banking and financial services, business and other services).
c. Production sectors (agriculture, forestry, fishing, industry, mineral resource and mining, construction, trade policy and regulations, tourism).
d. Multi-sector.
e. Commodity aid/general program assistance (food aid, excluding relief food aid)
f. Action related to debt.
g. Emergency Assistance (Relief food aid, non food emergency and distress relief)
h. Administrative costs of donors.
i. Support to NGOs.

Among these categories of aid, the first three (a, b and c categories) are more related to growth in Vietnam. First the effects of aggregated aid are examined and then the impacts of each sector are considered separately: social infrastructure and services, economic infrastructure, and production sectors. Effects of social infrastructure and economic infrastructure may not be realized in the four-year regression. However, due to a lack of data, the impact of each sector is assessed and compared in four-year regressions.

Moreover, the aid-growth relationship with different sources and forms of foreign aid is evaluated. For the question of which sources and forms of aid contribute most to economic growth in Vietnam, aid variables are decomposed into grants and loans, or bilateral and multilateral aid, in the growth model.
3.3.4 Construction of policy index

In the cross-country model, the Burnside and Dollar (2000) policy index has been used in the most recent empirical studies. This index is defined as a weighted sum of budget surplus, inflation rate and the Sachs-Warner openness index. However, as inflation rate and openness are captured as key independent variables in our growth model, we therefore construct policy variables by using the Vietnam Provincial Competitiveness Index 2006 (PCI).

The PCI was conducted by the Vietnam Chamber of Commerce and Industry (VCCI) and the Vietnam Competitiveness Initiative (VNCI)\footnote{VNCI is an economic growth project of the United States Agency for International Development (USAID) to improve the competitiveness of small and medium-size enterprises in Vietnam} to assess and rank 64 provincial governments by their environments for private sector development. Using survey data from 6,300 firms, the PCI rates provinces on a 100-point scale by weighting 10 sub-indices including key dimensions of the local economic environment that can be directly influenced by the actions and attitudes of provincial officials:

- Entry Cost (Business Establishment Cost)
- Land Access and Security of Tenure
- Transparency and Access to Information
- Time Cost of Regulatory Compliance
- Information Charges
- State-Sector Bias (Competition Environment)
- Private Sector Development Services
- Pro-activities of Provincial Leadership
- Private Sector Development Services
- Labour Training
- Legal Institutions

The PCI is used as a proxy for the policy of provincial governments in the aid-growth model since it is developed to compare governance practices at the provincial level. The PCI explains why some provinces outperform others in economic performance, and provides initial estimates of how important governance practices are to attracting
investment and accelerating growth. Empirical evidence on the strong relationship between the PCI and economic growth is captured by a regression of GDP per capita in 2004 on structural conditions\textsuperscript{16}, un-weighted PCI variables and their interaction. The results show that areas with better PCI are able to produce higher GDP from the same level of development.

However, there are some limitations in using the PCI in an aid-growth model. First, the PCI is designed to assess regulatory environments for private sector development. Therefore, both selected sub-indices and their weights are based on their actual contribution to private sector development. Second, PCI data for 64 provinces only became available in 2006, which is a barrier to evaluating the impact of aid on growth in the 2001-04 period. To handle these problems, first policy is constructed using un-weighted PCI, then the dummy variable is applied for high PCI (provinces above the median un-weighted PCI of 55.12) and low PCI (below 55.12). The reason for using dummy variables is that the absolute index may change for each year, but it usually takes longer periods to jump from a poor policy to a good policy category. To double-check the effects of policy in the aid-growth model, the same method for each of the four sub-indices of PCI is used including: transparency and access to information, informal charges, pro-activities of provincial leadership and legal institutions. These sub-indices reflect overall economic policy of provinces and are not biased toward private sector development.

3.4 Data sources, specification and variable construction

3.4.1 Data sources

The foreign aid data are published in the Development Assistance Database of Vietnam (DAD Vietnam). Other macroeconomic provincial data are obtained from the General Statistics Office of Vietnam (GSO) for various years over the period 1993-2004. However, province-level data related to macroeconomic indicators before 2000 are not only lacking, but are also of poor quality and inconsistent. Therefore, a four-year period 2001-04 is used in the regression results.

\textsuperscript{16} Structural conditions include infrastructure (telephones per capita in 1995), human capital (% secondary school graduates in 2000), and proximity to markets (distance in kilometres from Ho Chi Minh and Hanoi cities).
The DAD Vietnam covers more than 15 years of historical data on foreign aid from the UNDP Development Cooperation Analysis System (DCAS). It has information on how aid is operating in one or more provinces, for one or more sectors, and by one or more donors from 1990, and is updated annually. In terms of province level, data can be grouped on aid disbursement or commitment into sector, type and form of aid. The data from each sector are entered and stored using the code classification of the UNDP at the three-digit level. The province-level data are also tabulated by 31 funding sources and by outcomes as per the Vietnam Development Goals and the Millennium Development Goals.

The macroeconomic province-level data are available for the variables needed in the growth model for the 2001-2004 period. However, the observations are available for 61 provinces, out of a total of 64 provinces in Vietnam. Vietnam’s renovation of administrative organizations has increased the number of provinces from 61 to 64, with three provinces being organized into six new ones. Therefore, from the original data set containing 64 provinces, the six provinces are collapsed into three. Moreover, Ba Ria-Vung Tau, a province with high GDP per capita resulting from oil revenues, is removed from the data sample. The reason is that GDP of this province gives a biased reflection of its economic growth. In all, 60 provinces are used in the aid-growth regression analysis over the 2001-04 period.

3.4.2 Specification and variable construction

A Barro-type growth model is employed and a number of variables are selected from both the growth literature and the aid literature. The tested model of aid and economic growth with cross-province evidence can be represented as:

\[ Y_i = \alpha + \beta.aid_i + \theta X_i + \lambda Z_i + \sum_j \rho_j DV_j + \varepsilon_i \]

\(X_i\): Control variables are selected from the growth literature: Initial per capita GDP, education, population, life expectancy and inflation.

\(Z_i\): Control variables are selected from the aid literature: Initial per capita GDP, life expectancy, inflation and openness.

The aim of this chapter is to analyze the effects of aid on growth in Vietnam using cross-province data of a single country. The results will be related to recent publications on aid
effectiveness using cross-country analysis such as Burnside and Dollar (2000) and Hansen and Tarp (2000; 2001). Therefore, a time span identical to that used in these studies is chosen. A four-year period is usually the time period considered in most aid-growth regressions by such as Burnside and Dollar (2000), Hansen and Tarp (2000; 2001); Collier and Hoeffler (2002), Dalgaard et al. (2004) (see Table 3.1, page 64). All variables in the model are measured over the four-year period 2001-04.

The dependent variable is the average growth rate of real GDP per capita over the four-year period of each province, and is measured in constant 1994 VND prices.

The foreign aid variable is measured at average four-year period of disbursement as a percentage of provincial GDP in the corresponding period in each province. Aid variables are aggregate aid or grants and concessional loans, or bilateral and multilateral aid, or volume of aid to several sectors as discussed earlier.

The investment variable is measured over an average four-year period of investment as a percentage of provincial GDP in the corresponding period in each province.

The initial per capita GDP is the log of a province’s per capita GDP in 2001 - the initial year of the period 2001-04.

The level of human capital is the education variable, that is, the percentage of people who completed at least secondary school in the total population in each province. Based on the empirical growth model of Barro and Sala-i-Martin (1995) all observations are selected at the start of the study period, 2001.

Population is the log of population that is observed at the start of the period 2001-04, to test for scale effect in the growth model (Barro and Sala-i-Martin 1995).

Inflation is measured at the average growth rate of GDP deflator over the four-year period for each province.

Life expectancy is the log of life expectancy at birth that is observed at the start of the period 2001-04 (Barro and Sala-i-Martin 1995).
Openness is measured at the average four-year period of total import and export as a percentage of GDP in the corresponding period in each province. An openness variable that proxies for a trade variable on growth regression is captured.

Six region dummy variables (DV) capture different natural conditions in seven different regions in Vietnam: North Uplands (DV1); Red River Delta (DV2); North Central Coastal (DV3); South Central Coastal (DV4); Central Highlands (DV5); Mekong River Delta (DV6); and the Southeast Region.

3.5 Empirical results

3.5.1 Base model

Model (8) is tested for the 2001-04 period when data for all the variables are available. Having identified that the different categories of aid do not have the same effect on growth, the estimated result of the aid-growth model as specified by Table 3.2 and Table 3.3 is reported here (pages 65 and 66). Regressions in Table 3.2 differ from the regressions in Table 3.3 in that the aid variable is measured by aggregated aid whereas the aid variable in Table 3.3 is disaggregated in terms of type, form and sector. Furthermore, regressions in Table 3.2 are obtained by both OLS and 2 SLS techniques, investigating whether aid might spur growth with diminishing returns. The regressions listed in Table 3.3 capture the same specifications and use the OLS technique to examine the impacts of various disaggregated aid on growth.

Overall, the regressions perform well. The chosen specification explains at least 60 per cent of the variation in the dependent variables. Foreign aid exerts positive impacts on Vietnamese provincial economic growth in the 2001-04 period and the impacts are at different significance levels depending on different aid variables. Other variables enter the regression with expected signs. The estimated coefficients for initial per capita GDP (log(GDP)), are negative and significant at 1 per cent in all regressions, showing the conditional convergence that has been reported in various studies (Barro 1991; Mankiw et al. 1992). The effect of inflation on growth is significantly negative because of the general idea that businesses and households are thought to perform poorly when inflation is high and unpredictable (Barro and Sala-i-Martin 1995). The magnitudes of the effects are
relatively large with evidence from Vietnamese provincial data; an increase in average inflation rate by 10 percentage points per year is estimated to lower the growth rate of real per capita GDP by 1.2-1.3 percentage points per year. In contrast, education and life expectancy appear to have higher growth performance. The former proxy for human capital in the growth model, observed at the start of the study period, shows that one-standard-deviation in education adds 0.05 percentage points to the growth rate, on average. The effect of the latter is consistent with the findings of Clements et al. (2004), but the magnitude is relatively high. An increase in openness also helps raise economic growth at the 10 per cent significance level.

Importantly, evidence is obtained of a positive effect of aid on growth. The direct relationship between total aid and growth (Table 3.2, page 65) is found to be positive and significant at the 5 per cent level. On average, an increase in total aid by one percentage point raises the growth rate of real per capita GDP by 0.051 percentage points (regression 2.1- Table 3.2). As expected, aid in the production sector shows stronger effect on growth in terms of magnitude and significance (regression 3.7- Table 3.3, page 66), with its estimated coefficient and t-value of 0.35 and 2.23, respectively. The remaining aid variables also appear to have higher growth performance, but there are differences in significance levels. In terms of aid type, the coefficient of loans is significant at the 10 per cent level and that of grants is 1 per cent significance (regressions 3.1 and 3.2 – Table 3.3). The bilateral-aid parameter is more sizable and positive than the parameter for multilateral aid (regressions 3.3 and 3.4-Table 3.3). The results found for regressions 3.5 and 3.6 (Table 3.3) do not support the significant effects of social and economic infrastructure aid on growth, at least for this four-year sample.

The differences in significance level effect of disaggregated aid variables found here have several causes. First, this supports the hypothesis that different sectors of aid have different impacts on growth. Second, that the coefficient for total aid is less than that for production sector aid shows that not all kinds of aid are given for the purpose of growth. In contrast to the production sector, aid for social and economic infrastructure does not have any significant effects on growth because they may not be evaluated within a four-year period. Clements et al. (2004) regard economic infrastructure aid as being under the short-term impact category of aid. However, in the case of Vietnam, this should be listed under the
long-term impacts of aid and it can be examined within a longer four-year period of economic growth.

Ram (2003) concludes that bilateral-aid contributes more to growth than multilateral aid. He finds that the estimated coefficient of multilateral aid is also negative and large in the growth model. The present results seem to be consistent with those reported in Ram (2003), in that bilateral aid and multilateral aid are positive but only the former is significant. However, the lack of significant effects of multilateral-aid are not surprising because multilateral donors such as the World Bank (WB) and the Asian Development Bank (ADB) have concentrated on projects with a large capital investment (see Chapter 2). Hence, the economic returns on these projects may not be realised within a short time period like 2001-04, meaning that the effects of multilateral aid turn out to be insignificant. In general, the statement about superiority of bilateral aid over multilateral aid is difficult and complex task because each donor has its own priorities and procedures that make comparing the overall effectiveness of aid across donors may be unrealistic.

In terms of grants and loans, the coefficient of grants is more significant and sizeable compared to the coefficient of loans. In theory, the comparative merits of loans and grants have long been in dispute. However, it is also believed that the benefits of grants and loans are not similar between different “economies” within countries as well as between countries (Schmidt 1994). In the case of Vietnam, the result can be partly explained by the facts that grants do not need to be reimbursed and have a quicker disbursement. Tam (2004) argues that grants have a shorter project span than loans since the latter take much time to meet the requirements of both Vietnam’s government and the donors, whereas the former is usually implemented by donor agencies. Moreover, grants have been given mostly to helping the government to undertake policy adjustments and economic reform. The cost of these projects is relatively small, but they have brought about remarkable achievements for Vietnam’s economy (Le et al. 2004).

Another important variable in the aid-growth model is aid squared (regression 2.2 and 2.4-Table 3.2, page 65). With the introduction of aid squared, the relationship between aid and growth is modelled as non-linear. This is consistent with the suggestions of the third generation of aid effectiveness studies (Hansen and Tarp 2000). This variable is present
with a negative sign suggesting decreasing marginal returns to aid flows. This result contributes to the conclusion of most studies from the mid-1990s to the present (Hadjimichael et al. 1995; Ramesh et al. 1998; Hansen and Tarp 2000, 2001; Lensink and White 2001; Dalgaard et al. 2004), that aid has a positive relationship with growth, but with diminishing returns as the volume of aid increases.

The significant effects of the estimated coefficients of most dummy variables in Table 3.2 and Table 3.3 (pages 65 and 66) show that location also matters to growth (except for DV6). Estimated dummy variables DV1 to DV4 represent a negative sign which indicates that being located in the Northern Uplands, Red River Delta, South Central Coast and North Central Coast regions reduces provincial growth compared with being located in the Southeast regions, ceteris paribus. This is because these regions suffer more difficult natural and socio-economic conditions compared with the Southeast region. In contrast, being located in the Central Highlands region is closely correlated with provincial GDP growing at a higher speed than being located in the Southeast region. This may be because of the low GDP level in the late 1990s of the provinces in the Central Highlands region. Similarly, parameters for the log of the population variable are significant in all regressions, which suggest that scale effect would account for much of the cross-province variation in growth rate.

Finally, to check the sensitivity of the results for endogeneity of aid, a Hausman test for aid was conducted in cross-province regression. Although the null hypothesis of exogeneity is not rejected (except for regression 2.2 - Table 3.2, page 65), the regression was also replicated using lag of aid and lag inflation as instrument variables. As shown in regression 2.3 and 2.4 (Table 3.2), using IV-estimation does not change the conclusion.

3.5.2 Aid, capital accumulation and growth

Table 3.4 (page 67) shows regressions for the relationship between aggregated aid, and capital accumulation and growth. The dependent variable in regression 4.1 is investment ratio whereas it is growth rate of real GDP per capita in the remaining regressions (4.2)-(4.5). The functional form of the first regression is the same as the one used for growth rate in Table 3.2. Investment ratio is the average value of investment as a percentage of GDP for
A highly significant positive impact of aid was found for investment in regression 4.1, as expected. The result suggests that aid is effective in increasing capital accumulation. As for the relationship between investment and growth, the investment ratio is a substitute for aggregated aid in the growth model, as in regression 4.3, and the investment variable also exerts significant positive impacts on growth.

Adding both investment and aid in the growth model, as in regression 4.4 (Table 3.4, page 67), changes the effect of aid on growth, in terms of both size and significance. Compared to regression 4.2 (Table 3.4), the coefficient of aid is biased downwards from 0.051 (regression 4.2) to 0.035 (regression 4.4). Similarly, the parameter of investment is also biased downward from 0.0052 (regression 4.3) to 0.0040 (regression 4.4). The results suggest that including aid and investment in the growth model may lead to double counting problems (Gomanee et al. 2002). Therefore, a residual generated regressor technique was used to overcome this problem, as discussed in Section 3.3.

By substituting investment residual (INVRES) for investment in regression 4.4 (Table 3.4), regression 4.5 (Table 3.4) presents the aid-growth regression in which investment residual has been regarded as that part of investment that is not financed by aid. INVRES is the residual of an aid-investment bivariate regression. Compared to regression 4.4, the parameter for the aid variable in regression 4.5 is greater, in terms of both size and significance level. Coefficients for other variables in regression 4.5 are the same as in regression 4.4, consistent with the explanation of the generated regressor technique in Section 3.3. This supports the hypothesis that the aid coefficient in the model includes an investment term. In summary, the results of regressions in Table 3.4 suggest that aid exerts significant positive impacts on growth by contributing to investment.

Table 3.5 (page 68) summarize the regressions using a residual generated regressor technique in which aggregated aid is substituted for disaggregated aid, including grants and loans, bilateral aid and multilateral aid. Due to the lack of data on investment sectors, the model is not examined by entering the aid variable allocated to social infrastructure, economic infrastructure and production sectors. Table 3.5 presents estimated coefficients and t-values of aid variables in the aid-growth model. Column 5.1 provides results from Table 3.2 and Table 3.3. Column 5.2 differs from column 5.1 in that the effect of
investment is included in the aid-growth model. Column 5.3 shows results of regressions using a residual generated regressor technique, in which investment residuals are captured by components of the aid-investment bivariate regression. We do not report regression results of other variables in the model because they remain fairly constant in their magnitude and significance across the regressions.

Table 3.5 (page 68) suggests that once investment residual is conditioned in all regressions of column 5.3, the parameters of aid’s components are greater, in terms of both magnitude and significance, compared to columns 5.2. Altogether, the evidence suggests that aid has significant positive effects on growth through investment channels.

3.5.3 Conditions of effectiveness of foreign aid

Using interaction terms between aid and several control variables allows the examinations of most conditions that might influence the effect of aid on economic growth (see Section 3.2). This study expands the findings of previous work by testing the relationship between aid and provincial government policy, and aid and education (proxy for human capital) using cross-province regressions in Vietnam.

The growth regression is formulated by including interaction terms as shown in Table 3.6 (page 69). Regressions 6.1 and 6.2 are the same as the original regression 2.1 (Table 3.2, page 65) except for the interaction term between aid and education. Regressions 6.3 and 6.4 employ two more variables: policy and an interaction term for aid and policy. As noted, the policy variable is a dummy variable and constructed by un-weighted PCI (see Section 3.3).

Adding an interaction term for aid and education, as in regression 6.1 (Table 3.6, page 69), does not lead to a significant change in most variables with the exception of aid, education and the interaction term, compared to the original regression 2.1 (Table 3.2). Parameters of aid and education lose their significance while the interaction term (aid*education) is highly significant and positively associated with economic growth. This result may be interpreted in two ways: (i) the education proxy for human capital is a condition of aid effectiveness, as has been suggested by earlier literature (Kosack and Jennifer 2006); (ii) there is a selection effect, whereby aid flows are distributed to those provinces with high
levels of education. The second interpretation is not possible because an important aim of foreign aid usually is to raise the literacy rate. Furthermore, due to the education variable being observed at the start of the study period, it does not change under the influence of aid flow in the same period. Therefore, the positive interaction term aid*edu suggests that the education is a condition of aid effectiveness. This positive interaction term may also be explained through the production function. As mentioned in Section 3.5.2, aid exerts significant positive impacts on growth mainly by contributing to investment. If aid increases capital accumulation, there is a higher level of human capital and the greater is the total factor productivity, according to the Cobb-Douglas production function 

\[ Y = f(k, h) = Ak^a h^b, \] 

where \( k \) is physical capital and \( h \) is human capital.

The coefficient of aid variable reduces its significant positive effect when the interaction term aid*policy is introduced, as in regression 6.3 (Table 3.6, page 69). Importantly, the interaction term aid*policy is found to be insignificant. This result indicates that a provincial government policy is weakly associated with effectiveness of aid flows. This can be partly explained by the fact that provincial government does not play a significant role in all aid project cycles in Vietnam. Over-centralization of Vietnam’s central government and over-dominance of the donor in decision-making can be seen in many aid projects (CIEM 2003). In Vietnam’s context, the government is highly centralized in its management of aid projects, for two reasons: (i) a donor-driven project is a big limitation to aid project management; and (ii) provincial governments are usually not competent or do not possess enough project management skills to work with foreign partners (Tam 2004).

In the aid-growth regression, aid and policy were expected to be endogenous in many earlier studies. Hence, a Hausman test was conducted and the regression was replicated by using the instrument regression. As shown in regressions 6.2 and 6.4 (Table 3.6, page 69), using IV-estimation does not change the conclusion. Finally, multicollinearity between the various exogenous independent variables and interaction terms suggests that some conclusions could be spurious. Therefore, the regressions were reformulated by including both interaction terms aid*edu and aid*policy in a single model. These results, as in regression 6.5 (Table 3.6), are similar to the conclusions of regression 6.1 and 6.3. This affirms that: (i) the higher the level of provincial education, the higher the impact of aid on
provincial economic growth; and (ii) there is no evidence that a provincial government policy is a condition of aid effectiveness.

To double-check the effect of provincial government policy, the same method of regression was used for each of the four sub-indices of PCI. The summary results in Table 3.7 (page 70) suggest that there are no sub-indices associated with the effectiveness of aid on economic growth. In other words, the provincial index such as (i) good transparency and access to information (PCI1); (ii) low informal charges (PCI2); (iii) strong pro-activities of provincial leadership (PCI3) and; (iv) good legal institutions (PCI4), do not impact on the effectiveness of aid.

3.6. Conclusions and policy implications

This chapter has examined the role of foreign aid in fostering Vietnam’s rapid economic growth as defined in terms of GDP growth rate. As the provincial cross-section data suggest, aid has played a significantly positive role in growth performance in Vietnam’s provinces. In line with the most recent cross-country studies, these results suggest that aid has positive effects on growth, but with diminishing returns. As for disaggregated aid, different categories of aid result in different levels of performance. Aid in the production sector shows the highest effect on economic growth, in terms of both magnitude and significance. Moreover, grants appear to make a higher contribution to growth than loans.

This chapter further investigates both theoretical and empirical reviews on modeling how aid works on growth. It explores the causal relationship between aid, investment and growth. In line with findings reported in the aid literature, the results indicate that aid exerts significant positive impacts on growth by contributing to an increase in capital accumulation. Estimates of specifications, based on the generated regressors technique, lend strong support to this hypothesis. In addition, the hypothesis is tested using different categories of aid in the aid-investment-growth model.

With respect to the circumstances under which aid influences growth, the chapter tested for the existence of any systematic relationship between aid effectiveness, provincial government policy and education level, using cross-province regressions. The results
suggest that the effectiveness of aid is not contingent on the macro policy environment defined by the PCI (provincial competitiveness index). Taking a more disaggregated look at different indices of PCI, no evidence was found for the contention that provincial government policy is a condition of aid effectiveness. In contrast to macro policy, better education was found to be the most favourable condition under which aid promotes provincial economic growth.

Finally, for Vietnam to benefit from foreign aid and to foster economic growth, the foreign aid received should be channeled towards projects that belong to the production sector, at least in the short term. The government may increase economic benefits through policies that promote education and training. This paper also points to the limited usefulness of using provincial macro government policies for analysing the relationship between aid, policy and growth. That would require future research efforts when more data on government policy are available.
### Table 3.1 List of some studies on conditions of aid effectiveness

<table>
<thead>
<tr>
<th>Regression</th>
<th>Estimator</th>
<th>Controls</th>
<th>Study Years</th>
<th>Years Period</th>
<th>Key significant term(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collier &amp; Dehn (2001)</td>
<td>&quot; &quot;</td>
<td>&quot; &quot;</td>
<td>1974–93</td>
<td>4 ys</td>
<td>Aid×policy, Δaid×negative shock</td>
</tr>
<tr>
<td>Collier &amp; Dollar (2002)</td>
<td>OLS</td>
<td>LGDP, ICRGE, policy, period and region dummies</td>
<td>1974–97</td>
<td>4 ys</td>
<td>Aid×policy, aid²</td>
</tr>
<tr>
<td>Collier &amp; Hoeffler (2002)</td>
<td>OLS</td>
<td>&quot; &quot;</td>
<td>&quot; &quot;</td>
<td>4 ys</td>
<td>Aid×policy×post-conflict 1</td>
</tr>
<tr>
<td>Hansen &amp; Tarp (2000)</td>
<td>2SLS</td>
<td>LGDP, ETHNF, ASSAS, ETHNF×ASSAS, ICRGE, M2, SSA, EASIA, period dummies</td>
<td>&quot; &quot;</td>
<td>4 ys</td>
<td>aid, aid²</td>
</tr>
<tr>
<td>Chauvet &amp; Guillaumont (2001)</td>
<td>2SLS</td>
<td>LGDP, ENV, SYR, POPG, M2, PINSTAB, ETHNF, period dummy</td>
<td>1970–93</td>
<td>12</td>
<td>aid, aid×environment</td>
</tr>
<tr>
<td>Kosack and Jennifer (2006)</td>
<td>System GMM</td>
<td>FDI, HUM, DEM; SAV; NAT</td>
<td>1970–1999</td>
<td>5 ys</td>
<td>Aid, Aid×human capital; FDI×human capital</td>
</tr>
</tbody>
</table>

**Abbreviations**: LGDP=log initial real GDP/capita; ETHNF=ethno-linguistic fractionalization, 1960; ASSAS=assassinations/capita; ICRGE=composite of International Country Risk Guide governance indicators; M2=M2/GDP, lagged; SSA=Sub-Saharan Africa dummy; EASIA=fast-growing East Asia dummy; ENV=Guillaumont & Chauvet “environment” variable; SYR=mean years of secondary schooling among adults; PINSTAB=average of ASSAS and revolutions/year; BB=budget balance/GDP; INFL=log(1+inflation); SACW=Sachs-Warner openness; HUM=human capital; DEM=democracy; Sav=savings
Table 3.2 **Total aid and growth regressions**

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Estimation method</th>
<th>Growth rate of real per capita GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OLS (2.1)</td>
<td>OLS (2.2)</td>
</tr>
<tr>
<td><strong>Total Aid</strong></td>
<td>0.051 (2.18)</td>
<td>0.17 (7.65)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.050 (1.86)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.20 (6.17)</td>
</tr>
<tr>
<td><strong>Total Aid Squared</strong></td>
<td>-0.012 (-7.06)</td>
<td>-0.012 (-4.91)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>log(gdp01)</td>
<td>-0.60 (-2.90)</td>
<td>-0.50 (-3.38)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.60 (-2.94)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.47 (-3.16)</td>
</tr>
<tr>
<td><strong>Inflation</strong></td>
<td>-0.13 (-5.91)</td>
<td>-0.12 (-6.55)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.13 (-5.86)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.12 (-6.93)</td>
</tr>
<tr>
<td><strong>Log(life expectancy)</strong></td>
<td>2.01 (1.69)</td>
<td>1.71 (1.44)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.02 (1.73)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.60 (1.35)</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td>0.050 (2.19)</td>
<td>0.043 (3.69)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.050 (2.20)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.041 (3.59)</td>
</tr>
<tr>
<td><strong>Log(Population)</strong></td>
<td>0.20 (2.33)</td>
<td>0.22 (3.12)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.20 (2.31)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.22 (3.20)</td>
</tr>
<tr>
<td><strong>Openness</strong></td>
<td>0.0012 (1.98)</td>
<td>0.0008 (1.94)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.0012 (1.98)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.0007 (1.71)</td>
</tr>
<tr>
<td><strong>Northern Uplands</strong></td>
<td>-0.29 (-2.12)</td>
<td>-0.33 (-4.33)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.29 (-2.08)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.34 (-4.50)</td>
</tr>
<tr>
<td><strong>Red River Delta</strong></td>
<td>-0.34 (-1.94)</td>
<td>-0.41 (-3.72)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.34 (-1.89)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.44 (-4.33)</td>
</tr>
<tr>
<td><strong>North Central Coast</strong></td>
<td>-0.39 (-1.83)</td>
<td>-0.47 (-3.28)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.39 (-1.73)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.50 (-3.29)</td>
</tr>
<tr>
<td><strong>South Central Coast</strong></td>
<td>-0.27 (-1.55)</td>
<td>-0.40 (-3.72)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.27 (-1.50)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.44 (-4.71)</td>
</tr>
<tr>
<td><strong>Central Highlands</strong></td>
<td>0.56 (1.90)</td>
<td>0.32 (1.43)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.57 (1.92)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.26 (1.31)</td>
</tr>
<tr>
<td><strong>Mekong River Delta</strong></td>
<td>-0.13 (-0.63)</td>
<td>-0.0011 (-0.01)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.13 (-0.63)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.008 (-0.01)</td>
</tr>
<tr>
<td><strong>Hausman test (t test)</strong></td>
<td>-1.58</td>
<td>4.9</td>
</tr>
<tr>
<td><strong>White’s test ((f^2))</strong></td>
<td>0.03</td>
<td>0.28</td>
</tr>
<tr>
<td><strong>Sargan test ((^3))</strong></td>
<td>0.10 (0.10)</td>
<td>0.28</td>
</tr>
<tr>
<td><strong>R^2</strong></td>
<td>0.67</td>
<td>0.79</td>
</tr>
<tr>
<td><strong>Number of obs</strong></td>
<td>60</td>
<td>60</td>
</tr>
</tbody>
</table>

