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**A MACROECONOMETRIC ANALYSIS OF FOREIGN AID IN
ECONOMIC GROWTH AND DEVELOPMENT IN LEAST
DEVELOPED COUNTRIES: A CASE STUDY OF THE LAO
PEOPLE'S DEMOCRATIC REPUBLIC (1978-2001)**

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To the memory of my father,
Choulaphonh XAYAVONG

ABSTRACT

Despite receiving large quantities of aid, many developing countries, especially the Least Developed Countries, have remained stagnant and became more aid-dependent. This grim reality provokes vigorous debate on the effectiveness of aid. This study re-examines the effectiveness of aid, focusing on the ongoing debate on the interactive effect of aid and policy conditionality on sustainable economic growth. A theoretical model of the aid-growth nexus was developed to explain why policy conditionality attached to aid may not always promote sustainable economic growth. Noticeable methodological weaknesses in the aid fungibility and aid-growth models have led to the construction of two macroeconometric models to tackle and reduce these weaknesses. The Lao People's Democratic Republic's economy for the 1978-2001 period has been used for a case study.

It is argued that the quality of policy conditionality and the recipient country's ability to complete specified policy conditions are the main factors determining the effectiveness of aid. Completing the policy prescriptions contributes to a stable aid inflow. The aid-growth nexus model developed in this study shows that stable and moderate aid inflow boosts economic growth even when aid is fungible. However, failure to complete the policy conditionality owing to inadequate policy design and problems of policy mismanagement caused by lack of state and institutional capability in the recipient country triggers an unstable aid inflow. The model shows that unstable aid flows reduce capital accumulation and economic growth in the recipient country. These empirical findings reveal that policy conditionality propagated through the "adjustment programmes" has mitigated the side effects of aid fungibility and "Dutch disease" in the case of the Lao PDR. Preliminary success in implementing the policy conditions in the pre-1997 period led to a stable aid inflow and contributed to higher economic growth. This favourable circumstance, however, was impaired by unstable aid flow in the post-1997 period. The lack of state and institutional capacity in the Lao PDR and the inadequate policy design to deal with external shocks triggered the instability of aid inflow, which in turn exacerbated the negative effects of the Asian financial crisis on the Lao PDR's economy.

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LIST OF ABBREVIATIONS

2SLS	2 Stage Least Squares
3SLS	3 Stage Least Squares
ADB	Asian Development Bank
ADF	Augmented Dickey-Fuller
ARDL	Autoregressive Distributed Lag
AusAID	Australia Agency for International Development
CGE	Computable General Equilibrium
CPI	Consumer Price Index
CPIA	Country Policy and Institution Assessment
DAC	Development Assistance Committee
DF	Dickey-Fuller
ESAF	Enhanced Structural Adjustment Facility
EU	European Union
FAO	Food and Agriculture Organisation
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GNP	Gross National Product
GSP	General Special Preference
ICOR	Incremental Capital Output Ratio
IDA	International Development Association
ILS	Indirect Least Squares
IMF	International Monetary Fund
Kips	Lao Currency Unit
Lao PDR	Lao People's Democratic Republic
LDCs	Least Developed Countries
LIML	Limited Information Maximum Likelihood
LPRP	Lao People's Revolution Party
NZODA	New Zealand Official Development Assistance
ODA	Official Development Assistance
OECD	Organisation for Economic Cooperation and Development
OLS	Ordinary Least Squares
PIP	Public Investment Program
PSBR	Public Sector Borrowing Requirement
REER	Real Effective Exchange Rate
RHS	Right Hand Side
SAC	Structural Adjustment Credit
SAF	Structural Adjustment Facility
SIDA	Swedish International Development Authority
SNPA	Substantial New Programme of Action
SOEs	State-Owned Enterprises
SURE	Seemingly Unrelated Regression Estimation
UK	United Kingdom
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UXO	Unexploded Ordnance

Chapter 1 INTRODUCTION

It is ironic and tragic that the volume of aid is declining just as the environment for effective aid is improving. By increasing financial assistance to poor countries with good policies and decent institutions, we could help hundreds of millions of the poorest people in the world to improve their lives, and those of their children.

Dollar, 1998, quoted in the World Bank's News Release

1.1 Foreign aid and economic development in Developing Countries: an overview

Issues affecting the economic development of developing countries have been on the agenda of international development cooperation for a relatively long time.¹ Since the end of the Second World War, the developing countries have called for more favourable arrangements on international trade and the transfer of resources from developed countries to developing countries. The demand for this international development cooperation gained particular momentum in the 1960s and 1970s when the number of developing countries gaining independence rose rapidly. Within the group of developing countries, it was soon realised that there was an even poorer group of countries whose distinctiveness lies not only in the profound poverty of their people but also in the weakness of their economic, institutional and human resources, often compounded by geophysical handicaps. The United Nations Conference on Trade and Development (UNCTAD) classified this group of countries as the Least Developed Countries (LDCs).² More than any other group of developing countries, the

¹ In this study "Developing countries" is used to refer to 108 countries based on the classification of the World Bank (World Bank, 1999).

² The criteria used to determine the LDCs are per capita GDP, share of manufacturing in total GDP, life index, economic diversification index and population size. The following 49 countries are designated by the United Nations as least developed: Afghanistan, Angola, Bangladesh, Benin, Bhutan, Burkina Faso, Burundi, Cambodia, Cape Verde, Central African Republic, Chad, Comoros, Democratic Republic of Congo, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gambia, Guinea, Guinea Bissau, Haiti, Kiribati, The Lao PDR, Lesotho, Liberia, Madagascar, Malawi, Maldives, Mali, Mauritania, Mozambique, Myanmar, Nepal, Niger, Rwanda, Samoa, Sao Tome and Principe, Senegal, Sierra Leone, Solomon Islands, Somalia, Sudan, Tanzania, Togo, Tuvalu, Uganda, Vanuatu, Yemen and Zambia (this information is available online at <http://www.unctad.org/lfdc/>).

LDCs are heavily dependent on external resources to expand the productive capacity of their economies. In response to the demand for the transfer of resources by developing countries, developed countries (donors) have provided financial support in the hope that aid³ would enable the developing countries (recipients) to build up their productive capacity, and in the long run finance their investment and import requirements for self-sustaining economic growth through normal commercial channels.⁴

Foreign aid is classified into two types: grant aid and loan aid. Both grant and loan aid can be divided into bilateral and multilateral components. Bilateral aid is administered by agencies of each donor government, such as the New Zealand Official Development Assistance (NZODA), Australian Agency for International Development (AusAid), Swedish International Development Authority (SIDA), etc. Multilateral aid is funded by contributions from developed country governments and administered by international institutions. Some examples of multilateral institutions include the World Bank group, the regional banks (e.g. Asian Development Bank and the Inter-American Development Bank) and the United Nations (UN) family of specialised agencies (e.g. the UN Development Programme (UNDP), the United Nations Conference on Trade and Development (UNCTAD), and Food and Agriculture Organisation (FAO)).

Foreign aid has been transferred to developing countries in the form of project aid, commodity aid (including food aid), technical assistance, and programme aid (balance of payments support and budget aid).⁵ With accelerating globalisation and liberalisation of the world's economy post-1980, aid donors have increasingly attached policy conditionality to most of

³ In this study, "foreign aid" and "aid" are used as interchangeable terms.

⁴ Although donors' objectives in providing aid is to achieve various goals such as poverty reduction, environmental sustainability, equal income distribution and good governance, this study mainly focuses on the objective of self-sustaining growth. Also, there are many articles that write about aid motivation and describe the donor's objectives in providing aid as the perpetuation and extension of international capitalism and the procurement of political support from developing countries (see for example, Hayter, 1971, 1989; Hayter and Watson, 1985; Frank, 1969, Chapter 8). The empirical analysis of aid motivation has been undertaken by McKinlay and Little (1977, 1978a, 1978b, 1979), Maizels and Nissanke (1984), McGillivay and Oczkowski (1991), and Gounder (1995). These areas are beyond the scope of this study.

⁵ For a detailed discussions of "What is aid?" and "Who is given aid?" see Cassen (1994, pp.2-5).

their aid allocation.⁶ To qualify for foreign aid a country must adopt economic policies that are broadly in line with the set of policy prescriptions called the “Washington Consensus”.⁷ In other words, a country is required to maintain macroeconomic stability by controlling inflation and reducing fiscal deficits, to expand its productive capacity by opening its economy to the rest of the world through trade and capital account liberalisation, and to liberalise domestic product and factor markets through privatisation and deregulation. These sets of policy conditions have been propagated through the stabilisation and structural adjustment programmes of the IMF and the World Bank.⁸

An additional emphasis devoted to finding solutions to the economic problems of the LDCs was established in the so-called Substantial New Programme of Action (SNPA).⁹ The main objective of the SNPA was to promote the necessary structural changes required to overcome the extreme economic difficulties of the LDCs. Increasing food production received special emphasis in order to augment food security and to increase nutritional levels. The LDCs were also urged to develop their human resources by taking the necessary steps to reduce illiteracy and to ensure a balanced development of the various types and levels of education. Other elements highlighted in the 2001 declaration of SNPA include strengthening state and institutional capability to foster a people-centred policy framework and create good governance.¹⁰

The past three decades witnessed a steady rise in aid flows from developed countries to developing countries, despite the fact that the growth of aid

⁶ In this study, “policy conditionality” and “donors’ conditionality” are occasionally used as interchangeable terms.

⁷ Washington Consensus is the name given to the policy prescription proposed by Williamson (1990) for countries embarking on market economic reform.

⁸ Apart from the stabilisation and structural adjustment measures that are imposed by the World Bank and the IMF, “since the end of Cold War, bilateral donors have taken the lead in extending conditionality to the sphere of political systems, introducing stipulation concerning the observance of human rights and the rule of law, and progress towards multi-party democracy. The *Bretton Woods institutions* have sought to distance themselves from such overtly political stipulation, but the enthusiastic espousal of political objectives by their major shareholders has meant that they are inevitably drawn into this extension of attempted influence” (Killick, 1998, p.278).

⁹ This programme of action was declared in each of the United Nation Conferences on the Least Developed Countries. The first and second conferences were held in Paris from 1-14 September 1981 and 3-14 September 1990, respectively. The third conference was held in Brussels from 14-20 May 2001.

¹⁰ This information is available at <http://www.unctad.org/lcds/>

faltered after 1992 (Lensink and White, 2000 p. 5). As indicated in Table 1.1 below, the LDCs have received more foreign aid as a percentage of Gross Domestic Product (GDP) and aid per capita than other groups of developing countries. Aid inflows have more than doubled in the LDCs, in that aid as a percentage of GDP (aid per capita) increased from 10.2 percent (US\$12) in the 1970-75 period to 25.1 percent (US\$29) in the 1991-96 period. Among the group of other low-income countries aid as a percentage of GDP (aid per capita) almost tripled from 4.7 percent (US\$6) in the 1970-75 period to 12.5 percent (US\$14) in the 1991-96 period. As for the rest of the group, aid as a percentage of GDP and aid per capita in the 1991-96 period has not altered much from the 1970-75 period, but the trend for aid flow as a percentage of GDP has declined since the 1981-85 period.

Table 1.1: Distribution of foreign aid among Developing Countries, 1970-1996.

	1970-75	1976-80	1981-85	1986-90	1991-96
	Aid as % of GDP				
LDCs	10.2	12	13.4	18.8	25.1
Other Low Income	4.7	6.2	6.6	10.5	12.5
Low Middle Income	9	12.9	10.8	10.7	7.9
Upper Middle Income	4.4	4	3	3.5	1.9
	Aid per capita in constant 1990 prices (\$US)				
LDCs	12	15	20	29	29
Other Low Income	6	7	9	14	14
Low Middle Income			9	12	13
Upper Middle Income				10	10

Sources: OECD (1997) and *World Bank* (1997b).

By 1992, the flow of foreign aid to developing countries, calculated in 1995 prices, reached its peak of nearly US\$520 billion. The cumulated amount of actual foreign aid flow by 1996 was more than US\$12 trillion (OECD, 1997). This figure just exceeds the amount of foreign aid that is required to achieve a growth rate of about 4 to 5 percent per year in developing countries.¹¹

¹¹ According to the two-gap model the well-known theoretical support of foreign aid and the growth rate of output can be predicted by the calculation of the product between the ratio of aid to GDP and the inverse of Incremental Capital Output Ratio (ICOR). Values of ICOR are between two to five depending on the stage of development of countries under investigation. Chenery and Strout (1966) present a detailed discussion of the two-gap model.

However, developing countries have not experienced this rate of growth since the 1980s. As Easterly points out:

In 1960-79, the median per capita growth in developing countries was 2.5 percent. In 1980-98, the median per capita growth of developing countries was 0.0 percent, [and] virtually no countries outside Asia registered per capita growth at or above the 1960-79 average of 2.5 percent.

Easterly (2000, p. 2).

In addition, it has become clear that the benefits from globalisation and liberalisation of the world economy have been unequally distributed among developing countries. As Nayyar indicates, 11 developing countries account for 66 percent of the total exports from developing countries, as well as receiving the lion's share of foreign direct investment inflow (Nayyar, 1997 cited in Murshed, 2000, p. 2). This evidence suggests that only a few developing countries have achieved high rates of economic growth while others have been stagnant over the course of decades.

Whilst the 1980s were dubbed the "lost decade" for developing countries in general and LDCs in particular, the 1990s have become, for LDCs, the decade of increasing marginalisation, inequality, poverty and social exclusion. The number of LDCs almost doubled from the first list compiled in the early 1970s to 49 countries in 2001. Only Botswana has "graduated" from the LDC group. During the 1980s, several African countries experienced negative economic growth despite a substantial increase of aid inflow to these countries (White, 1992a, p. 175). "A large number of countries became more aid-dependent in the 1990s than they were in the late 1970s" (Tsikata, 1998, p. 7).

This grim reality has raised many concerns over the effectiveness of foreign aid. Questions such as "What is effective aid?", "What is ineffective aid?", and whether aid works or not have become a substantial source of debate among academic researchers and aid practitioners over the past few decades. These issues are summarised in the next section.

1.2 Economic impact of foreign aid on recipient country: a quest for growth

Over the past few decades, the assessment for aid effectiveness has been approached from different ideological and methodological viewpoints. To answer the question as to whether foreign aid contributed to economic growth in the recipient country, aid activities have been typically assessed at the microeconomic level. This approach has used the economic rate of return of an individual project as a criterion for the assessment. Using this approach, considerable success has been claimed for the effectiveness of foreign aid. To illustrate this claim, Cassen *et al.* point out the assessment of projects that have been funded by many financial institutions as follows:

... 80 percent of IDA projects achieve a rate of return of 10 percent or more. The Asian and Inter-American Bank have concluded that 60 percent of samples of their loans fully met their objective; 30 percent partially did so, and less than 10 percent were marginal or unsatisfactory. Five other major agencies have conducted in-house reviews of large number of their evaluations; while three of these studies remain confidential, they all found that the great bulk of their lending had a satisfactory rate of return...

Cassen *et al.*, (1994, p. 8).

The above claim by Cassen *et al.*, (1994) seems to be inconsistent with the evidence of poor economic performance in developing countries. In addition, many empirical studies of the macroeconomic impact of aid using data from the 1960s onwards concluded that aid has no significant positive impact on growth.¹² Mosley called this contradiction as the *micro-macro paradox* and offered three explanations for the causes of this paradox: first, inaccurate measurement of aid effectiveness; second, fungibility of aid¹³ within the public sector; and third, aid's negative effect on investment and output in the

¹² See for example, cross-country studies by Mosley *et al.* (1987), Reichel (1995), Boone (1994, 1996); and for specific-country studies: of Islam (1992), Mbaku (1993).

¹³ Aid fungibility means that a government can increase resources through the aid inflows, to increase spending, fund tax cuts, or reduce the fiscal deficit (reducing future tax). This would cause a negative impact of aid on growth (World Bank, 1998).

private sector (Mosley, 1987, pp. 139-140). White also claims “there are genuine theoretical reasons for not expecting the macroeconomic impact of aid to simply be the aggregate of the micro benefits” (White, 1992a, p. 165). He adds two more explanations to Mosley’s (1987) explanations. One is the over-aggregation in cross-country studies of aid effectiveness. The other is the application of inconsistent data between microeconomic and macroeconomic assessments of aid effectiveness, with the former using economic (social) data whereas the latter uses financial (private) data (White, 1992a, p. 164).

Furthermore, the quest for the explanation of the “micro-macro paradox” proceeded through the impact of aid on various macroeconomic variables affecting growth. As such, the debates have mainly hinged around the channel through which aid contributes to growth, which suggest that:

while the microeconomic and welfare benefits of well-designed and implemented projects may be considerable, the macroeconomic effect - expressed in terms of overvaluation of the exchange rate as a disincentive to exports, and continued budget deficits as a disincentive to domestic saving and investment - may well be negative.

White (1998, p. xvi)

The discussion of aid effectiveness in the previous paragraphs is likely to suggest that the evidence of foreign aid’s achievements at the microeconomic level indicates nothing about its macroeconomic impacts, and that both measurements are not comparable. Moreover, the discussion is likely to suggest that foreign aid is not very useful for spurring growth in the developing world. Indeed, this view coincided with a syndrome often known as “aid fatigue”, especially from the early 1990s. This syndrome also led to a downward trend of aid contributions, as the donor community has been increasingly concerned over the effectiveness of aid. “ODA flows as a proportion of GNP in the OECD countries have fallen from 0.4 per cent in 1975 to 0.3 per cent in 1994...[Also] aid has fallen from 66 per cent of total resource flows to LDCs in 1986 to 40 per cent in 1994” (White, 1998, p. xv).

Despite the quest for the effectiveness of aid being approached from different theoretical and methodological aspects, there is a growing consensus that policy conditionality can no longer be regarded as a response to a purely technical economic problem,¹⁴ and that capital accumulation is not regarded as the only source of economic growth.¹⁵ This view has changed the assessment of aid effectiveness by focusing on how the economic policies and state and institutional capability of the recipient country may contribute to growth. Much of this literature has regarded the need for a stable macroeconomic environment, open trade regimes, protected property rights, good quality public services, as well as political and social stability as the factors that are important for maintaining sustainable economic growth.

A recent study on aid effectiveness using cross-country data found that foreign aid has a positive effect on economic growth in countries with sound economic management and good quality public services (Burnside and Dollar, 1997). However, aid-financed projects are always found to be fungible (Feyzioglu *et al.*, 1996, 1998). With respect to the impact of aid on the private investment and trade sectors, so far “not much empirical work has been done on the possible “Dutch disease” effects of aid, but the studies that have been undertaken highlight the importance of an appropriate macroeconomic policy mix to address the issues of competitiveness and the crowding out of private investment” (Tsikata, 1998).¹⁶

The above findings have provoked the donor community to reconsider the role of foreign aid and its strategies in promoting growth in developing countries. It was re-emphasised in the World Bank policy research report, *Assessing Aid*,

...There remains a role for financial transfers from rich countries to poor ones... in countries with sound economic

¹⁴ See for example, Haggard, *et al.*, (1995).

¹⁵ See for example, Easterly (1999) and Easterly and Levine (2001).