**Note:**
- (\(^1\)) Instrument variables: lagged aid; lagged inflation.
- (\(^2\)) The p-value of white’s test for heteroscedasticity, using \(\chi^2\) distribution.
- (\(^3\)) The p-value of Sargan’s test for over identifying restriction.
- t-statistics in the parentheses are based on white Heteroskedasticity-Consistent Standard errors
Table 3.3  **Disaggregated aid and growth regressions**

<table>
<thead>
<tr>
<th>Dependent variable: Annual growth rate in GDP per capita, period (2001-2004)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Regressions (OLS)</strong></td>
</tr>
<tr>
<td>grants</td>
</tr>
<tr>
<td>loans</td>
</tr>
<tr>
<td>Bilateral aid</td>
</tr>
<tr>
<td>Multilateral aid</td>
</tr>
<tr>
<td>Social infrastructure sector</td>
</tr>
<tr>
<td>Economic infrastructure</td>
</tr>
<tr>
<td>Production sector</td>
</tr>
<tr>
<td>log(gdp01)</td>
</tr>
<tr>
<td>Inflation</td>
</tr>
<tr>
<td>Log(life expectancy)</td>
</tr>
<tr>
<td>Education</td>
</tr>
<tr>
<td>Log(Population)</td>
</tr>
<tr>
<td>Openness</td>
</tr>
<tr>
<td>Northern Uplands</td>
</tr>
<tr>
<td>Red River Delta</td>
</tr>
<tr>
<td>North Central Coast</td>
</tr>
<tr>
<td>South Central Coast</td>
</tr>
<tr>
<td>Central Highlands</td>
</tr>
<tr>
<td>Mekong River Delta</td>
</tr>
<tr>
<td>The p-value of White test (')</td>
</tr>
<tr>
<td>R^2</td>
</tr>
<tr>
<td>Observation</td>
</tr>
</tbody>
</table>

**Note:** t-statistics in the parentheses are based on white Heteroskedasticity-Consistent Standard error. (')The value of white’s test for heteroskedasticity using X^2_2 distribution.
<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Investment</th>
<th>Growth rate of real per capita GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regressions</td>
<td>(4.1)</td>
<td>(4.2) (4.3) (4.4) (4.5)</td>
</tr>
<tr>
<td>Aid</td>
<td>3.89</td>
<td>0.051 (2.65)</td>
</tr>
<tr>
<td></td>
<td>(2.65)</td>
<td>0.035 (1.76)</td>
</tr>
<tr>
<td>Investment</td>
<td>0.0052</td>
<td>0.0040 (3.59)</td>
</tr>
<tr>
<td></td>
<td>(3.59)</td>
<td>(2.83)</td>
</tr>
<tr>
<td>INVRES(1)</td>
<td></td>
<td>0.0040</td>
</tr>
<tr>
<td>log(gdp01)</td>
<td>-35.97</td>
<td>-0.60 (-1.91)</td>
</tr>
<tr>
<td></td>
<td>(-1.91)</td>
<td>-0.48 (-2.90)</td>
</tr>
<tr>
<td></td>
<td>(-2.90)</td>
<td>-0.45 (-2.45)</td>
</tr>
<tr>
<td></td>
<td>(-2.45)</td>
<td>-0.45 (-2.36)</td>
</tr>
<tr>
<td></td>
<td>(-2.36)</td>
<td>-0.45 (-2.36)</td>
</tr>
<tr>
<td>Inflation</td>
<td>-1.01</td>
<td>-0.13 (-0.71)</td>
</tr>
<tr>
<td></td>
<td>(-0.71)</td>
<td>-0.11 (-5.91)</td>
</tr>
<tr>
<td></td>
<td>(-5.91)</td>
<td>-0.12 (-4.59)</td>
</tr>
<tr>
<td></td>
<td>(-4.59)</td>
<td>-0.12 (-5.45)</td>
</tr>
<tr>
<td></td>
<td>(-5.45)</td>
<td>-0.12 (-5.45)</td>
</tr>
<tr>
<td>Log(life expectancy)</td>
<td>-33.20</td>
<td>2.01 (1.69)</td>
</tr>
<tr>
<td></td>
<td>(1.69)</td>
<td>2.49 (1.83)</td>
</tr>
<tr>
<td></td>
<td>(1.83)</td>
<td>2.14 (1.65)</td>
</tr>
<tr>
<td></td>
<td>(1.65)</td>
<td>2.14</td>
</tr>
<tr>
<td>Education</td>
<td>2.13</td>
<td>0.050 (0.90)</td>
</tr>
<tr>
<td></td>
<td>(0.90)</td>
<td>0.043 (2.19)</td>
</tr>
<tr>
<td></td>
<td>(2.19)</td>
<td>0.041 (2.78)</td>
</tr>
<tr>
<td></td>
<td>(2.78)</td>
<td>0.041 (2.59)</td>
</tr>
<tr>
<td></td>
<td>(2.59)</td>
<td>0.041</td>
</tr>
<tr>
<td>Log(Population)</td>
<td>-1.45</td>
<td>0.20 (0.17)</td>
</tr>
<tr>
<td></td>
<td>(0.17)</td>
<td>0.20 (2.33)</td>
</tr>
<tr>
<td></td>
<td>(2.33)</td>
<td>0.21 (2.10)</td>
</tr>
<tr>
<td></td>
<td>(2.10)</td>
<td>0.21</td>
</tr>
<tr>
<td></td>
<td>(2.1)</td>
<td>0.21</td>
</tr>
<tr>
<td>Openness</td>
<td>0.20</td>
<td>0.0012 (3.01)</td>
</tr>
<tr>
<td></td>
<td>(3.01)</td>
<td>0.0003 (1.98)</td>
</tr>
<tr>
<td></td>
<td>(1.98)</td>
<td>0.0004 (0.08)</td>
</tr>
<tr>
<td></td>
<td>(0.08)</td>
<td>0.0004</td>
</tr>
<tr>
<td></td>
<td>(0.87)</td>
<td>0.0004</td>
</tr>
<tr>
<td>Northern Uplands</td>
<td>-13.70</td>
<td>-0.29 (-1.13)</td>
</tr>
<tr>
<td></td>
<td>(-1.13)</td>
<td>-0.19 (-2.12)</td>
</tr>
<tr>
<td></td>
<td>(-2.12)</td>
<td>-0.23 (-2.03)</td>
</tr>
<tr>
<td></td>
<td>(-2.03)</td>
<td>-0.23 (-2.59)</td>
</tr>
<tr>
<td></td>
<td>(-2.59)</td>
<td>-0.23</td>
</tr>
<tr>
<td>Red River Delta</td>
<td>-11.08</td>
<td>-0.34 (-0.81)</td>
</tr>
<tr>
<td></td>
<td>(-0.81)</td>
<td>-0.22 (-1.94)</td>
</tr>
<tr>
<td></td>
<td>(-1.94)</td>
<td>-0.29 (-1.74)</td>
</tr>
<tr>
<td></td>
<td>(-1.74)</td>
<td>-0.29 (-2.25)</td>
</tr>
<tr>
<td></td>
<td>(-2.25)</td>
<td>-0.29</td>
</tr>
<tr>
<td>South central coast</td>
<td>-21.46</td>
<td>-0.39 (-1.40)</td>
</tr>
<tr>
<td></td>
<td>(-1.40)</td>
<td>-0.20 (-1.83)</td>
</tr>
<tr>
<td></td>
<td>(-1.83)</td>
<td>-0.30 (-1.09)</td>
</tr>
<tr>
<td></td>
<td>(-1.09)</td>
<td>-0.30 (-1.98)</td>
</tr>
<tr>
<td>Central highlands</td>
<td>10.93</td>
<td>0.56 (0.51)</td>
</tr>
<tr>
<td></td>
<td>(0.51)</td>
<td>0.57 (1.90)</td>
</tr>
<tr>
<td></td>
<td>(1.90)</td>
<td>0.57 (1.51)</td>
</tr>
<tr>
<td></td>
<td>(1.51)</td>
<td>0.52 (1.75)</td>
</tr>
<tr>
<td></td>
<td>(1.75)</td>
<td>0.52</td>
</tr>
<tr>
<td>Mekong River Delta</td>
<td>-25.91</td>
<td>-0.13 (-1.71)</td>
</tr>
<tr>
<td></td>
<td>(-1.71)</td>
<td>0.08 (-0.63)</td>
</tr>
<tr>
<td></td>
<td>(-0.63)</td>
<td>0.03 (-0.36)</td>
</tr>
<tr>
<td></td>
<td>(-0.36)</td>
<td>0.03 (-0.16)</td>
</tr>
<tr>
<td></td>
<td>(-0.16)</td>
<td>0.03</td>
</tr>
</tbody>
</table>

**White’s test (2)** | 0.03 | 0.02 | 0.07 | 0.07 |
**R^2** | 0.34 | 0.67 | 0.69 | 0.72 |
**Number of obs** | 60 | 60 | 60 | 60 |

**Note:**
- (1) INVRES is recovered from regression: Inv = 3.75 Aid (t=2.87, R^2=0.12).
- (2) The p-value of white’s test for heteroskedasticity, using \(\chi^2\) distribution. t-statistics in the parentheses are based on white heteroskedasticity-Consistent Standard error.
Table 3.5 **Summary of disaggregated aid-investment-growth regressions**

<table>
<thead>
<tr>
<th>Aid variable</th>
<th>Regression</th>
<th>Aid - growth (5.1)</th>
<th>Aid-investment-growth (5.2)</th>
<th>Aid-INVRES-growth (5.3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aid variable</td>
<td>Coeff. (t-value)</td>
<td>Coeff. (t-value)</td>
<td>Coeff. (t-value)</td>
</tr>
<tr>
<td>Total aid</td>
<td></td>
<td>0.051(2.18)</td>
<td>0.035(1.76)</td>
<td>0.051(2.79)</td>
</tr>
<tr>
<td>Aid grants</td>
<td></td>
<td>0.19(3.47)</td>
<td>0.14(2.21)</td>
<td>0.19(3.46)</td>
</tr>
<tr>
<td>Aid loans</td>
<td></td>
<td>0.035(1.75)</td>
<td>0.025(1.63)</td>
<td>0.033(2.04)</td>
</tr>
<tr>
<td>Bilateral-aid</td>
<td></td>
<td>0.12(2.66)</td>
<td>0.083(1.95)</td>
<td>0.12(3.33)</td>
</tr>
<tr>
<td>Multilateral-aid</td>
<td></td>
<td>0.037(1.61)</td>
<td>0.020(1.27)</td>
<td>0.044(3.11)</td>
</tr>
</tbody>
</table>

**Note:** t-statistics in the parentheses are based on white Heteroskedasticity-Consistent Standard error.
Table 3.6 **Conditions of effectiveness of aid**

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Growth rate of real per capita GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OLS</td>
</tr>
<tr>
<td>Regressions</td>
<td>6.1</td>
</tr>
<tr>
<td>Aid</td>
<td>0.017</td>
</tr>
<tr>
<td></td>
<td>(0.74)</td>
</tr>
<tr>
<td>Education</td>
<td>-0.062</td>
</tr>
<tr>
<td></td>
<td>(-1.16)</td>
</tr>
<tr>
<td>Aid*Edu</td>
<td>0.073</td>
</tr>
<tr>
<td></td>
<td>(1.89)</td>
</tr>
<tr>
<td>policy</td>
<td>-0.006</td>
</tr>
<tr>
<td></td>
<td>(0.07)</td>
</tr>
<tr>
<td>Aid*policy</td>
<td>0.012</td>
</tr>
<tr>
<td></td>
<td>(0.37)</td>
</tr>
<tr>
<td>log(gdp01)</td>
<td>-0.57</td>
</tr>
<tr>
<td></td>
<td>(-3.57)</td>
</tr>
<tr>
<td>Inflation</td>
<td>-0.12</td>
</tr>
<tr>
<td></td>
<td>(-6.59)</td>
</tr>
<tr>
<td>Log(life expectancy)</td>
<td>1.36</td>
</tr>
<tr>
<td></td>
<td>(1.19)</td>
</tr>
<tr>
<td>Log(Population)</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>(3.00)</td>
</tr>
<tr>
<td>Openness</td>
<td>0.0007</td>
</tr>
<tr>
<td></td>
<td>(1.58)</td>
</tr>
<tr>
<td>Northern Uplands</td>
<td>-0.22</td>
</tr>
<tr>
<td></td>
<td>(-2.85)</td>
</tr>
<tr>
<td>Red River Delta</td>
<td>-0.28</td>
</tr>
<tr>
<td></td>
<td>(-2.48)</td>
</tr>
<tr>
<td>North Central coast</td>
<td>-0.43</td>
</tr>
<tr>
<td></td>
<td>(-2.43)</td>
</tr>
<tr>
<td>South central coast</td>
<td>-0.26</td>
</tr>
<tr>
<td></td>
<td>(-2.21)</td>
</tr>
<tr>
<td>Central highlands</td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td>(1.92)</td>
</tr>
<tr>
<td>Mekong River Delta</td>
<td>-0.06</td>
</tr>
<tr>
<td></td>
<td>(-0.35)</td>
</tr>
</tbody>
</table>

**Note:** - (\(^1\)) Instruments: lagged aid; lagged aid*lagged edu; lagged edu; (\(^2\)) Instruments: lagged aid; lagged aid*policy.
- (\(^3\)) The t-value of Hausman test for endogeneity of aid.
- (\(^4\)) The p-value of White’s test for heteroskedasticity, using \(\chi^2\) distribution.
Table 3.7 **Summary of t value of interaction terms in the regressions on aid, provincial government policy and growth**

<table>
<thead>
<tr>
<th>Interaction terms</th>
<th>Regression</th>
<th>OLS</th>
<th>INST</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>t-value</td>
<td>t-value</td>
<td></td>
</tr>
<tr>
<td>PCI1*aid</td>
<td>OLS</td>
<td>0.75</td>
<td>0.77</td>
<td>Not significant</td>
</tr>
<tr>
<td></td>
<td>INST</td>
<td>0.53</td>
<td>1.59</td>
<td>Not significant</td>
</tr>
<tr>
<td>PCI2*aid</td>
<td>OLS</td>
<td>0.46</td>
<td>0.64</td>
<td>Not significant</td>
</tr>
<tr>
<td></td>
<td>INST</td>
<td>0.37</td>
<td>0.66</td>
<td>Not significant</td>
</tr>
</tbody>
</table>

**Note:** t-statistics in the parentheses are based on White Heteroskedasticity -Consistent Standard error.
CHAPTER 4
FOREIGN AID AND GOVERNMENT EXPENDITURE
4.1 Introduction

Although foreign aid disbursed to low-income countries has been increasing over the years, it does not seem to contribute to economic growth and poverty alleviation in most developing countries (Easterly et al. 2003). The economic growth of these countries is based in part on how recipient governments utilize foreign aid. Much of the aid effectiveness literature, therefore, focuses on the impacts of foreign aid on government expenditure in recipient countries. Nevertheless, the relationship between foreign aid and government budgets is not straightforward since aid may be “fungible”. It is widely recognized that the level of displacement of local resources by foreign aid has important implications for the assessment of aid’s effectiveness. It is difficult to evaluate exactly what aid finances and hence what development impacts it has if foreign aid is fungible. In the case of aid fungibility, for example, the development impact of an electric power station loan is not captured by the rate of return of that project (Devarajan and Swaroop 1998). Consequently, the question of the fungibility of aid has important implications for assessment of the effectiveness of aid.

Empirical studies of budgetary impacts of aid have tended to be based on cross-country regressions or assessments of single countries over time at the national level. Few studies have looked at the inter-governmental relationships in examining aid fungibility (Jha and Swaroop 1998). This chapter investigates the budgetary impact of foreign aid at both national and sub-national levels in Vietnam.

Although, studies by Van de Walle and Cratty (2005) and Van de Walle and Mu (2007) offer some insight into the fungibility of foreign aid based on micro evidence of the development project aid in the road sector, no study has looked at the macro evidence for aid fungibility in Vietnam. The purpose of this chapter is to fill these gaps by evaluating the impact of budgetary aid at both national and provincial level. Using annual time-series data from 1986 to 2006, the effects of foreign aid is first estimated on aggregates and the composition of national government budgets. Using a panel data across 61 provinces over the period 2000-2004, the impact of aid on totals and components of local government expenditure were tested, as well as in three sectors: education, health and agriculture.
Concerns have been raised that fiscal transfer systems penalize aid recipient provinces (Jha and Swaroop 1998), so the panel data were also used to examine the influence of aid to provinces on transfers from the central to the provincial governments.

The remainder of the chapter is divided into six sections. Section 4.2 discusses related literature on the relationship between aid and government expenditure. This is followed by a review of Vietnam’s government expenditure and foreign aid. Section 4.4 lays out the analytical framework for both the time-series model for national level data and the cross-section model for provincial level data. Section 4.5 describes data sources and the choice of sectors for a cross-section regression. Section 4.6 discusses the main results and other evidence. Conclusions and policy implications are provided in Section 4.7.

4.2 Previous studies

Empirical studies on foreign aid, ranging from country case studies to cross-country panel data analysis, have produce mixed results about the extent of the relationship between aid and government expenditure. The literature is mainly concerned with the utilization of aid funds for designated purposes. Some studies (Heller 1975; Pack and Pack 1993; Khilji and Zampelli 1994) argue that a large part of aid in the hands of recipient governments may be fungible. In contrast, other studies (Gang and Khan 1990; Pack and Pack 1990) find that development aid has a flypaper effect implying that all foreign aid funds are spent on earmarked projects. In an important paper, Feyzioglu et al. (1998) obtain mixed results about aid fungibility and the flypaper effect, using different levels and components of government expenditure data. Therefore, what is meant by fungibility and the flypaper effect are defined first. Second, the available evidence is presented on: (i) the impacts of different aid categories on recipient government expenditure, and (ii) the effects of aid on levels, components and sectors of recipient government expenditure. Third, the implications of aid fungibility for development assistance are reviewed. Finally, the existing studies on aid and government expenditure in Vietnam are discussed and some conclusions drawn.
4.2.1 Fungibility or “flypaper effect”

Aid fungibility is defined as a recipient’s ability to transfer some portion of earmarked aid to pure revenue that can be spent effectively in any way the recipient chooses (Feyzioglu et al. 1998). It can be diverted to other levels, components or sectors of government expenditure and may be used to extend tax relief to citizens. From a donor’s perspective, a portion of fungible aid may finance a recipient’s “unproductive” public expenditure and thereby, undermine the desired development outcome of the aid.

The aid fungibility question is replete with a number of empirical studies over the past four decades. Among early papers, Heller (1975) used panel data for 11 African countries to examine government response to foreign aid. He argued that 30-60 per cent of aid dollars were used for government spending and about one third was used to reduce the level of domestic tax and borrowing. In another study, Khilji and Zampelli (1994) used data from eight major US aid recipients for 1971-87 to estimate the expenditure system derived from the Stone-Geary utility function. They found that US non-military aid was fungible with a major portion financing private sector consumption via tax relief. In a study of the Dominican Republic, Pack and Pack (1993) confirm that foreign aid is fungible since about 88 cents per US dollar of aid are employed for debt repayment and deficit reduction.

Parallel to these studies, several examples of empirical research find a stimulatory effect of foreign aid on recipient spending. Foreign aid may generate much larger public spending by the recipient than would be predicted by an equivalent increase in income. This abnormality has come to be known as the “flypaper effect” (World Bank 1998). In cross-country studies, Cashel-Cordo and Craig (1990) find that each dollar of hard loan aid from multilateral development banks succeeds in increasing recipient government expenditure by USD 2.03 (USD1.00 in aid plus up to USD1.03 in local funds). In single country studies, examples from Indonesia (Pack and Pack 1990), India (Gang and Khan 1990) and Nepal (Tiwari 2007) also show that a dollar’s worth of foreign aid raises their governments’ total public spending by more than USD 1. One explanation of such behaviour is that these countries have a flypaper effect implying that all foreign funds are spent on their designated purposes.
4.2.2 Impacts of different aid categories on recipient governments’ expenditure

In order to gain insight into aid fungibility or the flypaper effect, the approach adopted by this thesis goes beyond investigating the effects of different kinds of foreign aid on government expenditure. However, the analysis is only interesting based on the assumption that the preferences of the donors are different from those of the recipients. If there is preference matching, then it will not matter that the aid is given as grants or loans, projects or budgetary support.

Concerning the mode by which foreign aid is channelled to recipients, donors usually refer to the choice being between project funding and budget support. Project funding is typically associated with a “visible” undertaking and involves strict supervision. As a result, this type of funding is only used for its intended purposes. In contrast, budget support can take place at the national level. It directly transfers foreign aid resources to the central government and the central government spends these funds according to its needs and based on its own procedures. Therefore, the budget support may not be committed to any particular expenditure item, raising the prospect that foreign aid will be fungible. Njeru (2003), using annual time-series data over the period 1970-99, studies project aid and budget support effects on government expenditure in Kenya. He finds that development aid strongly influences both total government expenditure and development expenditure. A one-dollar increase in project aid leads to a USD 0.82 increase in development expenditure, against only a USD 0.02 increase accruing from budget support. Since most foreign aid is recorded as development vote, Njeru’s (2003) results provide some evidence that budget support raises fungibility events. Thus, decomposing aid into project aid and budget support may present a clearer picture of the relationship between aid and government expenditure.

Feyzioglu et al. (1998) employ a newly constructed data series on disbursement of total aid and concessional loans to test and compare the effects of aid and its components across public spending categories. Based on a sizable sample of 38 countries, they find that USD 1 in total aid, including both loans and grants, translates into USD 0.33 in government spending. For concessional loans USD 1 leads to USD 0.63 in additional government expenditure. Comparing these results, there appears to be a greater flypaper effect with concessional loans than with grants. Based on a smaller sample (sub-sample of 14
countries), they find that a USD 1 increase in concessional loans is associated with a USD 1.24 increase in government expenditure, against a USD 0.95 increase from total aid.

Noting that the sources of aid are crucial to an accurate determination of the impact of aid on government expenditure, Cashel-Cordo and Craig (1990) use pooled time-series cross-section data of aggregated expenditure across 46 developing countries to evaluate aid effects between the multilateral development bank (MDB) and bilateral sources. They find that MDB's loans have flypaper effects because each dollar of hard loan MDB aid succeeds in increasing recipient government expenditure by USD 2.03 and soft loan MDB aid also leads to increasing government expenditure by USD 3.60 per USD 1 of aid. Nevertheless, bilateral aid has no significant effect on public expenditure in terms of loans and grants. They point out that the insignificant relationship between bilateral aid and government expenditure appears to be a consequence of the restrictions imposed by donors. Their result, however, is inconsistent with findings presented by Burnside and Dollar (2000). Using a large sample of low-income countries, Burnside and Dollar (2000) argue that bilateral aid has a strong association with government spending, whereas multilateral aid has none. Moreover, according to them, USD 1 of the former is strongly associated with increasing government consumption by USD 1.7, which suggests that bilateral aid does indeed have a flypaper effect.

4.2.3 Effect of aid on levels, components and sectors of government expenditure

It is possible that a recipient government could convert some portion of aid into fungible resources if donor and recipient preferences differ. Hence, the donor community would further like to know the levels, components and sectors of government spending in which aid is able to be more or less fungible. This section reviews these issues.

Some research analyses whether aid financed for specific components or sectors of expenditure is transformed by the recipient government, contrary to the purposes of the donors. Cashel-Cordo and Craig (1990) and Khilji and Zampelli (1994), among other cross-countries studies, have offered some insight into the impact of aid on the composition of government expenditure. However, the expenditure cited in their studies was limited to defence and non-defence spending. A study by Feyzioglu et al. (1998) not only examines
the impacts of total aid and loans on total government expenditure (section 4.2.2), but also splits government expenditure into several categories. They find that foreign aid shifts onto the recipients’ current and capital expenditure based on a sample of 38 countries. Using a sub-sample of 14 countries, they also find that concessional loans of foreign aid are fungible in education, health and agriculture, partially fungible in energy and fully non-fungible in transport and communication. Education expenditure increases by USD 1.5 for every dollar in aid given to that sector; money earmarked for other sectors is reallocated to education. Although many useful conclusions can be drawn from their paper, the results of their tests of significance on the coefficient are conservative due to resulting higher variance.

Devarajan et al. (1999) employ a data set of 18 countries from 1975 to 1995 in Sub-Saharan Africa, the region with the largest ratio of foreign aid per capita, to examine aid fungibility. Their result is broadly consistent with the evidence of Feyzioglu et al. (1998). Devarajan et al. find that foreign aid in Africa produces an increase in the recipient’s current and capital expenditure. Moreover, sectoral foreign aid in Africa is also partially fungible at different levels in different sectors of recipient government spending.

The findings on aid fungibility vary enormously from country to country. For components of government spending in Indonesia, Pack and Pack (1990) find that a dollar of aid increases spending by USD 1.58, of which development expenditure accounts for USD 0.89. This suggests that total aid has a flypaper effect, but it is fungible between development and current expenditure since most aid is targeted to specific investment projects. In terms of sectors of spending, one dollar of aid in agriculture stimulates agricultural expenditure of almost 1:1. In contrast, Pack and Pack (1993), using data from the Dominican Republic show that an additional dollar in aid does not stimulate total government spending but reduces it by USD 0.27 per dollar of aid. According to them, in terms of categories, USD 0.33 of every dollar of aid is intended for the agricultural sector, but the resulting increase in agriculture expenditure is only about USD 0.015. In explaining such divergent behaviour, Pack and Pack argue that the size of foreign aid matters for fungibility. In Indonesia, foreign aid is, on average over the period, about 4 per cent of GDP and nearly 20 per cent of government expenditure, compared with about 1 per cent and 8 per cent, respectively, in the Dominican Republic. Such divergent behaviour may
also be partly explained by the differences in management of foreign aid among countries and by the reasons donors give aid to different recipient countries.