¹⁶ In the aid effectiveness literature, the “Dutch disease” refers to the situation where high-levels of aid inflow may generate undesirable effects on the recipient economy; for example, a high level of aid inflow tends to bring about real exchange rate appreciation and hence harms a country’s international competitiveness.

management, foreign aid acts as a magnet and “crowds in” private investment... In countries committed to reform, aid increases the confidence of the private sector and supports important public services... [thus] effective aid supports institutional development and policy reforms are the heart of successful development...

World Bank (1998, p. ix and p. 3).

The above discussion indicates that sound economic management and the quality of state and institutional capability of the recipient country have played a crucial role in the improvement of aid effectiveness. However, there remains some dispute as to whether policy conditionality induced by the IMF and the World Bank is sufficient to promote sustainable economic growth (Beynon, 2001; and Lloyd *et al.*, 2001). In fact, many Least Developed Countries have not achieved sustainable economic growth, despite the fact that they have made significant policy reforms (UNCTAD, 2000a). In this context, the question that remains unanswered is why policy conditionality attached to aid might not always promote sustainable economic growth in Developing Countries. It is with this question that this study is predominantly concerned.

Overall, the persistence of aid effectiveness evidence being elusive has been attributed to an incomplete theory of the aid-growth nexus and the use of the econometric methodology for the cross-country analysis. In addition, the prior analyses of aid effectiveness do not include the issues of policy conditionality relating to the quality of policy designed for aid delivery. Recent studies of aid effectiveness also paid too little attention to the heterogeneous nature of the developing world. In particular, the underdeveloped nature of LDCs increases their volatility to external shocks (i.e., natural disasters and negative spillover effects from the globalisation and liberalisation of the world economy). Different stages of economic development and wide cultural diversity can make state and institutional capability vary from country to country. In this context, cross-section results of the interactive effect of aid and policy conditionality on economic growth should be interpreted with caution.

The appropriateness of country-specific studies over cross-country studies has long been recognised (Cassen *et al.*, 1994; Pack and Pack, 1990, 1993; White, 1992b; and Lloyd *et al.*, 2001). These studies indicate that there is still much to be learnt about the impact of aid on economic growth. Therefore, a country-specific study is needed to shed light on how economic growth is affected by the interaction between aid and policy conditionality. Further examination of this interaction would assist the governments of donor and recipient countries in making aid more effective.

1.3 The role of foreign aid in economic development of the Lao PDR: aims and objectives of the study

The Lao People's Democratic Republic (the Lao PDR) is a landlocked country located in the centre of the Indochina peninsula. In 1999, the estimated population was 5 million citizens, of whom 22 percent reside in cities and towns (World Bank, 2000). In 1975, following the end of a protracted civil war, the Lao People's Revolution Party (LPRP) came into power. The Kingdom of Laos was re-named as "the Lao People's Democratic Republic" replacing the democratic institutional monarchy by an authoritarian regime and a centrally planned economy.

At the beginning of the new regime, the country was severely underdeveloped and much of the country's capital stock and infrastructure had been destroyed during the war.¹⁷ Thousands of entrepreneurs and educated people had fled the country. The economy was dominated by subsistence agricultural production, contributing 60 percent to GDP and employing almost 90 percent of the labour force. The industrial sector produced less than 10 percent of GDP and was largely composed of state-owned enterprises operating under the state planning system. The service

¹⁷ "During the 1964-1973 Vietnam War, Laos was subjected to both ground battles and aerial bombing. A total of 580,344 bombing missions were launched and more than two million tones of ordnance were dropped. Twenty years after the end of the war, unexploded ordnance (UXO) still affects 13 (out of 17) provinces of the country, contaminating up to 50 percent of the country's total land area. UXO contamination threatens the livelihood and food security of the large sections of the country's population. It also inhibits the development of infrastructure and other services throughout the country" (Lao Government, 2001, p.4).

sector was dominated by the state-owned enterprises that controlled both foreign and domestic trades. With income per capita in 1978 estimated at US\$ 90, the country was one of the world's least developed economies and heavily dependent on foreign aid to meet its source requirements for development (Otani and Pham, 1996; The Bank of the Lao PDR, various issues).

During the 1975-85 period of pursuing economic development along socialist lines, the government had established a highly regulated economic system. Farm-gate prices and trade in agricultural products were administratively determined and trade between provinces was restricted. Domestic price controls and tight restrictions on foreign trade led to the emergence of parallel markets for goods and foreign exchange. Private sector activities, though discouraged, existed on a small scale. Domestic investment was therefore dominated by the government's capital spending on the new establishments of state-owned enterprises and infrastructure projects, which were still constrained by the lack of foreign exchange and low aid inflows. During 1978-85, the ratio of investment to GDP was less than 15 percent of GDP and the growth of real GDP was less than 2 percent annually. A distorted incentive structure created supply shortages and a lax monetary policy and fiscal deficit fuelled rapid inflation (Otani and Pham, 1996). Economic stagnation was mainly attributed to the low level of foreign capital inflow and the implementation of an inward-oriented economic strategy.¹⁸

Disappointing economic performance during the 1975-85 period and a dramatic change in economic reform in many socialist countries led the Lao Government to launch an economic reform programme, the "New Economic Mechanism" in 1986.¹⁹ The main purpose of the "New Economic Mechanism" was to achieve two transformations: first, from a centrally planned economy

¹⁸ From 1975 to the late 1980s, the Lao Government established a centrally planned economy and formed a tight economic relationship with socialist countries. During this era, most of the Lao Government's capital investments were supported by economic aid from the Socialist bloc, especially the former Soviet Union. The Lao Government also received economic aid from Western countries and other multilateral aid agencies but the amount of aid from this group was very small.

¹⁹ It should be noted that the implementation of the "New Economic Mechanism" in the Lao PDR coincided with the "Perestroika" in the former Soviet Union, the "Doi-Moi" in Vietnam and similar reform in many socialist countries in Eastern Europe.

towards a market-oriented economy, and second, from a subsistence-based and isolated rural economy to a manufacturing and service economy.

During the 1986-88 period of economic transition towards a market economy, economic conditions deteriorated due to an unstable macroeconomic environment (i.e., a surge in hyperinflation and a rapid depreciation of the exchange rate). The cause of this economic instability was rooted in a large current account deficit and an unsustainable balance-of-payment-position. The main manifestation of this adverse effect was attributed to the severe weakness of institutional reforms that resulted in a lax monetary policy and lack of fiscal discipline (Bourdet, 2000, pp. 29-30). In 1989, the Lao Government entered the stabilisation and structural adjustment programmes under the auspices of the IMF's Structural Adjustment Facility (SAF) and Enhanced Structural Adjustment Facility (ESAF), with parallel financial support provided by the Asian Development Bank and an arrangement under the World Bank's Structural Adjustment Credit (SAC).

Although the carrying out of economic reform was not preceded by political change, the Lao Government has increasingly received support from the World Bank, IMF, Asian Development Bank and other aid donors. At the outset of the programme, the Lao Government focused on establishing macroeconomic stability by tightening credits and increasing budgetary control in order to adjust external current account deficits down to the level that could be financed by sustainable capital inflows. Many policy measures were also taken to raise revenues, reduce and rearrange public investment priorities and downsize the civil service, as well as applying market instruments to manage the growth of money supply. Emphasis was placed on the strengthening of structural production by privatising non-strategic state-owned enterprises (SOEs) and increasing the autonomy of the remaining SOEs. This task required the Lao Government to turn more decisively towards reform and the establishment of various economic institutions and legal frameworks necessary for the functioning of a market economy.

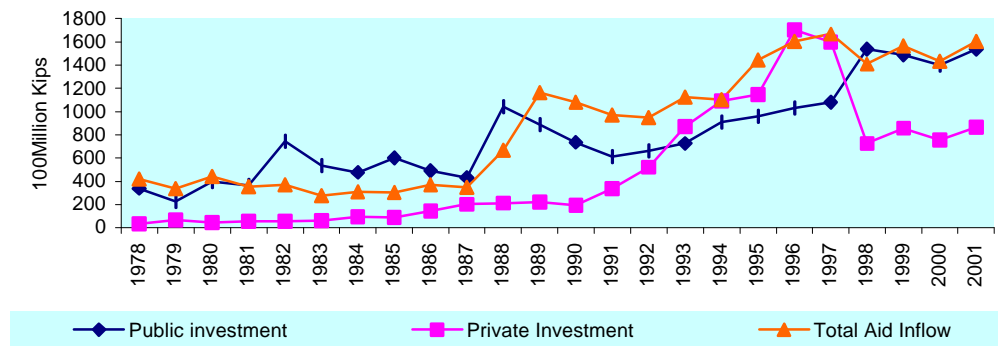
To stimulate domestic resource mobilisation, the Lao Government built on the tax system that was particularly reformed in 1988 to compensate for the loss of government revenue previously derived mostly from the financial surpluses of profitable state-owned enterprises. Many waves of tax reform were carried out to broaden the tax base and many measures taken to improve the domestic tax system and move away from a heavy reliance on trade taxes. To develop the financial sector, major restructuring of the banking system was undertaken. The State Bank and its 17 provincial branches were separated into a two-tier banking system, i.e., the Central Bank (Bank of the Lao PDR) and state-owned commercial banks. The Central Bank was made responsible for conducting prudent monetary policies, auctioning treasury bills, managing official international reserves, licensing and regulating financial institutions, and establishing an effective system of bank supervision. Entry into the banking and finance sector was opened up to both domestic and foreign investors in order to enhance the sector's competitiveness.

To stimulate foreign exchange earnings, the Lao Government further liberalised the foreign trade system. Legal and administrative measures and foreign direct investment have been promoted under liberal and generous policy regimes. All exports and imports other than those on specified lists were freed from quantitative restrictions. At the end of 1992, only timber exports remained subject to quantitative restrictions, and only imports of rice and certain types of motor vehicles still required quantitative licensing. The authorities removed the barriers of access to foreign exchange markets, and exporting firms were allowed to retain and repatriate their foreign exchange earnings. In late 1989 residents were allowed to open foreign currency accounts with the commercial banks in order to create a more formal and stable foreign exchange market. Efforts to raise foreign exchange earnings from tourism were initiated in 1997 when the Lao Government launched the "Visit Laos Year" tourist promotion.

Overall, the Lao Government's development efforts during the last decade of economic transformation have gone towards the establishment and building up of the fundamental institutions and infrastructure necessary for

sustainable development. While the expansion in public investment is still heavily reliant on financial aid inflows, efforts to mobilise both internal and external resources to supplement aid inflows have been carried out under the guidance of donors' conditionality. Throughout the period of economic transition up to 1997, the Lao PDR has moved decisively in the direction of economic liberalisation and has enjoyed socio-political stability. This economic environment contributed to a rapid increase in both public and private investment, as illustrated by Figure 1.1 below.

Figure 1.1: Foreign aid and investment in the Lao PDR, in constant 1990 prices.



Source: ADB (various issues), UN (various issues) and author's estimation

Since 1989, when the Lao Government entered the stabilisation and structural adjustment programmes, an increase in aid inflows has led to an increase in public investment. Private investment also has risen following a rapidly increased inflow of foreign direct investment (FDI). As a result, the growth of real income averaged 7 percent annually from 1989 to 1997. In this period, income per capita increased fourfold, from US\$90 in 1978 to US\$400 in 1997.

However, the Asian financial crisis led to a balance-of-payment crisis and economic volatility. This adverse effect was exacerbated by fiscal and monetary mismanagement and in turn led to instability of aid and FDI inflows. As Thailand is a major trading partner and the main source of FDI in the Lao PDR, its economic downturn resulted in the Lao currency

depreciating by almost 90 percent against the US dollar and the inflation rate in the Lao PDR reaching 3 digits (IMF, 2000). In 1997, the IMF and other donors also withheld some financial aid in order to put pressure on the Lao Government to speed up state and institutional reform, as well as to stabilise the economy from the deteriorating macroeconomic environment. As a result, real income growth tumbled from 6.5 percent in 1997 to about 4 percent in 1998–99 (ADB, 2000).

Assessing whether policy conditionality attached to aid promoted sustainable economic growth in the Lao PDR requires the examination of the interaction between aid and the incentive regimes (i.e., the state and institutional capability to implement the policy conditions) and how this interaction affected economic growth. In this context, this study will focus on the potential effects of aid on economic growth through three channels. Firstly, it examines whether foreign aid has a significant impact on tax revenue and government spending (i.e., to address the issue of aid fungibility and its impact on investment). Secondly, it measures the impact of stable aid inflow on economic growth via the investment channel. Thirdly, it examines the potential impact of unstable aid inflow on economic growth. The outcome of this study will provide a useful insight about the channels through which foreign aid can affect growth. It will also assist both donor and recipient governments to address the policy implications for making foreign aid more effective.

The period 1978 to 2001 will be studied, as this is the period for which data are available for the Lao PDR. Most of the data used here is derived from the annual reports of the Bank of the Lao PDR and from various issues of the statistical yearbooks published by the Asian Development Bank and the United Nations.

1.4 Chapter outline

This study consists of eight chapters and is organised in the following manner. This chapter (Chapter 1) has briefly discussed the role of foreign aid and development issues in developing countries. It has raised the

question as to why aid given over the past four decades has been incapable of spurring economic growth in the developing world. The roles of foreign aid and policy conditionality have also been highlighted as a crucial factor for promoting sustainable economic growth in the recipient country. However, as there remains no clear-cut explanation for the interactive effect of aid and policy conditionality on economic growth, this raises another question as to why policy conditionality attached to aid might not always promote sustainable economic growth. In this context, the role of foreign aid played in economic development of the Lao PDR has been briefly discussed. The approaches to finding the solutions to improve aid effectiveness have also been pointed out.

The literature review in Chapter 2 presents insights into the puzzle of why foreign aid may not always have an positive impact on economic growth. Many developing countries show continuing poor economic performances, despite receiving a considerably substantial amount of aid. Thus, the investigation focuses on the interactive effect of aid and policy conditionality on economic growth. The relevant theories and empirical evidence of the macroeconomic impact of foreign aid on the recipient economy are discussed along with the two strands of aid effectiveness. The first strand of aid effectiveness examines whether foreign aid increases economic growth via the investment channel, while the second strand examines whether foreign aid displaces investment via the internal balance (savings-investment channel) and external balance (export-import channel).

Chapter 3 expounds on the recent debate as to whether policy conditionality attached to aid is sufficient to promote sustainable economic growth. The analytical framework is mainly drawn from the development issues of LDCs, including the weakness of policy conditionality designed for aid delivery. The argument in this chapter is that donors' conditionality and the recipient country's state and institutional capability are crucial factors determining the effectiveness of aid. It is also argued that strengthening the ability to raise investment with external viability is the key to achieving sustainable economic growth in LDCs. In this regard, the Steger's (2000) linear growth model is modified to form a theoretical model of the aid-growth nexus. The

simulation technique is employed to demonstrate the interaction between aid and the recipient country's incentive regime and how this interaction may influence economic growth and economic volatility.²⁰

Chapter 4 presents macroeconometric methods to solve problems of the aid fungibility and aid-growth models. Since aid has various economy-wide effects, aid inflows tend to directly and indirectly affect both the demand side and the supply side of an economy. The macroeconometric model of aid fungibility is developed focusing on the potential impacts of aid on the demand side of the Lao PDR's economy. To take a closer look at the potential effects of aid on the supply side of the Lao PDR's economy, the macroeconometric model of the aid-growth nexus is developed focusing on the potential impacts of aid on investment and hence economic growth. In this regard, the standard neoclassical measure of growth is modified to integrate several aspects of the impact of capital inflow on the Lao PDR's economy through its role in financing domestic investment, as explained by the two-gap model. Estimating, validating and analysing several techniques for the macroeconometric model are discussed next. Sources of data and methods of variable constructions employed in this study are also explained.

Chapters 5 and 6 present the effect of stable aid inflow on economic growth. In Chapter 5, the analysis focuses on the effects of donors' conditionality on fiscal policy reforms. This analysis addresses the controversy issues regarding the ongoing debate of the selective strategy for aid allocation by examining whether aid fungibility affects investments. Therefore the macroeconometric model of aid fungibility is employed to analyse the Lao Government's fiscal behaviour in response to aid inflows. Multiplier analysis is employed to measure the short-run and long-run effects of aid on fiscal variables (i.e., government consumption spending, public investment and

²⁰ The incentive regime refers to the aid-receiving country's state and institutional capability to implement the policy conditionality.

government revenue). Whether aid fungibility may crowd in or crowd out private investment is examined using the conditions of fiscal response to aid inflow proposed by White and McGillivray (1992).

Chapter 6 supplements the analysis of the effects of aid on economic growth carried out in Chapter 5 by focusing on the effect of stabilisation and structural adjustment programmes on economic growth. The macroeconometric model of the aid-growth nexus is employed to analyse the effect of aid attached with conditionality on the stabilisation and structural adjustment programmes on economic growth. Since completing donors' conditionality is a prerequisite for the disbursement of aid, the aid multiplier is used as a proxy to measure the short-run and long-run effects of the interplay between aid and policy conditionality on economic growth. The estimated multiplier values are employed to examine the Lao PDR's ability to raise investment with external viability.

Chapter 7 presents the effect of unstable aid inflow on economic growth. It also examines how various types of political regimes may influence economic growth and create unstable aid inflow. The role that the Lao PDR's state and institutions played in the implementation of the stabilisation and structural adjustment programmes are analysed. It is argued that the problem of policy mismanagement posed by the lack of state and institutional capability is the main cause of policy slippage. This problem coupled with the weakness of policy conditionality in turn triggered the instability of aid inflow worsening the negative effect of the Asian financial crisis on economic growth. The macroeconometric model developed in Chapter 6 is modified to analyse the effect of unstable aid flows on economic growth. The counterfactual simulation techniques are applied to disentangle the adverse effects of unstable aid flows from the adverse effects of the Asian financial crisis on economic growth.

Chapter 8 summarises the contributions made in this study and provides an answer to the question of why policy conditionality attached to aid might not always promote sustainable economic growth, with specific reference to the case of the Lao PDR.

Chapter 2

THEORIES AND EMPIRICAL EVIDENCE OF THE MACROECONOMIC IMPACT OF FOREIGN AID: LITERATURE REVIEW

...Poor countries have been held back not by a financing gap, but by an “institutions gap” and a “policy gap”...

World Bank (1998, p. 33)

It is now widely accepted that governments complement the market. A market economy cannot thrive, and the majority of people cannot benefit, without wise government and effective state institutions.

Cornia stated in Stiglitz (1998, p. V)

Aid brings a package of knowledge and finance... Aid can be the midwife of good policies and institutions.

World Bank (1998, pp. 1-5)

2.1 Introduction

As pointed out in Chapter 1, sound economic management and the quality of the state and institutional capability in recipient country do matter for improving the effectiveness of foreign aid. To clarify this point, this chapter investigates theoretical and empirical studies of aid effectiveness. Through surveying these studies, light can be shed on the puzzle of why foreign aid may not always have an impact on economic growth. The issues discussed here will be empirically analysed in the case of the Lao PDR in the later chapters.

The traditional economic justification for foreign aid is that aid will increase growth in the recipient country. For example, foreign aid under the Marshall Plan represented a transfer of US\$13.2 billion in the 1948-52 period from the United States of America to Europe, spurring economic recovery in that region after the end of World War II (OECD, 1985). Theoretical support for

this view can be tracked back to Rostow (1963) who illustrated that developing countries in the first stage of development need foreign capital to “kick start” their economy. In Rostow’s growth stages theory, developing countries can then “take-off” to a stage of self-sustaining growth. Later, Chenery and Strout (1966) put this idea into a theoretical framework, the so-called “two-gap” theory. This model incorporated the growth process of the Harrod-Domar growth model, which considers the level of investment in physical capital (measured by the ratio of physical capital to GDP) and the incremental capital output ratio (ICOR) as the main driving force for output growth. Developing countries have surplus labour but their ability to invest is constrained by a lack of domestic savings (saving gap) and foreign exchange availability (trade or foreign exchange gap), thus there is not enough of these relevant resources to lead to the achievement of higher levels of growth. In this context, the two-gap model illustrates that aid inflows would supplement domestic savings and foreign exchange earnings one-for-one. Therefore, more aid inflows will lead to higher investment and ultimately to higher growth.

However, the theoretical basis of the two-gap model outlined above has been challenged on various grounds. One major criticism is of the underlying principles of the two-gap model. With an emphasis only on capital accumulation for growth strategy, the two-gap model is too simplistic to represent the growth process. Indeed, many aid effectiveness studies have incorporated various growth theories to derive an analytical framework in ascertaining the effect of foreign aid on growth. This issue is discussed in Section 2.2. The other major criticism is the assumption of the two-gap model which states that aid inflows will be matched by a one-for-one increase in investment. Much of the aid effectiveness literature points out that there are possibilities that this assumption may be incorrect (White, 1998, p. 6). Enquiry along this line has led to the development of displacement theories, as White (1998) has dubbed them. Displacement theories examine various links in the chain from aid to growth; this is

discussed in Section 2.3. Finally, Section 2.4 gives a summary of theories and empirical evidence explaining the puzzle of why aid may or may not have an impact on growth.

2.2 Aid and policy in growth theories

The past three decades have witnessed a large number of studies on aid effectiveness. The aid-growth nexus has been approached from different ideological and methodological aspects. To see this, the following sections present theoretical and empirical approaches of the aid-growth nexus model. Firstly, Section 2.2.1 demonstrates the aid-growth regressions employed in the various growth models. Secondly, Section 2.2.2 presents the empirical evidence focusing on the relationships between aid, policies and growth.

2.2.1 Aid-growth regression analysis in various growth models

The earliest growth model focused on the growth of aggregate output and resource mobilisation. The underlying analytical framework applied to ascertain the economic-growth nexus was the Harrod-Domar growth model. It links output growth to aggregate investment in a linear function. The rate of output growth in the Harrod-Domar model can be captured in the production function with capital as the sole input. This production function represents the basic premise of developing countries, which are characterised by a surplus of labour and the shortage of capital. Therefore, the production function of developing countries can take the following form:

$$Y(t) = f(K(t)) \quad (2.1)$$

where $Y(t)$ is aggregate output at time t and $K(t)$ is capital stock at time t . By taking the derivative of equation (1) with respect to time (t) and dividing by Y , this gives the growth rate of output as follows:

$$\frac{\dot{Y}}{Y} = \frac{1}{\frac{\partial K}{\partial Y}} \frac{I}{Y} \quad (2.2)$$

where $\frac{\dot{Y}}{Y}$ is the rate of output growth, $\frac{\partial K}{\partial Y}$ is the incremental capital-output ratio (ICOR), $\frac{I}{Y}$ is the ratio of investment to output, and $\dot{K} = I$.

The implication of this model is that capital accumulation is the key to prosperity in development. This model was extended in 1966 to add a foreign exchange constraint into the Chenery-Strout two-gap model. The potential impact of aid on growth is simply seen as an increment to the stock of physical capital, and can be captured in the planned investment identity, as follows:

$$I = S_d + A + OF \quad (2.3)$$

where S_d is domestic saving, A is the inflow of aid, and OF is other source of capital inflows.

By combining equations (2.2) and (2.3) and holding the incremental capital-output ratio (ICOR) constant, the rate of output growth in the two-gap model simply depends on the accumulation of physical capital, which in turn depends on aid inflows, domestic saving and other sources of capital inflows. The empirical approach in the two-gap model takes the following form:

$$\frac{\dot{Y}}{Y} = a_0 + a_1 \frac{A}{Y} + a_2 \frac{S_d}{Y} + a_3 \frac{OF}{Y} + e \quad (2.4)$$

where $\frac{\dot{Y}}{Y}$ is the rate of output growth, $\frac{A}{Y}$, $\frac{S_d}{Y}$, $\frac{OF}{Y}$ are respectively aid inflow, domestic saving and other source of capital inflows as percentage of GDP, e is an error term.

Various studies published before the 1980s have been based on the above single equation to ascertain the effectiveness of aid (for example, Griffin, 1970; Massell *et al.*, 1972; Papanek, 1972; Gupta, 1975; and Stoneman, 1975). Some researchers have also endogenised the right hand side (RHS) variables of equation (2.4) to tackle the simultaneity issues (for example, Mosley, 1980).

It should be noted that throughout the periods of aid flows there have been several changes in development policies. Many developing countries have had to comply with new growth strategies in order to steer their economies into the path of sustainable growth. The change obviously makes the empirical approach of the two-gap model (equation (2.4)) inappropriate because it has no part that allows for capturing the change in those development policies. Therefore, equation (2.4) may suffer from omitted variable bias, which implies that the model would yield inconsistent estimator of aid-growth coefficients.

Over the past few decades growth theory has undergone a radical process of renewal and has remarkably enlarged its scope, resulting in the development of various growth theories offering different growth strategies. For instance, the export-led growth model (Lamfalussy, 1963) emphasises export growth as an important factor that will encourage more investment, bring in technical progress and increase the ability to import, thus improving the capacity to grow. The financial liberalisation model (McKinnon, 1973; Shaw, 1973) illustrates that financial distortion in developing countries is caused by governments' policies and regulations. Also, the central bank *tends* to distort the real interest rate and causes credit rationing. This distortion has an unfavourable impact on savings and investment hence retarding economic growth. Liberalising financial markets will encourage domestic savings in the banking system. Financial deepening¹ will increase

¹ Financial deepening is defined as a proportion of demand deposits to Gross Domestic Product (GDP).

so credit rationing will be ruled out. Neoclassical and endogenous growth theories consider productivity growth to have a leading role in the growth process. Therefore, shifting more resources into improving human capital, technological innovation or research and development (R&D), and institutional quality are the keys to successful development.² The re-emergence of political economy emphasises the role of political factors in the determination of economic growth. This literature has illustrated that political institutions can influence the efficiency of resource allocation. Many studies have indicated that countries are likely to sustain economic growth where their political institutions promote socio-economic stability, create good quality public services, offer freedom and civil liberties, provide credible and predictable policy changes, as well as delivering stable property rights and fair law enforcement.³ However, it is not clear which type of political institution could provide such an environment. Furthermore, the recent growth literature considers other factors, including *inter alia* the influence of economic growth on developed countries through international trade, as the factors that are important for the long-term growth for developing countries (Easterly, 2000; Dollar and Kraay 2000).

To improve the estimation of the aid-growth coefficient, many studies of aid effectiveness have incorporated a number of factors accounting for policy and institutional quality into the model of the aid-growth nexus. The aid-growth regression takes the following form:

$$\frac{\dot{Y}}{Y} = a_0 + a_1 \frac{A}{Y} + a_2 \frac{S_d}{Y} + a_3 \frac{OF}{Y} + a_4 Z + e \quad (2.5)$$

where $\frac{\dot{Y}}{Y}$ is the rate of output growth, $\frac{A}{Y}$, $\frac{S_d}{Y}$, $\frac{OF}{Y}$ are respectively aid inflow, domestic saving and other source of capital inflows as percentage of

²For the new growth models see, for example, Barro and Sala-i-Martin (1995). See also North (1994) for the role of institutional change influencing resource allocation.

³ See for example, Persson and Tabellini (1990), Alesina and Perotti (1995), World Development Report (1997) and Borner and Paldam (1998), and Gounder (2002).

GDP, Z is a vector of control variables including the growth rate of various factor inputs and policy variables affecting growth. Dowling and Hiemenz (1982) add four policy variables emphasising the role of an open-trade regime and domestic resource mobilisation in the growth process. Rana and Dowling (1988) add the rate of export growth to the study of nine Asian countries. In addition to domestic savings, Mosley (1987) adds growth in literacy rates, various types of foreign capital inflows and export growth into the aid-growth regression. Hadjimichael *et al.* (1995) add human capital and various macroeconomic variables that they hypothesised to affect growth. The macroeconomic variables used in various other studies include terms of trade, real effective exchange rate, the rate of inflation and the size of the budget deficit.

More recently, the research on aid effectiveness includes the possibility of the interaction between aid and the policy index in the aid-growth regression. The research pioneered by Burnside and Dollar (1997) focuses on the necessity of sound policy management as conducive to sustainable economic growth. They modify the neoclassical growth model to show how distortionary policy may affect economic growth in developing countries. As illustrated in neoclassical growth theory, the marginal return to investment in poor countries is high, thus countries tend to grow faster when their capital accumulation is rising (see, for example Romer, 1996, Chapter 1). However, Burnside and Dollar argue that:

With a subsistence consumption constraint and imperfect international capital markets, poor countries will tend to grow slowly despite a high marginal return to investment. In this context, foreign aid can accelerate growth rates in the transition to a steady state. Furthermore, various institutional and policy distortions can lower the return to capital and reduce transitional growth rates.

Burnside and Dollar (1997, p. 2).

Though the role of aid in this model is similar to the two-gap model in the sense that aid will raise investment and savings in the recipient country,

Burnside and Dollar (1997) incorporate aid and policy variables into the neoclassical growth framework. They point out that the aid-growth relationship depends on the recipient country's position on the growth path and the level of distortion in economic policy. As such, they suggest:

...one would find a positive relationship between aid and growth, as long as the recipient's GDP is below the level corresponding to its peak transitional growth rate...[also] one would find a negative relationship between distortionary taxes and growth.

Burnside and Dollar (1997, p. 8)

To test the interactive effect of aid and economic policy on growth, Burnside and Dollar (1997) incorporate aid into a Barro-type growth regression.⁴ They also include the interactive term for an aid variable and a policy index into the regression. The aid variable and policy index are endogenised in order to tackle the simultaneity issues. The analytical-framework consists of three equations as follows:

$$\frac{\dot{Y}}{Y} = \mathbf{b}_{0Y} + \mathbf{b}_{1Y}YPC + \mathbf{b}_{2Y}\frac{A}{Y} + \mathbf{b}_{3Y}P + \mathbf{b}_{4Y}\frac{AP}{Y} + \mathbf{b}_{5Y}Z + \mathbf{e}_Y \quad (2.6)$$

$$\frac{A}{Y} = \mathbf{b}_{0A} + \mathbf{b}_{1A}YPC + \mathbf{b}_{2A}P + \mathbf{b}_{3A}Z + \mathbf{e}_A \quad (2.7)$$

$$P = \mathbf{b}_{0P} + \mathbf{b}_{1P}YPC + \mathbf{b}_{2P}\frac{A}{Y} + \mathbf{b}_{3P}Z + \mathbf{e}_P \quad (2.8)$$

where $\frac{\dot{Y}}{Y}$ is the growth rate of output, YPC is income per capita measuring the difference of initial income across countries, $\frac{A}{Y}$ is the ratio of aid inflows to GDP, P is an index measuring the distortion of macroeconomic policy, $\frac{AP}{Y}$ is

⁴ For the details of the Barro growth regression see Barro (1991) and Barro and Sala-i-Martin (1995).

the variable to capture the interactive effect of aid and the economic policy index, and Z is a vector of control variables, including *inter alia* government consumption spending, institutional quality index, political instability and country-region variables.

So far, aid appears as a component of physical capital investment in the model of the aid-growth nexus and is assumed to have an impact on growth if the appropriate policies are in place. As such the level of aid flow and its interaction with macroeconomic policy variables is included in the aid-growth regression for testing the positive effect of aid on the recipient economy. Nevertheless, there is a view that aid may do more harm than good to the recipient economy when the level of aid inflow is high. This view has been recognised in the analysis of the two-gap model, where it is also known as the “absorptive capacity constraint” (Durberry *et al.*, 1998, p. 10). The reasoning behind this view is that high aid inflows which exceed those which can feasibly be used in profitable investment are likely to be allocated to unprofitable investment or consumption. This is also known as the issue of aid fungibility which will be further discussed in Section 2.3. Therefore, if a sufficiently large amount of aid is allocated to unproductive investment, aid will reduce productivity of investment, thus high aid inflows will have a negative effect on growth (see for example, Griffin, 1970; Mosley *et al.*, 1987; and Lavy and Seheffer, 1991).

To provide a theoretical rationale, Lensink and White (1999) apply an endogenous growth model that exhibits a negative return to aid at higher aid levels. The underlying theoretical model is one in which the level of technology is endogenised in the system and depends on the level of aid flow. They show that there exists a certain value of aid flow for turning the growth rate of output into a negative value. “The implication of this analysis is that there may exist an *aid Laffer curve*: for small levels of aid, aid has a positive effect on economic growth, while for high levels of aid, aid negatively affects growth” (Lensink and White, 1999, p. 10). The potential side effect of high aid inflow on the productivity of investment has also been

emphasised in the “fiscal response” and “Dutch disease” literatures (discussed in detail in Section 2.3). To test the possibility of an inverse relationship between aid and growth, many researchers have included a quadratic term of aid flow in the aid-growth regression equation, which is basically an extension of equation (2.6) (see for example, Hadjimichael *et al.*, 1995; Durbarry *et al.*, 1998; Hansen and Tarp, 1999; Lensink and White, 1999; Collier and Dollar, 1999).

On the other hand, there is a view that the impact of aid on economic growth is determined by the stability of the flow, not by the level of aid *per se* (Lensink and Morrissey, 1999). As mentioned in Chapter 1, policy conditions have been attached to aid; aid disbursement may also be subject to the recipient country’s achieving certain criteria. For this reason, the failure of the recipient country to fulfil such policy conditionality may relate to the uncertainty of aid inflow, which in turn can have an adverse effect on the level of investment and thus on economic growth. As Lensink and Morrissey argue:

If the recipients are unsure whether they will achieve the policy targets required to trigger the release of a tranche of aid... uncertainty may be increased ...uncertainties with respect to [aid] inflows may render aid less effective as investors, confronted with uncertainty, may decide to postpone or even cancel investment decisions. Uncertainty may have similar effects on the investment decisions and broader fiscal behaviour of government.

Lensink and Morrissey (1999, p. 1).

Lensink and Morrissey employed three forecasting equations to capture the expected value of aid flow. Those forecasting equations are as follows:

$$\left(\frac{A}{Y}\right)_t = b_0 + b_1 t + b_2 \left(\frac{A}{Y}\right)_{t-1} + b_3 \left(\frac{A}{Y}\right)_{t-2} + e_t \quad (2.9)$$

$$\left(\frac{A}{Y}\right)_t = b_4 + b_5 \left(\frac{A}{Y}\right)_{t-1} + b_6 \left(\frac{A}{Y}\right)_{t-2} + e_t \quad (2.10)$$

$$\left(\frac{A}{Y}\right)_t = \mathbf{b}_7 + \mathbf{b}_8 t + \mathbf{b}_9 t^2 + e_t \quad (2.11)$$

where $\frac{A}{Y}$ is aid inflow as percentage of GDP, t is a time trend. Then, the uncertainty proxies or the volatility of aid flow can be obtained by calculating the standard deviation of the residuals of those forecasting equations (i.e. equations (2.9) to (2.11)).

Lensink and Morrissey (1999) test whether the uncertainty of aid flow affects the relationship between aid and growth in the model of aid-growth regression as follows:

$$\frac{\dot{Y}_{pc}}{Y} = \mathbf{b}_0 + \mathbf{b}_1 Y_{pc} + \mathbf{b}_2 SECR + \mathbf{b}_3 \frac{I}{Y} + \mathbf{b}_4 \frac{A}{Y} + \mathbf{b}_5 UA + e \quad (2.12)$$

where $\frac{\dot{Y}_{pc}}{Y}$ is the growth rate of per capita GDP, Y_{pc} is the initial level of per capita GDP, $SECR$ is the initial secondary-school enrolment rate, $\frac{I}{Y}$ is total investment as a percentage of GDP, $\frac{A}{Y}$ is aid inflow as a percentage of GDP, and UA is the uncertainty proxy of aid inflow.

It should be noted that including both investment and aid variables (i.e., $\frac{I}{Y}$ and $\frac{A}{Y}$, respectively) in the aid-growth regression is problematic because aid and investment are likely to have a strong linear relationship between them (see equation (2.3)). In addition, the aid-growth regression could be misspecified, as many variables that correlate with growth are excluded from the regression (see the critique to equation (2.4)). In other words, equation (2.12) may suffer from the presence of multicollinearity and the omitted variable bias, thus it could yield unreliable estimates of the aid-growth coefficient.

However, Lensink and Morrissey (1999) applied equation (2.12) to test the effect of the volatility of aid flow on the relationship between aid and growth rather than estimate the impact of aid on growth. Moreover, they estimate equation (2.12) with and without investment in order to demonstrate the efficiency effect of aid on growth (*ibid.*, pp. 10-11). They also conduct a large-scale stability analysis to test the reliability of the regression result. The variables they include in the stability analysis are a civil liberties index, a political rights index, political instability variables and various macroeconomic variables (*ibid.* pp. 18-19).

In summary, the role of aid in the growth theories is seen as a factor input that contributes to economic growth through a direct increment of the stock of physical capital. Nevertheless, whether aid is effective for spurring economic growth still depends on the policies of both donor and recipient countries and the potential side effects of aid inflows. On the one hand, aid may have a positive effect on economic growth if appropriate policies are in place. This argument is based on the hypothesis that market forces in association with the government adopting sound management may be enough to generate economic development. On the other hand, aid may have a negative effect on growth if a high level of aid inflows leads to the decline in the productivity of capital investment, and if the volatility of aid inflows leads to delaying or cancelling investment decisions. The next section discusses the possible effects of aid on growth in the empirical frameworks.

2.2.2 The empirical evidence of the effectiveness of aid

The empirical work on aid effectiveness has been dominated by cross-country analysis. The selected studies of aid effectiveness shown in Table 2.1 below indicate that the impact of aid on growth is mixed. Some studies find a statistically significant correlation between aid and growth and some do not. For example, Papanek (1973) using data covering the 1955-65 period for a sample of 34 LDCs, obtains a significant positive impact of aid on growth. Gupta (1975) and Stoneman (1975) obtain a similar result for a

wider sample of LDCs and data. On the other hand, Griffin and Enos (1970) report a negative impact of aid on growth for a sample of 32 Latin American countries for the 1957-64 period. Voivodas (1973) uses data covering the 1956-68 period for a sample of 22 LDCs and obtains a negative impact of aid on growth, although the aid-growth coefficient is not significant. Thus, it is not surprising that the ambiguity of the effectiveness of aid may partly arise from using the OLS technique for estimating the aid-growth coefficient.