While most studies test the idea of aid fungibility in different sectors and components of government spending, few studies analyse the impact of foreign aid on the level of government expenditure. Foreign aid could also influence central and subsidiary government spending, as well as inter-governmental fiscal transfer mechanisms. Jha and Swaroop (1998) examine this issue for India. At central government level, using annual time-series data they find that total expenditure and development expenditure are unaffected by foreign aid whereas the link between non-development expenditure and aid is positive and significant. This suggests that the central government of India converts most aid funds into fungible money in order to soften its budget constraints. Furthermore, they also find no evidence that foreign aid impacts on different sectors of central government expenditure. However, this is due to the limitations of the annual time series data over the period 1974-88. They examine the impact of aid resources on fiscal transfers from the central government to the states by using a panel of time-series data across 14 major states of India. They obtain evidence of a negative and significant relationship between fiscal transfers to a state and aid flows to that state as well as aid flows to other states. Their results suggest that central government transfers to a state are reduced with an overall increase in foreign aid to that state. Evidently, India is an example of “budget offsets” – the central government reduces subsidies to the states when foreign aid funds those states. However, Jha and Swaroop (1998) do not provide any conclusions about the effects of foreign aid on subsidiary government budgets (state budgets) nor across sectors of state government expenditure. The latter issue is addressed in relation to Vietnam in this chapter.

4.2.4 Implications of aid fungibility for development assistance

Recipient governments' spending has been regarded as a useful tool to assess aid effectiveness since it is one of the main channels thought which aid influences development outcomes. Reviews of government expenditure also help donors know what a recipient’s needs are and how aid should be allocated to best assist each country. However, if aid funds are fungible, then it does not matter what donors finance. Moreover, the donor community has been increasingly concerned that aid targeted to development is being used to fund
unproductive expenditure and crowds out domestic resources (UNDP 1994). Importantly, traditional approaches to evaluating the effectiveness of aid using the project’s rate of return are not completely accurate in this case.

Providing a largely clear explanation of fungibility and its origins, *Assessing Aid* (World Bank 1998) is regarded as a complete research on this topic. Several core implications of aid fungibility for aid policy are worth noting.

In countries with sound policies, appropriate allocations of expenditures, and effective services, donors can provide large amounts of assistance as general budget support, knowing the resources will be well used. In cases where there is agreement about allocation but efficiency is low, aid projects and financing should be evaluated not just as money for a particular project but also for what they contribute to improving the overall efficacy of government expenditures (World Bank 1998: 61)

The World Bank regards general budget support as an aid modality, which could effectively control the problem of fungibility. The term “budget support” is used to describe aid channeled directly to the recipient government using their own allocation, procurement, and accounting system, and is not linked to specific project activities (DFID 2005). Following the suggestions of the World Bank (1998) and Devarajan & Swaroop (1998), if the recipient’s overall public expenditure program is satisfactory, such an aid modality may have several advantages: (i) Cost-efficiency: replacing project aid with budget support results in savings on appraisal, preparation and even administrative costs of project; (ii) Leverage: project aid can only influence policies in the sectors it is involved in. Budget support usually finances a portion of the program relating to several sectors, so it provides that kind of leverage; and (iii) Donor coordination: budget support encourages more donor coordination by agreeing on the public expenditure programs and financing a portion of it.

Budget support takes place not only at national level, but also under the form of programmatic sectoral support, such as in the Sector-Wide Approaches (SWAPs). The former is typically financed for the central government budget whereas the latter amounts to transferring aid resources directly to targeted sectors, ensuring that aid targeted to a specific sector will be spent on that sector. Moreover, SWAPs can encompass a wide range of instruments, from a set of coordinated projects, pooling fund managements, to the provision of sector budget support, thereby contributing significantly to targeted sectors (DFID 2005).
4.2.5 Research aid and government expenditure in Vietnam

Much of the research related to aid to Vietnam analyses the link between government spending and economic growth or poverty reduction. However, a few papers examine whether or not foreign aid contributes to the formation of public capital, which in turn affects economic growth and poverty reduction. Hence, this section focuses on the relationship between foreign aid and government expenditure. Only two papers, sponsored by the World Bank, analyse the fungibility of the first World Bank rural transport project in Vietnam. The two papers use local-level survey data collected from the project to test the micro-evidence of aid fungibility in rural road rehabilitation. In the first paper, Van de Walle and Cratty (2005) are unable to conclude whether aid is fungible or not since they are constrained in identifying the income effect of the project aid. However, the results suggest the importance of dealing with selection bias in project aid fungibility. In a second paper, Van de Walle and Mu (2007) use a difference-in-difference estimator methodology to find evidence of fungibility of aid in the road sector. Based on kilometers of road rehabilitated and built, the paper obtains evidence that the kilometers of rehabilitated road are less than intended whereas more new roads were built in project areas. The evidence implies that aid is fungible within the road sector since aid for road rehabilitation was diverted to spending on new road building. The study also explains that project communes ignored the donors’ purpose of road rehabilitation, and imposed their own priorities and used some of the aid for new road building.

4.2.6 Conclusions

Recent studies on aid utilization have attempted to identify government responses to aid flows. Several questions are raised to address the issue. Is aid fungible or does it have a flypaper effect? Which kind of aid is commonly a source of fungible money? How does aid affect levels, components and sectors of government expenditure? There are two ways to answer these questions: by comparing aid and government spending relationships across

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17 A project launched in 1997 and aiming to rehabilitate 5,000 kilometers of district and commune-level roads in 18 provinces in Vietnam.

18 Van de Walle and Cratty (2005) assume that (i) income effect on the demand for roads is positive and (ii) when communities get rich, roads will be improved.
countries, or comparing it over time within countries. The answers to mentioned questions often suggest that the effect of aid on government spending varies. Aid may appear to be fungible in some countries whereas it seems to have a flypaper effect in others. Mixed results of aid fungibility and flypaper effect may also be obtained based on examining the relationship between different kinds of aid and different levels, components and sectors of government expenditure. The results depend on two factors: first, which option recipient governments choose when they receive aid. They can increase current or capital spending dollar for dollar. They can use aid for tax relief or to balance their budgets. Different governments will make different choices. Second, what kind of foreign aid the recipient governments choose: grants or loans, project or budget support, and multilateral or bilateral aid. Budget support is regarded as a panacea for aid fungibility in countries with sound policies of effective allocations of expenditures. In general, using a large sample of countries also suggests that the relationship is not seen uniformly. This confirms that the specific country studies may reveal the valid conclusions. In this context, the purpose of this chapter is to investigate the relationship between aid and government expenditure in Vietnam.

The methodology is developed to assess the budgetary impact of foreign aid on central and provincial government spending. By using both time-series and panel models, the constraints of most single country studies relying on time-series data may be reduced. Compared to the paper of Jha and Swaroop (1998) studying aid fungibility based on level of governance, the innovation of this chapter is to investigate the effects of foreign aid not only on fiscal transfers from central to provincial governments, but also on general provincial budgets as well as across sectors of provincial government expenditure.

### 4.3 Government expenditure in Vietnam

Before identifying government responses to aid flows, Vietnam’s budget processes are first reviewed. This section, therefore, considers major trends, characteristics and compositions of government spending, and explores the relationship between foreign aid and government expenditure.
The budget process in Vietnam has been institutionalized through implementation of the 1996 Budget Law and its amendments. This Law empowered the National Assembly and the People’s Councils at all levels to decide on budget appropriation and make the government accountable for the use of public resources. The introduction of five-year forward-looking budget plans as the background for annual submissions to the National Assembly, together with the capture of budget allocation norms for capital and recurrent expenditure, have produced greater coherence. The budget system reflects a unitary or national budget covering the four levels of government – national, provincial, district and commune. The system provides for top-down and bottom-up coordination at each level, requiring considerable consultation between levels. In fact, Vietnam’s budgetary system is relatively complex. This chapter does not attempt to review all aspects of this system; rather, it qualifies the budget system in several directions.

4.3.1 Trends and composition of government spending

During the study period, 1986-2005, the average total government expenditure as a proportion of GDP was about 24 per cent. Table 4.1 (page 112) compares the summary statistics of government budgets as a proportion of GDP between two periods: 1986-1992 and 1993-2005. From a low of 19.8 per cent in 1986-1992, total government expenditure rose to 26.30 per cent over the period 1993-2005. Although average total government expenditure accounted for a high percentage of GDP, the deficit to GDP ratio was relatively small, averaging less than 3 per cent, because total government revenue increased by over 15 per cent per annum in the period 1993 and 2005. Since 1993 government revenue has risen significantly due to a surge in crude oil exports and a high rate of economic growth. Total government revenue amounted to 23.19 per cent of GDP in the same period, as illustrated in Table 4.1(page 112).

The rapid growth of government expenditure presented Vietnam with opportunities to restructure the composition of its expenditure. However, Vietnam has always accorded high priority to capital expenditure. During the review period, the average share of capital spending grew from 4.65 per cent to 7.29 per cent while the average share of current spending to GDP remained about the same, 15.11 per cent and 15.61 per cent in the periods 1986-93 and 1993-2005, respectively. As seen in Table 1 (page 112), the Vietnamese
government shifted its spending priorities towards capital spending during the review period. This was ratified with a resolution adopted by the National Assembly which stipulates that the growth rate of capital expenditure should be higher than that of current expenditure because capital expenditure is regarded as a vital contribution to socio-economic development.

Nevertheless, the World Bank (2000) suggests that the government fiscal policies should be reviewed to come up with an appropriate balance between the two types of expenditure. An imbalance between current and capital expenditure may cause two problems. First, this limits maintenance expenditure, leading to deterioration of assets and higher operation costs in the long run, especially in roads, inland waterways and the irrigation sectors. Second, this may overlook key priorities in service delivery, particularly in social services. For instance, an increased number of trained teachers may be equally important in improving service delivery in education as constructing more school buildings.

Most sectors of government spending have increased the share of government expenditure to GDP in the period. Table 4.9 (page 119) shows the government budget share by main sectors over 10 years in 1994 – 2003. Education received the highest share of the government budget, about 15 per cent, increasing from 11.2 per cent by 1994 to 17.8 per cent in 2003. During this period, the transport sector with 10.63 per cent of total government expenditure had an annual growth rate of 4.4 per cent. Following the transport sector, the healthcare sector accounted for 6.3 per cent of the annual budget with some fluctuations over 10 years. Nearly 5.5 per cent of total public spending went to agriculture in the period.

4.3.2 Fiscal decentralization

Vietnam commenced extensive decentralization from the national to sub-national government in 1992, and has significantly improved the decentralization process through implementation of the 1996 Budget Law and its amendment in 2002. The Law clarified the roles and responsibilities of the central and sub-national levels of government. In particular, provinces are given explicit powers and duties to allocate their funds to different sectors, to transfer budgets to lower levels and to prioritize resources. Discretion accorded to
provinces in fiscal arrangements could allow more efficient resource mobilization and allocation. Such arrangements grant provincial governments more flexibility and an ability to adapt to particular circumstances in the provinces. In principle, the local government is in charge of services that benefit areas within their geographical boundary. The central government is responsible for inter-provincial, regional and national program/projects and services provided in several provinces.

Over the past decade, local governments have spent an increasing share of total government expenditure, as Figure 4.1 (page 110) illustrates. Total government expenditure implemented at the sub-national level rapidly increased from 26 per cent in 1992 to 43 per cent in 1998 and reached 48 per cent of total spending in 2002. These shares in total expenditure positioned Vietnam among the world's most highly decentralized countries (World Bank 2006b). As a result, provincial per capita expenditure substantially increased from about $12 in 1992 to $53 in 2002. With this level of spending, if provincial governments have efficient fiscal management, they will be able to achieve some targeted public service outcomes.

Alongside the upward trends of local spending, there has been a shift in terms of sectoral composition. In health, education and agriculture, most spending has been undertaken at the sub-national level, as Figure 4.2 (page 110) illustrates. The share of central government spending in each of these sectors decreased to less than 20 per cent of total expenditure in 2003.

4.3.3 Fiscal transfers

Like most other developing countries where decentralization is taking place, Vietnam faces fiscal imbalances. These imbalances are generally addressed through a system of transfers. Vietnam has pursued a system of balancing transfers, which plays an important role in reducing horizontal imbalances of the budget. Horizontal imbalances can be caused by differences in local economic activities, resource endowments or from diverse demographic profiles. The transfers are unconditional grants, determined using a formula measuring the difference between estimated expenditure needs and revenue capacity. The former are derived on the basis of expenditure norms, and are supposed to cover all current
expenditure and a minimum amount of capital expenditure. The norms are adjusted for different regions depending on geography and remoteness. The latter are determined by the actual revenue collected in the previous years and expected economic growth during the year.

General purpose of transfers is to alleviate the effects of differential provincial capacities to provide basic public services. Clearly, rich provinces have much more sources of funding for investment than just capital transfer as poor provinces. In 2005, pro-poorness of equalization grants was strong evidence (Vietnam Development Report, 2007). Since 2006, with the issuance of Decision 210 and Decision 151, the government’s transfer of budget had substantial changes, in which poor provinces benefit much more from transfers of both recurrent and capital expenditure.

According to the Budget Law, there are two main types of targeted transfers in Vietnam. First, transfers are used for the implementation of “National Targeted Programs” (NTF), such as those for the poorest communes, reforestation or national health programs. Like in many developing countries, NTF funding is small in comparison with the main funding, and thus its impact is limited. Second, the transfers are used to implement important projects for social-economic development.

According to the estimation of the World Bank’s Public Expenditure Review (PER) (2005) and Disclosure of State Budget of the MOF 2002-2005, supplementary transfers from the central budget as a share of total local spending fluctuated without a clear direction. The transfers as a percentage of total local spending rapidly increased from 35.5 per cent in 1997 to 59 per cent in 2000, and then reduced to 36.5 per cent in 2002. In 2003, this percentage grew again to 48.65 per cent and in two following years it accounted for around 34 per cent of total local expenditure.

4.3.4 Government expenditure and foreign aid

Since 1993, Vietnam has embarked on a new era in foreign aid relationships with multilateral financial institutions and many DAC countries (see Chapter 2). Hence, as a share of GDP, average annual ODA disbursements increased eightfold between the two
periods 1986-1992 and 1993-2005, by an annual average rate of 0.53 and 4.11 per cent, respectively. Figure 4.3 (page 111) shows the changes to aid flows as a percentage of GDP over the period 1993-2005. As a result, that government expenditure as a proportion of GDP increased from 19.77 to 26.30 per cent (see Table 4.1, page 112) may be explained partly by the presence of increasing aid flows. Empirical work on the causal relationship between foreign aid and government capital expenditure is discussed in the next sections.

Table 4.10 (page 119) illustrates the share of sectoral aid in total government budget during the period 1994-2003. The transport sector was the largest sector of aid disbursements, accounting for 19.2 per cent of total government expenditure on average in this area. The next largest sector of aid disbursement was agriculture, contributing to 22.3 per cent of total government expenditure on average. Following donor priorities in human development projects, aid in health and education amounted to 14 per cent and 5.3 per cent of government expenditure for these two sectors.

The decentralization process in Vietnam has given provincial bodies an increasingly important role in the coordination and implementation of aid-funded projects at the local level. The UNDP (2001; 2003) estimates that the share of foreign aid allocated for specific regions and provinces roughly doubled between 1995 and 2000. In 2002, 58 per cent of foreign aid disbursement could be directly attributed to the provincial level, amounting to USD 806 million. This volume was a 14 per cent increase over 2001 and was spread relatively equally across provinces. The increasing decentralization of foreign aid was necessary for increased aid effectiveness. This may reduce the aid fungibility on the level of government expenditure since aid resources transfer directly to the local budget.

4.4 Analytical framework

This section discusses the methods used for analysing the budgetary impacts of foreign aid on central and provincial government spending. First, the mechanism through which the government budget responds to aid flows is identified. Then we use this analytical framework to lay out econometric modeling for relationship of aid and government budgets at both national level and provincial level. At national level, time-series data are used to address the linkage between Vietnamese central government budgets and foreign aid flows.
Cross-province models capture the spirit of the discussion of aid fungibility at sub-national level.

4.4.1 How recipients utilize foreign aid

Figure 4.4 (page 111) illustrates how recipient governments utilize the foreign aid received. Suppose a recipient country has indifference curves between two goods, \( G_1 \) and \( G_2 \), and budget constraints determined by domestic resources plus those available from foreign aid. The government adjusts its budget allocation (total own resources and foreign aid) to the two goods to achieve its highest indifference curve. As a result, the recipient government has three options for spending aid funds: (i) the entire aid fund can be treated as a pure supplement to the recipient’s domestic resources. Aid as designated for one good from a donor agency is spent on others – foreign aid is said to be fully fungible; (ii) all aid funds are spent on designated purposes – aid is fully non-fungible; and (iii) if a portion of aid is used to supplement domestic resources, then foreign aid is said to be partially fungible.

As can be seen from Figure 4.4 (page 111), the budget line \( B'B' \) is generated by domestic resources and \( C'C \) represents the post-aid period. Two goods, \( G_1 \) and \( G_2 \), are assumed to be normal (non-inferior). In the absence of foreign aid, point \( A \) represents the optimal mix of the two goods in the case of budget line \( B'B' \). Now, suppose the donor is willing to give amount \( F \) to finance \( G_2 \). Upon receiving \( F \), the recipient government could make it fungible by using some of \( F \) for \( G_1 \). Depending on the percentage of \( F \) used for \( G_1 \), in the case of the new budget line \( C'C \), new points are defined between point \( D \) and \( E \) (including \( D \) and \( E \)), showing the optimal mix in the post-aid consumption of the recipient government. This percentage of aid is defined as the magnitude of aid fungibility and is denoted as \( \phi \). The values of \( \phi \) are zero, 1 and \( 0 < \phi < 1 \), representing the three options from which recipient governments could choose to spend aid, are as follows:

+ If \( \phi = 1 \) – aid is fully fungible. The recipient government chooses \( E \) which represents the same \( G_1/G_2 \) ratio as that at \( A \). Full fungibility means that the amount \( F \) for \( G_2 \) is treated exactly the same as if the amount were provided as general budget support. This implies that foreign aid has been added to the budget line without regard to its earmarked purpose.
+ If $\varphi = 0$ – aid is fully non-fungible. The recipient government chooses point D in Figure 4.4. This implies that all foreign aid has been spent on the targeted goods. In this case, the recipient government is not able to adjust foreign aid resources without the permission of the donor agency, or there are perfect matching requirements between the donor agency and the recipient government.

+ If $0 < \varphi < 1$ – aid is partially fungible. The recipient government chooses a point that lies between E and D. This implies that part of amount F will be spent on earmarked $G_2$, the remainder will be treated as a pure supplement to recipient domestic resources.

The term “foreign aid fungibility” is used in various ways when describing fiscal recipient behavior. Recent literature shows that foreign aid is fungible in not only certain goods or sectors, but also in changing the level and composition of its public expenditure program.

In terms of level, aid earmarked for provincial governments (or subsidiary governments) could replace funds that the central government would have given in the absence of that aid (Jha and Swaroop 1998). The ‘fungible component’ refers to the recipient’s ability to transform some portion of sectoral aid into pure revenue or income-augmenting resources that are spent effectively in any way the recipient government prefers. The recipient government allows aid provided for investment to finance consumption spending, tax relief and deficit reduction - or any mix of the three.

### 4.4.2 Time-series empirical model

Based on the mechanism through which government budgets respond to aid flows, variants of the fungibility model include those suggested by Pack and Pack (1990, 1993) and Feyzioglu et al. (1998) and Heller’s (1975) utility model. The model assumes that recipient countries use foreign aid to maximize social welfare of their citizens when they have to face budgetary constraints.

For simplicity, assume that the welfare function of the recipient country has two types of public goods: development ($g_1$) and non-development ($g_2$). Let the utility function be of the Stone-Geary (1954) form:
(4.1) \[ U(c_p, g_1, g_2) = F(c_p) + \prod_{j} (g_j - \gamma_j)^{\beta_j} \]

Where \( c_p \) is a private good; \( \gamma_j \) are subsistence quantities of public goods.

In the absence of foreign aid, the recipient government has to maximize its utility function based on its domestic revenue (R). In the presence of foreign aid, the recipient government may raise the government budget outlays in the model using foreign aid, then the budget constraint faced by the government is:

(4.2) \[ p_1 g_1 + p_2 g_2 = R + A \]

Maximizing equation (4.1) subject to the budget constraints in equation (4.2), if the solution exists and is interior, we have a system of linear expenditure equations (see details in appendix 4.1, page 107):

\[ p_1 g_1 = p_1 \gamma_1 + \bar{\beta}_1 [R + A - \sum_j p_j \gamma_j] \]
\[ p_2 g_2 = p_2 \gamma_2 + \bar{\beta}_2 [R + A - \sum_j p_j \gamma_j] \]

From (4.3), we derive the functional form of how changes in foreign aid affect national government budgets:

(4.4) \[ G_j = \alpha_0 + \alpha_1 R + \alpha_2 A + \sum_{c=1}^{C} \alpha_c Z_c + \varepsilon \]

As noted in Section 4.3, large changes in total aid inflows occurred between the two periods 1986-1992 and 1993-2006 (Figure 4.3, page 111). To capture the effects of the changes of aid flow on public expenditure over time, an interactive term (Aid*Dt) is introduced which is computed as a dummy for aid flow (with 0 for 1986-1992 and 1 for 1993-2005) multiplied by total aid flow.

Following Feyzioglu et al. (1998) \( Z_c \) are social and other economic variables that capture the underlying differences in preference across different countries. In Vietnam, using the time-series model with limited observations, say 21, we cannot afford a more complex model. Like other single-country studies in India and Kenya, the basic model is used for testing the effects of aid on national government budget:

(4.5) \[ G_j = \alpha_0 + \alpha_1 R + \alpha_2 A id + \alpha_3 Aid * D t + \varepsilon \] (r: 1986 - 2006)
4.4.3 Cross-province empirical model

Consider an economy in which the system of governance includes a central government and a number of provincial governments, which buy public goods in the market to provide for their citizens. In the time-series model, foreign aid and maximizing the social welfare utility function at the central level of government are addressed. In this cross-section model, foreign aid entering the welfare function at provincial level is considered. The cross province models are adapted to examine: (i) how changes in foreign aid affect provincial government budgets; (ii) how defined aid impacts on targeted sectors of government expenditure; (iii) whether aid is fungible among public expenditure sectors; and (iv) whether aid reduces inter-governmental fiscal transfers from the central government. These questions are discussed based on the methodology adopted by Feyzioglu et al. (1998) with the main innovation of incorporating the inter-governmental fiscal transfers in the models. Several steps for specifying the functional form of models are presented.

How changes in foreign aid affect provincial government budgets

As discussed in Section 4.4.2, earmarked aid is fungible if it can be treated as a revenue supplement. Moreover, an annual transfer from the central government to local government is recorded as a revenue resource. Setting \( T \) as the amount of transfers to local budgets, \( A \) is the provincial aid and \( R \) is all other sources of revenue, then the budget constraint faced by the provincial government is:

\[
P_1 g_1 + P_2 g_2 = R + A + T
\]

As with most previous studies, a utility function of the Stone-Geary form (Stone 1954) is used to estimate the linear expenditure function with identifiable parameters. Similar to the method used at the national level, the functional form of how changes in foreign aid affect provincial government budgets is as follows:

\[
G_j = \alpha_0 + \alpha_1 R + \alpha_2 A + \alpha_3 T + \sum_{c=1}^{C} \alpha_c Z_c + \epsilon \quad \text{Where } G_j = p_j g_j (j = 1, 2)
\]

How defined aid impacts on targeted sectors of government expenditure

In order to analyze the impact of aid on various sectors of government expenditure, it is assumed that two types of public goods (development and non-development), include S
(s=1,2...s) public goods. It is also assumed that there is K (K ≤ S) specific goods that receive the amount of earmarked aid \(a_k\). Given the fungible portion of aid earmarked for good \(k (\phi_k)\), total aid fungibility is \(\sum_{k=1}^{K} \phi_k a_k\).

Let the representative agent’s utility function, \(W\), define public good, \(g_s\), and single private good, \(c_p\), thus:

\[
(4.8) \quad W = U(c_p, g_1, g_1^{NF}, g_K, g_K^{NF}, g_{K+1}, ..., g_s)
\]

Assume that: \(S ≥ K\)

Where:

\[
g_k^{NF} = \frac{(1 - \phi_k) a_k}{p_k}, \quad k = 1, 2,...K
\]

\(g_k^{NF}\) - is the quantity of \(k^{th}\) good that the province has to purchase from nonfungible aid earmarked for good \(k\).

Provincial governments also receive annual transfers from the central government that are treated as provincial revenue supplements. Therefore, the new budget constraint faced by the government is:

\[
(4.9) \quad p_1 g_1 + ... + p_s g_s = R + \sum_{k=1}^{K} \phi_k a_k + T
\]

The left hand side of equation (4.9) is total expenditure of the provincial government. The right side is all funds including: (i) provincial revenue, (ii) total fungible funds and (iii) transfers from the central government.

Given \(R\), \(p_s\), \(a_k\) and fungible (\(\phi_k\)), the provincial government chooses \(S\) goods to maximize equation (4.8) subject to the budget constraints in equation (4.9), if the solution exists and is interior, we have a system of linear expenditure equations (see details in Appendix 4.1, page 107)

\[
(4.10) \quad p_s \overline{g}_s = p_s \gamma_s + (1 - \phi_s + \beta_s \phi_s) a_s + \beta_s (R + \sum_{k=1}^{K} \phi_k a_k + T) - \beta_s (\sum_{j=1}^{s} \gamma_j)
\]

where \(\overline{g}_s = g_s + g_s^{NF}\)

In this section, the focus is to analyze the impact of the portion of aid fungibility (\(\phi\)) on government expenditure in preference to measuring government spending financed by the provincial revenue or transfers from the central government. Therefore, equation (10) is simplified by using total government spending net of foreign aid \(G^N\):
Where \( G = \sum_{s=1}^{k} p_{s} g_{s} + T + \sum_{k=1}^{k} p_{k} g_{k}^{N} \); \( A = \sum_{k=1}^{k} a_{k} \)

By substituting the \( G^{N} \) into equation 4.10, a new equation is formulated that captures the same content of Feyzioglu et al.’s (1998) equation for analysing the effects of foreign aid on various sectors of government expenditure.

\[
(4.11) \quad G_{i,s} = p_{s} \gamma_{s} + (1 - \phi_{s} + \beta_{i} \phi_{s}) a_{i} + \beta_{i} G^{N} + \beta_{i} \left( \sum_{k \neq s}^{k} \phi_{k} a_{k} \right) - \beta_{i} \left( \sum_{j=1}^{j} p_{j} \gamma_{j} \right) \quad \text{where } s = 1, \ldots, S
\]

According to the analysis of Feyzioglu et al. (1998), the parameter \( \gamma_{s} \) (s=1...S) is proxied - the subsistence quantities of various public goods – by social and other economic variable. These variables also capture the underlying differences in preferences across provinces.

From (4.11), the estimable equation of sector government spending becomes:

\[
(4.12) \quad G_{i,s} = \lambda_{1,i,s} + \lambda_{2,i,s} G^{N}_{i,s} + \lambda_{2,i,s} A i d_{i,s} + \sum_{k \neq s}^{k} \lambda_{3,i,s} A i d_{i,k,s} + \sum_{c=1}^{C} \lambda_{4,i,s} Z_{c,s} + \sum_{c=1}^{C} \lambda_{5,i,s} Z_{c,i,s-1} + \epsilon_{i,s}
\]

where: \( \lambda_{4,i,s} = \beta_{i} \); \( \lambda_{2,i,s} = (1 - \phi_{i} + \beta_{i} \phi_{i}) \); and \( \lambda_{3,i,s} = \beta_{i} \phi_{i} \) for \( k \neq s \)

### 4.5 Data sources

To estimate the impact of foreign aid on government spending at national level, annual time-series data from 1986 through to 2006 are used. The choice of time period is based on data availability for the relevant variables in the analysis, considering Vietnam’s transformed economic performance since 1986. Moreover, two periods with different volumes of foreign aid fall within the time period of interest, 1986-1992 and 1993-2006, as noted in Section 4.3. The foreign aid data are collected from the Ministry of Planning and Investment (MPI) and the website DAD Vietnam. Annual data on government budgets are taken from annual issues of the General Statistics Office of Vietnam (GSO). Data relating to inflation and exchange rate are obtained from the annual issues of Key Indicators of Developing Asian and Pacific Countries of the Asian Development Bank (ADB).

The data employed in the cross province model cover the period 2000-04 for 61 provinces to test linkages of foreign aid and government spending at the sub-national level. This database was constructed based on three dimensions: the foreign aid variable, the
government expenditure variables and control variables. The foreign aid data are obtained from the website DAD Vietnam. The data on provincial government expenditure are taken from three sources: the GSO, the Ministry of Finance (MOF) and the World Bank. Although there has been increased disclosure of information on detailed government budgets at all levels, data on sectoral government spending at province level are still seldom collected and involve high costs. However, in 2004, the Vietnamese government and World Bank jointly conducted a Public Expenditure Review and Integrated Fiduciary Assessment (PER-IFA). The resulting report discloses data on cross-provincial government spending over the period 1999-2002 for three sectors: health, education and agriculture. Because updated sectoral data are available from the MOF, a cross-province database is employed covering the time period 2000 to 2004 on these sectors to examine how defined aid impacts on targeted sectors of government expenditure. Data on control variables, that is the information on GDP, population, infant mortality rates, urbanization, the percentage of educated people in the total population and the share of agriculture in national income are also captured. All control variable are selected from the aid fungibility literature (see Feyzioglu et al. 1998; Devarajan et al. 1999). Their data are taken from annual issues of the GSO and Socio-economic Statistical Data of 61 Provinces and Cities in Vietnam (GSO 2005a).

There are several reasons for choosing the three sectors - health, education and agriculture - in this study. First, all three sectors receive high shares of total government spending, especially the education sector with over 15 per cent of the annual budget. Second, they are also a priority of the donor community so their foreign aid presents a relatively high proportion of the total ODA disbursement. Third, the three sectors highlight the process of government decentralization and, therefore are appropriate sectors to discuss at a sub-national level. Finally, the three sectors are also used in most previous studies such as Feyzioglu et al. (1998) and Pack and Pack (1993). Hence it is easy to relate the results of this study to recent contributions on this topic.

4.6 Regression analysis

4.6.1 Time-series models for a national level analysis

From equation (4.5), the tested model can be represented as:
\[ (4.5) \quad G_{i,j} = \alpha_0 + \alpha_1 R_i + \alpha_2 Aid_i + Aid_i * D_t + \epsilon_i \quad (t: 1986 - 2006; j: 1-5) \]

All variables are expressed as shares of real GDP and are in 1994 constant prices. Detailed variables are:

- \( G_{i1} \) is the total government spending; 
- \( G_{i2} \) Government spending on current expenditure; 
- \( G_{i3} \) Government expenditure on development; 
- \( G_{i4} \) General administrative expenditure; 
- \( G_{i5} \) interest expenditure.

\( R \) : Total domestic resources including taxation, non-tax revenue and domestic borrowing; excluding grant aid.

\( \text{Aid} \) : Total aid; Grants and Loans; Budget support and Projects


Before carrying out the regressions, the time series data were tested to reject the hypothesis of spurious regression and erroneous inferences. Because most macroeconomic aggregates such as GDP, government expenditure, consumption, and investment seem to have the unit root, an augmented Dicker-Fuller (ADF) test was used to examine stationary. Then, the linear long-run economic relationship is checked among variables by using an Engle-Granger test for cointegration. The result of the unit root tests and cointegration tests are presented in Table 4.2 (page 113).

The results indicate that all variables have a unit root or are integrated of order one (I1). Next, cointegration is tested by checking whether residuals of all regressions have the unit root. The hypothesis that residuals have a unit root can not be rejected; hence there are no cointegrating relationships between dependent and independent variables. This suggests that an ADL model should be estimated using the first differences of the relevant variables in the estimation process.

The regression outcomes are introduced in Tables 4.3 and 4.4 (page 114). Regressions in Table 4.3 differ from regressions in Table 4.4 in that the aid variable is measured by aggregated aid, whereas the aid variable in Table 4.4 is disaggregated in terms of type and form. Dependent variables change across regressions to test how the different forms of aid impact on different components of government expenditure. Like many developing
countries, Vietnam has weak time-series data on how government expenditure is split into different components (such as subsidies, defence, and public security). However, in regressions (3.4) and (3.5) in Table 4.3, the effects of total aid on administration expenditure and interest expenditure, respectively, are investigated.

The regressions generate most coefficient estimates with expected signs in both tables. Importantly, the results show a strong and positive significant relationship between share of disbursement of foreign aid in GDP and share of government expenditure, except for administration expenditure and interest expenditure. In regression 3.1 (Table 4.3, page 114), a dollar increase in total foreign aid stimulates total government spending by USD 6.7. Regressions 3.2 and 3.3 (Table 4.3) show that an additional dollar in total aid raises capital expenditure and current expenditure by USD 2.52 and USD 3.99, respectively. The results are consistent with the findings of Devarajan et al. (1999) and Feyzioglu et al. (1998) that aid stimulates current expenditure more strongly than it does capital expenditure. Moreover, to inquire which activities among the current expenditure could be benefiting from aid, administration expenditure and interest expenditure on the total aid variable are regressed in regressions 3.4 and 3.5. Both regressions suggest that there is no relationship between aid and administration expenditure, or aid and interest expenditure. Due to limited time-series data available on sub-categories of current expenditure, the effects of aid on all activities in the current expenditure cannot be examined. However, the results of regressions 3.4 and 3.5 (Table 4.3) suggest that aid does not soften budget constraints, at least in cases of administration expenditure and interest expenditure during the study period.

In terms of components of foreign aid, the regressions in Table 4.4 (page 114) show that a dollar increase in grants and loans, or in budget support and project aid, leads to an increase of more than USD 1 in government spending. Specifically, grants show a stronger influence on government spending than loans do (regressions 4.1, 4.3 and 4.5). The former stimulates total spending by USD 7.75, against a USD 5.13 increase from the latter. Similarly, capital and current spending are raised by grant on almost 1:3 and 1:5, respectively. The two components are also increased by loans on ratio 1:2 and 1:2.6. In line with Njeru’s (2003) case study of Kenya, regressions 4.2, 4.4 and 4.6 (Table 4.4) suggest that an increase in project aid stimulates government expenditure by a higher proportion than does an increase
in budget support. At the total government expenditure level, a USD 1 increase in project aid leads to about USD 6.85 in additional spending, as opposed to USD 5.44 increase from budget support. Disaggregating expenditure into current and capital, estimation results do not change any conclusions about project aid and budget support. Interestingly, by comparing the coefficients on the aid variable between regression 4.3 and 4.5, or 4.4 and 4.6 (Table 4.4), it is found that all considered components of aid raise current expenditure more strongly than they do capital expenditure.

In most regressions, total foreign aid and its components stimulate government spending by more than the increase in aid. In line with the previous studies, this supports the hypothesis that there is a flypaper effect. In the case of Vietnam, the flypaper effect is found for two reasons. First, like other developing countries, aid in Vietnam may relieve constraints that limit government spending. For instance, aid supports Vietnam’s government in mobilizing domestic resources via increased taxation or better access to available funds (MPI 2003). Second, project aid usually causes government budget problems because Vietnam becomes responsible for all operations and maintenance expenditure after the construction phase of the project (JBIC 2001). This is also the reason that project aid in Vietnam triggers a considerable increase in current expenditure. Although several studies (Jha and Swaroop 1998; Njeru 2003) argue that the linkage between aid and current expenditure may explain why not all aid flow is spent for development purposes, Devarajan et al. (1999) show that the linkage may not necessarily be bad. For example, operations and maintenance expenditure may have higher rates of return than capital expenditure. As a result, aid may be designed for current expenditure related activities, thereby contributing to growth.

The domestic resources variable has a positive sign and is significant in most regressions. The domestic resources reflect the changes in government expenditure as a result of changes in all of the country’s resources except foreign aid. However, regression 3.1 (Table 4.3, page 114) shows that a dollar increase in domestic resources leads to a USD 0.43 increase in total government spending, against a USD 6.69 increase from total aid. The result is consistent with the findings in other countries, that foreign aid strongly promotes government spending. For current and development spending, foreign aid again stimulates government spending by a higher proportion than does an increase in domestic resources.
Regressions 3.2, 3.3 (Table 4.3) suggest that an additional dollar in domestic revenue raises capital and current expenditure by only USD 0.16 and USD 0.24, respectively.

The interaction term aid*dummy captures the impact of changes in aid flows on government spending. As expected, this variable is negative and significant across regressions of both government expenditure and its components. This supports the hypothesis that the government may revise its budget downward if foreign aid is falling. In such a case, the government also reduces both current and development spending to cope with the downward change in aid flow.

4.6.2 Cross-province models for a sub-national level analysis

Aid affects components of provincial expenditure

From equations (4.7) and (4.12), the tested model can be represented below.

For aggregate government spending:

\[(4.13) \quad G_{ij} = \delta_{0,j} + \delta_1 \text{Aid}_{ij} + \delta_2 T_{ij} + \sum_{c=1}^{C} \delta_{c,j} Z_{c,j-1} + \epsilon_{i,j}\]

For current and capital government spending:

\[(4.14) \quad G^c_{ij} = \alpha_{0,j} + \alpha_1 R_{ij} + \alpha_2 \text{Aid}_{ij} + \alpha_3 T_{ij} + \sum_{c=1}^{C} \alpha_{c,j} Z_{c,j-1} + \epsilon_{i,j}\]

where \(G_j^c = p_j g_j(1,2)\) - are current and capital expenditures.

For system of sectoral government spending:

\[(4.15) \quad G_{s,t,j} = \lambda_{0,s,j} + \lambda_{1,s,j} G_{s,t} + \lambda_{2,s,j} \text{Aid}_{s,t,j} + \sum_{k \neq s} \lambda_{s,k,j} \text{Aid}_{k,t,j} + \sum_{c=1}^{C} \lambda_{c,s,j} Z_{c,j-1} + \epsilon_{i,j}\)

where: \(\lambda_{s,j} = \beta_s(1 - \phi_s + \beta_s \phi_s); \text{ and } \lambda_{s,k,j} = \beta_s \phi_s \text{ for } k \neq s\)

These regressions use the following variables for province \(i\), sector \(s\) and time \(t\).

- \(G_{s,t,j}\): Share of total government expenditure (including foreign aid) in GDP for province \(i\) at time \(t\);
- \(R_{s,t,j}\): Share of government revenue (excluding grant aid and transfers from the central government) in GDP for province \(i\) at time \(t\);
- \(T_{s,t,j}\): Share of transfers from the central government to provinces in GDP for province \(i\) at time \(t\);
$G_{t,i}^E$ Share of government expenditure for current or capital purposes (including foreign aid) in GDP for province $i$ at time $t$;

$Aid_{t,i}$ Share of disbursement of total foreign aid in GDP for province $i$ at time $t$;

$G_{s,t,i}$ Share of government expenditure (including foreign aid) in sector $s$ in GDP for province $i$ at time $t$;

$G_{t,i}^N$ Share of total government expenditure in GDP for province $i$ at time $t$;

$Aid_{s,t,i}$ Share of disbursement of foreign aid to sector $s$ in GDP for province $i$ at time $t$;

$Z_{c,t,i}$ A vector of other control variables (GDP per capita; infant mortality rates, ratio of agriculture output to GDP, percentage of educated people in the total population)

In line with approaches such as Boone (1995) and Feyzioglu et al. (1998), economic and social indicators of provinces ($Z_{c,t,i}$) are captured as control variables for two reasons. First, they capture the effect of the minimum quantity of various public goods (see Section 4.4 for variable $y_t$). Specifically, the past year’s infant mortality rate is included because it is an important determinant of a province's health sector expenditure. Similarly, schooling and agriculture variables are also captured because they influence education and agricultural sector spending of provinces. GDP per capita at 1994 constant prices is included to control for the effect of the different levels of development of provinces in the model. Second, the above economic and social indicators are used with a single-period lag to mitigate simultaneity problems of foreign aid with some budget variables. The lags of these indicators are added in order to treat foreign aid and government expenditure as exogenous because these lags in simultaneous equation models are predetermined variables (Wooldridge 2003: 525-50). However, adopting these control variables may lead to the problem of multicollinearity. Table 4.8 (page 118), checking correlations between explanatory variables, shows that a single-period lag of infant mortality rate is correlated with the transfers variable. This is the opposite of Huong’s (2006) findings that the size of transfers is not strongly related to the indicators of poverty in the provinces. Moreover, if one of the collinear variables is dropped, a specification bias may arise from an omitted variable. Note that collinearity does not destroy the property of the OLS estimators, although it is difficult to determine coefficient estimates with a small standard error.
Therefore, both variables, a single-period lag of infant mortality rate and transfers, are adopted in the model.

The use of a cross-section time series database presumes the presence of heteroskedasticity and correlation of unobserved effects (province dummy variables) with each explanatory variable. To minimize the heteroskedasticity problem, it is estimated with white heteroskedasticity-consistent standard error. To check for the latter, a Hausman (1978) test for fixed effects and random effects is conducted. If the test rejects the null hypothesis, indicating that province dummy variables are correlated with all exogenous variables, then the fixed effects method is appropriate.

Table 4.5 (page 115) reports the estimates for equation (4.13) and equation (4.14) based on a sample of 61 provinces in Vietnam in the period 2000-2004. Regression 5.1 (Table 4.5) differs from regressions 5.3 and 5.5 (Table 4.5) in that the dependent variable is measured by aggregated government expenditure, whereas the dependent variables in 5.3 and 5.5 are current and capital expenditure, respectively. Regressions 5.2, 5.4 and 5.6 (Table 4.5) provide the estimate of the same equations reported in 5.1, 5.3 and 5.5 except that the total foreign aid variable is replaced by loan aid.

Overall, the coefficients of foreign aid are all positive and significant, except in the regressions estimating the effects of aid on current expenditure. Table 4.5 (page 115) shows that a dollar increase in total foreign aid raises government spending by USD 1.1, of which capital expenditure accounts for USD 0.89. Moreover, roughly USD 0.17 of an additional dollar in total aid is spent on current expenditure. However, the coefficient of aid is insignificant at 5 per cent. Similarly, a dollar’s worth of loan aid raises government spending by USD 0.98. Of that, the whole USD 0.98 is devoted to capital expenditure. The coefficient of loan aid in equation 5.4 controlling for the effect on current expenditure is again insignificant at 5 per cent. The sizable and positive coefficients on foreign aid for government expenditure indicate that aid funds are non-fungible. Aid relates roughly dollar-for-dollar to government spending and most aid is associated with an increase in government capital spending.
Revenue available is measured by all sources of provincial finances, except foreign aid and transfers from the central government. This variable, therefore, captures the changes in provincial government expenditure as a result of changes in mobilizing most provincial resources, excluding foreign aid and transfers. As expected, revenue variables influence provincial government expenditure positively and significantly. In particular, the regressions show that a dollar given as provincial revenue is accompanied by an increase in spending of current expenditure and capital expenditure by USD 0.57 and USD 0.32, respectively. It is clear that the source of additional resource matters for government spending, since a dollar increase in the provincial revenue leads to a USD 0.32 increase in capital spending, compared to a USD 0.98 increase accruing from loan aid.

The variables of transfers from the central government are all positive, but statistically significant in relation to total and current government expenditure. The insignificant coefficient on transfer variables for capital expenditure indicates that the transfers from the central government are not recorded in the development vote of provinces, otherwise this acts as additional funding for current provincial spending. In terms of the degree of effects, the transfers and provincial revenue equally affect the level of provincial current spending. Every dollar given as transfers or provincial revenues is associated with a nearly USD 0.60 increase in current expenditure. For total provincial spending, a dollar’s worth of transfers raises government spending by a half dollar. The evidence shows that transfers from the central government play an important role in total provincial expenditure as well as current expenditure.

Among the control variables, the variables of the share of agricultural output in GDP are significant in models controlling for disaggregated provincial expenditure. However variables of infant mortality rate are significant in models of total expenditure and capital expenditure. The relationship between infant mortality rates and government budget variables is unclear because they affect total expenditure positively, as opposed to a negative effect on capital spending. The positive coefficients on the share of agricultural output in GDP for provincial expenditure indicate that provinces that obtain a large share of their GDP from agriculture have higher government spending.
Aid affects sectors of provincial expenditure

Table 4.6 (page 116) shows the regressions of equation 15. Regression outcomes in Table 4.6 examine the relationship between provincial government expenditure in particular sectors and disbursement of foreign aid to those sectors. As mentioned in Section 4.5, three sectors, health, education and agriculture, are tested based on annual data from 2000-2004 across provinces in Vietnam. An important variable in all three models is the government expenditure variable. It enters models with a positive sign, and is significant in all regressions. This variable reflects how provinces allocate additional money that they receive from all resources without foreign aid, for each sector. By comparing the magnitudes of the three coefficients on total government expenditure, it is found that the provincial government gives the highest priority to education among the three sectors considered. This result is consistent with the conclusions of the World Bank’s (2005) report on public expenditure in Vietnam.

To analyse aid fungibility, the coefficients on sectoral-aid variables need to be considered and the level of fungibility (portion \( \phi \)) calculated based on other coefficient estimates in the three models. Foreign aid to the three sectors shows positive impacts on their respective sectoral spending and the impacts are at different significance levels that depend on different sectoral aid. At 10 per cent significance level, the coefficient on aid to the health sector in regression 6.1 (Table 4.6) shows that of one dollar in aid provided to health, USD 0.24 is spent elsewhere. Similarly, regression 6.3 (Table 4.6) shows a positive and significant relationship between government spending in, and aid to, agriculture. The coefficient on aid to agriculture in this regression is 0.58 and significant at 1 per cent level, which indicates that aid to agriculture is fungible in the sample provinces. Moreover, this coefficient in regression 6.2 (Table 4.6) is negative and significant, suggesting that aid to agriculture appears to reduce government spending on education. However, aid to education stimulates its sectoral spending in the ratio 1: 1.53. This can be seen in regression 6.2, where the linkage between government spending in, and aid to, the education sector is positive and statistically significant at 1 per cent.

There are not enough data in the sample to examine how foreign aid to the health and agriculture sector is being diverted. For the education sector, there could be several reasons
why a flypaper effect occurs in aid. First, aid projects to most sectors in Vietnam include
technical assistance (TA) components that are usually used for training or capacity building
of government officials. Therefore, funds for TA components of different aid projects are
recorded in provincial government expenditure on education (My 2005). This raises data
collection issues in the government budget system. Second, according to the assignment for
expenditure responsibility, basic education (primary, lower secondary and upper secondary
school) is primarily assigned to the provinces whereas higher education is central.
Moreover, basic education is the donor’s preference because within that education level,
poorer households receive a larger share of the subsidy than richer households (World Bank
2005). As a result, foreign aid to education frequently shows matching requirements
between donors and provincial governments that leads to non-fungibility in this sector.
Finally, the estimated coefficient of aid to education, larger than 1 in regression 6.2, is also
consistent with Feyzioglu et al. (1998) finding that education expenditure increases by USD
1.55 for every dollar in aid given to that sector.

Aid affects inter-governmental fiscal transfers

From equation (4.7) in Section 4.4.3, the relationship between the transfers from the central
government with foreign aid and other government budget variables can be derived as:

\[ T = \lambda_0 - \lambda_1 R - \lambda_2 A + \lambda_3 G + \sum_{c=1}^{c} \lambda_c Z_c + \epsilon \]

However, if equation (4.16) is used to examine the impacts of aid on fiscal transfers, then
some problems arise with econometric regressions. First, simultaneous problems arise
because government expenditure is jointly determined with fiscal transfers. As discussed,
transfers affect provincial expenditure positively and are statistically significant. Second, by
including provincial revenue and provincial expenditure in the model there is a potential
multicolinearity problem because a significant portion of the former is used for the latter.
Since the main objective is to explore the effect of aid on fiscal transfer, therefore
government expenditure is dropped from the model to address these problems.
Consequently, the tested model can be represented as:

\[ T_{it} = \alpha_0 + \alpha_5 Aid_{it} + \alpha_6 R_{it} + \sum_{c=1}^{c} \alpha_c Z_c + \epsilon_i \]

Where \( T_{it} \), \( R_{it} \) and \( Aid_{it} \) are denoted as in the previous section.
Control variables are constructed from the determinants of Vietnam's intergovernmental fiscal transfers system. As mentioned in Section 4.3.3, Vietnam has pursued a system of balancing transfers to reduce horizontal imbalances of budgets caused by differences in local economic activities, resource endowments or from diverse demographic profiles (see Section 4.3.3). Therefore, control variables consist of available economic and social indicators of provincial structure including: per capita GDP, urbanization (the percentage of the population living in the urban areas), inflation, education, and share of agriculture output in GDP.

Model (4.17) is based on annual data from 2000-2004 for 61 provinces in Vietnam. The regression outcomes are presented in Table 4.7 (page 117). Point estimates for how foreign aid affects the fiscal transfers are statistically significant with the expected sign. For instance, regression 7.1 (Table 4.7) indicates that a dollar increase in foreign aid to a province is accompanied by a reduction of USD 0.18 in the fiscal transfers to that province. By including different groups of control variables in the remaining regressions, the effects of aid on transfers seem to be spread out across the coefficients of the control variables. The magnitude of aid effects reduces from USD 0.18 to USD 0.09 cents across regressions 7.1 to 7.4 (Table 4.7). The results are consistent with the study in India (Jha and Swaroop 1998) and suggest that the central government reduces subsidies to the provinces when foreign aid is directed to the provinces.

The share of the provincial revenue variable also enters the model with the expected sign, but the effects are at different significance levels that depend on different groups of control variables. Regression 7.1 suggests that a dollar increase in provincial revenue leads to a USD 0.04 decrease in fiscal transfers. This implies that the central government reduces subsidies to the provinces when the provinces themselves balance their budgets. Other regressions in Table 4.7 also suggest that this effect may be spread out across the model with the presence of different groups of control variables.

Among the control variables, the education variables are not significant in all regressions. This result does not support the view that education, as an important social indicator, is a determinant of fiscal transfers, at least for this sample. In contrast, the GDP per capita variable is negative and significant in regression 7.2. Since GDP per capita is a measure of
the level of development in a province, this result indicates that the higher the level of provincial development, the lower the central government subsidy to the province. In regressions 7.3 and 7.4, using the share of agricultural output in the GDP variable as a proxy for the level of provincial development, the same results are obtained. The larger the share of provincial GDP from agriculture, the lower the level of fiscal transfers. Finally, growth of the inflation variable helps raise the fiscal transfers at the 1 per cent significance level.

4.7 Conclusions and policy implications

Motivated by the recent increase in the level of foreign aid disbursement and its contribution to Vietnam’s economic growth (see Chapter 3), the impact of aid receipts on the Vietnamese government expenditure is investigated. Two dimensions of linkages between aid and government expenditure are explored - one at the national level using time series data over the 1986-2006 period, and the other at the provincial level, using unbalanced panel data from 61 provinces for 2000-2004. In line with the related literature, the model of aid fungibility is captured to test the effects of foreign aid on aggregate government spending, various components and levels of government spending and, the fiscal transfers from the central to provincial governments.

Major findings

At the national level, the time-series regression results show that foreign aid and its components stimulate government spending by more than the increase in aid. This result is consistent with the empirical study of Indonesia by Pack and Pack (1990) and implies that aid acts as additional funding for donor-favoured purposes. It does not substitute for Vietnam’s government expenditure that would be undertaken in the absence of aid. By disaggregating government expenditure into current and capital spending, the results show that aid and its components raise the former more strongly than they do the latter. This may not necessarily be bad because some current spending, such as operations and maintenance expenditure, may have higher rates of return than capital expenditure. Moreover, the time series model reveals that if foreign aid is falling or absent, then the Vietnamese government

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19 Vietnam is an agricultural country, so most provincial revenues are based on agricultural production.
may revise its budget downwards for both current and development spending. This implies an important role of foreign aid in stimulating government budgets.

In analysing the effect of foreign aid on provincial government expenditure, aid fungibility observed was tested for, not only in aggregate, current and capital spending, but also in three sectors of spending: health care, agriculture and education. The findings concur with the results from the national level, indicating that aid in Vietnam is non-fungible, but the linkage of aid and current expenditure is statistically insignificant. In other words, aid goes roughly dollar-for-dollar to government spending and most aid is associated with an increase in government capital spending. In terms of sectors of spending, earmarked aid given to the health care and agriculture sector is also diverted whereas aid in the education sector significantly stimulates government spending in this sector. This suggests that foreign aid is fungible in the case of sectoral government spending.

The Chapter further investigated both theoretical and empirical models of how aid affects the fiscal transfers from central to provincial governments, using cross-province regressions. In line with findings from the aid literature on federated countries such as Ethiopia and India, the results of this research indicate that the Vietnamese government has pursued a policy of “Budget Offsets”, whereby the central government reduces subsidies to the provinces when foreign aid is directed to the provinces.

Policy implications
Although foreign aid appears to be non-fungible with total government expenditure as well as current and capital expenditure, aid fungibility may be a reality in the case of sectors and levels of government expenditure. In these cases, as discussed in Section 4.2.4, budget support is a panacea for aid fungibility in Vietnam. Furthermore, there are at least two favourable conditions for mobilizing general budget support in Vietnam. First, in relation to concerns about the World Bank’s suggestion that donors are reluctant to provide budget support when the overall public expenditure program is unsatisfactory, it is worth emphasizing that public administration and public expenditure management have undergone major reform in Vietnam (Bartholomew and Lister 2002). Second, budget support accounted for a small share of total aid disbursement, only 15 percent in the period
In light of the evidence, a move toward more budget support is necessary for increased aid effectiveness in Vietnam.

In addition to mobilizing general budget support, sector budget support, as discussed in Section 4.2.4, should be tailored to ensure that aid targeted to a specific sector will be spent on that sector. In the decentralization process of foreign aid, as shown in Section 4.3.4, increasing the shift of aid to development needs at the provincial level may reduce aid fungibility on the level of government expenditure.

**Limitations**

This chapter has analysed budgetary impacts of foreign aid on national and provincial government spending, using both time series and a panel model, respectively. Although the combination of time series and panel model is expected to strengthen the reliability of the results, the main limitation of the study is the data constraints. Because of the nature of the data set, there are only 21 observations in the annual time-series data (1986-2006) which may lead to misleading results since it produces a weak power of unit root and cointegration tests. In terms of sectoral level, although aid to the transportation and energy sectors accounted for a high percentage of total disbursement, comparisons of their effects on government expenditure for the respective sectors are impossible. Hence, the empirical results in this chapter should be read with care, and further research should be carried out if better data were to become available.

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20 In terms of share of total disbursement, projects and budget support accounted for 75 per cent and 15 per cent respectively, and the remainder to the “To be defined” (see Chapter 1).
Appendix 4.1

How changes in aid affect national government budget

With the Stone-Geary specification, equation (1) can be written as:

\[(A 4.1) \quad U(c^p, g_1, g_2) = F(c^p) + \prod_{j} (g_j - \gamma_j)^{\beta_j} = F(c^p) + (g_1 - \gamma_1)^{\beta_1} (g_2 - \gamma_2)^{\beta_2}\]

Where \(c^p\) is a private good; \(\gamma_j\) are subsistence quantities of public goods.

In the presence of foreign aid, the recipient government may raise the government budget outlays in the model using foreign aid, then the budget constraint faced by the government is:

\[(A 4.2) \quad p_1 g_1 + p_2 g_2 = R + A\]

Given \(R, p_1, p_2\) and \(A\), the government chooses \(g_1\) and \(g_2\) to maximize equation (A 4.1) with respect to equation (A 4.2). The following first-order conditions were derived to find a solution of the Lagrange function:

\[(A 4.3) \quad \beta_1 (g_1 - \gamma_1)^{\beta_1 - 1} (g_2 - \gamma_2)^{\beta_2} - \lambda p_1 = 0 \quad \beta_2 (g_2 - \gamma_2)^{\beta_2 - 1} (g_1 - \gamma_1)^{\beta_1} - \lambda p_2 = 0 \quad R + A - p_1 g_1 - p_2 g_2 = 0\]

If the solution exists and is interior, a system of linear expenditure equations appears:

\[(A 4.4) \quad p_1 g_1 = p_1 \gamma_1 + \tilde{\beta}_1 [R + A - \sum_{j} p_j \gamma_j] \quad \text{where} \quad \tilde{\beta}_1 = \frac{\beta_1}{\beta_1 + \beta_2} \quad p_2 g_2 = p_2 \gamma_2 + \tilde{\beta}_2 [R + A - \sum_{j} p_j \gamma_j] \quad \text{where} \quad \tilde{\beta}_2 = \frac{\beta_2}{\beta_1 + \beta_2}\]

The functional form of how changes in foreign aid affect national government budgets are derived:

\[G_j = \alpha_0 + \alpha_1 R + \alpha_2 A + \sum_{c=1}^{C} \alpha_c Z_c + \varepsilon \quad \text{where} \quad G_j = p_j g_j (j = 1, 2)\]
How does categorical aid impact on targeted sectors of provincial government expenditure?