Table 2.1: Aid, policies, and growth relationships: selected results

Study	Sample size and countries case study	Explanatory variables	Estimation Method	Variables with significant coefficients (sign in the bracket)
Griffin and Enos (1970)	n=32 LA 1957-64	A	OLS	A(-)
Voivodas (1973)	n=22 LDCs 1956-68	A	OLS	A(-) but not significant
Papanek (1973)	n=34 LDCs 1955-65	S, A, FDI, OF, L	OLS	A(+)
Gupta (1975)	n=40 LDCs 1960	S, A, FDI, OF	OLS	A(+), OF(+)
Stoneman (1975)	n=188 LDCs 1955-70	S, A, FDI, OI	OLS	S(+), A(+), OI(-)
Mosley (1980)	n=83 LDCs 1970-77	S, A, I	3SLS	None
Mosley <i>et al.</i> (1987)	n=63 LDCs 1970-80	S, A, OF, GX, GL	3SLS OLS	GX(+), GL (+)
Dowling and Hiemenz (1983)	n=13 Asian 1968-79	S, A, FDI, OP, T, CG, FD	OLS	A(+), S(+), FDI(+)
Mosley <i>et al.</i> (1992)	n=71 LDCs 1980-88	S, A, FDI, GX, GL, PI	OLS	A(+), S(+), X(+)
Reichel (1995)	n=83 LDCs Average 1980s	S, A, GX, GDP, YPC, L, SP	2SLS	GX(+), SP(+)
Hadjimichael <i>et al.</i> (1995)	N=31 S-African 1987-92	A, A ² , IP, IG, H ₀ , N, tot, RER, INF, BD	GLS	All variables are significant
Burnside and Dollar (1997)	n=56 LDCs 1970-93	A, AP, YPC, EthAs, Inst, FD, BD, INF, OP, PI, Cg	2SLS	AP (+), Inst (+), INF(-), OP(+)
Bowen (1998)	n=67 LDCs 1970-1988	S, A, OF, GX, SA, OFA, XA	2SLS	A(-), GX(+), SA(-)
Durberry <i>et al.</i> (1998)	n=58 LDCs 1970-93	A, A ² , S, OF, tot, INF, Bg, FD	2SLS	A(+), A ² (-), S(+), OF(+), tot(+), INF(-), BD(-)
Hansen and Tarp (1999)	n=56 LDCs 1974-93	A, A ² , OP, INF, CG, FD, YPC	IV	All variables are significant

Legend: I: total investment, IG: public investment, IP: private investment S: domestic saving, A: aid inflows, FDI: foreign direct investment, OF: other foreign inflow, L: population or labour force, OI: other investment, OP: openness index, T: tax revenue, CG: government consumption spending, FD: financial deepening, GX: growth rate of exports, GL: growth rate of literacy, GDP: gross domestic product, YPC: income per capita, SP: stable prices, EthAs: interactive effect between ethnic issues and political assassination, Inst: institutional quality, BD: budget deficit, INF: inflation, tot: term of trade AP: interactive effect between aid and policy, PI: policy index, LA: Latin American Countries, LDCs: less developed countries, OLS: ordinary-least-squares, 2SLS: two-stage-least-squares, 3SLS: three-stage-least-squares, GLS: generalised-least-squares, IV: instrumental-variables.

Sources: as shown in the column study.

Despite many studies augmenting the aid-growth nexus model to include policy variables and employing more sophisticated estimation techniques during the 1980s-90s period, the results of the impact of aid on growth still remain controversial. For example, Mosley (1980) uses data covering the 1970-77 period for 83 LDCs and employs 3SLS techniques. He finds that the effect of aid on growth is not significant, except for the 30 poorest countries where aid has a significant positive effect on growth. In the follow up study, Mosley *et al.* (1987) introduce other explanatory variables into the regression equation. These variables include the growth rate of exports, growth of literacy and a variable to cover other source of financial inflows. They apply both OLS and 3SLS technique to estimate the impact of aid on growth. Neither method yields a statistically significant aid-growth coefficient. They conclude that this result may relate to the issues of aid fungibility and the crowding out of investment in the private sector. On the other hand, Dowling and Hiemenz (1983) examine the aid-growth nexus using data covering the 1968-79 period for 13 Asian countries, and control for a number of policy variables such as trade, finance and government intervention. They obtain a positive and significant impact of aid on growth.

In the last few years, the empirical studies on aid effectiveness still show no sign of agreement. Nevertheless, a majority of aid effectiveness studies have paid more attention to the policies which recipient governments have followed. For example, Mosley *et al.* (1992) examine the role of policy orientation in the determination of the effectiveness of aid by including the index of policy-orientation in the aid-growth regression. Using a sample of data covering 1980-88 for 71 LDCs, they obtain a positive coefficient of aid and policy index variables, despite the latter being not statistically significant. Their explanation for the insignificant statistical result of the policy variable is due to the problem of data aggregation. They note that 55 percent of the countries in the group of “high aid, high growth” category adopted “moderately” to “strongly outward-oriented” development strategies, while 35 percent of the countries in the group of “low aid, low growth”

category adopted “strongly inward-oriented” development strategies. Therefore, as the group of countries that adopted outward-oriented policies is larger and the sign of policy orientation is positive, they suggest that aid may be effective in an environment of “outward-oriented” policies. Hadjimichael *et al.*, (1995) investigate the impact of macroeconomic policy, structural reforms and external factors (terms of trade, foreign aid) on savings, investment and growth in 31 Sub-Saharan African countries for the 1987-92 period. They find that aid is effective for the group of “sustained adjusters” who pursue stable macroeconomic policies and implement the “adjustment programmes”, so that this group of countries is able to maximise beneficial effects of aid and attract adequate aid inflows.

On the other hand, Bowen (1998) investigates the impact of aid on growth through the potential interactive effect between aid and savings, investment and export growth. His results from 2SLS estimation based on data covering the 1970-1988 period for a sample of 67 LDCs shows that aid has a negative impact on growth in the countries with income less than US\$1000 (i.e. about 55 percent of the sample). Otherwise, aid has a positive impact on growth. Based on this finding, he concludes that the effectiveness of aid increases with the level of development. He also finds that aid displaced domestic savings, which he gives as the main reason for the poor record of economic performance in the developing countries. Boon (1994; 1996) employs data covering the 1970-92 period for a sample of 56 LDCs to examine aid effectiveness. He finds no significant relationship between aid and growth and criticised recipient governments for not having appropriate economic policies. Similarly, Burnside and Dollar (1997) examine the interactive effect of aid and policy conditionality on growth for a sample covering 56 LDCs over the 1970-93 period. While their results indicate a negatively insignificant statistic of the aid-growth coefficient, they illustrated that sound policy management is conditional for aid to have a positive effect on growth. They conclude that aid only works when government policies are good, and

that aid should be given to countries where governments pursue sound policy management.

In the study by Burnside and Dollar (1997), the policy index is formed by three variables: the level of inflation, the size of budget surplus, and the openness to trade; the measure of institutional quality involves an assessment of the strength of the rule of law, the quality of public services, and the pervasiveness of corruption.⁵ Using these criteria, a country with sound policy management would be one with low inflation, small fiscal imbalances, an open trade regime, and a high score for the institutional quality. The World Bank's report of "Assessing Aid" cites the empirical findings of Burnside and Dollar (1997) and concludes as follows:

Aid generally has a large effect in a good-management environment: 1 percent of GDP in assistance translates to a sustained increase in growth of 0.5 percentage points of GDP. Some countries with sound management have received only small amounts of aid and have grown at 2.2 percent per capita. The good-management, high-aid group, however, grew much faster [at] 3.7 percent per capita. There is no such difference for countries with poor management. Those receiving small amounts of aid have grown sluggishly, as have those receiving large amounts. Introducing other variables does not change the picture.

The World Bank (1998, p. 14).

⁵ This policy index has been criticized in the study by Lensink and White (2000). However, Collier and Dollar (1999) replaced this policy index with the World Bank's Country Policy and Institution Assessment (CPIA) score in a similar model to that applied by Burnside and Dollar (1997), and obtain a similar result. For more details see Beynon (2001, p.15). The CPIA has 20 different components covering four groups of policy and management measures. Those are: (1) *Macroeconomic Management* which consists of general macroeconomic performance, fiscal policy, management of external debt, macroeconomic management capacity, sustainability of structural reforms; (2) *Structural Policies* which consists of trade policy, foreign exchange regime, financial stability and depth, banking sector efficiency and resource mobilization, property rights and rule-based governance, competitive environment for the private sector, factor and product markets, environmental policies and regulations; (3) *Policies for Reducing Inequalities* which consists of poverty monitoring and analysis, pro-poor targeting and programmes, safety nets; and (4) *Public Sector Management* which consists of quality of budget and public investment process, efficiency and equity of revenue mobilization, efficiency and equity of public expenditure, accountability of the public service. Each component is scored on a 1-6 scale, and given equal weight in computing the overall policy score.

Although the study by Burnside and Dollar (1997) is considered pivotal to a new generation of aid effectiveness studies, it has been criticised for its intriguing policy implication (Hansen and Tarp, 1999). Beynon notes that:

...the original [Burnside and Dollar] research was undertaken partly in response to critics on the right who argued that aid was ineffective and therefore wasted, and to critics on the left who argued that structural adjustment policies were failing...

Beynon (1999, p. 2).

The central message of the study by Burnside and Dollar (1997) is that aid only really works when government policies are good and that aid should be allocated to countries with good policies. This conclusion is broadly in line with the “Washington Consensus” view on development policies (Hansen and Tarp, 1999). According to Hansen and Tarp (1999; 2000), foreign aid can induce growth both in countries with salutary and unfavourable policy environments, and increased foreign aid has a positive impact on growth so long as the ratio of aid to GDP is not excessively high or beyond a certain threshold, the “optimal level of aid inflows”. Hadjimichael *et al.*, (1995) and Hansen and Tarp (1999) estimate the optimal level of aid inflows to GDP as equivalent to 25 percent, while Durbarry *et al.*, (1998) and Lensink and White (1999) have estimation results which range between 40 to 50 percent of GDP.

The crux of the ongoing dispute is the interpretation of the interactive term (A*P) between foreign aid (A) and policy index (P) in the earlier work by Burnside and Dollar (1997). The statistical significance of the coefficient for this interactive term may imply that foreign aid can affect growth, but only when policies are right. However, Lensink and White (2000, p. 6) demonstrate that the A*P interactive term can be interpreted as either aid can affect growth if policies are right or policies work better if supported by aid inflow. Although the statistical robustness of this interactive term has been re-examined in many studies, there remains no agreement as to whether policy conditionality is a necessary condition to improve the

effectiveness of foreign aid (Beynon, 2001, pp. 23-24).⁶ This may imply that the theory of the aid-growth nexus is incomplete. Indeed, Dalgaard and Hansen (2000, p. 7) demonstrate that the links between good policy and foreign aid are substituted for each other in the model in which both variables decrease the probability of social unrest, and they conclude that “the links between aid, growth and good policy are ambiguous” on account that “while good policies spur growth they may at the same time lead to the decreasing effectiveness of foreign aid”. Empirically, part of the ambiguity may be due to the methodological weaknesses of the aid-growth regression, as the estimated aid-growth coefficient is found to be highly sensitive to the choice of the set of control variables (Lensink and White 2000; Hansen and Tarp, 2000).

Although there remains controversy regarding the effect of aid on growth, a new wave of studies into aid effectiveness has acknowledged that sound policy management is crucial for developing countries to maintain sustainable economic growth. For example, Durbarry *et al.*, (1998) found that a stable macroeconomic policy environment contributes to a greater beneficial effect of aid on growth. They also found that the growth performance of developing countries depends on the external economic environment, i.e. an increasing integration into the world economy through the ongoing process of globalisation and liberalisation. Lensink and Morrissey (1999) found that the uncertainty of aid flows has a negative impact on investment, and hence on growth. For this reason, they suggested that the stability of the donor-recipient relationship is crucial for enhancing

⁶ Other studies on aid effectiveness approach this issue by comparing economic growth between countries which did and countries which did not adopt the “adjustment programmes”; nevertheless there remains dispute as to whether policy conditionality works. For example, the IMF (1999a, p.2) indicates that real per capita growth of countries that enter the IMF programmes “had caught up with that in other developing countries by the mid-1990s, ...and have been rising at an average 2.5 percent a year” for the late 1990s. However, Przeworski and Vreeland (2000, p.385 and p.395) indicate that countries that enter the IMF programmes have a lower output growth as long as they remain in the programmes and that countries participating in the IMF programmes have economic growth of 2.35 percent less than developing countries not participating in the IMF programmes. Apparently, the IMF’s indication about the impact of foreign aid on growth is not consistent with the latter studies.

the effectiveness of aid because such stability has fostered the implementation of appropriate economic policies.

Until now, the effectiveness-of-aid literature has demonstrated that foreign aid contributes to economic growth through the impact of aid flow on the accumulation of the domestic capital stock and the productivity of capital investment. It has also emphasised the need for appropriate policy to accommodate aid flows in order to enhance the effectiveness of aid. The next section further explores the potential effects of aid and policy on the accumulated capital stock and the productivity of capital investment in the saving-investment and the export-import channels.

2.3 Aid and policy in displacement theories

Displacement theories suggest that there are possibilities that more aid inflows may not raise investment by as much as of the value of aid inflow and therefore an increase in aid may not lead higher rates of economic growth. One possibility is that aid inflows may displace domestic savings and/or “crowd out” private investment. The debate on this view has been reproduced within the “savings debate” and the “fiscal response” literatures, which are discussed, respectively, in Sections 2.3.1 and 2.3.2. Another possibility concerns the impact of aid on the real exchange rate. Aid could erode export earnings, which in turn reduces the ability to import and thus the ability to increase investment as required. This is the subject of the “Dutch disease” literature, which is discussed in Section 2.3.3.

2.3.1 Aid and the savings debate

The aid-savings debate was initially introduced by Griffin (1970) and Griffin and Enos (1970). This debate focused on the hypothesis that aid inflows may displace domestic savings. They argued that aid inflow is seen as a complement to rather than the stimulant for income. As they indicated, the marginal propensities to save and consume are between zero and unity, thus aid inflows will be allocated between savings and consumption. As a

result, savings and investment will not rise as much as the values of aid inflows do.⁷ To support this argument, Griffin and Enos (1970) estimated the aid-savings regression in the following form:

$$\frac{S}{Y} = f_0 + f_1 \frac{A}{Y} + d \quad (2.13)$$

Later, for a similar reason discussed in the model of the aid-growth nexus, many researchers have incorporated more explanatory variables in the aid-savings nexus model in order to obtain unbiased estimators. The following aid-savings regression is used to ascertain the impact of aid on savings:

$$\frac{S}{Y} = f_0 + f_1 \frac{A}{Y} + f_2 \frac{Z}{Y} + d \quad (2.14)$$

where $\frac{S}{Y}$ and $\frac{A}{Y}$ are the ratio of domestic saving and foreign aid to GDP, respectively, and $\frac{Z}{Y}$ is a vector of variables affecting savings (for example the levels of exports or inflation). In this model the expected sign of the aid-savings coefficient (f_1) is negative.

However, there have been several criticisms of both the theoretical and empirical approaches put forward in the studies by Griffin (1970) and Griffin and Enos (1970). For example, White (1992a, 1992b and 1992c) criticised Griffin's model as merely a simple accounting analysis, allowing for no feedback effect from the possibilities that aid may stimulate income and lead to higher savings. Indeed, the analysis of Grinols and Bhagwati (1976) incorporated the potential effect of income growth on savings, even allowing

⁷ This claim can be illustrated by analysing the impact of aid inflows on savings in the national accounting identity. In the equilibrium position total investment identity is equivalent to $I \approx S_d + A$ or $\frac{DI}{DA} \approx \frac{DS_d}{DA} + 1$, if aid inflow displaces savings, i.e., $\frac{DS_d}{DA} < 0$, $\Rightarrow \frac{DI}{DA} < 1$, thus investment will increase less than aid inflow.

a negative relationship between aid and savings, which contradicted Griffin's view. As such, they demonstrated that aid is able to raise savings through the dynamic effect of the increase of income on savings. Therefore, White (1998) suggested that the greatest weakness of Griffin's model "is probably the fact that it holds income constant in the face of aid inflow. If aid also affects income, then the impact on savings becomes ambiguous" (White, 1998, p. 6).

With respect to the critique of the empirical approach, there are possibilities that the aid-savings regression equations could suffer from econometric misspecifications such as omitted variable bias, simultaneity and multicollinearity problems.⁸ Therefore, applying the aid-savings regression equation to assess aid effectiveness is misleading and will yield ambiguous results. Indeed, as White (1992a) indicates, "Despite some more sophisticated treatments of the problem in recent years, there remains no agreement as to the relationship between aid and savings" (White, 1992a, p. 189). The following paragraph highlights the empirical evidence regarding the aid-savings nexus which have been found in various studies undertaken since the 1970s.

The proponent of the aid-savings displacement theory estimate the aid-savings regression equations using data from both cross-country and time-series studies and report negative values for the aid-savings coefficient ranging between -0.73 to -0.84 (Griffin, 1970, pp. 105-106). Chenery and Eckstein (1970) and Weisskopf (1972) also obtain a negative value for the aid-savings coefficient. In contrast, Over (1975) finds a positive value for the aid-savings coefficient in a similar sample to that used by Griffin (1970). In more recent studies, the evidence on the aid-savings nexus remains ambiguous. Snyder (1990) uses a sample of data for 50 low and middle-income countries covering the 1960-85 period and obtains a negative value

⁸ For a detailed discussion on the aid-savings regression critique, see White (1992b, pp.125-132).

for the aid-*savings* coefficient, despite its insignificant statistical result.

However, Snyder does not rule out the possibility that there is some inverse relationship between aid and savings because the aid coefficient was found to have a negative relationship due to various specifications of the *savings* function. Reichel (1995) uses 2SLS to estimate the model consisting of three endogenous variables (growth, aid, domestic saving) and finds a significantly negative coefficient for the aid-*savings* relationship. In a sample of 39 sub-Saharan African countries, Hadjimichael et al., (1995) find that the aid-*savings* nexus varied depending on the growth performance and the degree to which adjustment efforts were sustained. In the group of “sustained adjusters”, foreign aid appears to have stimulated domestic savings, whereas in a group of countries with negative per capita growth rate and protracted economic imbalances, foreign aid has a negative impact on savings.

It is not surprising that the empirical evidence on the aid-*savings* nexus is mixed and ambiguous. These results reflect the theoretical weakness of the aid-*savings* displacement hypothesis. Although the analysis of the aid-*savings* nexus does not provide clear-cut information about how aid may affect growth through this channel, further enquiry in this area has continued in more detail. Attention is directed towards aid fungibility issues which involve the investigation of the relationships among aid inflows, fiscal policy variables and investment. This is discussed below.

2.3.2 Aid fungibility and the fiscal response effects

As argued in the aid-*savings* displacement theory, Griffin (1970) indicated that recipient countries tend to substitute aid inflow for domestic resources. As most of the aid goes to support public expenses, recipient governments may reduce their tax efforts. If this is the response recipient governments pursue to accommodate aid inflows, it could create an unfavourable environment for encouraging domestic savings and private investment. Indeed, by reducing tax revenues, governments could face chronic budget

deficit problems, as government spending could rise to accommodate the escalation of aid inflows. Sooner or later the recipient governments may not be able to avoid the need to print money and/or to raise public sector borrowing requirement (PSBR) to finance their budget deficits. These moves could affect private savings (investment) through the negative effects of high inflation (high interest rates), which may occur due to the growth of high-powered money (the increase in PSBR will bid up the interest rate). Besides, the government may change the composition of its expenditure towards unproductive investment and/or consumption (i.e., the issue of aid fungibility).⁹ The influence of foreign aid on public investment may thus be unproductive and not promote economic growth.¹⁰

There are two main approaches to the estimation of aid fungibility coefficients. The most popular of the aid fungibility models, the “fiscal response” model, was first developed by Heller (1975). This model was further extended by Mosley *et al.* (1987), Gang and Khan (1991) and Franco-Rodriguez *et al.* (1998). In this approach, the government minimises a loss function subject to expenditure constraints to obtain empirical frameworks in the form of structural or reduced-form equations. The aid fungibility coefficients can be obtained by estimating the fiscal behavioural coefficients from such an equation system. Another aid fungibility model was developed by Pack and Pack (1990; 1993), in which the aid fungibility coefficient can be obtained by regressing government spending on a range of variables. Although this approach is an atheoretical model, it can tackle the essence of the bureaucratic decision-making process (Pack and Pack, 1990, p. 189). Other researchers applying similar approaches to that of Pack and Pack (1990; 1993) are, for example, Khilji and Zampelli (1991; 1994), Feyzioglu *et al.* (1998) and Swaroop *et al.* (2000). Each of these studies

⁹ The issue of aid fungibility is another strand in aid-effectiveness studies. Aid fungibility has been widely explored at both aggregate and sectoral levels. However, this study focuses only on evaluating aid fungibility at the aggregate level. Some recent studies of aid fungibility are Pack and Pack (1991), Khilji and Zampelli (1991) and Mitsuhashi (1996).

¹⁰ See Griffin (1970, pp. 103-107) for a detailed discussion on this issue.

derives the empirical framework from a utility maximising problem. Aid is said to be fungible at the aggregate level if the following conditions are satisfied:

$$\frac{DIG}{DA} < 1 \quad (2.15)$$

$$\frac{DCG}{DA} > 0 \quad (2.16)$$

$$\frac{DT}{DA} < 0 \quad (2.17)$$

where CG , IG , T and A are government consumption spending, public investment, taxation and aid inflows, respectively.

Equation (2.15) indicates that aid intended to be used for public investment does not increase public investment to the extent of the value of aid inflow. This implies that the recipient government is able to avoid donor attempts to target aid, and some of released resources that are available due to an increase in aid inflow can be used to increase consumption (equation (2.16)) or to fund tax cuts (equation (2.17)). To estimate the aid fungibility coefficient, the first approach employs a structural model which is represented by a system of equations as follows:

$$DI_t = f_1(DI_t^*, T_t, A_t) \quad (2.18)$$

$$IDI_t = f_2(CG_t^*, IDI_t^*, T_t, A_t) \quad (2.19)$$

$$CG_t = f_3(CG_t^*, IDI_t^*, T_t, A_t) \quad (2.20)$$

$$T_t = f_4(T_t^*, CG_t^*, CG_t, DI_t, A_t) \quad (2.21)$$

Equations (2.18) through to (2.21) consist of fiscal-choice variables. These variables are: direct public investment (DI), indirect public investment (IDI) (here $IG = DI + IDI$), government consumption spending (CG), government

revenue (T) and total aid (A) which can be classified into grant aid and loan aid. An asterisk (*) denotes the fiscal-target variables which are defined in equations (2.22) through to (2.25) as follows:

$$DI_t^* = f_5(Y_{t-1}, IP_t) \quad (2.22)$$

$$IDI_t^* = f_6(Enr_t, Y_t, GY_t) \quad (2.23)$$

$$CG_t^* = f_7(CG) \quad (2.24)$$

$$T_t^* = f_8(Y_t, M_{t-1}) \quad (2.25)$$

where Y is real income and GY is growth of real income, IP is private investment, Enr is primary school enrolments and M is imports. Estimation of the target variables in equations (2.22) through to (2.25) is crucial for the subsequent estimation of the aid fungibility coefficients in equations (2.18) through to (2.21).

Other approaches to estimate the aid fungibility coefficient are represented by equations (2.26) through to (2.29):

$$T_t = f_9(A_t, Z_t) \quad (2.26)$$

$$CG_t = f_{10}(A_t, Z_t) \quad (2.27)$$

$$IG_{i,t} = f_{11}(A_{i,t}, A_{\neq i,t}, Z_t) \quad (2.28)$$

$$CG_t + \sum_{s=1}^n IG_{i,t} = T_t + A_t + PSBR_t \quad (2.29)$$

where T , CG , IG , and A , are defined as before, $A_{i,t}$ is aid allocation to sector i at time t , $A_{\neq i,t}$ is aid allocation to other sectors at time t , $PSBR$ is public sector borrowing requirements and Z is a vector of control variables. Pack and Pack (1990, 1993) use GDP as the control variable, while Feyzioglu *et al.* (1998) use the infant mortality rate, average years of schooling in the labour force, average ratio of a neighbouring country's military expenditure to GDP, and

ratio of agricultural output to GDP. Equation (2.28) is employed to capture sectoral-aid fungibility coefficients of the public investment (i.e., the coefficients of $\frac{\Delta IG_{i,t}}{\Delta A_{i,t}}$). The aid fungibility coefficient of the public investment

at the aggregate level (i.e., the coefficient of $\frac{\Delta IG}{\Delta A}$) can be obtained by summing up the sectoral aid fungibility coefficients.

Although the fiscal response model provides useful information about the effectiveness of aid, it implicitly indicates that aid fungibility could affect economic growth through affecting the marginal productivity of aid. To solve this puzzle, Mosley *et al.* (1987) extended Heller's framework to incorporate a production function. This analytical framework highlights the relationship among aid, growth and private investment. The impact of aid on growth can be derived from the simplified equations noted by White (1992a), as follows:

$$U = g_0 - \frac{g_1}{2}(G - G^*)^2 - \frac{g_2}{2}(T - T^*)^2 \quad (2.30)$$

$$G = g_3 A + g_4 T \quad (2.31)$$

$$G^* = g_5 IP \quad (2.32)$$

$$T^* = 0 \quad (2.33)$$

$$IP = g_6 A \quad (2.34)$$

$$Y = Y(KP, KG, L) \quad (2.35)$$

where U is the government's utility in the form of a welfare-loss-function, G is government spending ($G=IG+CG$), G^* is the government spending target, T is taxation, T^* is the taxation target, A is foreign aid, IP is private investment, Y is production, KP and KG are respectively, fixed capital stock of private and government sectors, and L is the labour force.

In this model, equation (2.30) implies that the welfare loss function depends on how a government's budget is allocated. The government can maximise the value of social welfare so long as its actual and target budget levels are the same (i.e., at $G = G^*$ and $T = T^*$). Thus the value of the welfare loss function is positive, ($U = g_0 > 0$), indicating that the social welfare function is maximised, and any allocations that deviate from the target will lower the value of social welfare (i.e., $U = g_1 < g_0$). Equation (2.31) is the government's budget constraint, assumed to depend only on aid inflows and taxation revenue. To simplify the model, the taxation target is set equal to zero in equation (2.33). Equation (2.32) captures the influence of government spending on private investment, as governments can set their spending targets to promote private investment. In other words, governments can set their spending targets to encourage private investment. Equation (2.34) captures the direct impact of aid on private investment. On the supply side, production is driven by the stock of private and public capital and the labour force (equation (2.35)).

By minimising the welfare loss subject to a budget constraint, the model yields a set of equations that determine the coefficient of governmental behaviour. The substitution of the reduced forms of IG (obtained from first order condition) and IP into the growth function gives the solution for the impact of aid on growth, as follows:

$$\frac{\partial \dot{Y}}{\partial A} = \left(\frac{\partial Y}{\partial KP} g_6 \right) + \left(\frac{\partial Y}{\partial KG} \frac{m}{1+m} g_3 \right) + \left(\frac{\partial Y}{\partial KG} \frac{m}{1+m} g_3 g_6 \right) \quad (2.36)$$

$$\text{where } m = \frac{g_2}{g_1 (g_4)^2} > 0.$$

Equation (2.36) illustrates that aid affects growth through three channels. The first term captures the impact of aid on growth through private investment (g_6) and the marginal productivity of private capital $\left(\frac{\partial Y}{\partial KP} \right)$. The

second term captures the impact of aid on growth through public investment (g_3) and the marginal productivity of public capital $\left(\frac{\partial Y}{\partial KG}\right)$. The last term captures the impact of aid on growth through the interactive effect of public and private investment (g_3g_6) and the marginal productivity of public capital $\left(\frac{\partial Y}{\partial KG}\right)$.

Despite the coefficient of government behaviour (m) entering into the last two terms of equation (2.36), this does not give a clear-cut view as to whether the issue of aid fungibility can be considered as a sufficient condition to solve the puzzle of why aid may or may not have an impact on growth. As White (1992a) argued, the fall in tax revenue due to the increase in aid inflows might not be observed. This is because aid may raise current income and hence increase tax collection. He further elaborated that the impact of the low level of public savings on private savings and investments perhaps depends on how governments finance their spending. Therefore, the most striking implication of equation (2.36) is that the impact of aid on growth mainly depends on the impact of aid on the private sector and the impact of aid fungibility on the productivity of public and private capitals, which in turn depend on the government's sound policy management. In this context, White and McGillivray (1992) applied a simple economic model to examine the relationship between aid and private investment with various sets of fiscal responses. The model consists of two equations as follows:

$$I_p = I_p(r) \text{ and } I'_p < 0 \quad (2.37)$$

where I_p is private investment, which is assumed to have an inverse relationship with the real interest rate (r).

$$PSBR = G - (T + A) \quad (2.38)$$

where $PSBR$, the public sector borrowing requirement, is equal to the government's budget deficit.

Table 2.2 below provides a summary of the sets of fiscal response to aid inflows under various conditions which may explain why aid fungibility may or may not have impact on private investment, and hence on economic growth.

Table 2.2: LDC fiscal response to foreign aid inflows

Case	Conditions	Description	Effect on I_p
1	$\frac{dT}{dA} = \frac{dG}{dA} = 0$ $\Rightarrow \frac{dPSBR}{dA} = -1$	Government uses aid to finance planned expenditure, taking opportunity to reduce PSBR (i.e., reducing future government expenditure); present value of reduction equals the value of aid inflow.	Crowding In
2	$\frac{\Delta T}{\Delta A} = 0, 0 < \frac{\Delta G}{\Delta A} < 1$ $\Rightarrow \frac{\Delta PSBR}{\Delta A} < 0$	Weaker version of Case 1 in which $(1-dG/dA)$ is used to reduce PSBR, with remainder used to increase government expenditure.	Crowding In
3	$\frac{dT}{dA} = 0, \frac{dG}{dA} = 1$ $\Rightarrow \frac{dPSBR}{dA} = 0$	No fungibility with all aid used to finance increased expenditure.	None
4	$\frac{dT}{dA} = 0, \frac{dG}{dA} > 1$ $\Rightarrow \frac{dPSBR}{dA} > 0$	Government increases expenditure by more than the value of aid inflows (as in, for example, counterpart funding requirement); PSBR increases.	Crowding Out
5	$\frac{dT}{dA} = 0, \frac{dG}{dA} < 0$ $\Rightarrow \frac{dPSBR}{dA} < -1$	Government reduces expenditure in response to aid inflows on belief that aid expenditure is more efficient than domestically financed expenditure.	Crowding In
6	$1 < \frac{dT}{dA} < 0, \frac{dG}{dA} = 0$ $\Rightarrow \frac{dPSBR}{dA} < 0$	Aid inflows used to both offset PSBR and reduce taxes.	Crowding In
7	$\frac{\Delta T}{\Delta A} < 0, 0 < \frac{\Delta G}{\Delta A} < 1$ $\Rightarrow \frac{\Delta PSBR}{\Delta A} < 0$ if $\frac{\Delta G}{\Delta A} - \frac{\Delta T}{\Delta A} < 1$	Aid inflows partly used to finance increased expenditure and partly to reduce taxes, net result being a decrease in PSBR.	Crowding In
8	$\frac{dT}{dA} < 0, 0 < \frac{dG}{dA} < 1$ $\Rightarrow \frac{dPSBR}{dA} > 0$ if $\frac{dG}{dA} - \frac{dT}{dA} > 1$	Aid inflows partly used to finance increased expenditure and partly to reduce taxes, net result being an increase in PSBR	Crowding Out
9	$\frac{\Delta T}{\Delta A} < 0, \frac{\Delta G}{\Delta A} > 0$ $\Rightarrow \frac{\Delta PSBR}{\Delta A} = 0$ if $\frac{\Delta G}{\Delta A} - \frac{\Delta T}{\Delta A} = 1$	Aid inflows partly used to increase expenditure and partly to reduce taxes, net result being no change in PSBR	None
10	$\frac{dT}{dA} > 0, \frac{dG}{dA} > 1$ $\Rightarrow \frac{dPSBR}{dA} > 0$	Government increases expenditure by more than the value of aid inflows; taxation revenue increases due to an income multiplier effect.	Crowding Out

Source: White and McGillivray (1992)

To evaluate the fiscal response effect from the aid inflow or the impact of aid fungibility on growth, the coefficients of the impact of aid on tax, government spending and the public sector-borrowing requirement are needed. Table 2.3 below provides empirical evidence of the fiscal response effect and adding

aid fungibility variables to the information provided by White and McGillivray (1992).

Table 2.3: The Fiscal Response Effect from Foreign Aid Inflows

Study	Data	$\frac{DG}{DA}$	$\frac{DT}{DA}$	$\frac{DPSBR}{DA}$	Is aid fungible in aggregated level?	Effect on private investment
Heller (1975)	n=11 African 1960s-70s	0.96	-0.4	0.36	Yes	Crowding Out (case 8)
Cashell & Craig. (1990)	n=46 LDC 1975-80s	3.60	0.00	2.60	Yes, soft-loan & grant are likely	Crowding Out (case 4)
McGuire (1987)	Israel	-0.52	0.00	-1.52	No	Crowding In (case 5)
Pack and Pack (1991)	Indonesia 1966-86	1.58	0.29	0.29	No	Crowding Out (case 10)
Gang & Khan (1991)	India 1961-84	-0.55	0.00	-1.55	No	Crowding In (case 5)
Khilji & Zampelli (1991)	Pakistan	0.26	-0.74	0.00	Yes	None (case 9)

Sources: as shown.

As can be seen from Table 2.3, the existence of aid fungibility is not always associated with the negative impact of aid on private investment. This is not a surprising result because the issue of aid fungibility is not a sufficient condition to indicate that aid may or may not have a negative impact on growth. Nevertheless, in the case of the aid fungibility crowding out private investment, the negative impact of aid on the private sector is due to the pressure on recipient governments to increase *PSBR*, which in turn could bid up the interest rate and lower investment demand. Moreover, there is a view that the negative impact of aid on the private sector could be channelled through the high level of aid inflows exerting upward pressure on the domestic price level, especially on non-tradable prices. As Mosley *et al.*, claimed:

the transfer of aid money raises the prices of some goods, depresses the prices of some others and hence has side effects on the private sector.

Mosley *et al.* (1987, p. 617).

This claim, however, could indicate that aid inflows might have dual impacts (positive and negative) on the recipient economy. On the one hand, aid inflows exert upward pressure on non-tradable prices that may encourage producers to produce more non-tradable goods. On the other hand, the increase in non-tradable prices might cause the appreciation of the real exchange rate if non-tradable prices rise faster than tradable prices. The latter is the issue known as “Dutch disease” effect, which is discussed in the following section.

2.3.3 Aid and the “Dutch Disease” effect

In the aid effectiveness literature, “Dutch disease” is used to refer to the situation where high levels of aid inflow may generate undesirable effects on the economy (Edwards and Van Wijnberger, 1989). “Dutch disease” arises when the high level of aid inflows brings about real exchange rate appreciation and creates booming sector (non-tradable sectors) at the cost of recession in other sectors (tradable sectors). The symptoms of “Dutch disease” can be observed once the increase of aid inflows draws resources away from tradable into non-tradable sectors. As a result, tradable production declines and hence threatens export performance (Corden and Neary, 1982). It is obvious that the effect of “Dutch disease” will erode the recipient’s export earnings and hence the ability to import. Therefore, more aid inflows which may cause the “Dutch disease”, will not be matched by a one-for-one increase in investment (White, 1998, pp. 6-7).¹¹

As “Dutch disease” arises due to the high level of aid inflow creating a booming sector in the economy, it is important to analyse the level of aid inflow that may cause the “Dutch disease” effect. White (1992a) indicates that the “Dutch disease” effect happens in both the developed and

¹¹ This claim can be illustrated by analysing the impact of aid inflows on export earnings in the national accounting identity. In the equilibrium position the import identity is equivalent to $M = X + A$ or $\frac{DM}{DA} \approx \frac{DX}{DA} + I$, if aid inflows displaces export earnings, i.e. $\frac{DX}{DA} < 0 \Rightarrow \frac{DM}{DA} < I$, imports increase less than aid inflows.

developing world, however, sector booms in the developed world, unlike those in the developing world, are not the result of high capital inflow. The “Dutch disease” syndrome arises when the booming sector accounts for a 6 to 15 percent share of GDP in developed countries, but in developing countries, the level of aid inflow to GDP varies from more than 5 percent to over 20 percent. Therefore, White suggests that there is a high potential that aid may bring in the “Dutch disease” effect (White, 1992a, pp. 166-67). In the past decade, studies of the “Dutch disease” effect have been approached from different methodologies. These range from the application of the single regression equation of aid-real exchange rate nexus models to the establishment of macroeconomic models or computable general equilibrium models (CGE). The appropriateness of an approach depends on the extent of aid inflows and the considerable economy-wide effects of aid on the recipient economies. Empirical evidence regarding the “Dutch disease” effect is highlighted below.

Van Wijnbergen (1986) applies a single regression equation to estimate the aid-real exchange rate nexus model for African countries. He finds a significantly negative relationship between aid and the real exchange rate in four out of six African countries. He also demonstrates that the effect of the “aid boom” permanently lowers the total productivity in the export sector. Despite the real exchange rate being allowed to depreciate after the effect of the “aid boom”, productivity does not return to the level before the “aid boom”. Nevertheless, he argues that if capital markets were perfect, there should have been no problem after the effect of the “aid boom” as the private sector can re-borrow and re-invest after the economic recovery from this effect.

Using the CGE model, Weisman (1990) investigates the impact of aid inflows to Papua New Guinea. He finds that aid inflows increased government spending, which in turn increased the prices of non-traded goods and services. Producers responded to the increase in prices of non-traded goods by increasing supply in this sector and shifting resources from

the production of traded goods. Therefore, aid inflows brought about the “Dutch disease” effect that threatened the export earnings of Papua New Guinea. Collier and Gunning (1992) also apply the CGE model to examine “Dutch disease” effects in African economies. They find that aid supported government spending that raised aggregate demand and exerted upward pressure on the prices of non-tradable sectors. As a result of the booming of non-tradable sectors, labour and capital were drawn away from the tradable sector. They illustrated that devaluation does reduce this inverse effect on tradable sectors.