With the representative agent’s utility function, \( W \), defining public good \( g_s \) and single private good, \( c_p \):

\[
W = U(c_p, g_1, g_{NF}^1, \ldots, g_K, g_{NF}^K, g_{K+1}, \ldots, g_s)
\]

Assume that: \( S \geq K \)

Where:

\[
g_{NF}^k = \frac{(1-\phi_k)a_k}{p_k}
\]

\( k = 1, 2, \ldots, K \)

\( g_{NF}^k \) - is the quantity of \( k \)th good that the province has to purchase from nonfungible aid earmarked for good \( k \).

Therefore, the Stone-Geary utility function (Stone 1954) is formed:

\[
W = F(c_p) + H\left(\sum_{k=1}^{K} g_{NF}^k\right) + \prod_{s=1}^{S} (g_s - \gamma_s)^{\beta_s}
\]

The new budget constraint faced by the government is:

\[
p_s g_1 + \ldots + p_s g_s = R + \sum_{k=1}^{K} \phi_k a_k + T
\]

Given \( R, p_s, a_k \) and fungible \( (\phi_k) \), the provincial government chooses \( S \) goods to maximize equation (A 4.6) with respect to equation (A 4.7). Using the Lagrange method, if the solution exists and is interior, a system of linear expenditure equations appears:

\[
p_s g_s = p_s \gamma_s + \beta_s (R + \sum_{k \neq s} \phi_k a_k + T - \sum_{j=1}^{s} p_j \gamma_j)
\]

However, the total spending of provinces on particular goods need to be observed rather than the spending contributed by aid fungible resources or transfers from the central government. From equation (A 4.5) and (A 4.8):

\[
p_s g_s + p_s g_{NF}^s = p_s \gamma_s + (1-\phi_s)a_s + \beta_s (R + \sum_{k \neq s} \phi_k a_k + T - \sum_{j=1}^{s} p_j \gamma_j)
\]

\[
p_s \bar{g}_s = p_s \gamma_s + (1-\phi_s + \beta_s \phi_s)a_s + \beta_s (R + \sum_{k \neq s} \phi_k a_k + T) - \beta_s (\sum_{j=1}^{s} p_j \gamma_j)
\]

where \( \bar{g}_s = g_s + g_{NF}^s \)
In this section, the focus is to analyse the impact of the portion of aid fungibility ($\phi$) on government expenditure in preference to measuring government spending financed by provincial revenue or transfers from the central government. Therefore, equation (A.4.10) is simplified by using total government spending net of foreign aid $G^N$:

$$R + T = G^N = G - A$$

Where $G = \sum_{s=1}^{s} p_s g_s + T + \sum_{k=1}^{K} p_k g_k^{NP}$; $A = \sum_{k=1}^{K} a_k$

Substituting the $G^N$ into equation A 4.10 results in an equation analysing the effects of foreign aid on various sectors of government expenditure.

(A 4.11) $G_{i,j} = p_s \gamma_s + (1 - \phi_s + \beta_s \phi_s) a_s + \beta_s G^N + \beta_s (\sum_{k \neq s} \phi_k a_k) - \beta_s (\sum_{j=1}^{s} p_j \gamma_j)$

This section draws heavily on the framework of Feyzioglu et al.'s (1998) models of aid fungibility.
Appendix 4.2

Figures

Figure 4.1 Vietnam’s sub-national budget, 1992-2002.

![Graph showing Vietnam's sub-national budget from 1992 to 2002.](image)


Figure 4.2 Central government share in budget expenditure 1997-2004

![Graph showing the central government share in budget expenditure from 1997 to 2004.](image)

Figure 4.3 Changes in aid flows as a percentage of GDP

Source: Author’s calculation based on website DAD Vietnam.

Figure 4.4 Aid fungibility

\[ G_2^* = G_D \rightarrow \varphi = 0 \]
\[ G_2^* = G_E \rightarrow \varphi = 1 \]
### Table 4.1 Government spending (as % of GDP)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total government expenditure</td>
<td>19.77</td>
<td>26.30</td>
</tr>
<tr>
<td>Current expenditure</td>
<td>15.11</td>
<td>15.61</td>
</tr>
<tr>
<td>Capital expenditure</td>
<td>4.65</td>
<td>7.29</td>
</tr>
<tr>
<td>Others expenditure</td>
<td>0.01</td>
<td>3.36</td>
</tr>
<tr>
<td>Revenue</td>
<td>18.19</td>
<td>23.19</td>
</tr>
</tbody>
</table>

**Source:** Author’s calculation based on GSO annual issues of Vietnam, 1986-2005.
### Table 4.2 Test for unit root and cointegration

<table>
<thead>
<tr>
<th>Variable</th>
<th>ADF levels</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit root test results</strong></td>
<td></td>
</tr>
<tr>
<td>Total expenditure</td>
<td>-1.81</td>
</tr>
<tr>
<td>Current expenditure</td>
<td>-2.41</td>
</tr>
<tr>
<td>Capital expenditure</td>
<td>-1.30</td>
</tr>
<tr>
<td>Revenue</td>
<td>-1.81</td>
</tr>
<tr>
<td>Total foreign aid</td>
<td>-1.67</td>
</tr>
<tr>
<td>Budget support aid</td>
<td>-2.81</td>
</tr>
<tr>
<td>Project aid</td>
<td>-1.74</td>
</tr>
<tr>
<td>Grants</td>
<td>-2.25</td>
</tr>
<tr>
<td>Loans</td>
<td>-1.22</td>
</tr>
<tr>
<td>Interaction term</td>
<td>-1.43</td>
</tr>
</tbody>
</table>

| **Cointegration test results** |            |
| Residual eq.(3.1)             | -2.00      |
| Residual eq.(3.2)             | -2.43      |
| Residual eq.(3.3)             | -1.79      |
| Residual eq.(3.4)             | -2.53      |
| Residual eq.(3.5)             | -1.66      |
| Residual eq.(4.1)             | -2.01      |
| Residual eq.(4.2)             | -2.62      |
| Residual eq.(4.3)             | -1.57      |
| Residual eq.(4.4)             | -2.00      |
| Residual eq.(4.5)             | -2.49      |
| Residual eq.(4.6)             | -1.80      |

**Note:** (*) variable stationary at 1%  (***) Residuals of eq(3.1-3.5) and eq(4.1-4.6) are residuals collected after regressing OLS estimations in level in Table 4.3, 4.4.
Table 4.3 Effects of total aid on government expenditure

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Total Exp (3.1)</th>
<th>Capital Exp (3.2)</th>
<th>Current Exp (3.3)</th>
<th>Administration Exp (3.4)</th>
<th>Interest Exp (3.5)</th>
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</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-0.096</td>
<td>0.018</td>
<td>-0.094</td>
<td>-0.15</td>
<td>-0.20</td>
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<tr>
<td></td>
<td>(-0.17)</td>
<td>(0.07)</td>
<td>(-0.26)</td>
<td>(-2.01)</td>
<td>(-3.22)</td>
</tr>
<tr>
<td>Total Foreign aid</td>
<td>6.69</td>
<td>2.52</td>
<td>3.99</td>
<td>0.32</td>
<td>0.23</td>
</tr>
<tr>
<td></td>
<td>(2.12)</td>
<td>(2.51)</td>
<td>(2.84)</td>
<td>(1.11)</td>
<td>(0.94)</td>
</tr>
<tr>
<td>Domestic resources</td>
<td>0.43</td>
<td>0.16</td>
<td>0.24</td>
<td>0.007</td>
<td>-0.002</td>
</tr>
<tr>
<td></td>
<td>(2.47)</td>
<td>(1.91)</td>
<td>(2.07)</td>
<td>(0.28)</td>
<td>(-0.11)</td>
</tr>
<tr>
<td>Interaction</td>
<td>-5.18</td>
<td>-2.11</td>
<td>-2.90</td>
<td>0.30</td>
<td>-0.39</td>
</tr>
<tr>
<td>Aid*dummy</td>
<td>(-2.66)</td>
<td>(-2.30)</td>
<td>(-2.25)</td>
<td>(1.15)</td>
<td>(-1.70)</td>
</tr>
<tr>
<td>R²</td>
<td>0.44</td>
<td>0.31</td>
<td>0.41</td>
<td>0.11</td>
<td>0.33</td>
</tr>
<tr>
<td>Number of obs</td>
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<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

Note: The regressions are based on 21 annual observations from 1986-2006. All variables are expressed as shares of real GDP and are in 1994 constant prices. All figures in parenthesis are robust t-ratios.

Table 4.4 Effects of disaggregated aid on government expenditure

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.037</td>
<td>-0.10</td>
<td>0.06</td>
<td>0.02</td>
<td>0.022</td>
<td>-0.095</td>
</tr>
<tr>
<td></td>
<td>(0.08)</td>
<td>(-0.19)</td>
<td>(024)</td>
<td>(0.07)</td>
<td>(0.08)</td>
<td>(-0.25)</td>
</tr>
<tr>
<td>Grants</td>
<td>7.75</td>
<td>2.85</td>
<td>4.91</td>
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<td></td>
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<tr>
<td></td>
<td>(4.08)</td>
<td>(2.87)</td>
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<td>Loans</td>
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<tr>
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<td>(2.62)</td>
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<td>Budget support</td>
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</tr>
<tr>
<td></td>
<td>(2.25)</td>
<td>(2.18)</td>
<td>(2.31)</td>
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<td>Project aid</td>
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<tr>
<td></td>
<td>(3.22)</td>
<td>(2.42)</td>
<td>(2.76)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Domestic resources</td>
<td>0.44</td>
<td>0.43</td>
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<td>0.16</td>
<td>0.25</td>
<td>0.24</td>
</tr>
<tr>
<td></td>
<td>(2.89)</td>
<td>(2.51)</td>
<td>(2.01)</td>
<td>(1.85)</td>
<td>(2.93)</td>
<td>(2.01)</td>
</tr>
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<td>Interaction</td>
<td>-5.17</td>
<td>-5.17</td>
<td>-2.11</td>
<td>-2.12</td>
<td>-2.89</td>
<td>-2.90</td>
</tr>
<tr>
<td>Aid*dummy</td>
<td>(-3.04)</td>
<td>(-2.66)</td>
<td>(-2.38)</td>
<td>(-2.23)</td>
<td>(-3.07)</td>
<td>(-2.18)</td>
</tr>
<tr>
<td>R²</td>
<td>0.60</td>
<td>0.48</td>
<td>0.40</td>
<td>0.31</td>
<td>0.70</td>
<td>0.48</td>
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<td>20</td>
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</table>

Note: The regressions are based on 21 annual observations from 1986-2006. All variables are expressed as shares of real GDP and are in 1994 constant prices. All figures in parenthesis are robust t-ratios.
<table>
<thead>
<tr>
<th>Estimation method</th>
<th>Dependent variable</th>
<th>Total Exp (5.1)</th>
<th>Current exp (5.2)</th>
<th>Capital exp (5.3)</th>
<th>(5.4)</th>
<th>(5.5)</th>
<th>(5.6)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Constant</td>
<td>-12.1 (-0.97)</td>
<td>-47.13 (-1.81)</td>
<td>-47.08 (-1.79)</td>
<td>-6.67 (-1.50)</td>
<td>-11.33 (-1.87)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Share of aid in GDP</td>
<td>1.10 (3.86)</td>
<td>0.17 (0.66)</td>
<td>0.89 (2.59)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Share of loan aid in GDP</td>
<td>0.98 (2.74)</td>
<td>0.14 (0.54)</td>
<td>0.98 (2.87)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Share of local government revenue (excluding transfer central to local government) in GDP</td>
<td>0.57 (3.20)</td>
<td>0.56 (3.18)</td>
<td>0.32 (5.65)</td>
<td>0.32 (5.48)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Share of transfer from central to local government in GDP</td>
<td>0.50 (1.95)</td>
<td>0.46 (1.77)</td>
<td>0.59 (2.91)</td>
<td>0.58 (1.05)</td>
<td>0.085 (0.06)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Real per capita GDP</td>
<td>0.002 (0.45)</td>
<td>0.001 (0.29)</td>
<td>0.027 (1.42)</td>
<td>0.028 (1.43)</td>
<td>-0.001 (-0.20)</td>
<td>-0.0012 (0.323)</td>
</tr>
<tr>
<td></td>
<td>% Educated people in the total population, lag (-1)</td>
<td>0.073 (0.98)</td>
<td>0.085 (1.10)</td>
<td>-0.16 (-1.22)</td>
<td>-0.15 (-1.19)</td>
<td>0.022 (0.36)</td>
<td>0.02 (0.44)</td>
</tr>
<tr>
<td></td>
<td>Share agriculture output in GDP, lag (-1)</td>
<td>0.058 (0.55)</td>
<td>0.051 (0.49)</td>
<td>0.53 (2.42)</td>
<td>0.53 (2.42)</td>
<td>0.18 (2.12)</td>
<td>0.18 (2.19)</td>
</tr>
<tr>
<td></td>
<td>Infant mortality rate, lag (-1)</td>
<td>1.01 (2.49)</td>
<td>1.1 (2.64)</td>
<td>0.16 (0.20)</td>
<td>0.17 (0.21)</td>
<td>-0.74 (-1.93)</td>
<td>-0.84 (-2.19)</td>
</tr>
<tr>
<td></td>
<td>R²</td>
<td>0.45</td>
<td>0.45</td>
<td>0.58</td>
<td>0.58</td>
<td>0.60</td>
<td>0.62</td>
</tr>
<tr>
<td></td>
<td>Model</td>
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<td>Random</td>
<td>Fixed</td>
<td>Fixed</td>
<td>Fixed</td>
<td>Fixed</td>
</tr>
<tr>
<td></td>
<td>Number of obs</td>
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<td>119</td>
<td>111</td>
<td>111</td>
<td>113</td>
<td>113</td>
</tr>
</tbody>
</table>

**Note:** All variable are expressed as shares of real GDP and are in 1994 constant prices. t-statistics in the parentheses are based on white heteroskedasticity-consistent standard error.
Table 4.6 **Foreign aid effects on sectors of provincial expenditure**

<table>
<thead>
<tr>
<th>Estimation method</th>
<th>Health (6.1)</th>
<th>Education (6.2)</th>
<th>Agriculture (6.3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>2.81</td>
<td>31.93</td>
<td>0.79</td>
</tr>
<tr>
<td></td>
<td>(1.96)</td>
<td>(5.90)</td>
<td>(1.01)</td>
</tr>
<tr>
<td>Share government</td>
<td>0.020</td>
<td>0.087</td>
<td>0.056</td>
</tr>
<tr>
<td>expenditure in GDP</td>
<td>(2.89)</td>
<td>(1.90)</td>
<td>(2.33)</td>
</tr>
<tr>
<td>Health aid</td>
<td>0.76</td>
<td>-2.47</td>
<td>-0.16</td>
</tr>
<tr>
<td></td>
<td>(1.69)</td>
<td>(-0.91)</td>
<td>(-0.14)</td>
</tr>
<tr>
<td>Education aid</td>
<td>0.08</td>
<td>1.53</td>
<td>0.72</td>
</tr>
<tr>
<td></td>
<td>(0.68)</td>
<td>(2.10)</td>
<td>(1.56)</td>
</tr>
<tr>
<td>Agriculture aid</td>
<td>-0.09</td>
<td>-0.35</td>
<td>0.58</td>
</tr>
<tr>
<td></td>
<td>(-1.63)</td>
<td>(-1.95)</td>
<td>(6.93)</td>
</tr>
<tr>
<td>Other aid</td>
<td>0.002</td>
<td>0.05</td>
<td>0.044</td>
</tr>
<tr>
<td></td>
<td>(0.12)</td>
<td>(0.75)</td>
<td>(1.76)</td>
</tr>
<tr>
<td>Real per capita GDP</td>
<td>-0.0002</td>
<td>-0.004</td>
<td>-0.003</td>
</tr>
<tr>
<td></td>
<td>(-0.03)</td>
<td>(-1.46)</td>
<td>(-1.09)</td>
</tr>
<tr>
<td>% Educated people in the total population, lag (-1)</td>
<td>-0.0026</td>
<td>0.023</td>
<td>0.010</td>
</tr>
<tr>
<td></td>
<td>(-0.61)</td>
<td>(0.44)</td>
<td>(2.36)</td>
</tr>
<tr>
<td>Share agriculture output in GDP, lag (-1)</td>
<td>0.023</td>
<td>0.049</td>
<td>-0.004</td>
</tr>
<tr>
<td></td>
<td>(3.16)</td>
<td>(1.82)</td>
<td>(-0.69)</td>
</tr>
<tr>
<td>Infant mortality rate, lag (-1)</td>
<td>-0.11</td>
<td>-1.15</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>(-2.48)</td>
<td>(-7.25)</td>
<td>(-0.007)</td>
</tr>
<tr>
<td>Aid fungibility ($\phi_s$)</td>
<td>0.24</td>
<td>-0.53</td>
<td>0.42</td>
</tr>
<tr>
<td></td>
<td>(1.69)</td>
<td>(2.10)</td>
<td>(6.93)</td>
</tr>
<tr>
<td>(R^2)</td>
<td>0.45</td>
<td>0.75</td>
<td>0.65</td>
</tr>
<tr>
<td>Model</td>
<td>Fixed</td>
<td>Fixed</td>
<td>Random</td>
</tr>
<tr>
<td>Number of obs</td>
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</tbody>
</table>

**Note:** All variables are expressed as shares of real GDP and are in 1994 constant prices. t statistics in the parentheses are based on white heteroskedasticity-consistent standard error.
Table 4.7 **Aid effects on inter-governmental fiscal transfers**

<table>
<thead>
<tr>
<th>Estimation method</th>
<th>Dependent variable</th>
<th>$T_{i,t}$ (7.1)</th>
<th>$T_{i,t}$ (7.2)</th>
<th>$T_{i,t}$ (7.3)</th>
<th>$T_{i,t}$ (7.4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OLS</td>
<td>Constant</td>
<td>11.8 (7.78)</td>
<td>5.87 (1.56)</td>
<td>15.17 (1.88)</td>
<td>13.5 (3.13)</td>
</tr>
<tr>
<td></td>
<td>Share of aid in GDP</td>
<td>-0.18 (-2.16)</td>
<td>-0.13 (-2.57)</td>
<td>-0.14 (-1.82)</td>
<td>-0.09 (-2.02)</td>
</tr>
<tr>
<td></td>
<td>Share of local government revenue in GDP</td>
<td>-0.038 (-1.64)</td>
<td>-0.034 (-1.37)</td>
<td>-0.030 (-1.45)</td>
<td>-0.028 (-1.25)</td>
</tr>
<tr>
<td></td>
<td>Real per capita GDP</td>
<td>0.006 (1.64)</td>
<td>-0.005 (-2.68)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Urbanization</td>
<td>-0.14 (-2.38)</td>
<td>0.24 (1.02)</td>
<td>-0.25 (-2.98)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inflation</td>
<td>9.2 (3.00)</td>
<td></td>
<td>7.9 (2.90)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Education</td>
<td>0.012 (0.83)</td>
<td>-0.02 (-1.27)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Share agriculture output in GDP</td>
<td>-0.11 (-1.69)</td>
<td>-0.08 (-2.83)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$R^2</td>
<td>0.10</td>
<td>0.07</td>
<td>0.10</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>Model</td>
<td>Fixed</td>
<td>Random</td>
<td>Fixed</td>
<td>Random</td>
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<tr>
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<td>Number of obs</td>
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<td>301</td>
<td>299</td>
<td>299</td>
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**Note:** All variables are expressed as shares of real GDP and are in 1994 constant prices. t-statistics in the parentheses are based on white heteroskedasticity-consistent standard error.
Table 4.8 **Correlation between explanatory variables**

<table>
<thead>
<tr>
<th></th>
<th>Share of aid in GDP</th>
<th>Real per capita GDP</th>
<th>% Educated people, lag(-1)</th>
<th>Share agriculture output in GDP, lag(-1)</th>
<th>Infant mortality rate, lag(-1)</th>
<th>Share of transfers in GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of aid in GDP</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Real per capita GDP</td>
<td>-0.191</td>
<td>1.000</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>% Educated people, lag(-1)</td>
<td>0.013</td>
<td>0.194</td>
<td>1.000</td>
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<tr>
<td>Share agriculture output in GDP, lag(-1)</td>
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<td>-0.407</td>
<td>-0.419</td>
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</tr>
<tr>
<td>Infant mortality rate, lag(-1)</td>
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<td>-0.379</td>
<td>-0.349</td>
<td>0.347</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Share of transfers in GDP</td>
<td>0.147</td>
<td>-0.340</td>
<td>0.097</td>
<td>0.097</td>
<td>0.601</td>
<td>1.000</td>
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### Table 4.9 Government budget share by sector, 1994-2003

<table>
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<tbody>
<tr>
<td>Education</td>
<td>11.22</td>
<td>12.68</td>
<td>12.52</td>
<td>14.10</td>
<td>17.37</td>
<td>15.71</td>
<td>15.49</td>
<td>16.3</td>
<td>16.9</td>
<td>17.8</td>
</tr>
<tr>
<td>Health</td>
<td>5.73</td>
<td>5.65</td>
<td>5.76</td>
<td>6.12</td>
<td>7.09</td>
<td>7.04</td>
<td>6.35</td>
<td>7.1</td>
<td>6.44</td>
<td>5.9</td>
</tr>
<tr>
<td>Transport</td>
<td>7.36</td>
<td>8.91</td>
<td>8.98</td>
<td>9.43</td>
<td>10.76</td>
<td>10.84</td>
<td>10.39</td>
<td>12.5</td>
<td>13.8</td>
<td>13.41</td>
</tr>
<tr>
<td>Agriculture</td>
<td>6.1</td>
<td>7.2</td>
<td>na</td>
<td>5.4</td>
<td>6.9</td>
<td>6.3</td>
<td>5.6</td>
<td>6.2</td>
<td>5.5</td>
<td>4.7</td>
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<tr>
<td>Water supply</td>
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<td>0.57</td>
<td>0.99</td>
<td>0.83</td>
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<td>0.63</td>
<td>0.45</td>
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<td>Telecommunication</td>
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<td>2.14</td>
<td>0.44</td>
<td>0.04</td>
<td>0.04</td>
<td>0.03</td>
<td>na</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Electricity</td>
<td>4.48</td>
<td>1.4</td>
<td>1.07</td>
<td>0.73</td>
<td>0.58</td>
<td>0.67</td>
<td>0.68</td>
<td>0.79</td>
<td>0.4</td>
<td>na</td>
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</tbody>
</table>

**Sources:** CIEM (1994-2000) and author's calculation based on WB report.

### Table 4.10 Share of sectoral aid in total government budget, 1994-2003

<table>
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<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>2.63</td>
<td>7.21</td>
<td>5.37</td>
<td>4.68</td>
<td>7.34</td>
<td>6.96</td>
<td>5.54</td>
<td>6.19</td>
<td>4.10</td>
<td>3.66</td>
</tr>
<tr>
<td>Health</td>
<td>14.01</td>
<td>15.54</td>
<td>18.88</td>
<td>11.82</td>
<td>8.64</td>
<td>10.79</td>
<td>22.18</td>
<td>18.42</td>
<td>10.30</td>
<td>9.30</td>
</tr>
<tr>
<td>Transport</td>
<td>2.33</td>
<td>4.38</td>
<td>9.71</td>
<td>17.03</td>
<td>23.55</td>
<td>28.68</td>
<td>30.77</td>
<td>28.45</td>
<td>24.92</td>
<td>21.78</td>
</tr>
<tr>
<td>Agriculture</td>
<td>15.64</td>
<td>29.62</td>
<td>na</td>
<td>25.40</td>
<td>26.84</td>
<td>18.17</td>
<td>26.30</td>
<td>23.96</td>
<td>29.46</td>
<td>28.10</td>
</tr>
</tbody>
</table>

**Sources:** Author’s calculation based on website DAD Vietnam and MOF data on government budget.
CHAPTER 5
FOREIGN AID AND RURAL POVERTY

Poverty in Vietnam has fallen at a rate almost unmatched anywhere in the world. The poverty rate (as measured by household income) has dropped from 90% in 1985 to 10% per cent in 2000, while over 25 million people moved out of the poverty line in this period. Nevertheless, new papers have identified the rural areas as the problem areas in this reduction. In fact, chapter 6, which is more urgently, how foreign aid can contribute to the reduction of poverty.

Over the last 20 years of Doi Moi, Vietnam’s economy has achieved remarkable poverty reduction alongside a high rate of economic growth and the reintegration. However, there remain concerns about the sustainability of poverty reduction, in particular because Vietnam’s growth has been concentrated in urban areas, especially in rural areas. Although there have been significant improvements in some living standards, rural dwellers still face many challenges due to the poor infrastructure and the Academy of Social Science 2007. Therefore, this chapter re-assesses on the effects of foreign aid on rural poverty reduction, 2014 Vietnam can use some ways.

In analysing the frequency of poverty, one can use 60 rural percent in 2005 and 2010, and that rural households reduced from 2009 to 2014 through three main sources, i.e. increased agricultural productivity, higher rural wages, and improvements in the living standards, i.e. improved farming and the final three years of Vietnam’s Bracelend during the Vietnam’s poverty reduction in 150. In 2000 and 2005, Vietnam is thus a way to reduce. Nevertheless, consider the urban-rural, rural-lane model which is still, the study of rural poverty on one side, the analysis of agricultural sector on the other side, poverty through different channels are highlighted.

The chapter is oriented on the rural in Section 5.2, to find relationships of households and sections of poverty in Vietnam. Moreover, the analytical framework adopted in these different statistical studies of rural poverty. Sections 5.6 and 5.7 focusing the new factors and issues in rural poverty of the applications, respectively. Conclusions and policy implications are given at Vietnam 10.
5.1 Introduction

Poverty in Vietnam has fallen at a rate almost unmatched anywhere else in the world. The poverty rate (as measured by headcount index) has come down from 58.1 per cent in 1993 to 16 per cent in 2006, with approximately 35 million people escaping from poverty during this period. However, few papers have focused on the role played by foreign aid in poverty reduction. In this chapter, the process of poverty reduction in Vietnam is reviewed, and more importantly, how foreign aid has contributed to this process is examined.

Over the last 20 years of Doi Moi, Vietnam’s economy has achieved impressive poverty reduction alongside a high rate of economic growth at the aggregate level. However, there remain concerns about the possibility of growing disparities in wellbeing across regions, especially in rural areas. Although there have been significant improvements in rural living standards, rural dwellers still overwhelmingly dominate the poor population (Vietnam Academy of Social Sciences 2007). Therefore, this chapter concentrates on the effects of foreign aid on rural poverty reduction, using Vietnam as a case study.

In analysing the important role of foreign aid as a way out of rural poverty, it was found that rural households benefited from foreign aid through three main channels: growth in agricultural production; higher rural wages; and improvement of non-farm employment. Province-level data for Vietnam and data from three rounds of Vietnam Household Living Standards in 1998, 2002 and 2004 are used in this analysis. Developing a simultaneous equations model based on data, the effects of different sectors of aid on rural poverty through different channels are examined.