In summary, the “Dutch disease” literature regards the high level of aid inflow as the potential source of side effects on the recipient economy. For this reason, aid may not have a positive impact on growth if high levels of aid inflow make tradable sectors less competitive in the world market through the appreciation of the real exchange rate and the lowering of export earnings. Eventually, the “Dutch disease” effect will lower the ability to import, invest and grow.

2.4 Summary

This chapter has surveyed theoretical and empirical aspects of the quest for aid effectiveness. This survey has focused on the interrelationship between aid and economic policies in the growth and displacement theories. It has also examined the empirical framework employed to estimate the aid-growth and aid fungibility coefficients in various models. The response to why aid may not always have an impact on economic growth can be summarised from the theoretical and empirical points of view as follows:

Theoretically, aid has economy-wide effects on the recipient country. Aid is said to be effective if an increase in aid raises savings, investment and export earnings. However, that aid may not always be effective has been attributed to the problems of the recipient country’s policy mismanagement. The problems that can make aid less effective are as follows:

- Aid is fungible. This means that the excess aid inflow may be used to invest in low productivity sectors and/or to increase government consumption spending and/or to fund tax reduction. The former two would make aid less effective while the latter would deter domestic savings and investments via upward pressure on prices and interest rates.
- Aid inflows bring in a source of “Dutch disease”. This means that high levels of aid inflow cause the overvaluation of exchange rates. Aid would undermine the external competitiveness of the recipient country thus crowding out investments in the traded goods sector and export earnings.
- The failure of the recipient country to accomplish donors’ conditionality leads to the uncertainty of aid inflow. This could lead both public and private sectors in the recipient country to postpone or even cancel investment decisions.

Empirical evidence of aid effectiveness has been mainly produced from cross-country analyses. Studies published before the late 1990s found mixed evidence regarding the aid-growth relationship and aid fungibility issues. However, aid shows a positive impact on growth once the models incorporate the side effects of aid as a quadratic term into the aid-growth regression. Indeed, many studies conclude that aid contributes to economic growth so long as the level of aid inflow is stable and not excessive. The estimate of the optimal level of aid ranges from 25 to 50 percent of GDP. The finding implies that aid does work although aid is fungible. Therefore, there is no need to resolve the micro-macro paradox puzzle.

While a positive effect of aid on economic growth has been found, the interactive effects between aid and policy conditionality remain ambiguous. For example, there has been an increasing consensus that countries with stable and open economic environments (e.g. low inflation, small fiscal imbalances, a free trade regime), give prominence to law and order as well as having good quality public services are likely to achieve sustainable economic growth. However, these studies do not provide a clear-cut explanation on the interactive effect of aid and the recipient country’s policies on sustainable economic growth. In fact, some studies of aid

effectiveness demonstrate that aid has also been found to make a positive contribution to economic growth even in countries hampered by unfavourable policy environments. The persistence of this puzzle is attributed to the theoretical and methodological weaknesses of the aid-growth relationship. This also gives rise to ongoing debate as to whether policy conditionality is a necessary and/or sufficient condition for aid to have a positive impact on economic growth. To clarify this puzzle, the quality of policy conditionality and the recipient country's incentive regime becomes vital in examining the effects of aid on sustainable economic growth. In other words, how the recipient country pursues economic policies to raise investment with external viability is a crucial factor to ensure sustainable economic growth. As such, the enquiry into the potential effects of aid on economic growth and economic volatility along the path of maintaining external viability will be further explored in Chapter 3.

Chapter 3

THE EFFECTS OF FOREIGN AID ON ECONOMIC GROWTH AND ECONOMIC VOLATILITY: THEORETICAL RE-EXAMINATION

The economic history of the world is replete with recessions and depressions. From the bursting of the British South Sea Bubble and the French Mississippi Bubble in 1720 (which at least one economic historian claims delayed the industrial revolution by 50 years) to the industrial depressions of the 1870s and 1930s, to the Latin American middle income debt crisis, African low income debt crisis, ex-Communist output collapse, and East Asian financial crisis...it is a wonder that anyone in the world has economic security.

Easterly et al. (2000, p. 1)

To a great extent, the obstacles to the successful participation of vulnerable developing economies in the international system are rooted in the causes of their underdevelopment and poor economic performance. Nevertheless, the new rules of the game and the international economic environment prevalent since 1980 following accelerated globalization, leaves them vulnerable in novel ways.

Murshed (2000, p. 1)

3.1 Introduction

The assessment of aid effectiveness discussed in Chapter 2 reveals that foreign aid has contributed to economic growth, although there remains some dispute as to whether policy conditionality is sufficient to support economic growth. It may be plausible to claim that foreign aid has a positive impact on economic growth because in past decades aid has been mainly allocated to investments in physical and human capital, factors presumed to be the fundamental driving force for economic growth.¹ But why have the majority of developing countries not achieved sustained economic growth,

¹ According to data from the *Geographical Distribution of Financial flow to Developing Countries* on CD-ROM (OECD, 2001), about 60 to 70 percent of total aid flow during the 1973 to 1999 period has been allocated to investments in physical and human capital.

despite the receipt of substantial amounts of foreign aid over the past decades?

As indicated in Chapter 1, the median per capita growth of developing countries was zero during 1980 to 1998. In fact, developing countries have not only experienced a low record of economic growth but also a high record of economic volatility (Easterly *et al.*, 2000, p. 4). Recent research by Gavin and Hausmann (1998) shows that economic volatility correlates negatively with economic growth and that a volatile macroeconomic environment leads to a significantly lower rate of investment, undermines educational attainment, harms the distribution of income and increases poverty. Apart from terms of trade fluctuation and other external shocks, macroeconomic policies (i.e., fiscal and monetary policy and the exchange rate regime) and political instability are the most important determinants of economic volatility (Gavin and Hausmann, 1998, pp. 97-98). Although policy index, institutional quality and political instability variables have been included in the assessment of aid effectiveness, none of the previous studies explicitly focused on the interrelationship among these factors. To solve this puzzle, a clear understanding is required of how the interaction between aid and the recipient country's incentive regimes (i.e. the state and institutional capability to implement the policy conditions) may affect economic growth and economic volatility. In this context, this chapter introduces the theory of the aid-growth nexus focusing on development issues of the Least Developed Countries (LDCs).

The rest of this chapter is organised as follows. Section 3.2 sketches the analytical framework for explaining the interactive effect of aid and the recipient country's incentive regime on economic growth and economic volatility. Section 3.3 presents the theoretical relationship within the aid-growth models that will be used to demonstrate the impact of aid flow on savings and capital formation, as well as the interactive effect of aid and the recipient country's incentive regimes on economic growth and economic volatility. Finally, Section 3.4 summarises and draws some implications for

the empirical investigation of the aid-growth nexus that will be undertaken in the case of the Lao PDR's economy.

3.2 The nexus between foreign aid, the incentive regime and sustainable economic growth

Although the aid-growth nexus has long been a source of vigorous debate in aid effectiveness literature, there are few theoretical models linking aid and growth. As discussed in Chapter 2, the theoretical nexus between aid and growth is mainly based on the Harrod-Domar and two-gap models, in which aid is seen as a driving force for economic growth via its contribution to capital accumulation in the recipient country. More than twenty years passed before further theoretical aid-growth models were presented by Mosley *et al.* (1987), Boone (1996), White (1992a), Burnside and Dollar (1997), Lensink and White (1999) and Dalgaard and Hansen (2000). The first two studies link the impact of aid fungibility and economic growth. While Mosley *et al.* (1987) demonstrate that aid fungibility could affect economic growth via the marginal productivity of public and private capital; Boone (1996) found that aid has no effect on long run growth because aid is used as substitute for consumption. Burnside and Dollar (1997) demonstrate that good policy improves the effectiveness of aid, while Lensink and White (1999) demonstrate that excessive aid inflow over the optimal level has a negative effect on economic growth. White (1992a) also shows in detail the macroeconomic impact of aid-growth relationship. In contrast to the first three studies, Dalgaard and Hansen (2000) demonstrate that aid fungibility is not the main problem for the effectiveness of aid and that the interactive effect of aid and good policy on growth is ambiguous.

To re-examine the aid-growth nexus, the following paragraph outlines the policy conditionality designed for aid delivery, as well as various factors that are believed to be obstacles to obtaining sustained economic growth in Least Developed Countries.

Like other developing countries, LDCs have undertaken the “adjustment programmes”² in order to promote sustained economic growth and improve the well being of their population. Since 1988, “thirty three out of the 48 LDCs have engaged in SAF or ESAF programmes” (UNCTAD, 2000a, p. 103).³ The policy conditionality induced by the World Bank and the IMF through the “adjustment programmes” is broadly in line with policy prescriptions under the Washington Consensus, and has been designed to support economic growth with external viability, i.e. external current account deficits could be financed by normal and sustainable capital inflows (UNCTAD, 2000a, p. 102). This adjustment strategy was based on the view that poor economic performance in LDCs during 1980s and 1990s was attributed to the persistent external debt burden and the lack of external finance. The theoretical justification for this adjustment strategy can be tracked back to the “two-gap” model of Chenery and Strout (1966).

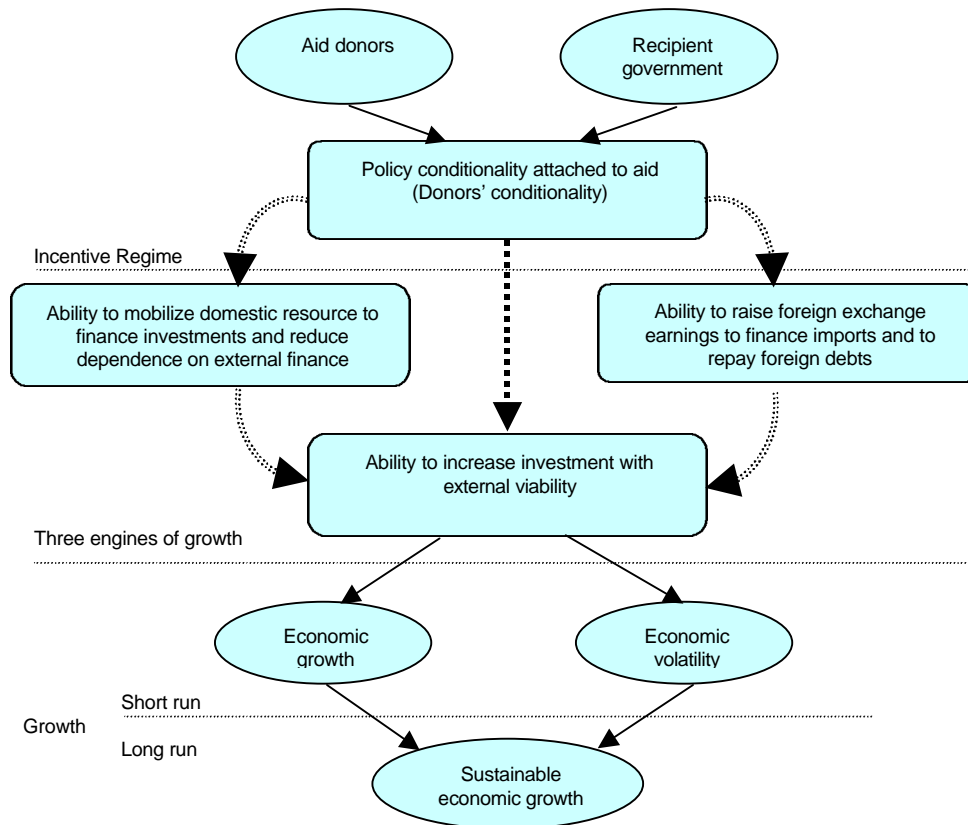
According to the “two-gap” model, developing countries face the fundamental constraint of lacking enough domestic savings and foreign exchange to meet the desired level of domestic investment. Consequently, such countries are limited in their ability to achieve a target growth rate and hence rely on external finance, including foreign aid, to fulfil their destiny. For self-sustaining economic growth, they have to mobilise domestic resources to finance investment and reduce their heavy reliance on external finance. In addition, they have to raise foreign exchange earnings to finance imported intermediate and capital goods as well as repay their debts. Whether they can break these financial constraints and fulfil their destiny

² “Adjustment programmes” are hereafter referred to as the stabilisation and structural adjustment programmes.

³ The Washington Consensus suggests 10 policy prescriptions for countries embarking on a market economic reform. These are: (1) keep fiscal deficit to minimum, (2) make public expenditure priority toward education, health and infrastructure development, (3) reform tax system by lowering marginal tax rates and broadening the tax base, (4) liberalise interest rate to discourage capital flight and increase savings, (5) adopt a competitive exchange rate to bolster exports, (6) liberalise trade and minimise tariffs for intermediate goods needed to produce exports, (7) encourage foreign direct investment, (8) privatise the state-owned enterprises, (9) deregulate the economy to allow enterprises entry and exit market freely, (10) secure property rights via law and order enforcement in order to encourage saving and accumulating wealth. For more details see Williamson (1990).

depends on their *ability to increase investment* with external viability.⁴ Given that “adjustment programmes” are designed to overcome the abovementioned financial constraints, the potential interaction between foreign aid and the recipient country’s incentive regime may affect economic growth. This is illustrated in Figure 3.1 below.

Figure 3.1: The nexus among foreign aid, incentive regime and sustainable economic growth



⁴ The view on demand side driven economic growth suggests that output growth is subject to balance of payment constraints. Thirlwall (1980) illustrates that the balance-of-payments constrained growth rate depends on capital inflows and trade performance, and that “in the long run a country cannot grow faster than the rate of growth of output consistent with the balance-of-payments equilibrium on current account” (Thirlwall, 1980, p. 251). For an up-to-date survey of the literature, see McCombie and Thirlwall (1997). On the supply-side approach, at least during the early stages of economic growth and development, it is necessary to accumulate capital from foreign capital. As foreign capital increases, it could raise the productivity of capital through the introduction of modern technology and management and by raising the skill base of the labour force. For the role of capital accumulation on economic growth and development in underdeveloped countries, see for example Nurkse (1953), Lewis (1955) and Arndt (1987). Moreover, to achieve sustainable economic growth it is required to establish a virtuous circle among savings, exports and investments. In this context, an increase in exports not only raises foreign exchange for imports and investments, but also provides markets for goods which would not otherwise be produced, or produced only to meet domestic demand. As investments increase, accelerated economic growth is expected, which in turn increasingly provides additional resources for capital accumulation though an increase in the ability to save (UNCTAD, 1999, Part II, and UNCTAD, 2000b).

The flow chart shows the nexus between foreign aid, the recipient country's incentive regime and three strategies to achieve sustainable economic growth. The double-dotted arrow shows the indirect nexus between foreign aid and investment via policies designed to enhance both internal and external resource mobilisations. The bold-dash arrow shows the direct foreign aid-investment nexus, as foreign aid is mainly used as budget support, which directly raises public investment. Policy conditions are officially set out in the Letter of Intent for financial support to the IMF (i.e., the policy conditions designed for aid delivery). In this letter, recipient governments spell out the details and time frame in which to implement an agreed three-year programme of policy commitments that often combine with the conditionality of other aid donors such as the World Bank and Asian Development Bank and consist of hard-core conditionality and pro forma elements. Completing the hard-core conditionality is a prerequisite for the approval of, or continued access to, foreign aid.⁵

Based on the above discussion, a country would need to raise investment with external viability in order to achieve sustainable economic growth. Success of this goal also depends on establishing a virtuous circle between investment, exports and savings (i.e., conducting a prudent policy to keep three engines of growth running). In this context, aid attached to the "adjustment programmes" was expected to help developing countries to take-off and reach the stage of self-sustaining growth in due time. However, from past development experience it has become clear that many developing countries, in particular LDCs, remained stagnant and become more aid dependent than they were previously. This poor economic performance is attributed to the weakness of the policy conditionality designed to deal with external shocks.

As explained earlier, the "adjustment programmes" have been designed to

⁵ For more details on the connection between structural policy designs and the monitoring of the aid delivery system see IMF (2001).

support economic growth at the level that external current account deficits can be financed by normal capital inflow. In practice, the policies designed to accomplish such an objective have often overlooked the underdeveloped nature of the LDCs. As indicated in the *Least Developed Countries Report* (UNCTAD, 2000a, p. 116), “terms-of-trade deterioration and shortfalls in external financing were often considered by IMF staff to be risks *ex ante*, but contingency measures and adjusters were not built into the programme”. And under the stabilising policy prescription, “any financing shortfall would have to be offset fully and immediately by a tightening of policies or a contraction of imports” (Mecagni, 1999, p. 236). However, it has been acknowledged that stabilising policy prescriptions, which seek to reduce aggregate demand as quickly as possible, often create political difficulty and even lead to nationalistic reaction (see for example, Haggard, *et al.*, 1995).

Poor economic performance in the LDCs is also attributable to policy mismanagement and the lack of enforcement of the rule of law, which often relates to the lack of state and institutional capability to create good governance.⁶ These problems are also compounded by many factors such as: (i) the extreme poverty in the LDCs that makes it very difficult for the mobilisation of domestic resources to be realised; (ii) the structural weakness of LDC economies characterised by lack of infrastructure (telecommunication, roads, electricity, etc); (iii) a vulnerable indigenous private sector which makes supply side capacity very rigid and heavily dependent on foreign direct investment (FDI); and (iv) the complex international trade barriers and lack of markets for key exports making it difficult for LDCs to maintain a current account balance.⁷ These are the biggest problems affecting the LDCs’ ability to raise investment with external viability.

⁶ The problems of policy mismanagement and the lack of enforcement of the rule of law posed by the lack of state and institutional capability that may have an influence on economic growth and economic volatility will be discussed in detail in Chapter 7.

⁷ See Murshed (2000) for a detailed discussion of the obstacles to the successful participation of the LDCs in the international system.

The abovementioned obstacles are not only a fundamental source of LDCs exposure to the negative effects of domestic and external shocks but also the causes of policy slippage (i.e., the interruptions that often result in LDCs failure to accomplish the policy conditionality they agreed to). As the disbursement of foreign aid is subject to the prior action and ability of the LDCs to fulfil certain policy conditions, it is quite often the case that the IMF withholds financial supports when efforts to implement the “adjustment programmes” are interrupted. Mecagni (1999) classifies the causes of programme interruption into three episodes: (1) no major policy slippage but there is disagreement over policy formulation in response to external shocks, (2) political disruptions that are serious enough to prevent meaningful negotiations or call into question the continuing authority of current government, and (3) policy slippage arising from fiscal issues and structural constraints which are often linked to four circumstances: (i) external shocks, (ii) natural disasters, (iii) social unrest related to structural adjustment effects, and (iv) democratisation or pre-electoral climate.

The *Least Developed Countries Report* (UNCTAD, 2000a, Table 26) indicates that a substantial proportion of programme interruptions occurred due to the tension between policy conditionality and the recipient country’s national sovereignty (i.e., policy ownership issues), in which 14 out of 34 interruption episodes were attributable to policy disagreements between recipient governments and the Fund’s staff. This is not surprising; as it has long been acknowledged that conditionality is regarded not only as a technique to tackle economic issues but also to handle political issues (see for example Haggard *et al.*, 1995). Five episodes of programme interruptions are related to political turmoil and social unrest. The incidence of the interruptions is either strongly or weakly linked to the effects of the “adjustment programmes” themselves. The rest of the interruptions are related to external shocks such as terms-of-trade deterioration and natural disasters (UNCTAD, 2000a, Table 26).