The chapter is organized as follows. In Section 5.2, a brief discussion of definitions and measures of poverty is presented. This is followed by a discussion of previous studies in this area. Section 5.4 reviews trends and causes of poverty in Vietnam. Section 5.5 lays out the analytical framework adopted to show different channel effects of aid on rural poverty. Sections 5.6 and 5.7 describe the data sources and discuss the main results of the regressions, respectively. Conclusions and policy implications are drawn in Section 5.8.
5.2 Poverty and how to measure it

5.2.1 Poverty definition

Poverty can be defined as the low absolute income received by certain households. However, poverty is not simply a matter of absolute income. Efforts have concentrated on linkage poverty with specific manifestations such as: starvation, severe malnutrition, illiteracy, substandard clothing and housing (Perkins et al. 2001: 123). The World Development Report (Kanbur et al. 2000: 15) defines poverty as to lack adequate food, shelter and clothing, to be ill and not cared for, to be illiterate and not schooled, to be particularly vulnerable to shocks, to be badly treated by the institutions of the society and to be excluded from having a voice and power in institutions. Income deprivation may make the poor less able to satisfy basic needs (food, clothing, etc.) and basic public services (healthcare, schools, etc.). Furthermore, a shortage of income may limit protection against exposure to adverse events. Similarly, being illiterate and sick may prevent the poor from getting jobs, making them more vulnerable to shocks. Income, education and health deprivation may make the poor less able to participate in social issues and decisions due to limited knowledge. Therefore, the poor seem to be voiceless and powerless, which in turn prevents them from influencing key decisions that may bring more opportunities to improve their income, education, healthcare and power, and in a state of vulnerability to shocks.

5.2.2 Measuring poverty

Adopting appropriate measurements is important for analysing poverty since they help formulation and testing of hypotheses on the determinants of poverty. Based on the dimensions of poverty, a poverty line is established to distinguish the poor from non-poor. The poverty line is defined as the amount of expenditure (or income) necessary to purchase a basket of basic needs. A household having expenditure (or income) below the poverty line is classified as being poor (Deaton 1997). Measurements of poverty are typically based on the poverty line and three major ways of doing it are discussed bellows.

The headcount index (P0) measures the ratio of the population for whom consumption is less than the poverty line (Ravallion 1992). Suppose $z$ is the defined poverty line; $I$ is a function equal to 1 if household expenditure ($Y_i$) is less than the poverty line and zero is
otherwise: \( N_p \) and \( N \) are the number of poor and total number of the population, respectively. Then the headcount index is:

\[
P_0 = \frac{1}{N} \sum_{i=1}^{N} I(Y_i \leq z) = \frac{N_p}{N} \quad \text{(Deaton 1997)}
\]

The headcount index is the simplest index hence it is easily constructed and applied. This index shows how widespread poverty is. However, it does not take the degree of poverty into account in that how far the household falls below the poverty line is ignored.

**Poverty gap ratio index** \((P_1)\) is defined as the sum of the deviation of the poor expenditure (or income) from the poverty line. This can be written as:

\[
P_1 = \frac{1}{N} \sum_{i=1}^{N} \left( \frac{z-Y_i}{z} \right) I(Y_i \leq z) \quad \text{(Deaton 1997)}
\]

This index is an indication of the depth of poverty. However, it cannot illustrate the severity of poverty well since it gives equal weight to all the poor. This index ignores inequality among the poor.

**Squared poverty gap index** \((P_2)\) is a weighted sum of poverty gaps, where the weights are the proportionate poverty gaps themselves. This index gives a greater weight to the greater income shortfall, so it is a good indication of the severity of poverty. However, it is not easy to interpret and hence is not used widely in the literature.

\[
P_2 = \frac{1}{N} \sum_{i=1}^{N} \left( 1 - \frac{Y_i}{z} \right)^2 I(Y_i \leq z) \quad \text{(Deaton 1997)}
\]

Although these indices based on the poverty line reflect the general idea of poverty, they do not take into account aspects of poverty like education and healthcare. Therefore, other indicators are constructed to supplement information on education and healthcare deprivation, including the illiteracy rate, mortality rate, average years of education, number of hospitals in the region. No single indicator reflects poverty comprehensively. Different indicators are designed to reflect different dimensions of poverty. Understanding the different dimensions of poverty is important for designing and implementing policies that help the poor escape poverty.
5.3 Previous studies

The role of foreign aid in addressing poverty is difficult to investigate since donors use a variety of aid instruments for various purposes and with different objectives that change over time. Therefore, evaluating the relationship between foreign aid and poverty requires examination of the various ways in which aid can impact on poverty (Figure 5.1).

![Diagram: Three ways Foreign Aid can impact on Poverty Reduction]

Figure 5.1 Three ways Foreign Aid can impact on Poverty Reduction

First, aid that contributes to economic growth should lead to increased income-earning opportunities. Second, aid that increases aggregate welfare by increasing government expenditure on social services (education, healthcare, etc.) contributes to poverty reduction. Third, aid directly reduces poverty by providing more income and social services through donor-funded projects in education, health, and job-creation. Hence, there are several strands of literature relevant to this analysis, including: (i) empirical works on the impacts of aid on growth, which in turn have contributed to poverty reduction; (ii) evidence on the relationship between foreign aid, government expenditure, and poverty reduction; and (iii) studies on the direct effects of foreign aid on poverty reduction.

5.3.1 Aid, growth and poverty

In Chapter 2, which analysed foreign aid and economic growth in Vietnam, the influences of aid on growth were discussed. In particular, Chapter 2 examined the literature on the effects of aggregated and sectoral aid on growth, as well as the circumstances in which aid
influences growth. Hence, this section analyses the contributions of growth to poverty reduction.

Empirical works investigating the effects of growth on poverty over many years mostly find that absolute poverty falls with economic growth. There is evidence from: cross-country studies (for example Dollar and Kraay 2002; Bourguignon 2003; Kraay 2004; Lopez 2004); time-series studies (for example Ravallion and Chen 2004); and microeconomic household analyses for various countries (for example Ravallion and Datt 1999). Among these studies, Kraay’s (2002, 2004) papers have attracted much attention. Dollar and Kraay (2002), using data from 92 countries, find that average incomes of the poorest fifth of society, which are in their poverty index, increase one-for-one with average income. Kraay (2004) further identifies three sources of growth leading to poverty reduction: a high growth rate, a high sensitivity of poverty to growth and a poverty-reducing pattern of growth. His results suggest that growth would account for roughly 70 per cent and 97 per cent of the short-run and long-run changes in poverty, respectively.

Schabbel (2007) suggests that cross-country evidence has limited explanatory value for policies related to poverty reduction. Therefore, more micro level studies and case studies in this area have attracted many researchers. Ravallion and Datt (1999), based on household surveys for India’s 15 major states over 1960-94, suggest that all the headcount indexes and poverty gap indexes are negatively affected by real agricultural output per hectare using a proxy for economic growth. Balisacan and Pemia (2002), using provincial data on the Philippines during the 1980s and 1990s, examine the robustness of the poverty-growth relationship. Their study reveals that growth elasticity of poverty is, on the average, roughly 0.5, indicating that income growth alone does not increase one-for-one the welfare of the poor. It seems clear that poverty reduction depends not only on the rate of growth but also on whether institutions and policies are reformed to favour the poor or not. This result is consistent with findings of other case studies, including for Thailand (Deolalikar 2002) and Indonesia (Hill 1996).
With respect to the absolute definition of pro-poor growth\textsuperscript{21}, the World Bank (WB) and the Department for International Development (DFID), the French Development Agency (AFD) and some other donor agencies co-funded a work program “Operationalizing Pro-Poor Growth” (OPPG). Countries in three regions, Africa, Asia and Latin America, are examined in 14 case studies on growth and poverty included under the umbrella of the program. The results of this program suggest that growth has been poverty-reducing in the selected countries since the 1990s. Out of 14 countries in the sample, 11 countries were able to reduce poverty and achieve economic growth. Interestingly, a one per cent increase in GDP per capita reduced the headcount index by 1.7 per cent per year on average (Schabbel 2007).

5.3.2 Aid, government expenditure and poverty

In Chapter 3 on foreign aid and government expenditure, figures on the extent of the relationship between aid and government expenditure were presented. That chapter concluded that whatever the relationship, across country-years or over time within countries, foreign aid appears to be a strong influence on government spending. In this section, therefore, the question of whether government expenditure has promoted poverty reduction or not is addressed.

Van de Walle and Nead (1995) argue that government expenditure is a potentially powerful instrument for fighting poverty. Government spending on basic services, primary schools and basic healthcare, mostly reaches the poor. Other government spending on food subsidies and distribution schemes, social cash transfers and public employment systems have been pro-poor. A number of empirical studies have probed this argument using different case studies (for example Jha et al. 2001; Heltberg et al. 2003; Chaturvedi and Upadhyay 2004). In an important recent contribution, Fan et al. (2000, 2004, 2005) address issues of government expenditure and rural poverty across countries: China (Fan and Chan-Kang 2005); India (Fan et al. 2000); Uganda (Fan et al. 2004c); Thailand (Fan et al. 2004b).

\textsuperscript{21} “Growth is considered to be pro-poor if and only if poor people benefit in absolute terms, as reflected in some agreed measure of poverty. In this case, the extent to which growth is pro-poor depends solely on the rate of change in poverty, which is determined by both the rate of growth and its distributional pattern. In short, under this definition the aim is to achieve the greatest amount of poverty reduction possible through growth and progressive distributional change.” - World Bank’s website on Pro-poor growth, available at (22/02/2008) http://web.worldbank.org/WEBSITE/EXTERNAL/TOPICS/EXTPOVERTY/EXTPGI
and Vietnam (Fan et al. 2004a). By using different levels of data, including household (for example, Egypt and Tanzania) and sub-national level (for example, Thailand, Vietnam and Uganda), most of these studies yield a statistically significant correlation between government expenditure and poverty reduction. A distinguishing feature of these studies is the use of a simultaneous system of equations to examine the impacts of different types of government expenditure on rural poverty. This present study uses a similar approach. Details of the methodology and technical regressions are presented in the next section.

5.3.3 Direct influence of foreign aid on poverty

Although an important objective of foreign aid is to support poverty reduction in developing countries, empirical studies examining and qualifying the direct impacts of aid on poverty are sparse. Most of the literature on aid effectiveness has concentrated on the effects of economic growth. Then, the impacts of aid on poverty are commonly drawn from the impact of aid on growth since growth is often regarded as the driver of poverty reduction. Several studies of the direct linkage between aid and poverty have usually captured a standard cross-country regression methodology, and replaced growth with poverty indices as the dependent variable (Boone 1995; Burnside and Dollar 1998; Asra et al. 2005; Masud and Yontcheva 2005). Boone (1995), using data for 97 countries, finds that aid is not associated with basic indicators of poverty (infant mortality, primary school and life expectancy). Using the infant mortality indicator as the dependent variable, Burnside and Dollar (1998) argue that aid spurs poverty reduction only in a good policy environment. In contrast, Asra et al. (2005) find that the relationship between aid and poverty is contingent on the amount of aid and is not associated with the quality of governance. Another important contribution of Asra et al.’s (2005) study is measuring poverty using a headcount index, when the poverty line is set at USD 2 per day. Entering the controversy on aid and poverty by disaggregating aid into bilateral and NGO aid flows, Masud and Yontcheva (2005), using unbalanced panel data for 58 countries from 1990 to 2001, show that NGO aid reduces infant mortality more than bilateral aid does.

Another strand of the literature related to this study tests the hypothesis that aid can improve aggregate welfare of the poor. Morrissey (2004), Verschoor and Kalwij (2002) and Gomanee et al. (2003) show evidence that foreign aid has both a direct impact on poverty,
if aid targets the poor, and an indirect impact, if aid finances pro-poor public expenditure. These studies use cross-country data with the headcount index, infant mortality and Human Development Index (HDI) as measures of poverty and welfare of the poor. Their results confirm that foreign aid potentially benefits the poor.

There have been few studies on the direct results of foreign aid on poverty in a single country so far. Feeny (2003) investigates the impact of foreign aid on poverty and well-being in Papua New Guinea during the 1990s. The approach of the paper is based on statistical methods and compares the mix of donor’s aid policy with the poverty situation in Papua New Guinea. This study finds that allocation of foreign aid has generally been consistent with a national strategy of poverty reduction. Lin et al. (2006) explore the impact of aid and poverty reduction based on cross province data in China since the mid 1990s. They assume that besides a direct effect on poverty, aid has an indirect benefit through its impact on economic growth and inequality. Hence, a simultaneous equation system is adopted to capture the linkage of aid and poverty. However, Lin et al. (2006) find that variables of foreign aid are not statistically significant for either direct or indirect impacts on poverty reduction.

5.3.4 Related studies in Vietnam

There have been a number of studies on poverty reduction in Vietnam. Since the goal of this thesis is to assess how foreign aid has reduced provincial poverty, it is important to review empirical evidence relating to the topic of linkages between economic growth, government expenditure and poverty reduction, especially using cross-province data in Vietnam.

Larsen et al. (2004) examine the effects of large-scale infrastructure investment in the period 1996-2000 on reducing the poverty rate between 1998 and 2002 in Vietnam. Using ordinary least squares (OLS) and two-stage least squares (2SLS), they regress the change in poverty rate between 1998 and 2002 on initial poverty rate, government investment, locally-funded investment and FDI at the provincial level from 1996-2000. They find that variables of initial poverty rate and government investment are significant in all regressions. They make a crude estimation that the elasticity of poverty reduction to
government investment is equal to -0.23. For comparison purposes, an additional USD 50 million in infrastructure investment is associated with an average reduction of 2 per cent in the poverty rate. Disaggregating total infrastructure investment by sectors, Larsen et al. (2004) reveal that investment in water supply, sanitation and transport strongly reduces poverty whereas electricity investment does not impact on poverty. Comparing estimated results for provinces at three different levels of poverty, they argue that the effect on poverty is less in the richest provinces and greater in the poorest provinces.

Fan et al. (2004a) using annual data from all 61 provinces of Vietnam over the period 1993-2000 focus on linkages between government expenditure, agricultural production and rural poverty. In order to estimate marginal returns in poverty reduction on various sectors of government spending, they develop a model of the rural economy, combining three relationships. First, the level of poverty is assumed to depend on agricultural production and non-farm employment. Second, determinants of agricultural production are supposed to be: agricultural research, education level of rural people and the development of local infrastructure. Finally, non-farm employment is assumed to depend on agricultural labour productivity, development of local infrastructure and education. By using simultaneous equations, this model allow both direct and indirect impacts on poverty reduction to be estimated. The results show that agricultural research has the largest poverty reduction impact, followed by rural roads investment. Investment in education also has a favourable impact on poverty reduction and ranks third. An important contribution of the paper refers to the ranking of poverty reduction impacts across different sectors of government spending. However, this study has several limitations of poverty measures and several unrealistic assumptions. These limitations are discussed in the methodology section (Section 5.5).

Several studies test the links between public investment, growth and poverty using different levels of data. Some studies focus on specific projects, such as the My Thuan bridge on the Mekong River Delta (AusAid 2003) or Highway 5 between Hanoi and Haiphong (JBIC 2003). Other studies review poverty alleviation impacts of sectoral government expenditure.

---

22 A set of variables reflecting development of infrastructure includes roads, telephone, electricity and irrigation.
such as the irrigation sector (Mekong Economics Ltd. et al. 2003) or the transportation sector (World Bank 2006a). In summary, education, roads and water supply investment are found to be good instruments for targeting particularly poor provinces.

Le and Winters (2001) use data on aid allocation to examine the effectiveness of foreign aid on poverty alleviation in Vietnam. However, their study covers a short period, 1993-97. Due to limited data, their study analyses the pattern of aid allocation instead of outcomes so it is not possible to directly assess the effectiveness of aid on poverty alleviation. In terms of econometric technique, they run a linear regression of aid per capita with poverty as an explanatory variable and find a negative and insignificant coefficient of poverty. Given poor data plus the simple technique, they conclude that there is an overemphasis on aid promoting economic growth while measures aimed at directly targeting the poor only play a minor role.

5.4 Poverty in Vietnam

5.4.1 Trends in poverty reduction

Vietnam has made great progress in poverty reduction in the past decade. One way to assess the poverty decline is to examine data on household expenditure from living standards surveys conducted by the GSO in 1993, 1998, 2002, 2004 and 2006. The living standards surveys show that the headcount index has come down from 58 per cent in 1993 to 16 per cent in 2006, a drop of 42 per cent points in 13 years, equivalent to about 35 million people. Another common indicator is food poverty, reflecting the percentage of households that can be expected to suffer from hunger at least during some periods of the year. Food poverty has also fallen rapidly from 25 per cent in 1993 to 6.7 per cent in 2006. Finally, the poverty gap indicator (see definition in Section 5.2) suggests that the depth of poverty has fallen significantly. Table 5.1 (page 157) shows that, during the period 1993-2006, a significant proportion of poor people moved out of poverty and for those who were still in poverty, their consumption shortfall was substantially decreased.

Over 90 per cent of the poor reside in rural areas. As a result, rural poverty is mainly driving poverty alleviation at the national level. In the period 1993 to 2006, rural poverty declined from 66.4 to 20.4 per cent, as indicated in Table 5.1 (page 157). However, the
speed of this decline reflects a slight slow-down. This speed fell by 2.3 per cent per year in the period 2004-06, compared to 3.5 per cent between 1993 and 2004. The slow-down rate of urban poverty also appears to have declined. According to Vietnam Development Report 2008 (World Bank 2007b), the slowdown in poverty decline in rural areas, and its stagnation in urban areas can be explained by: (i) the poverty rate usually becomes stable when it gets close to zero; (ii) statistical bias, such as the better sampling of migrants in recent surveys.

Poverty reduction has also been reflected in non-monetary indicators such as education, healthcare, access to infrastructure and ownership of consumer durables. These indicators in Table 5.3 (page 158) show the improvement in living standards in the period 1993-2004. In terms of education, upper secondary school enrolment rates increased dramatically, from 7.2 per cent in 1993 to 63 per cent in 2004. With regard to health care services, coverage of health insurance rose from only 16 per cent to 38 per cent of people in 1998-2004 period. Access to infrastructure, including public health, clean water, and electricity also improved quickly. For example, the percentage of households using electricity as the main source of lighting increased from 49 per cent in 1993 to 93 per cent in 2004. Ownership rates of radios, televisions, bicycles and motorbikes have all increased, confirming significant improvements in well-being.

5.4.2 Regional and provincial poverty

All regions of Vietnam are witnessing declines in their poverty rates, but with large variations. Table 5.2 (page 157) reveals that poverty incidence varies considerably across regions, and the speed of alleviation of poverty differs also. In general, mountainous areas are much poorer than the lowlands. Specifically, the Northern Uplands is the poorest, followed by the North Central Coast and the Central Highlands. In these regions, more than half the poor people moved out of poverty between 1993 and 2004. In contrast, in the Red River Delta and the Southeast, the two least poor regions, there has been a considerable slowdown. Therefore, the poverty gap between regions has been narrowing because of the combination of fast decline in poverty rate of poor regions and slower declines in that of the rich ones.
Provincial poverty rates have a similar story to regional poverty reduction. The poorest provinces in highland areas are doing considerably better, compared to the richer ones in the lowlands. However, there has been a marked gap in poverty rates between the richest and the poorest provinces in Vietnam. We further analyse provincial circumstances, the diversity of experience across poor communities, to understand why the poverty rate remains high in specific areas.

5.4.3 Causes of rural poverty

One of the challenges of working out good poverty reduction policies is to understand the nature, extent and location of rural poverty in Vietnam. This section, therefore, provides some ideas about possible reasons for rural poverty and what should be done about poverty reduction.

Rural people tend to work in the agricultural sector since there are usually limited non-farm employment opportunities in rural areas. Many poor income families depend on agricultural activities that pose high risks for the poor due to vulnerability to climatic conditions such as floods, droughts, storms and pest infestations. Table 5.4 (page 159) shows that 84 per cent of the poor worked in agriculture in 2002. From 1993 to 2002, there has been very a slight decrease in the share of the population engaged in agriculture.

Like many developing countries, the barriers that might prevent the rural poor from participating in the opportunities for poverty reduction include low level of education, poor access to credit and physical infrastructure, many children or few labourers and being landless. The Ministry of Labour, Invalids and Social Affairs (MOLISA) conducted small-scale surveys across the country to show the diversity of causes of rural poverty, as presented in Table 5.5 (page 159).

Given that rural poverty rates vary from one region to another, the main reasons for poverty seem to be similar. Table 5.5 (page 159) ranks the reasons for poverty across different regions in 2001. Of the eight reasons, shortage of capital is regarded as the main cause of poverty. Even in the economically developed regions of the South East and North Central Coast this is still the most serious challenge. Lack of knowledge ranked as the second most
important reason for poverty for the whole country. For regions like the Northern Uplands and North Central Coast, lack of knowledge is more important because these regions lag behind in the overall economic development of the country. In the Mekong River Delta, lack of land is more concern for poverty. Poverty reduction policies should take land regulations into account because peasants usually do not hesitate to sell off their land for income at present. About one third of poor households say that illness is the main cause of poverty in the Red River Delta and South Central Coast, whereas one in five (20.7 per cent) say a family with many children is a reason for poverty in the latter region. The remaining reasons, social evils and risks are also related to poverty at different levels in different regions. However, MOLISA’s survey does not mention whether less-developed infrastructure (roads, electricity, water, market and so on) would be a cause of poverty.

In addition to identifying the cause of poverty by listening to the poor directly, World Bank (2003) summarizes the main reasons for poverty through the regression of expenditure per capita on household characteristics, using data form 2002 VHLSS. In line with the MOLISA survey, the regression results show a strong relationship between education level and poverty. For example, a household whose head has primary education spends 27 per cent less than if the head has higher education, controlling for other variables. Family size is also strongly related to poverty indicating that many children and older family members tend to lower the level of expenditure per capita. In terms of community characteristics, having a rural road or a school increases the average expenditure of all the households in the community by around 5 per cent. Geographic region also matters in this respect. If all other characteristics are the same, the expenditure of households in the Mekong Delta, for instance, is 26 per cent higher than that of households in the Red River Delta. Thus the evidence suggests poverty is associated with geographical region and characteristics of community, for example roads and schools, as well as some household characteristics, such as education level, occupation and family size.

5.4.4 Foreign aid and poverty

Vietnam ranks as one of the largest receivers of foreign aid over the last two decades (see Chapter 2 for an overview of foreign aid in Vietnam). However, it is not clear how foreign aid contributes to the success of poverty alleviation in the country. Based on this poverty
analysis, a number of perspectives for examining the linkages between foreign aid and poverty reduction are discussed.

First, there is consensus that rapid economic growth accounts for an important part of poverty alleviation over the last decade; this is admitted in much research on Vietnam (World Bank 2003). Government expenditure also matters to poverty reduction (see Fan et al. 2004a; Larsen et al. 2004). Therefore, given its significant contribution to economic growth and government expenditure (see Chapters 3 and 4), foreign aid is expected to reduce poverty.

Second, given that the Vietnamese poor are the predominantly farmers living in rural areas, the impact of aid on agricultural growth and rural development should be considered in the context of poverty reduction. The fundamental reasons for poverty include shortage of land, inadequate non-farm employment and lack of knowledge. This suggests that the impacts of foreign aid on poverty should be elaborated through foreign aid’s influences on areas including education, non-farm employments and agricultural inputs.

Third, an essential requirement for attacking the poverty process is to remove and reduce the isolation of the poor regions. Therefore, foreign aid should concentrate on investment in both basic physical infrastructure (roads, communication facilities and information systems) and social infrastructure (illiteracy, primary education, health care services).

Finally, Van de Walle and Tarr (1998) emphasize that sources of vulnerability in Vietnam are wars, droughts, typhoons, crop pest infestations, severe food and economic recessions. Therefore, one role for foreign aid in poverty reduction is in the effectiveness of emergency relief aid for limiting the effects of these risks.

5.5 Modelling the impacts of aid on rural poverty reduction

5.5.1. Analytical framework

This section presents the modelling procedures used to examine the impacts of foreign aid on poverty reduction. As most Vietnamese poor are farmers living in rural areas, the methodology focuses on the impact of various sectoral aid programs on rural areas that can
be expected to make a significant contribution to poverty alleviation. The econometric model therefore is based on the reasons for poverty presented in section 5.4.3 and the contributions of aid to public investment. The former gives the assumption that the level of poverty declines with growth in agricultural production, rural wages and non-farm employment, controlling for other factors. The latter suggests that, like public investment, foreign aid reduces poverty through channels based on the impacts of aid on agricultural production, rural wages and non-farm employment.

Foreign aid may raise farmers’ incomes directly by increasing agriculture productivity, which in turn reduces the rural poverty rate. The indirect effects of improved agricultural productivity promote non-farm employment opportunities and rural wages, contributing to poverty reduction. Furthermore, foreign aid also directly increases rural wages and non-farm employment through improving physical infrastructure (roads, communication facilities and information system) and social infrastructure (illiteracy eradication, primary education, health care services). For example, improved road access and communication facilities help farmers to more easily find non-farm jobs or even set up small businesses such as food processing, transportation, trade and others services. Similarly, good education and health are fundamental conditions for getting different kinds of jobs, thereby improving farmers’ living standards. Building on these different effects of poverty reduction in rural areas, two steps are now proposed to estimate the effects of foreign aid on rural poverty in Vietnam.

First, the effects of different sectors of aid on public input variables including education, roads, water, electricity and telecommunication are estimated by using links between physical stocks of public input variables and foreign aid capital stock in money terms (see details in Section 5.5.3).

\[
\begin{align*}
EDU &= f_1(AID_{EDU}) \\
PHONE &= f_2(AID_{PHONE}) \\
ELE &= f_3(AID_{ELE})
\end{align*}
\]

Second, a simultaneous structural equations system is captured to estimate determinants of rural poverty as:

\( P = f_6 (LP, NFE, RWAGES, URBAN) \)

\( LP = f_7 (LAND, ANIMAL, EDU, PHONE, ELECT, ROAD, WATER, AAGR) \)

\( NFE = f_8 (EDU, PHONE, ELECT, ROAD, WATER, LP) \)

\( RWAGES = f_9 (EDU, PHONE, ELECT, ROAD, WATER, LP) \)

Where

- \( P \): Rural poverty headcount index
- \( LP \): Labour Productivity
- \( NFE \): Non-farm employment
- \( RWAGES \): Rural Wages
- \( LAND \): Land per agricultural worker
- \( URBAN \): Urbanization
- \( ANIMAL \): Draft animal per worker
- \( EDU \): Education level
- \( PHONE \): Number of telephones
- \( ELE \): Rural access to electricity
- \( ROAD \): Rural access to road
- \( WATER \): Rural access to water
- \( AAGR \): Monetary stock of foreign aid in agriculture (see Section 5.5.3)

Equation (5.6) models the direct determinants of rural poverty \( (P) \), which is defined as the percentage of the rural population living under the poverty line. Explanatory variables include agricultural labour productivity \( (LP) \), non-farm employment \( (NFE) \), rural wages \( (RWAGES) \) and urbanization \( (URBAN) \). The first three explanatory variables capture the level of poverty decline with growth in agricultural production, rural wages and non-farm employment. The last independent variable reflects the effects of rural to urban migration on rural poverty reduction, as suggested by Fan et al. (2004a).

Equation (5.7) models agricultural labour productivity, which is defined as the value of agricultural production per agricultural worker. Independent variables include important inputs of agricultural production functions such as land per agricultural worker \( (LAND) \), draft animal per worker \( (ANIMAL) \), and also the extent of public input variables including rural education levels \( (EDU) \), rural access to electricity \( (ELE) \), rural access to clean water \( (WATER) \), rural access to roads \( (ROAD) \) and number of telephones \( (TEL) \). Moreover, the
monetary stock of foreign aid in agriculture \((AAGR)\) is added directly to the equations to capture the impacts of agricultural aid on productivity of this sector.

Equation (5.8) and equation (5.9) are non-farm employment and rural wages determination functions, respectively. Rural wages and non-farm employment are determined by a set of public input variables including education, electricity, water, roads and telecommunications. Agricultural labour productivity is also included in both equations to capture the impacts of growth of agricultural productivity on non-farm employment and rural wages.

The spirit of the model of public investment and poverty is captured in a study of rural India (Fan et al. 2000) as well as the model of government spending and poverty in Vietnam (Fan et al. 2004a). However, this study is different from that of Fan et al. (2004a) in several ways. First, Fan et al. (2004a) capture general poverty\(^{24}\) in the model based on the suggestion that rural poverty accounts for more than 90 per cent of total poverty in Vietnam. The explicitly rural poverty is exploited as a dependent variable in this model. Second, they use agricultural production instead of agricultural labour productivity function, as done in this study. Therefore they assume that the effect of growth in labour productivity on poverty reduction is equivalent to that of growth in agricultural production. Third, Fan et al. (2004a) cannot capture the impacts on poverty of improved rural wages due to data unavailability\(^{25}\). Finally, in this study, different time intervals are used, which is in the period 1998 – 2004\(^{26}\) whereas they use data for the period 1993-2002.

### 5.5.2 Marginal impacts on poverty reduction

By totally differentiating equations (6) to (9), marginal impacts on rural poverty of aid in the agricultural sector and public services can be derived. These effects are not

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\(^{24}\) Poverty, the dependent variable, is defined as the percentage of population below the poverty line.

\(^{25}\) The Fan et al. model includes three equations of poverty, agricultural production and non-farm employment.

\(^{26}\) Poverty data from three rounds of VLSS 1998 and VHLSS 2002 and 2004 are used; data on foreign aid stock in monetary term are accumulated over the period 1993-2004 (see details in Section 5.6.1).
straightforward because all variables not only affect poverty via agricultural labour productivity but also via non-farm employment and rural wages.

For example, the impacts on poverty of foreign aid in the agricultural sector can be derived as:

$$\frac{dP}{dAAGR} = \left(\frac{\partial P}{\partial LP}\right)\left(\frac{\partial LP}{\partial AAGR}\right) + \left(\frac{\partial P}{\partial NFE}\right)\left(\frac{\partial NFE}{\partial LP}\right)\left(\frac{\partial LP}{\partial AAGR}\right) + \left(\frac{\partial P}{\partial RWAGE}\right)\left(\frac{\partial RWAGE}{\partial LP}\right)\left(\frac{\partial LP}{\partial AAGR}\right)$$  \hspace{1cm} (5.10)

The first term on the right-hand side of equation (5.10) is the direct poverty impact of agricultural labour productivity due to foreign aid in the agricultural sector. The remaining two terms measure the indirect poverty effect of aid in the agricultural sector through non-farm employment and rural wages due to aid-induced growth in agricultural labour productivity.

The impact on poverty of improved education level in rural areas can be derived as:

$$\frac{dP}{dEDU} = \left(\frac{\partial P}{\partial LP}\right)\left(\frac{\partial LP}{\partial EDU}\right) + \left(\frac{\partial P}{\partial NFE}\right)\left(\frac{\partial NFE}{\partial LP}\right)\left(\frac{\partial LP}{\partial EDU}\right) + \left(\frac{\partial P}{\partial RWAGE}\right)\left(\frac{\partial RWAGE}{\partial LP}\right)\left(\frac{\partial LP}{\partial EDU}\right) + \left(\frac{\partial P}{\partial NFE}\right)\left(\frac{\partial NFE}{\partial EDU}\right) + \left(\frac{\partial P}{\partial RWAGE}\right)\left(\frac{\partial RWAGE}{\partial EDU}\right)$$  \hspace{1cm} (5.11)

Similar to equation (10), the first three terms on the right-hand side are direct poverty reduction effects of increased labour productivity attributable to improved education level, and indirect effects of increased labour productivity from improving non-farm employment opportunities and rural wages. The last two terms capture the direct effect of greater non-farm employment opportunities and higher rural wages arising from improved rural education.

Similarly, the effects on rural poverty of other improved public inputs such as roads, telecommunication, electricity and water can also be derived.

5.5.3 Marginal returns to foreign aid investment

Using regression equations (5.1) to (5.5), marginal returns to foreign aid investment for different public services are derived: education, roads, water, electricity and
telecommunications. The general model captures the links between improved public inputs and monetary stocks of these inputs which are functions of past foreign aid investment, as suggested by Fan et al. (2004a).

\[ PUB_{i,t} = f(AID_{i,t}, C_{i,t}) \]

In this, the dependent variable measures physical stocks of public input variables \( i \) in year \( t \) (\( PUB_{i,t} \)), for example average years of schooling, access to roads, electricity, clean water in rural areas and the number of telephones per person. Independent variables include foreign aid stocks in monetary terms for sector \( i \) in year \( t \) (\( AID_{i,t} \)); year and regional dummies (\( C_{i,t} \)) controlling for other factors that may have been omitted from the model.

To measure annual foreign aid stocks in monetary terms, the perpetual inventory approach is used:

\[
(5.12) \quad K_t = I_t + (1 - \delta)K_{t-1}
\]

Where \( K_t \) is the foreign aid stock in year \( t \); \( I_t \) is gross foreign aid capital formation in year \( t \); and \( \delta \) is the depreciation rate. To obtain initial values for foreign aid stock \( (K_0) \), a similar procedure to Kohli (1982) is used:

\[
(5.13) \quad K_0 = \frac{I_0}{(\delta + r)}
\]

Equation (5.13) shows the initial value for foreign aid stock \( (K_0) \) in year 0 \( (I_0) \) divided by the sum of depreciation rate \( (\delta) \) and real interest rate \( (r) \). In the case of Vietnam, the same assumption as that of Fan et al. (2004a) is used, that depreciation rate \( (\delta) \) and real interest rate \( (r) \) are 5 per cent. Fan et al. (2004a) also confirm that the sensitivity analysis based on different depreciation rates and real interest rates would be negligible.

5.5.4 Marginal effect of foreign aid on poverty reduction

From the results of Sections 5.5.2 and 5.5.3, the marginal return is calculated in terms of poverty reduction of a different sector of foreign aid disbursements. Derivatives are used in the form:

\[
(5.14) \quad \frac{d(P)}{d(AID_i)} = \frac{d(P)}{d(PUB_i)} \times \frac{d(PUB_i)}{d(AID_i)}
\]
The first term on the right-hand side of equation (5.14) captures the impacts of public input variables on poverty estimated in Section 5.5.2. The second term measures the marginal effects of the defined sector of foreign aid on these public inputs and is also calculated based on the procedure in Section 5.5.3. In other words, equation (5.14) allows the ranking of the impacts of related sectors of foreign aid such as agriculture, education, water, roads, telecommunication and electricity on poverty reduction in rural areas.

5.6 Data sources and estimation method

5.6.1 Data sources and variables

Panel datasets at the provincial level for 1998, 2002 and 2004 are used in the model estimations. Most of the data were collected from the General Statistics Office of Vietnam (GSO), the Ministry of Agriculture and Rural Development (MARD), the Ministry of Planning and Investment (MPI) and some international organizations such as the World Bank (WB) and the Asian Development Bank (ADB) in Vietnam.

Data on poverty are provided by the GSO and the World Bank. The GSO computes the food and general poverty line, which is in accordance with international methods. The former is based on a consumption basket needed to secure 2100 calories per person per day and the latter takes food into account and some minimum non-food expenditure. Moreover, the GSO estimates poverty data based on national surveys with large samples. The GSO and World Bank conducted household surveys in 1992/93 and 1997/98, namely, the 1993 and 1998 VLSS. The GSO produced the survey in 2002 and 2004 with the sample increased to 45,000 households (namely VHLSS 2002 and 2004). Although several set of time point data produced to date, the VLSS and VHLSS are favoured among researchers because the data are high quality and more reliable. Like many other international household surveys, the VLSS and VHLSS provide sound information on demography, housing assets, ownership, wages and income and household access to public services such as electricity, clean water, roads and schools. Moreover, they are ideal for addressing the questions posed in this paper since these surveys are administered mainly in rural areas. Based on the 1998 VLSS and 2002, 2004 VHLSS, several variables are generated at provincial level:
To estimate the rural poverty headcount index, aggregate household expenditure and the poverty line developed by the GSO and World Bank are used. The former includes expenditure on rice, non-rice, non-food expenditure, tobacco, durable goods, education, health, garbage, electricity, water and imputed house rent. To compare household welfare across surveys, different inflators are also applied by regions and by time, to inflate aggregate household expenditure. The poverty line is calculated by the World Bank at 1,789,871 dong for 1998, 1,917,459 dong for 2002 and 2,077,000 dong for 2004. Any rural individual whose annual aggregate expenditure is less than the poverty line is counted as being rural poor.

The education variable: Average number of years of schooling achieved by household members in rural areas is used as the education variable.

The rural wages variable: This is based on information on income and sources of income earned by household members over a period of 12 months. Mean rural wages are tabulated by province, expressed in thousands of Vietnam dong per annum.

The employment variable: Employment statuses as well as the code for industry and occupation are available in surveys. Total labour force and percentage of non-farm employment are estimated in total employment in rural areas.

The electricity variable: The percentage of rural households that have electricity connection (main source of lighting is electricity) is defined as the electricity variable.

The water variable: The percentage of rural households that have a clean water connection is used as the water variable.

The roads variable: The percentage of rural households that can access roads is used as the roads variable.

Other variables are taken and aggregated from the MARD and Social-economic Statistical Data of 61 Provinces and Cities in Vietnam (GSO), including:
The agricultural labour productivity variable: Agricultural labour productivity is measured as gross agricultural output value per agricultural worker, expressed in constant 1994 prices.

The land variable: The land input is measured as total agricultural land used in agricultural production per farm worker.

The animals variable: The animal input is measured as total number of draft animals, mainly water buffalos in Vietnam, expressed as a number per farm worker.

The urbanization variable: The share of urban population in the total population is captured as the urbanization level of each province.

The telephone variable: The number of telephone connections is taken as the telephone variable. This variable is used to proxy for development of telecommunications.

The foreign aid variables: These are taken from the website DAD Vietnam that consists of the series on annual net disbursement of ODA. As mentioned in introduction section, changes in poverty statistics over the period 1998 – 2004 are analysed. Therefore, it is reasonable to expect that foreign aid stocks in monetary terms should be accumulated over a longer period, from 1993 to 2004. Foreign aid disbursement in 1993 is regarded as an initial value for foreign capital stock since in that year Vietnam embarked on a new era in ODA with large signed commitments. Six sectors of aid are used in the model: agriculture, education, water, telecommunication, roads and electricity. Note that a network effect is an important characteristic of investment in infrastructure, particularly in the energy sector (Larsen et al. 2004). For example, an electric power station is located in a province, however its impacts are related to increased electricity connection elsewhere in the country. In the energy sector, when a foreign aid project targets more than one province, DAD data assume equal distribution of project disbursements among the provinces targeted.
5.6.2 Model estimation

In addition to the simultaneous structural equations system used to estimate the determinants of rural poverty, double-log functional forms are also used for all equations in order to estimate the elasticity of the dependent variables with respect to their independent variables in each equation. This approach is adopted in the studies of Fan et al. (2004, 2005) of government expenditure and poverty across China, Uganda, Thailand and Vietnam.

The discussion on the reasons for poverty in Section 5.4 suggests that policy reforms and geographical conditions make great contributions to economic growth and poverty in rural areas. Therefore, regional dummies are added to all equations to capture the fixed effects of regional differences in geographical conditions as well as socio-economic factors. Year dummies are also used in all equations to control for year-specific policy reforms in Vietnam. The model is estimated for three time points 1998, 2002 and 2004.

5.7 Regression analysis

5.7.1 Estimates of the equations system

Table 5.6 (page 160) presents the estimated coefficients of the simultaneous equations system. Since the double-log functional form is used for all equations, the estimated coefficients are elasticities in their respective equations.

The estimated poverty equation (equation 1- Table 4, page 160) indicates that improvements in agricultural productivity, higher rural wages and growth in non-farm employment have contributed significantly to poverty reduction. Growth in agricultural productivity is explained by the fact that Vietnam’s food production increased from 19.5 million tons in 1991 to 21.7 million tons in 1998, 32.1 in 2001 and 39.5 million tons in 2005 (Vietnam Academy of Social Sciences 2007). Such a rate of growth in food production is essential to reduce poverty and especially reduce food poverty over this period. Increasing non-farm employment opportunities and higher rural wages are also important factors in improving incomes of rural people. Vu et al. (2006) using VHLSS 2004 data confirm that a shift in the employment of household head from agriculture to a
non-agricultural sector reduces the probability of the household falling into poverty. Moreover, the percentage of the population that has wage employment rising by 19 per cent in 1998 to 31 per cent in 2004 appears to be a way to increase wellbeing and further reduce poverty.

In terms of the marginal effects on poverty, non-farm employment and rural wages have the same elasticities of roughly 0.4, indicating that for every one per cent increase in non-farm employment or rural wages, 0.4 per cent of rural poor will be lifted above the poverty line. For the effects of agricultural productivity, equation 1 shows that rural poverty reduced by 0.13 per cent for a one per cent increase in agricultural productivity. However, the impact of agricultural productivity is also realized through growth in non-farm employment and rural wages indicated in equations (2) and (3). Therefore, if considering both indirect and direct effects of agricultural productivity on poverty, their impacts are double. Up to 0.25 per cent of rural poor will be lifted above the poverty line for a one per cent increase in agricultural productivity.

The urbanization variable is statistically significant at 10 per cent, reflecting that rural to urban migration is important in rural poverty reduction. This is consistent with a survey by Nguyen (2005) in the poor provinces of Thanh Hoa and Nghe An. In this survey, 85 per cent of respondents said that there had been a lot of people in their village who worked always from home, and 36 per cent of them confirmed that migration had supported a rise the income of their household.

The estimated agricultural labor productivity, equation 2, suggests that agricultural land, foreign aid in agriculture, education, access to clean water and electricity are important determinants of the production function. The land variable is the most significant in the equation, indicating that land allocation contributed significantly to agricultural production. Ravallion and Van de Walle (2006) provide evidence that land allocation in Vietnam has become more efficient since the 1993 Land Law. Specifically, under the Land Law, Land Use Rights can now be legally transferred, exchanged, mortgaged and inherited. These new land arrangements have had a positive effect on land allocation in Vietnam. Except for the dummy variables, the education variable is also positively significant and is the largest. The agricultural foreign aid variable is positive and significant at the 5 per cent level, indicating
a high correlation of aid flow in the agricultural sector and growth of agricultural production. It is worth noting that this variable is measured at annual capital stock in money terms from 1993 to 2004, based on the procedures set out in Section 5.5.3.

The rest of the variables in equation 2 refer to effects of infrastructure inputs on agricultural production including access to clean water and electricity, telephones and roads. The two former are statistically significant and therefore contribute to growth in agriculture. In contrast, the two latter are not statistically significant. In terms of regional dummy variables, all dummies are negative and significant, implying that location matters to agricultural productivity and the South East region (the referent region) has the highest productivity. More interesting, the South East region also has the lowest incidence of poverty. This confirms that higher agricultural productivity is positively associated with poverty reduction.

The estimates for equations 3 and 4 present important determinants of non-farm employment and rural wages, respectively. The two equations capture the same independent variables. Similar to equation 1, the education variables have positive signs, are statistically significant and are the largest for both equations 3 and 4. Agricultural labour productivity has a positive impact on non-farm employment and rural wages, highlighting that the poverty alleviation impacts of higher agricultural productivity are direct as well as indirect through non-farm employment and rural wages. In addition, infrastructure variables have all contributed to the improved non-farm employment opportunities, as evidenced by the significant coefficient of all these variables in equation 3. However, the linkages of access to rural water and electricity on rural wages are insignificant in equation 4. In other words, estimates for equation 4 show that rural wages are determined by education level, agricultural productivity and likelihood of access to rural roads and telephones.

5.7.2 Elasticities and marginal returns of agricultural production and poverty reduction at the national level

Table 5.7 (page 161) presents estimates of the linkages between defined foreign aid in monetary stocks and various types of public input variables such as rural education, access
to rural roads, clean water, electricity and telephones. A double-log form is used for all regressions. Except for electricity, all coefficients are statistically significant, showing that foreign aid in these sectors has contributed to development of the education level, the number of telephones and access to roads and clean water. Although the sign of its coefficient is positive, that the impacts of aid in the electricity variable are insignificant is not surprising. As indicated in Sector 5.6.1, there are limited provincial level impacts of aid on electricity due to its considerable network effects. Most of its impacts seem to be experienced elsewhere in the country. Note that aid to electricity is assigned to large national projects and distributed unequally across provinces.

Significant coefficients in Table 5.7 (page 161) are used to calculate the total effect of foreign aid on poverty reduction. Two impact measures are presented in Table 5.8 (page 161). First, the elasticity of aid is calculated in each sector, measuring the percentage change in agricultural productivity and poverty reduction corresponding to a 1 per cent change in foreign aid in that sector. Since all equations use the double-log form, the elasticities can be obtained directly from coefficients in the system equations (Table 5.6) and foreign aid investment estimation (Table 5.7). Columns 8.2 and 8.3 (Table 5.8) present total elasticities for each foreign aid sector decomposed into their various direct and indirect components in Diagrams 5.1 to 5.4 (Appendix 5.1, page 153-156). Diagram 5.2 (page 154), for example, shows that elasticity of agricultural production with respect to foreign aid on education is calculated by multiplying the coefficient of aid in monetary stocks estimation by the education variable in the equation of agricultural productivities. Similarly, the elasticity of poverty reduction corresponding to foreign aid on education is obtained by the sum of the effects of aid to education on non-farm employment, agricultural productivity and rural wages.

The second measure is to derive the marginal returns to different sectors of aid in terms of growth in agricultural output and poverty reduction. The marginal returns are calculated by multiplying the elasticities by the ratio of the number of poor or agricultural output to the

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27 The derivatives used are of the following form: \[ \frac{d(LP)}{d(AID_{Edu})} = \frac{d(Edu)}{d(AID_{Edu})} \times \frac{d(LP)}{d(Edu)} = 0.0145 \times 0.74 = 0.108 \]
relevant capital stocks of the foreign aid sector in 2004\textsuperscript{28}. Column 8.4 presents the marginal returns in agricultural production, measured in Vietnam dong (VND) of additional output per additional VND of foreign aid investment. Column 8.5 shows the number of poor people who would be raised above the poverty line for each 1 billion Vietnam dong of additional foreign aid in different sectors. Such measures provide useful information for comparing the relative benefits of additional investment in foreign aid in different sectors.

In Table 5.8 (page 161), the impacts of telephones are not calculated since this can be considered as a private good. The telephone variable is used to control for the model since it has a strong and statistically significant impact in all equations of the system. Table 5.8 shows that all four sectors of foreign aid reduced poverty and increased agricultural production at the same time.

Not surprisingly, foreign aid to agriculture produces the most favourable marginal returns in agricultural production. Its elasticity shows that for every one per cent increase in aid to agriculture, agricultural productivity will increase by 0.04 per cent. Marginal returns of this sector indicate that 1.63 VND of agricultural production would be produced for an additional 1 VND of foreign aid invested in agriculture. Foreign aid in education ranks as the second largest return. For every 1 VND invested, agricultural production increases by 1.26 dong. Water has the smallest impact in both marginal returns and elasticity, with a benefit-cost ratio of only 0.11 VND. In Vietnam, investment in water has always received a substantial government subsidy.

In terms of the poverty reduction effect, foreign aid to education has the largest effect on poverty in both marginal returns and elasticity. Based on an elasticity of 0.011, for every billion dong invested in this sector, 164 people are lifted out of poverty. The poverty reduction effect of agricultural aid ranks second. An additional 1 billion VND invested in

\textsuperscript{28} Using the expression of marginal production of a Cobb-Douglas, marginal returns measured as elasticity*output/input. For example, marginal returns to aid to agriculture is calculated = E_{A}* (Y/AAGR), where E_{A} is labour productivity elasticity of aid to agriculture; Y is total agricultural production value (given unchanged labour quantity); AAGR is capital stock of foreign aid to agriculture.

Similarly, marginal return of aid to agriculture on poverty calculated as: E_{P}* (P/AAGR), where E_{P} is poverty reduction elasticity of aid to agriculture; P is number of rural poor in year 2004.
agriculture would raise 52 people above the poverty line. For the two infrastructure variables, access to rural roads and clean water, the number of poor is reduced by 17 and 11 for every billion VND invested in improving rural roads and water supply, respectively.

Moreover, using decomposition of the impacts derived in all equation systems allows the evaluation of channels in which different sectors of aid impact on poverty alleviation. Among total effects of foreign aid in education on rural poverty, for example, the productivity effect accounts for 25 per cent; improved non-farm employment opportunities account for 40 per cent and increases in rural wage account for the remaining 35 per cent (Diagram 5.2, page 154). Of the total poverty reduction effects of foreign aid to water access, 30 per cent arises from increasing productivity, whereas the remainder comes from improved non-farm employment (Diagram 5.4, page 156).

Foreign aid to education has by far the greatest effect on reducing the number of poor since it reduces poverty through multiple channels, as indicated. Vietnam’s education sector has received a high and increasing share of public spending, from 14 per cent in 1994 to 18 per cent of the total budget in 2005. Moreover, spending on primary and lower secondary education receives 53 per cent of total education expenditure and comes mainly from foreign aid. An investment in basic education\(^{29}\) is targeted specifically at the poor since in that education level poorer households receive a larger share of the subsidy than richer households (World Bank 2005).

Foreign aid to rural roads exhibits the smallest marginal returns, although this affects poverty reduction through both promoting non-farm employment opportunities and increasing rural wages (Diagram 5.3, page 155). This may be because foreign aid in Vietnam has already been invested heavily in roads and therefore the marginal returns from additional disbursements are now low\(^{30}\). Larsen et al. (2004) estimate that roughly 70 per

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\(^{29}\) Basic education includes primary, lower secondary and upper secondary school.

\(^{30}\) Marginal returns = \(E^* \frac{P}{RoadA}\), where \(E\) is poverty reduction elasticity; \(P\) is total number of poor; \(RoadA\) is capital stock of foreign aid in road. Therefore, the bigger \(RoadA\) is, the smaller its marginal returns will become.
cent of government spending in infrastructure comes from foreign aid. Therefore, about 4,575 km of national roads and 65,000 km local roads have been added over the period 2001-05.

5.7.3 Marginal returns of agricultural production and poverty reduction at the regional level

Table 5.9 (page 162) reveals wide regional variations in the marginal returns to foreign aid in both agricultural productivity and poverty reduction. In terms of agricultural productivity effects, all sectoral aid considered has high returns in the South East region. This is consistent with the high growth rate of the South East region. Household data surveys in Vietnam show that per capita expenditure of the South East grew by as much as 133 per cent, which is nearly double the national average over the period 1993-2004. However, the largest impact of marginal returns from the education sector occurs in the Central Highlands, perhaps due to the low level of education in this area.

With regards to poverty reduction effects, the education sector appears to have a larger impact in poorer regions. The Central Highlands, the Northern Central Coast, and the Northern Uplands, with poverty incidences over 30 per cent, show the highest poverty reduction. The respective number of poor reduced were 447, 190 and 293 for every billion VND invested in education. For the agriculture sector, the South East, the Red River Delta and the South Central Coast exhibit the largest impact on poverty reduction. The South East and South Central Coast also achieved the highest agricultural production returns, suggesting the importance of the role of agricultural production in poverty alleviation. For access to rural roads and clean water, the Northern Central Coast ranks these as having the largest impact on poverty reduction. For a billion VND of foreign aid invested in these two sectors, the numbers of people escaping from poverty are 71 and 64, respectively.

In general, if disbursement of foreign aid is equal among the four sectors of aid considered, poorer regions will receive higher poverty reduction returns for every billion VND of foreign aid invested in all sectors. This is consistent with the Collier and Dollar (2004) finding that there are diminishing returns to foreign aid for poverty reduction. The policy implications of Table 5.9 are clear. The Vietnamese government should allocate foreign aid
to education in the poor regions and to agriculture in the remaining regions in order to achieve greater poverty reduction.

5.8 Conclusions and policy implications

This chapter has tackled one of the most important questions in Vietnamese economic development, whether foreign aid can reduce rural poverty rate and which sectors of aid play a significant role in poverty alleviation. Moreover, how aid attacks poverty through higher agriculture production, increased rural wages and improved non-farm employment opportunities is examined, using provincial data for the period 1998-2004.

The models are generally drawn from the broad foreign aid growth literature on aid and economic growth, aid and government expenditure and the direct effects of aid on poverty reduction. This study develops a simultaneous equations model to estimate the effects of foreign aid in various sectors on rural poverty in Vietnam through several channels. The double-log form has been used for all equations in this system in order to calculate elasticities and marginal returns of agricultural production and rural poverty at both national and regional levels, with respect to defined foreign aid. Several significant results have emerged.

First, most foreign aid to agriculture, education, roads and water has contributed to agricultural productivity growth and reduced rural poverty. However, their effects on productivity and poverty differ considerably across regions in terms of both elasticities and marginal returns. The effects of telecommunication and energy are also captured in the simultaneous equations model, but their elasticities and marginal returns could not be calculated because the former is regarded as private goods whereas the latter shows that network effects of aid in energy induces insignificant coefficients of aid in this sector in the model.

Second, for the country as a whole, foreign aid to education has the largest impact on rural poverty alleviation in terms of both elasticity and marginal returns, although it ranks second in marginal returns, behind agricultural production. For every billion VND of foreign aid
invested in education, about 160 people are brought out of poverty, three times as many as for agricultural foreign aid investment, which had the second largest effect in poverty reduction. The largest poverty reduction effect is explained by the simultaneous contributions of aid in education to higher agricultural productivity, improved non-farm employment opportunities and increased rural wages. Foreign aid to agriculture improved agricultural productivity substantially and showing a trickle-down benefit for poverty. Foreign aid to roads and water ranked third and fourth in terms of both elasticities and marginal returns, respectively. Low marginal returns with respect to aid to roads reflect the fact that investment in transportation in Vietnam depended heavily on foreign aid in the study period.

Finally, in terms of the regional level, there are also sizable differences in elasticities and marginal returns to rural poverty reduction across sectors for the investment of foreign aid. However, if disbursement of foreign aid is equal among the four sectors of aid considered, additional investment in the Central Highlands, North Central Coast and Northern Uplands contributes substantially to eliminating poverty because most of Vietnam’s poor reside in these regions. The poverty-reduction effects of foreign aid to education are particularly high in these areas. Nonetheless, foreign aid to agriculture has had significant effects on agricultural productivity and rural poverty reduction in the South East and South Central Coast.