When an interruption occurs, it disrupts capital accumulation in the recipient country. As Sachs *et al.*, (1999, p. 7) point out, suspension of the IMF's aid disbursement can deny the recipient government access to other sources of concessional finance from other major creditors, including the World Bank and bilateral donors. It is often the case that the interruption is followed by difficult negotiations to restart the programme. There can thus be a prolonged shortage of foreign exchange resulting in an inability to maintain external viability. This in turn worsens the budget situation, creating a balance-of-payments crisis, economic volatility, and instability of aid inflow.

3.3 A theoretical model of the aid-growth nexus

The issues indicated above are further discussed in this section including the theoretical model of the aid-growth nexus. A linear growth model developed by Steger (2000) is extended to include the potential effects of aid inflows. The steps of developing the model and its properties are explained in Section 3.3.1. The potential of interactive effects between aid and the recipient country's incentive regime on growth are examined in Section 3.3.2.

3.3.1 The model

The linear growth model developed by Steger (2000) is based on a closed economy framework to explain economic growth with subsistence consumption. This indicates that a country only relies on internal resources to finance domestic investments. This assumption is not appropriate for LDCs. The model utilized in this study differs from Steger (2000) by employing an open economy framework to explain the aid-growth nexus. As discussed in Section 3.2, LDCs rely heavily on both internal and external resources to expand their ability to raise domestic investment. To incorporate the external resource constraints into the model, a capital accumulation equation is modified to include the net per capita capital inflow variable. In this context, the evolution of per capita capital stock is equal to the sum of domestic savings and the net capital inflows minus the

depreciation of per capita capital stock, and thus can be expressed as follows:

$$\dot{k}(t) = s(t) + f(t) - (d + n)k(t) \quad (3.1)$$

where $s(t)$ is per capita savings, $f(t)$ is the net per capita capital inflow, n is constant rate of population growth and $d+n$ is the depreciation rate of per capita capital stock.

As illustrated in Figure 3.1, LDCs require the ability to mobilise domestic resources and raise foreign exchange earnings in order to achieve sustainable economic growth. In equation (3.1), $s(t)$ and $f(t)$ capture the LDCs' ability to raise investment from internal and external resources, respectively. The LDCs' ability to maintain economic growth with external viability is also captured by $f(t)$. This is because $f(t)$ represents net per capita capital inflow at the sustainable level of the external account. Any changes that affect the flow of external capital (i.e., unstable aid inflow) will affect the LDCs' ability to raise investment. Therefore, equation (3.1) captures the LDCs' ability to raise investment with external viability.

Based on equation (3.1), it is further assumed that net per capita capital inflow includes only foreign aid inflows. It is also assumed for now that net per capita aid inflow grows at a constant rate (m). Therefore, the amount of net per capita aid inflow takes the following form:

$$f(t) = F_0 e^{mt} \quad (3.2)$$

where $f(t)$ and (m) are defined as above and F_0 is the initial stock of capital.

The model is also extended to include a modification of Steger's (2000) distortion index in the production function, which reflects the level of structural distortion in the economy created by poor policies and institutional rigidities in the LDCs. It is further assumed that the only factors of production are capital and labour and that technology exhibits constant returns to scale. Although this kind of technology is simple, it can capture a change in

productivity that can be derived from the improvement of technical and management skills gained from learning-by-doing and knowledge spillovers (Barro and Sala-i-Martin, 1995, p. 140). Besides, this production function has possible implications for desirable government policy (*ibid.*, p. 140). It is therefore appropriate to apply constant returns to scale to capture the positive effects of technology transfers and changes to the liberal policy regime because of aid inflows. For the sake of simplicity, the size of the labour force and population are assumed to be equal so that per capita output net of distortion can be expressed in the following form:

$$y(t) = (1 - \mathbf{p})\Phi k(t) \quad (3.3)$$

where $y(t)$ is per capita output, $k(t)$ is per capita capital stock, \mathbf{p} is the distortion index, and Φ is total productivity.

Now, a benevolent social planner with dictatorial powers will choose to maximise the utility of the representative household subject to the economy's resource constraints, thereby allowing the complete model to read as follows:

$$\text{Max}_{c(t)} \int_0^{\infty} \frac{[c(t) - \bar{c}]^{1-q} - 1}{1-q} e^{-(r-n)t} dt$$

subject to resource constraints $\dot{k}(t) = s(t) + f(t) - (\mathbf{d} + n)k(t)$

$$k(0) = k_0, k(t) \geq 0 \text{ for } \forall t, \text{ and } \bar{c} \leq c(t) \leq \Phi k(t) \quad (3.4)$$

where \bar{c} is the subsistence level of per capita consumption, q is a constant preference coefficient and r is the individual time preference rate. Following the standard way to solve the preceding dynamic problem, it can be expressed as the optimal path of per capita consumption and capital, as follows.⁸

⁸ See Appendix 3.1 for a detailed mathematical solution to the model.

$$c(t) = \bar{c} + [c(0) - \bar{c}]e^{q^{-1}[(1-p)\Phi - d - r]t} \quad (3.5)$$

$$k(t) = \bar{k} + [k(0) - \bar{k}]e^{q^{-1}[(1-p)\Phi - d - r]t} + F_1 e^{mt} \quad (3.6)$$

where \bar{k} is the per capita subsistence capital stock and its value is defined

$$\text{as follows: } \bar{k} \equiv \frac{\bar{c}}{(1-p)\Phi - d - n}$$

In the case of no foreign aid inflow (i.e., $F_1=0$), the model has a similar property to the linear growth model with subsistence consumption developed by Steger (2000), in which the economy is caught in the poverty trap when both per capita consumption and capital stock are equal to their subsistence level and the net marginal product of capital is relatively lower than the time preference. Intuitively, at the subsistence level of income individuals do not have the *ability to save* or the *ability to raise investment (ibid.)*. Escaping the poverty trap in the world without foreign aid can only be achieved when the net marginal product of capital exceeds the time preference rate and consumption exceeds the subsistence level (*ibid.*). In other words, whenever individuals are *willing to save* and have the *ability to save and invest*, the economy will take off. Both per capita consumption and capital stock will grow and reach their asymptotic balance-growth equilibrium at a certain time.

In the case where a country receives foreign aid, policy conditionality attached to aid will raise the ability to invest. The growth rate of per capita consumption and capital stock will approach asymptotic balanced-growth equilibrium at the following rate:

$$\lim_{t \rightarrow \infty} \frac{\dot{c}(t)}{c(t)} \rightarrow q^{-1}[(1-p)\Phi - d - r] \quad (3.7)$$

$$\lim_{t \rightarrow \infty} \frac{\dot{k}(t)}{k(t)} \rightarrow q^{-1}[(1-p)\Phi - d - r] \quad (3.8)$$

Whenever the economy moves on the transitional path from the subsistence level of income to the self-sustained balanced-growth equilibrium, the

savings rate is increased along with per capita income and approaches its asymptotic balanced-growth equilibrium at the following rate:

$$s_y(t) = \left\{ \frac{[(1-p)\Phi - d - r]}{q[(1-p)\Phi - d - n]} \right\} \left\{ \frac{k(t) - \bar{k}}{k(t)} \right\} \quad (3.9)$$

$$\lim_{t \rightarrow \infty} s_y(t) \rightarrow \frac{[(1-p)\Phi - d - r]}{q[(1-p)\Phi - d - n]} \quad (3.10)$$

It should be noted that the economy would no longer need foreign aid when it achieves its asymptotic balanced-growth equilibrium. At this stage the property of economic growth is similar to Steger's (2000) linear growth model. As Steger demonstrated, economic growth is driven by the savings rate (similar to equation (3.9)), which in turn is determined by two terms. The first term represents the *willingness to save* which is determined by the preference and technology coefficients (*ibid.*). The second term represents the *ability to save or invest* which is measured by the relative distance between the starting value of the capital stock and its subsistence level (*ibid.*). The closer *the ability to save and invest* is to zero (i.e., $a \equiv k(0) - \bar{k} / k(0) \approx 0$), the longer the time required for the economy to take off (*ibid.*).

3.3.2 The aid-growth nexus: simulation results

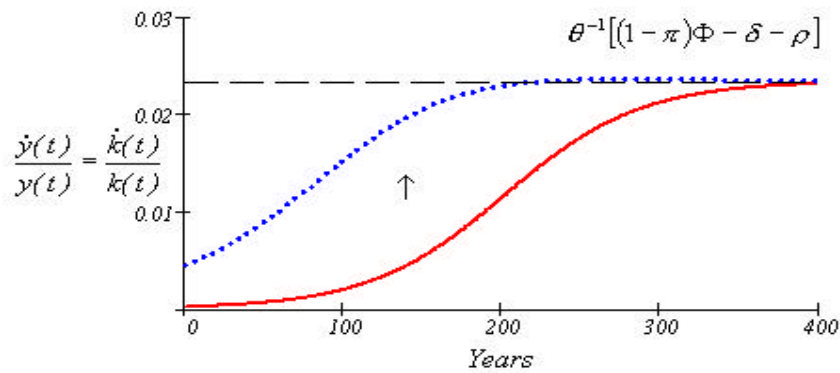
To analyse the aid-growth nexus, a simulation technique is employed. The coefficient values used here are similar to those employed by Steger (2000).⁹ The economy is assumed to start at the point where the ability to save and invest are close to zero, aid inflow is assumed to raise the *ability to invest* from $a=0.009$ up to $a=0.09$, and the per capita capital stock is assumed to grow at the rate of 1 percent per year. The simulation results are displayed in Figure 3-2 below.

⁹ Coefficients used for the simulation are: $\Phi=0.1$, $\theta=3$, $\delta=0.02$, $\rho=0.01$, $n=0.025$, $\bar{C}=2$, $F_1=0.009$, $\mu=0.01$, $a=0.009$, and MATHCAD is employed to perform the simulation analysis.

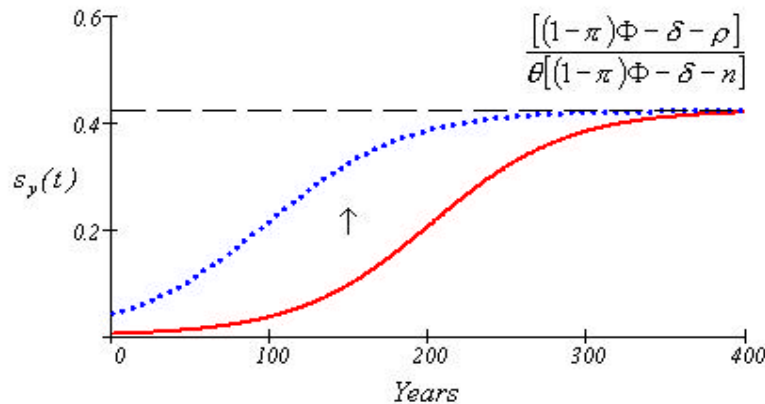
Panel (a) of Figure 3.2 indicates that an increase in aid raises the growth rate of per capita income by shifting up the transitional growth path of per capita income, and that an increase in aid by 1 percent per year shortens the time required for the economy to achieve its balance-growth equilibrium value.

Besides, as illustrated in Panel (b), an increase in aid shifts up the transitional path of savings rate to a relatively higher path than in an economy without aid inflows. It is therefore obvious that an increase in aid inflow gives rise to an increase in per capita income growth and domestic savings.

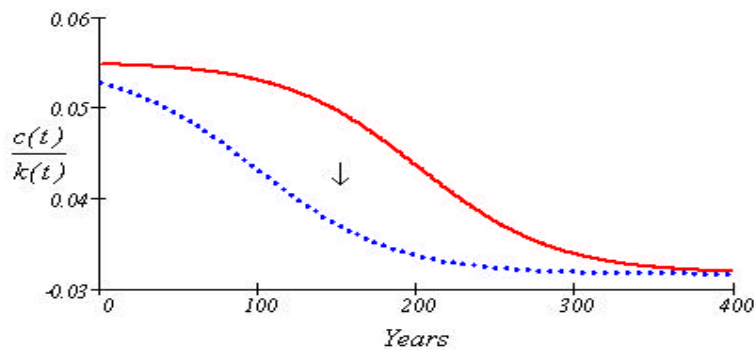
Figure 3.2: Simulation of the effects of an increase in a stable aid flow on economic growth, investments, savings and consumption



(a)



(b)



(c)

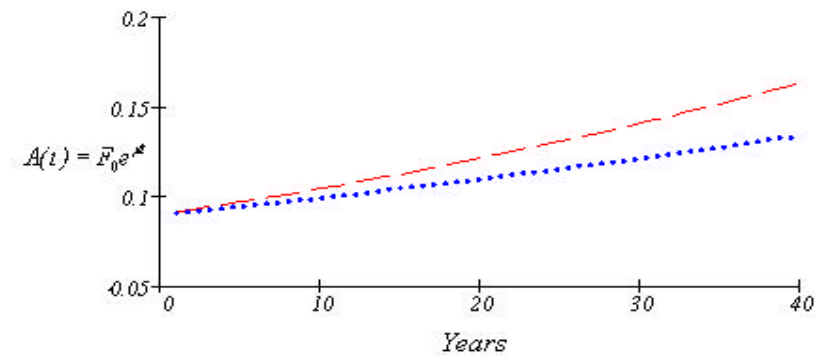
Note: the solid line represents the case of no aid inflow while the dotted line represents the impact of aid inflows.

Panel (c) of Figure 3.2 shows the effects of aid on consumption and investment which are in line with the model used by Dalgaard and Hansen (2000). They demonstrate that aid fungibility is not the main problem for the effectiveness of aid because an increase in aid inflow gives rise to an increase in the expected return on investment, which in turn is a reason for consumption growth along with increased aid inflows (Dalgaard and Hansen, 2000, pp. 5-6). On the transitional path both consumption and capital pursue an unbounded growth rate. It is therefore not surprising to observe an increase in consumption along with an increase in aid inflows in the economy. This substitution effect is varied along the transitional path.

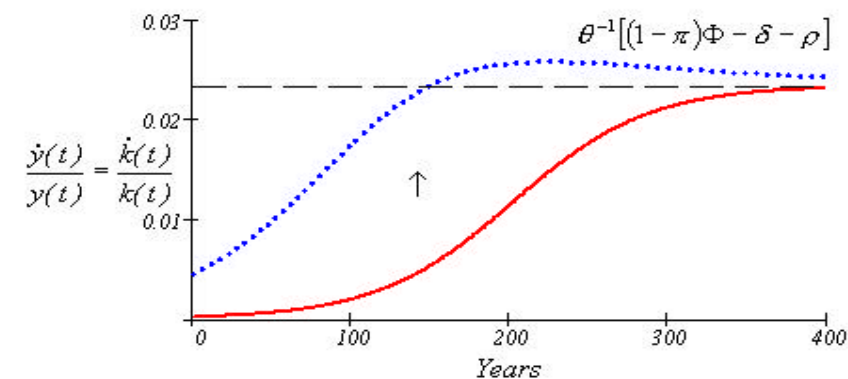
As illustrated in Panel (c) of Figure 3.2, an increase in aid inflow causes a downward shift of the transitional path of the consumption-capital stock ratio. Initially, the ratio declines sharply. This indicates that the growth path of capital stock is rising faster than the growth path of consumption. In other words, the substitution of investment for consumption is small at the beginning of transitional path; therefore aid fungibility is not important. When the economy reaches its optimal level, it is expected that consumption will increase at a similar rate to the increase in the growth rate of capital stock, in which the consumption-capital stock ratio changes at a constant rate when it approaches its balanced-growth equilibrium. This is so because the need to improve standard of living can be achieved only by keeping investment growth at the same level as consumption growth.

Figure 3.3 below shows the negative effect of a high level of aid inflow on economic growth. The model simulation revealed a prediction that is consistent with the model of the “Aid Laffer Curve” used by Lensink and White (1999), in which increased aid inflow beyond a certain level gives rise to a negative effect on economic growth.

Figure 3.3: Simulation of the effects of excess aid inflow on the growth of output and capital accumulation: the Aid Laffer Curve effect



(a)



(b)

Note: In Panel (a) of Figure 3.3, the dash represents the increased path of aid with the accumulative rate of 1.5 percent per year, while the dotted line represent with the accumulative rate of 1 percent per year. In Panel (b) of Figure 3.3, the solid line represent the case of no aid inflows while the dot line represents the impact of aid inflows

As illustrated in Panel (a) of Figure 3.3, the growth rate of aid inflow is assumed to have increased by 50 percent (from the dotted line to the

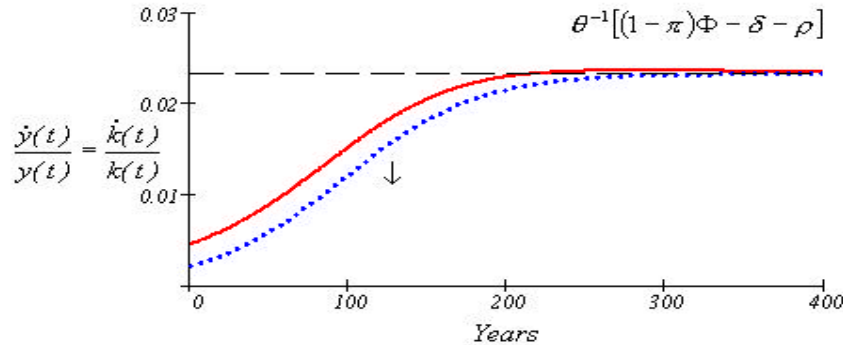
dashed line). The increased aid boosts the economy to overshoot the steady state equilibrium growth rate of per capita capital stock.¹⁰ As illustrated in Panel (b) of Figure 3.3, after the overshooting point, the economy travels along the optimal growth path and approaches the asymptotic-balanced growth equilibrium with a negative growth rate of per capita capital stock so that the increased aid inflow causes a negative rate of economic growth on average.

The analysis of the interaction between aid and the recipient country's incentive regime on economic growth and economic volatility is carried out by employing two different simulation approaches. Firstly, the simulation process takes into account a favourable impact of aid on economic growth that is impaired by the distortions of economic structure created by poor policies and institutional rigidities. This assumption is based on the view that the problems of structural distortion have resulted from the implementation of an inward-oriented development strategy, and the lack of state and institutional capability to enforce the rule of law. In this context, poor policies and institutional rigidities render the supply side of the economy less responsive to market signals. Therefore, poor policies and the lack of state and institutional capability could create high transaction costs; thus lowering the country's total productivity and leading to a decline in economic growth (North, 1990).

The simulation of this effect is illustrated in Figure 3.4, in which the distortions created by the poor policies and the lack of state and institutional capacities lower the transitional growth rate of per capita capital stock and economic growth in an economy with a stable aid inflow.

¹⁰ The growth rate of aid inflow causing the economy to overshoot its steady state can vary and depend on coefficients employed in the simulation model.