These findings have potentially important policy implications for future mobilization and allocation of foreign aid priorities in Vietnam. It is clear that maximizing the benefit of foreign aid in terms of poverty reduction requires determining which sectors of aid need to be mobilized and how aid should be allocated across regions. The results presented here suggest that foreign aid to education, agriculture and rural infrastructure achieves a high rate of agricultural productivity and of poverty reduction. However, the government should mobilize more aid investment to agriculture and education. Although currently foreign aid investment in education and agriculture is relatively high, our results show that they have the largest poverty reduction effect per unit of investment. Note that improved education not only helps farmers to use new technology to promote agricultural productivity, but it also improves their skills for non-farm jobs, thereby increasing rural wages.
In terms of regional investment priorities, it seems that more foreign aid investment in education in the poor regions, of the Central Highlands, North Central Coast and Northern Uplands, can achieve greater poverty reduction. Foreign aid investment in agriculture should be targeted to the remaining regions that maximize agricultural productivity, thereby reducing the poverty rates in these areas. Finally, the diminishing returns of poverty-efficient aid suggest that the government give priority aid to the poor areas.
Appendix 5.1

Diagram 5.1 Effects on poverty of foreign aid to the agriculture sector

The elasticity of poverty reduction with respect to foreign aid to agriculture:

\[
dP / dAAGR = \left( \frac{\partial P}{\partial LP} \right) \left( \frac{\partial LP}{\partial AAGR} \right)
+ \left( \frac{\partial P}{\partial NFE} \right) \left( \frac{\partial NFE}{\partial LP} \right) \left( \frac{\partial LP}{\partial AAGR} \right)
+ \left( \frac{\partial P}{\partial WAGE} \right) \left( \frac{\partial WAGE}{\partial LP} \right) \left( \frac{\partial LP}{\partial AAGR} \right)
= -0.0099
\]
Diagram 5.2 Effects on poverty of foreign aid to the education sector

The elasticity of poverty reduction with respect to foreign aid to education:

\[
\frac{dP}{dAEDU} = \frac{dP}{dEDU} \cdot \frac{dEDU}{dAEDU} = \frac{dEDU}{dAEDU} \cdot \left\{ \left( \frac{\partial P}{\partial LP} \frac{\partial LP}{\partial EDU} \right) + \left( \frac{\partial P}{\partial NFE} \frac{\partial NFE}{\partial LP} \frac{\partial LP}{\partial EDU} \right) + \left( \frac{\partial P}{\partial RWAGE} \frac{\partial RWAGE}{\partial LP} \frac{\partial LP}{\partial EDU} \right) + \left( \frac{\partial P}{\partial NFE} \frac{\partial NFE}{\partial EDU} \right) + \left( \frac{\partial P}{\partial RWAGE} \frac{\partial RWAGE}{\partial EDU} \right) \right\} = -0.011
\]
Diagram 5.3 **Effects on poverty of foreign aid to the roads sector**

The elasticity of poverty reduction with respect to foreign aid for roads:

\[
\frac{dP}{dA_{ROAD}} = \frac{dP}{dROAD} \cdot \frac{dROAD}{dA_{ROAD}} \\
= \frac{dROAD}{dA_{ROAD}} \cdot \left[\left(\frac{\partial P}{\partial NFE} \cdot \frac{\partial NFE}{\partial ROAD}\right) + \left(\frac{\partial P}{\partial RWAGE} \cdot \frac{\partial RWAGE}{\partial ROAD}\right)\right] \\
= -0.0089
\]

The diagram illustrates the relationships and impacts as follows:

- **Aid to roads**
  - 0.273
  - **Percentage of households with access to rural road**
    - 0.050
    - **Non-farm Employment**
      - -0.434
    - **Agriculture Productivity**
      - -0.133
    - **Rural Wages**
      - -0.395

**RURAL POVERTY**
Diagram 5.4 Effects on poverty of foreign aid to the water sector

The elasticity of poverty reduction with respect to Foreign aid to water:

\[
\frac{dP}{dAWATE} = \frac{dP}{dWATE} \times \frac{dWATE}{dAWATE} \\
= \frac{dWATE}{dAWATE} \times \left\{ \frac{\partial P}{\partial LP} \frac{\partial LP}{dWATE} \right\} \\
+ \left\{ \frac{\partial P}{\partial NFE} \frac{\partial NFE}{\partial LP} \frac{\partial LP}{dWATE} \right\} \\
+ \left\{ \frac{\partial P}{\partial RWAGE} \frac{\partial RWAGE}{\partial LP} \frac{\partial LP}{dWATE} \right\} \\
+ \left\{ \frac{\partial P}{\partial NFE} \frac{\partial NFE}{\partial WATE} \right\} \\
= -0.0044
\]
### Table 5.1 Poverty rate, 1993-2006

<table>
<thead>
<tr>
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<td>37.4</td>
<td>28.9</td>
<td>19.5</td>
<td>16.0</td>
</tr>
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<td>9.2</td>
<td>6.6</td>
<td>3.6</td>
<td>3.9</td>
</tr>
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<td>45.5</td>
<td>35.6</td>
<td>25.0</td>
<td>20.4</td>
</tr>
<tr>
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<td>15.0</td>
<td>10.9</td>
<td>7.4</td>
<td>6.7</td>
</tr>
<tr>
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<td>7.9</td>
<td>2.5</td>
<td>1.9</td>
<td>0.8</td>
<td>1.2</td>
</tr>
<tr>
<td>Rural</td>
<td>29.1</td>
<td>18.6</td>
<td>13.6</td>
<td>9.7</td>
<td>8.7</td>
</tr>
<tr>
<td><strong>Poverty gap (%)</strong></td>
<td>18.5</td>
<td>9.5</td>
<td>6.9</td>
<td>4.7</td>
<td>3.8</td>
</tr>
<tr>
<td>Urban</td>
<td>6.4</td>
<td>1.7</td>
<td>1.3</td>
<td>0.7</td>
<td>3.2</td>
</tr>
<tr>
<td>Rural</td>
<td>21.5</td>
<td>11.8</td>
<td>8.7</td>
<td>6.1</td>
<td>4.9</td>
</tr>
</tbody>
</table>


### Table 5.2 Regional poverty rates (headcount index in %), 1993-2006

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Red River Delta</td>
<td>62.7</td>
<td>29.3</td>
<td>22.4</td>
<td>12.1</td>
<td>8.8</td>
</tr>
<tr>
<td>Northern Uplands</td>
<td>81.5</td>
<td>64.2</td>
<td>43.9</td>
<td>35.4</td>
<td>30.2</td>
</tr>
<tr>
<td>North Central Coast</td>
<td>74.5</td>
<td>48.1</td>
<td>43.9</td>
<td>31.9</td>
<td>29.1</td>
</tr>
<tr>
<td>South Central Coast</td>
<td>47.2</td>
<td>34.5</td>
<td>25.2</td>
<td>19.0</td>
<td>12.6</td>
</tr>
<tr>
<td>Central Highlands</td>
<td>70.0</td>
<td>52.4</td>
<td>51.8</td>
<td>33.1</td>
<td>28.6</td>
</tr>
<tr>
<td>South East</td>
<td>37.0</td>
<td>12.2</td>
<td>10.6</td>
<td>5.4</td>
<td>5.8</td>
</tr>
<tr>
<td>Mekong River Delta</td>
<td>47.1</td>
<td>36.9</td>
<td>23.4</td>
<td>15.9</td>
<td>10.3</td>
</tr>
</tbody>
</table>

Table 5.3 Social indicators 1993-2004

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary Enrolment Rate</td>
<td>87</td>
<td>91</td>
<td>90</td>
<td>95</td>
</tr>
<tr>
<td>Lower Secondary Enrolment Rate</td>
<td>30</td>
<td>62</td>
<td>72</td>
<td>90</td>
</tr>
<tr>
<td>Lower Secondary Enrolment Rate</td>
<td>7</td>
<td>29</td>
<td>42</td>
<td>63</td>
</tr>
<tr>
<td><strong>Health</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health insurance and free health care card</td>
<td>n/a</td>
<td>16</td>
<td>n/a</td>
<td>38</td>
</tr>
<tr>
<td><strong>Access to Infrastructure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% rural population with public health within the centre</td>
<td>93</td>
<td>97</td>
<td>99</td>
<td>100</td>
</tr>
<tr>
<td>% of population with access to clean water</td>
<td>26</td>
<td>41</td>
<td>49</td>
<td>59</td>
</tr>
<tr>
<td>% of population using electricity as a main source of lighting</td>
<td>49</td>
<td>78</td>
<td>87</td>
<td>93</td>
</tr>
<tr>
<td><strong>Ownership rates of consumer durables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% households owning a radio</td>
<td>40</td>
<td>47</td>
<td>26</td>
<td>19</td>
</tr>
<tr>
<td>% households owning a TV</td>
<td>22</td>
<td>56</td>
<td>68</td>
<td>78</td>
</tr>
<tr>
<td>% households owning a bicycle</td>
<td>65</td>
<td>73</td>
<td>69</td>
<td>70</td>
</tr>
<tr>
<td>% households owning a telephone</td>
<td>n/a</td>
<td>7</td>
<td>13</td>
<td>21</td>
</tr>
<tr>
<td>% households owning a motorbike</td>
<td>11</td>
<td>20</td>
<td>40</td>
<td>45</td>
</tr>
</tbody>
</table>

Table 5.4 Poverty by occupation for people who have a job the past 12 months

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, forestry and fishery</td>
<td>66.1</td>
<td>44.4</td>
<td>38.9</td>
<td>85.7</td>
<td>84.3</td>
<td>84.0</td>
<td>73.9</td>
<td>67.1</td>
<td>58.7</td>
</tr>
<tr>
<td>Mining, manufacturing and construction</td>
<td>37.8</td>
<td>20.9</td>
<td>15.3</td>
<td>7.4</td>
<td>8.0</td>
<td>8.5</td>
<td>11.1</td>
<td>12.8</td>
<td>17.0</td>
</tr>
<tr>
<td>Services</td>
<td>28.1</td>
<td>12.7</td>
<td>9.9</td>
<td>5.7</td>
<td>6.4</td>
<td>6.4</td>
<td>11.6</td>
<td>15.5</td>
<td>18.6</td>
</tr>
<tr>
<td>Others</td>
<td>20.8</td>
<td>9.1</td>
<td>4.9</td>
<td>1.2</td>
<td>1.3</td>
<td>1.1</td>
<td>3.4</td>
<td>4.7</td>
<td>5.7</td>
</tr>
<tr>
<td>Total</td>
<td>57.0</td>
<td>34.8</td>
<td>27.6</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Central Institute for Economic Management (cited in Fan et al. 2004a).

Table 5.5 Causes of rural poverty in Vietnam in 2001 (percentage of poor household saying major cause)

<table>
<thead>
<tr>
<th>Area</th>
<th>Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lack of</td>
</tr>
<tr>
<td></td>
<td>capital</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>The whole country</td>
<td>63.69</td>
</tr>
<tr>
<td></td>
<td>7.30</td>
</tr>
<tr>
<td>Red River Delta</td>
<td>54.96</td>
</tr>
<tr>
<td>Northern Uplands</td>
<td>57.88</td>
</tr>
<tr>
<td>North Central Coast</td>
<td>80.45</td>
</tr>
<tr>
<td>South Central Coast</td>
<td>50.84</td>
</tr>
<tr>
<td>Central Highlands</td>
<td>65.95</td>
</tr>
<tr>
<td>South East</td>
<td>79.92</td>
</tr>
<tr>
<td>Mekong River Delta</td>
<td>48.44</td>
</tr>
</tbody>
</table>

Source: Data on poverty in 2001 (Hoa 2002; Hai 2004).
Table 5.6 Estimates of system equations

(1) Poverty equation:
\[ P = -0.133L_P - 0.434NFE - 0.395WAG + 0.104URBAN \]
\[ (-1.91)^* (-6.17)^* (-3.37)^* (-1.74)^* \]
\[ -0.14DV1 + 0.20DV2 + 0.29DV3 + 0.23DV4 + 0.20DV5 - 0.60DV6 - 0.04T1 + 0.29T2 \]
\[ (-1.29) (0.16) (2.18)^* (1.42) (1.35) (-4.88)^* (-0.38) (3.78)^* \] \[ R^2 = 0.74 \]

(2) Agricultural labor productivity function:
\[ L_P = 0.56LAND + 0.05ANIMAL + 0.04AGRODA + 0.74EDU + 0.043PHONE + 0.050WATER - 0.02ROAD + 0.22ELE \]
\[ (9.06)^* (1.12) (1.99)^* (3.23)^* (0.96) (1.72)^* (-0.90) (2.49)^* \]
\[ -0.51DV1 - 0.95DV2 - 0.95DV3 - 0.95DV4 - 0.47DV5 - 0.71DV6 - 0.07T1 + 0.20T2 \]
\[ (-3.04)^* (-5.35)^* (-4.91)^* (-4.90)^* (-2.47)^* (-4.62)^* (-0.57) (2.58)^* \] \[ R^2 = 0.76 \]

(3) Rural non-farm employment equation:
\[ NFE = 0.174L_P + 0.698EDU + 0.210PHONE + 0.066WATER + 0.050ROAD + 0.195ELE \]
\[ (2.39)^* (2.62)^* (4.36)^* (1.95)^* (1.92)^* (1.92)^* \]
\[ -0.33DV1 - 0.51DV2 + 0.074DV3 + 0.32DV4 - 0.58DV5 + 0.17DV6 - 0.08T1 + 0.09T2 \]
\[ (-0.23) (-3.45)^* (0.47) (1.85)^* (-4.19)^* (1.39) (-0.67) (1.09) \] \[ R^2 = 0.74 \]

(4) Rural wages equation:
\[ WAGE = 0.095L_P + 0.685EDU + 0.094PHONE - 0.013WATER + 0.027ROAD - 0.038ELE \]
\[ (2.13)^* (4.19)^* (3.17)^* (-0.63) (1.68)^* (-0.61) \]
\[ -0.15DV1 + 0.056DV2 - 0.098DV3 + 0.23DV4 - 0.20DV5 + 0.27DV6 - 0.56T1 + 0.045T2 \]
\[ (-1.70)^* (0.62) (-1.01) (2.16)^* (-2.28)^* (3.41)^* (-7.07)^* (0.83) \] \[ R^2 = 0.75 \]

Note: The method of the system estimators is seemingly unrelated regressions (SUR). The numbers in parentheses are z test value and * indicates that coefficients are statistically significant at the 5% level. DV1 is dummy variable for the North Uplands; DV2 for the Red River Delta; DV3 for the North Central Coast; DV4 South Central Coast; DV5 for Central Highlands; DV6 for Mekong River Delta. The Southeast is the base region. T1 is dummy for 1998; T2 for 2002 and 2004 is base year.
Table 5.7 Estimated foreign aid investment equations

<table>
<thead>
<tr>
<th>Sector</th>
<th>Equation</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>( Edu = 0.0145 \text{Aid}_{Edu} )</td>
<td>0.57</td>
</tr>
<tr>
<td>Roads</td>
<td>( \text{Roa}ds = 0.273 \text{Aid}_{Road} )</td>
<td>0.26</td>
</tr>
<tr>
<td>Water</td>
<td>( \text{Water} = 0.107 \text{Aid}_{Water} )</td>
<td>0.28</td>
</tr>
<tr>
<td>Electricity</td>
<td>( \text{Elect} = 0.132 \text{Aid}_{Electric} )</td>
<td>0.28</td>
</tr>
<tr>
<td>Phone</td>
<td>( \text{Phone} = 0.358 \text{Aid}_{Phone} )</td>
<td>0.77</td>
</tr>
</tbody>
</table>

**Note:** Dependent variables are rural education, access to rural roads, clean water, electricity and telephones. Each variable measure is described in section 5.1. Independent variables are foreign aid measured in monetary terms using equation 13. Region and year dummies are not presented in the table.

Table 5.8 Impact on poverty and agricultural productivity of additional foreign aid

<table>
<thead>
<tr>
<th>Foreign aid Sectors</th>
<th>Elasticiies</th>
<th>Marginal returns in agriculture production (VND / VND)</th>
<th>Number of poor reduced /VND billion Aid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sector</td>
<td>Poverty</td>
<td>Agriculture productivity</td>
<td>(8.2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>-0.0099</td>
<td>0.0400</td>
<td>1.63</td>
</tr>
<tr>
<td>Education</td>
<td>-0.0110</td>
<td>0.0108</td>
<td>1.26</td>
</tr>
<tr>
<td>Roads</td>
<td>-0.0089</td>
<td>NS (NS)</td>
<td>NS</td>
</tr>
<tr>
<td>Water</td>
<td>-0.0044</td>
<td>0.0054</td>
<td>0.108</td>
</tr>
</tbody>
</table>

**Note:** Marginal returns are calculated for 2004. Only statistically significant coefficients are used in the calculation of marginal returns.
Table 5.9 **Regional impact on poverty and agricultural productivity of foreign aid**

<table>
<thead>
<tr>
<th>Regions</th>
<th>Agriculture</th>
<th>Education</th>
<th>Roads</th>
<th>Water</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Marginal returns in agriculture production (VND/VND)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red River Delta</td>
<td>1.54</td>
<td>0.78</td>
<td>NS</td>
<td>0.135</td>
<td>NS</td>
</tr>
<tr>
<td>Northern Uplands</td>
<td>0.83</td>
<td>0.86</td>
<td>NS</td>
<td>0.055</td>
<td>NS</td>
</tr>
<tr>
<td>North Central Coasts</td>
<td>0.61</td>
<td>0.53</td>
<td>NS</td>
<td>0.232</td>
<td>NS</td>
</tr>
<tr>
<td>South Central Coasts</td>
<td>4.47</td>
<td>2.37</td>
<td>NS</td>
<td>0.127</td>
<td>NS</td>
</tr>
<tr>
<td>Central Highlands</td>
<td>0.93</td>
<td>4.72</td>
<td>NS</td>
<td>0.423</td>
<td>NS</td>
</tr>
<tr>
<td>South East</td>
<td>8.98</td>
<td>1.38</td>
<td>NS</td>
<td>0.895</td>
<td>NS</td>
</tr>
<tr>
<td>Mekong River Delta</td>
<td>2.04</td>
<td>0.90</td>
<td>NS</td>
<td>0.076</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>Reduction in number of poor people per VND billion of Aid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red River Delta</td>
<td>140.73</td>
<td>101.69</td>
<td>46.26</td>
<td>39.16</td>
<td>81.96</td>
</tr>
<tr>
<td>Northern Uplands</td>
<td>23.87</td>
<td>293.05</td>
<td>5.84</td>
<td>2.94</td>
<td>81.43</td>
</tr>
<tr>
<td>North Central Coasts</td>
<td>53.32</td>
<td>190.60</td>
<td>71.33</td>
<td>64.05</td>
<td>94.83</td>
</tr>
<tr>
<td>South Central Coasts</td>
<td>207.77</td>
<td>70.10</td>
<td>3.83</td>
<td>18.72</td>
<td>75.11</td>
</tr>
<tr>
<td>Central Highlands</td>
<td>21.41</td>
<td>447.13</td>
<td>NA</td>
<td>17.72</td>
<td></td>
</tr>
<tr>
<td>South East</td>
<td>118.16</td>
<td>75.15</td>
<td>54.34</td>
<td>24.90</td>
<td>68.14</td>
</tr>
<tr>
<td>Mekong River Delta</td>
<td>27.94</td>
<td>45.49</td>
<td>8.08</td>
<td>1.94</td>
<td>20.62</td>
</tr>
</tbody>
</table>
In the wake of the Doi Moi policy reform, Vietnam saw a remarkable reduction in the number of people living in poverty, with the percentage of the population below the poverty line decreasing significantly. Although it is widely recognized that the success was largely attributed to the government's efforts and the important assistance of international donors, the role of foreign aid cannot be overstated in Vietnam's development. It not only funded specific projects, but also contributed to budget support and lifting living standards to sustainable levels.

Chapter 2 identified and described the key factors or sectors that were the foundation for foreign aid. The process of using foreign aid in the 1990s involved the government's commitment to economic reform and transformation of the economy from a centrally planned model to a market-oriented one, encouraging external economic cooperation with all countries. By 1998, the economy achieved a high annual growth rate of around 7.5%, which ignited several foreign aid projects. Approximately 35 million people escaped poverty during the period. However, the increase of foreign aid and the contributions of donors were key factors in Vietnam's successful development.

The large amount of foreign aid flow to Vietnam has significantly contributed to the enhancement of institutional reform, administrative restructuring, human development and macroeconomic stability. On the other hand, while the foreign aid-driven process saw positive achievements, it also incurred certain costs, such as the devaluation of domestic currency and the need for better control of foreign aid. The macroeconomic effects of these changes in Vietnam's economy have been thoroughly analyzed and discussed in terms of sectoral and overall impacts, with a focus on macroeconomic stability and development.

The role of foreign aid in funding Vietnam's economic growth was significant. It not only funded specific projects and contributed to budget support but also played a crucial role in facilitating trade and economic cooperation. The analysis of the macroeconomic effects of foreign aid suggests that it can contribute to economic growth. Cross-country studies for the period 1990-2000 also reveal that foreign aid can be effective in promoting growth. However, it is important to consider the long-term sustainability and the potential for creation of a virtuous cycle.
In the wake of the *Doi Moi* policy reform, Vietnam has had a high rate of economic growth, remarkable results in poverty reduction, and rapidly increased foreign trade and foreign aid. Although it is widely recognized that this success has been gained from the coordinated efforts of Vietnam and the important assistance of international donors, the objective of this thesis was to re-examine the role of foreign aid in Vietnam’s development. It has addressed the role of foreign aid in fostering the rapid economic growth, balancing the government budget and lifting living standards to acceptable levels.

Chapter 2 identified and described the key features of socio-economic change in Vietnam that were the foundation for foreign aid flows. The economic crisis in Vietnam in the early 1980s motivated the government to implement wide-ranging reform in 1986, which transformed the economy from a centrally planned model to a market-oriented economy encouraging external economic cooperation with all countries. As a result, the economy achieved high annual growth rates of around 7.5 per cent that were associated with approximately 35 million people escaping poverty during the period 1993-2006. An increase levels of foreign aid, one of the elements of these reforms, has been argued to be one of the key factors in Vietnam’s successful development. Over the same period, about USD 32 billion of foreign aid was pledged, of which nearly USD 16 billion was disbursed. The large amount of foreign aid flow to Vietnam has significantly contributed to Vietnam’s institutional reforms, infrastructure renovation, human development and poverty reduction. On the other hand, other factors, such as developing and strengthening the government’s institutional framework related to aid management, improving aid disbursements and favourable international conditions have also contributed to the volume of foreign aid in Vietnam. Aligned to government development priorities, foreign aid has been increasingly committed and disbursed in terms of sector, form and source of assistance. The macroeconomic effects of these changes in foreign aid are examined in the chapter by using descriptive and comparative analysis. The results suggest that foreign aid (i) complements investment and promotes FDI in the long term; (ii) contributes to balancing the foreign exchange gap; and (iii) increases government expenditure.

The role of foreign aid in fostering Vietnam’s economic growth is examined in Chapter 3 by investigating the question of whether or not, how and under what conditions aid effects growth. Cross-province data for the period 2001-04 are used since such a four-year time
span is usually considered in most aid-growth regressions. The results show that aggregate aid spurs provincial growth performance with diminishing returns, obtained by both OLS and 2SLS regression techniques. This chapter takes the analysis further by disaggregating aid data into (i) grants and loans; (ii) bilateral and multilateral aid; and (iii) three sectors: social infrastructure and services, economic infrastructure and production which are the sectors most closely related to economic growth. Results indicate that different categories of aid result in different levels of performance. Grants appear to make a higher contribution to growth than loans. In addition, aid in the production sector shows the strongest effect on economic growth, in terms of magnitude and significance. In contrast, aid that goes to social infrastructure and services and economic infrastructure does not have a significant effect on growth since it may not be evaluated within a four-year period and should be listed as a long-term impact of aid.

Based on the generated regressors technique, estimates of specifications in Chapter 3 lend strong support to the hypothesis that aid exerts significant positive impacts on growth by contributing to an increase in capital accumulation. Using different categories of aid, the regression results do not change any conclusions on the aid-investment-growth relationship. On the question of the circumstances under which aid influences growth, no evidence was found that the effectiveness of aid is contingent on the macro policy environment defined by the provincial competitiveness index in 2006. In contrast, better education is found to be the most favourable condition under which aid promotes provincial economic growth.

Aid effectiveness is further investigated in Chapter 4 by examining how the government utilizes foreign aid. Two dimensions of linkages between aid and government expenditure are explored – one at national level using time series data over the 1986-2006 period, and the other at provincial level, using panel data from 61 provinces between 2000-04. At the national level, the results show that foreign aid stimulates government spending as well as current and capital expenditure. Moreover, the government may revise its budget downwards if foreign aid is falling or absent. At the provincial level, aid is also non-fungible in the case of total and capital expenditure. However, foreign aid appears to be fungible in three sectors of spending: health care, agriculture and education. This highlights that aid earmarked for the health care and agriculture sectors is diverted whereas aid in the education sector significantly stimulates government spending in this sector.
Chapter 4 further examines theoretical and empirical reviews on modeling how aid affects fiscal transfers from the central to a provincial government. Using cross-province regressions, the results indicate that the central government reduces subsidies to those provinces to which foreign aid is directed. Foreign aid appears to soften the government's budget constraints. In this case, budget support is a panacea for aid fungibility in Vietnam.

Impacts of aid on rural poverty are investigated in Chapter 5 using Vietnam’s provincial data for 1998, 2002 and 2004 and various sectors of aid. Here, a simultaneous equation model is developed to estimate the effects of sectoral aid on rural poverty through three channels: agricultural production, rural wages and non-farm employment. In addition, the double-log form has been captured in all equations to calculate elasticities and marginal returns of rural poverty at both national and regional levels.

The results reveal that foreign aid to agriculture, education, roads and water has contributed to agricultural productivity and reduced poverty. However, their contributions differ considerably in terms of elasticities and marginal returns at national and regional level. For the country as a whole, aid to education has the largest effect on poverty reduction, explained by its simultaneous contributions to higher agricultural productivity, improved employment opportunities and increased rural wages. Foreign aid to roads and water ranks third and fourth, respectively, followed by aid to agriculture. As Vietnam is an agricultural country, aid to agriculture has improved agricultural productivity substantially, resulting in trickle-down benefits for poverty reduction. In contrast, aid to roads has impacted on poverty reduction less significantly than expected. This is because the foreign aid has already been invested heavily in roads and therefore marginal returns of additional aid are now low. As far as regional poverty reduction is concerned, effects of foreign aid to education are the highest in poorer regions with an incidence of poverty over 30 per cent, whereas the effects of foreign aid to agriculture are significant in the other, better-off regions. Importantly, the poverty-reduction effects of foreign aid across regions suggest diminishing returns of poverty-efficient aid, which is consistent with the findings of Collier and Dollar (2004).

The relationship between aid and development was also examined from the perspective of Vietnam only, rather than cross-country which has been the goal of most other papers in
this area. This shift in the aid effectiveness debate from the point of view of the donor to that of a single country, Vietnam, is an important study for Vietnam to help form its judgment and policies in relation to aid.

The policy implications of the thesis are clear. First, foreign aid should be channeled toward investment projects that belong to the production sector to provide for short-term economic development in Vietnam. Second, although grants appear to make a higher contribution to growth, it will be difficult to mobilize aid grants in the future. Given the current level of economic development, foreign aid that goes to Vietnam will move toward less concessional terms and low grants, so the government should now ensure sufficient access to loan projects over the longer period. Third, one of the factors increasing aid effectiveness is upgrading education levels (proxy for human capital), as discussed in Chapter 3. On the other hand, aid to education stimulates government spending in this sector (Chapter 4) and has the largest impact on poverty reduction (Chapter 5). This implies that education development should be taken into account in government policies on mobilization and utilization of aid. Fourth, in terms of aid modality, Chapter 4 suggests that moving toward budget support is necessary for increased aid effectiveness in Vietnam. Finally, as far as regional aid allocation is concerned, the diminishing returns of poverty-efficient aid suggest the government give priority to aid to the poor areas.

Although the thesis has examined the impacts of foreign aid on socio-economic development in Vietnam, there are still some limitations and issues that must be considered in future research. First, data constraints may affect the reliability of the results. For example, due to the lack of data on the provincial macroeconomic environment and institutional quality, the provincial competitive index (PCI) in 2006 was used as the proxy for the government policy in the aid-growth model during the period 2001-04. Hence, the government policy is found to be weakly associated with aid effectiveness, which can be partly explained by data constraints. The availability of updated data on aid and other macro variables in the next period 2005-08 would allow better analysis of the aid-policy-growth relationship using PCI in 2006. Similarly, government spending data disaggregated by component, by sector and over time are missing in several provinces. Data on public services such as road density, rural electricity and clean water consumption are also not available. Appropriate variables, therefore, are used as the proxy for these data and are
constructed using the Vietnam household surveys. In addition, limitations associated with data availability may be incorporate in misleading policy recommendation. In the future, any improvements in data quality would help make the results clearer.

Secondly, the effect of aid on economic growth may be better depicted if a time-series model is adopted. However, the number of observations for Vietnam is about 21 since Doi Moi began in 1986, and thus it is difficult to derive a reliable result by applying the time-series econometric methodology. The lack of sufficient long time series prevents not only adoption of a more complex framework for the analysis, but also taking robust testing for the concrete results. Further estimations should be carried out if more observations become available. Finally, the effectiveness of individual foreign aid projects is another perspective that lies beyond the scope of this thesis. However, addressing this issue in combination with the findings of this thesis would give a comprehensive picture of aid effectiveness in Vietnam.
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