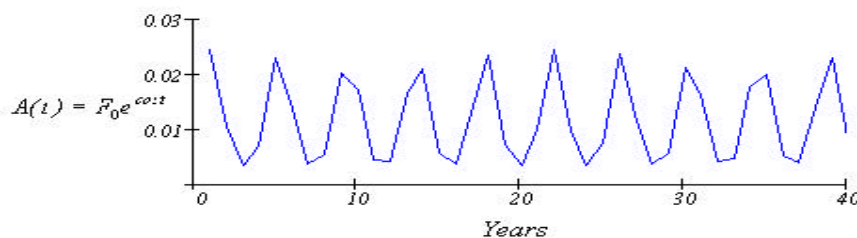
Figure 3.4: Simulation of the effect of an increase in stable aid flow on the growth of output and capital accumulation in an economy with poor policy environment



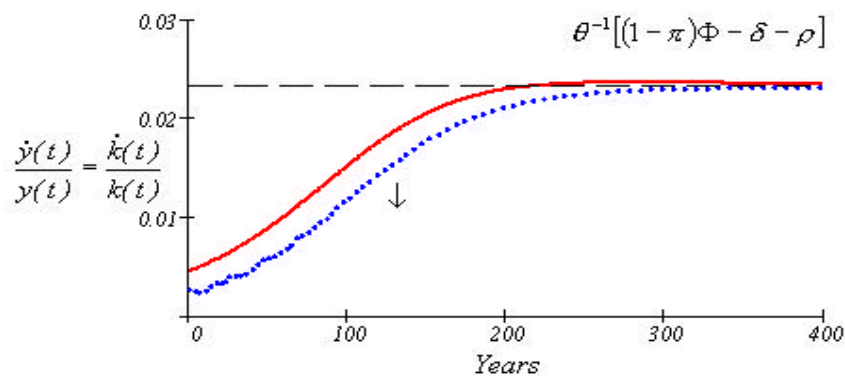
Note: the solid line represent the case of a stable aid inflow while the dotted line represents the impact of economic distortion created by the recipient government's poor policies and deficient institutions. The distortion index is assumed to increase from $p=0$ to $p=0.02$.

Secondly, the simulation process takes into account a favourable impact of aid on economic growth that is impaired by instability in aid inflows. As explained earlier, the cause of instability in aid inflows is attributable to the shortcomings of donors' conditionality coupled with the recipient country's policy mismanagement posed by the lack of state and institutional capability. This in turn creates economic volatility and hence lowers the process of capital accumulation. To capture the effect of unstable aid inflows on the growth of output and capital accumulation, the flow of aid is assumed to fluctuate over time. Here the growth rate of aid flow is assumed to grow at the rate of $m(t)=\cos(t)$. The simulation result of unstable aid flow is displayed in panel (a) of Figure 3.5 below.

Figure 3.5: Simulation of the effect of unstable aid inflows on the growth of output and capital accumulation



(a)



(b)

Note: In panel (b) of Figure 3-5, the solid line represents the case of a stable aid inflow while the dotted line represents the impact of unstable aid inflows.

Panel (a) of Figure 3.5 shows that aid flows are interrupted twice a 10-year period. The impact of this unstable aid flow is illustrated in Panel (b), in which the instability of aid inflow reduces the growth rate of per capita capital stock and hence per capita income. As financial aid is mainly given for budget support, the decline in aid inflow by itself lowers public investment, which in turn, has a negative effect on the indigenous private sectors reliant on government contracts. Also, as discussed in Chapter 2, when investors are faced the uncertainty of aid inflows, they may delay or cancel investment decisions.

From the above analysis, it can be said that the extent to which aid may have a negative effect on economic growth depends on whether the interplay between aid and the LDCs' incentive regimes creates either structural distortions or economic volatility. Given UNCTAD's (2000a) report that LDCs have moved decisively in the direction of economic liberalisation (i.e., removed structural distortions resulting from the implementation of the inward-oriented development strategy), it is not hard to claim that LDCs' poor economic performances are rooted in the policy mismanagement posed by the lack of state and institutional capability, and the shortcomings of the policy conditions designed for aid delivery.

3.4 Summary

This chapter has provided a theory of the aid-growth nexus, in which the interactive effect of aid and the recipient country's incentive regime on sustainable economic growth has been established on the premise of financial constraints long recognised in the two-gap model. Given that aid donors have increasingly attached policy conditionality, the model developed in this chapter approaches this issue by focusing on how the interactive effects of aid and policy conditionality may influence the recipient country's ability to raise investment from internal and external sources. Whether foreign aid may or may not contribute to sustainable economic growth is assessed through the recipient country's ability to raise investment with external viability.

To solve the remaining dispute as to whether policy conditionality is sufficient to promote sustainable economic growth, this chapter provides a proposition of the interaction between aid and the recipient country's incentive regime and how this interaction may influence economic growth. Weakness of policy design (i.e., lack of contingency measures to deal with external shocks, and tensions between policy conditionality and the recipient country's national sovereignty), coupled with the problems caused by lack of state and institutional capability (i.e., lack of enforcement of the rule of law and policy mismanagement) are the main problems that result in LDCs' failing to achieve sustainable economic growth. This argument is certified by performing the simulation of the interactive effects of aid and the recipient country's incentive regime on investments, savings, consumption, and income growth in the aid-growth model. The simulation results demonstrate that an increase in aid contributes to economic growth when the flow of aid is stable. In this regard, an increased aid inflow will stimulate the ability to raise investment and savings along with the path of income growth, although aid is fungible. In addition, when the flow of aid is unstable or excessive, the model demonstrates that aid lowers the growth rate of capital accumulation and hence decelerates economic growth.

From the above point of view, the question as to why policy conditionality attached to aid might not always promote sustainable economic growth in Least Developed Countries can be answered as follows:

- The main cause for aid failure is attributable to the weak design of policy conditionality and the problems of policy mismanagement posed by the lack of state and institutional capacity of the recipient country. Because of these problems the LDCs failed to maintain economic growth with external viability and this in turn can cause economic volatility and unstable aid inflows. Therefore, donors' conditionality to induce changes in policies is not enough to ensure sustainable economic growth. The aid-growth nexus model has demonstrated that it is not only policy and institutional changes but also their design and enforcement that matter for the improvement of aid effectiveness and the achievement of sustainable economic growth.
- As the literature about aid effectiveness predominantly reports a positive impact of aid on economic growth, it can be argued that the favourable impact of aid on economic growth is impaired by the instability of aid flow and economic volatility. These negative effects are worsened by the weakness of policy conditionality and the lack of state and institutional capability of LDCs. These are the predominant factors that cause LDC failure to achieve sustainable economic growth.

While this chapter has demonstrated that foreign aid could have both positive and negative effects on economic growth, these results will be further explored in the case of the Lao PDR. Before carrying out this task, Chapter 4 addresses the methodological shortcomings of aid fungibility and aid-growth models, and presents the macroeconometric methods and data that will be employed to measure the positive effect of stable aid inflows on economic growth in Chapters 5 and 6. The negative effects of unstable aid flow on economic growth will be explored in Chapter 7.

Appendix 3.1: Solving the model

Before solving the model, the resource constraint equation is re-written as follows:

Substituting $s(t) = y(t) - c(t) = (1 - \mathbf{p})\Phi k(t) - c(t)$ and $f(t) = F_0 e^{\mathbf{m}}$ into equation (3.1) yields

$$\dot{k}(t) = (1 - \mathbf{p})\Phi k(t) - c(t) - (\mathbf{d} + n)k(t) + F_0 e^{\mathbf{m}}$$

Now the problem of a benevolent social planner can be solved as follows:

$$\text{Max}_{c(t)} \int_0^{\infty} \frac{[c(t) - \bar{c}]^{1-q} - 1}{1-q} e^{-(r-n)t} dt$$

with respect to the resource constraint:

$$\dot{k}(t) = (1 - \mathbf{p})\Phi k(t) - c(t) - (\mathbf{d} + n)k(t) + F_0 e^{\mathbf{m}}$$

Setting the current value of Hamiltonian gives:

$$H = \frac{[c(t) - \bar{c}]^{1-q} - 1}{1-q} + \mathbf{I} [(1 - \mathbf{p})\Phi k(t) - c(t) - (\mathbf{d} + n)k(t) + F_0 e^{\mathbf{m}}]$$

Deriving the first order conditions gives:

$$\frac{\partial H}{\partial c(t)} = 0 \Rightarrow [c(t) - \bar{c}]^{-q} = \mathbf{I}(t) \quad (\text{A3.1})$$

$$\Rightarrow -\mathbf{q}[c(t) - \bar{c}]^{-q-1} \dot{c}(t) = \dot{\mathbf{I}}(t) \quad (\text{A3.2})$$

$$\Rightarrow \dot{\mathbf{I}}(t) + [(1 - \mathbf{p})\Phi - \mathbf{d} - \mathbf{r}]\mathbf{I}(t) = 0 \quad (\text{A3.3})$$

Use resource constraint $\dot{k}(t)$ and substitute (A3.1) and (A3.3) into (A3.2) to find the system differential equations:

$$\Rightarrow \dot{c}(t) = \mathbf{q}^{-1} [c(0) - \bar{c}] [(1 - \mathbf{p})\Phi - \mathbf{d} - \mathbf{r}] \quad (\text{A3.4})$$

$$\Rightarrow \dot{k}(t) = [(1 - \mathbf{p})\Phi - \mathbf{d} - n]k(t) - c(t) + F_0 e^{\mathbf{m}} \quad (\text{A3.5})$$

Use (A3.3) to find $\mathbf{I}(t)$

$$\int e^{[(1-\mathbf{p})\Phi - \mathbf{d} - \mathbf{r}]t} [\dot{\mathbf{I}}(t) + [(1 - \mathbf{p})\Phi - \mathbf{d} - \mathbf{r}]\mathbf{I}(t)] = 0$$

$$\Rightarrow I(t) = I_0 e^{-[(1-p)\Phi-d-r]t} \quad (\text{A3.6})$$

Substitute (A3.6) into (A3.1) to find the optimal path of consumption $c(t)$

$$\begin{aligned} [c(t) - \bar{c}]^{-q} &= I_0 e^{-[(1-p)\Phi-d-r]t} \\ \Rightarrow c(t) &= \bar{c} + [c(0) - \bar{c}] e^{q^{-1}[(1-p)\Phi-d-r]t} = C_0 e^{q^{-1}[(1-p)\Phi-d-r]t} \end{aligned} \quad (\text{A3.7})$$

Substitute (A3.7) into (A3.5) to find the optimal path of capital $k(t)$

$$\begin{aligned} \dot{k}(t) - [(1-p)\Phi - d - n]k(t) &= -C_0 e^{q^{-1}[(1-p)\Phi-d-r]t} + F_0 e^{mt} \\ \int e^{-[(1-p)\Phi-d-n]t} [\dot{k}(t) - [(1-p)\Phi - d - n]k(t)] dt &= \\ &= -C_0 \int e^{q^{-1}[(1-p)\Phi-d-r]t - [(1-p)\Phi-d-n]t} dt + F_0 \int e^{m - [(1-p)\Phi-d-n]t} \\ e^{-[(1-p)\Phi-d-n]t} k(t) &= \frac{-C_0 e^{q^{-1}[(1-p)\Phi-d-r]t - [(1-p)\Phi-d-n]t}}{q^{-1}[(1-p)\Phi-d-r] - [(1-p)\Phi-d-n]} + \frac{F_0 e^{m - [(1-p)\Phi-d-n]t}}{m - [(1-p)\Phi-d-n]} \\ k(t) &= \bar{k} + \frac{-C_0 e^{q^{-1}[(1-p)\Phi-d-r]t}}{q^{-1}[(1-p)\Phi-d-r] - [(1-p)\Phi-d-n]} + \frac{F_0 e^{mt}}{m - [(1-p)\Phi-d-n]} \\ \Rightarrow k(t) &= \bar{k} + [k(0) - \bar{k}] e^{q^{-1}[(1-p)\Phi-d-r]t} + F_1 e^{mt} \end{aligned} \quad (\text{A3.8})$$

$$\text{where } k(0) - \bar{k} = \frac{-C_0}{q^{-1}[(1-p)\Phi-d-r] - [(1-p)\Phi-d-n]}$$

$$\text{and } F_1 = \frac{q^{-1}[(1-p)\Phi-d-r] - [(1-p)\Phi-d-n]}{-C_0} \frac{F_0}{m - [(1-p)\Phi-d-n]}$$

where \bar{k} is the level of subsistent capital and its value is similar to the one set by

$$\text{Steger (2000), in that } \bar{k} \equiv \frac{\bar{c}}{(1-p)\Phi-d-n}$$

Use (A3.7) to find the growth rate of consumption at the balanced-growth

$$\text{equilibrium position: } \lim_{t \rightarrow \infty} \frac{\dot{c}(t)}{c(t)}$$

Differentiating (A3.7) with respect to time, then dividing the result by $c(t)$ gives:

$$\begin{aligned} \dot{c}(t) &= [c(0) - \bar{c}] q^{-1} [(1-p)\Phi - d - r] e^{q^{-1}[(1-p)\Phi-d-r]t} \\ \frac{\dot{c}(t)}{c(t)} &= \frac{[c(0) - \bar{c}] q^{-1} [(1-p)\Phi - d - r] e^{q^{-1}[(1-p)\Phi-d-r]t}}{\bar{c} + [c(0) - \bar{c}] e^{q^{-1}[(1-p)\Phi-d-r]t}} \end{aligned}$$

Applying the l' hospital rule gives:

$$\lim_{t \rightarrow \infty} \frac{\dot{c}(t)}{c(t)} = \lim_{t \rightarrow \infty} \frac{[\dot{c}(t)]}{[c(t)]} \rightarrow \mathbf{q}^{-1}[(1-\mathbf{p})\Phi - \mathbf{d} - \mathbf{r}] \quad (\text{A3.9})$$

Use (A3.8) to find the growth rate of capital at the balanced-growth equilibrium

position: $\lim_{t \rightarrow \infty} \frac{\dot{k}(t)}{k(t)}$

Differentiating (A3.8) with respect to time, then dividing the result by $k(t)$ gives:

$$\begin{aligned} \dot{k}(t) &= [k(0) - \bar{k}] \mathbf{q}^{-1} [(1-\mathbf{p})\Phi - \mathbf{d} - \mathbf{r}] e^{\mathbf{q}^{-1}[(1-\mathbf{p})\Phi - \mathbf{d} - \mathbf{r}]t} + \mathbf{mF}_1 e^{\mathbf{m}t} \\ \frac{\dot{k}(t)}{k(t)} &= \frac{[k(0) - \bar{k}] \mathbf{q}^{-1} [(1-\mathbf{p})\Phi - \mathbf{d} - \mathbf{r}] e^{\mathbf{q}^{-1}[(1-\mathbf{p})\Phi - \mathbf{d} - \mathbf{r}]t} + \mathbf{mF}_1 e^{\mathbf{m}t}}{\bar{k} + [k(0) - \bar{k}] e^{\mathbf{q}^{-1}[(1-\mathbf{p})\Phi - \mathbf{d} - \mathbf{r}]t} + F_1 e^{\mathbf{m}t}} \end{aligned}$$

In the balanced-growth equilibrium position the economy would no longer need to borrow foreign capital, as the economy can rely on domestic savings to finance investment demands. So, the term $f(t) = \mathbf{mF}_1 e^{\mathbf{m}t} = 0$

$$\text{Then } \frac{\dot{k}(t)}{k(t)} = \frac{[k(0) - \bar{k}] \mathbf{q}^{-1} [(1-\mathbf{p})\Phi - \mathbf{d} - \mathbf{r}] e^{\mathbf{q}^{-1}[(1-\mathbf{p})\Phi - \mathbf{d} - \mathbf{r}]t}}{\bar{k} + [k(0) - \bar{k}] e^{\mathbf{q}^{-1}[(1-\mathbf{p})\Phi - \mathbf{d} - \mathbf{r}]t}}$$

Applying the l' hospital rule gives:

$$\lim_{t \rightarrow \infty} \frac{\dot{k}(t)}{k(t)} = \lim_{t \rightarrow \infty} \frac{[\dot{k}(t)]}{[k(t)]} \rightarrow \mathbf{q}^{-1}[(1-\mathbf{p})\Phi - \mathbf{d} - \mathbf{r}] \quad (\text{A3.10})$$

Use the system differential equation (A3.4) and (A3.5) and apply the time-elimination method to find the policy function

$$\begin{aligned} \dot{c}(t) &= [c(t) - \bar{c}] \mathbf{q}^{-1} [(1-\mathbf{p})\Phi - \mathbf{d} - \mathbf{r}] \\ \dot{k}(t) &= [(1-\mathbf{p})\Phi - \mathbf{d} - \mathbf{n}]k(t) - c(t) + F_0 e^{\mathbf{m}t} \\ c'(k) &= \frac{\dot{c}}{\dot{k}} = \frac{[c(k) - \bar{c}] \mathbf{q}^{-1} [(1-\mathbf{p})\Phi - \mathbf{d} - \mathbf{r}]}{[(1-\mathbf{p})\Phi - \mathbf{d} - \mathbf{n}]k - c(k) + F_0 e^{\mathbf{m}t}} = \frac{c'(k) \mathbf{q}^{-1} [(1-\mathbf{p})\Phi - \mathbf{d} - \mathbf{r}]}{[(1-\mathbf{p})\Phi - \mathbf{d} - \mathbf{n}] - c'(k)} \end{aligned}$$

Simplifying the result gives:

$$\begin{aligned} c'(k) [(1-\mathbf{p})\Phi - \mathbf{d} - \mathbf{n}] - c'(k) &= c'(k) \mathbf{q}^{-1} [(1-\mathbf{p})\Phi - \mathbf{r} - \mathbf{d}] \\ [c'(k)] &= \frac{c(t) - \bar{c}}{k(t) - \bar{k}} = [(1-\mathbf{p})\Phi - \mathbf{d} - \mathbf{n}] - \mathbf{q}^{-1} [(1-\mathbf{p})\Phi - \mathbf{d} - \mathbf{r}] \\ \Rightarrow c(t) &= z[k(t) - \bar{k}] + \bar{c} \end{aligned} \quad (\text{A3.11})$$

Find the transitional path of saving rate: $s_y(t) = \left(1 - \frac{c(t)}{y(t)}\right)$

Simplifying (A3.11) gives:

$$c(t) = \{[(1-p)\Phi - d - n] - q^{-1}[(1-p)\Phi - d - r]\}[k(t) - \bar{k}] + [(1-p)\Phi - d - n]\bar{k}$$

$$\begin{aligned} c(t) &= [(1-p)\Phi - d - n][k(t) - \bar{k}] - q^{-1}[(1-p)\Phi - d - r][k(t) - \bar{k}] + [(1-p)\Phi - d - n]\bar{k} \\ - c(t) &= q^{-1}[(1-p)\Phi - d - n][k(t) - \bar{k}] - [(1-p)\Phi - d - n]k(t) \end{aligned}$$

In an equilibrium position of the balance of payments the following identity holds:

$$i(t) + f(t) = s(t) + f(t)$$

$$[(1-p)\Phi - d - n]k(t) - c(t) + f(t) = s(t) + f(t)$$

$$[(1-p)\Phi - d - n]k(t) - c(t) = y(t) - c(t)$$

Deleting $c(t)$ from the above equation then multiplying both sides by $\frac{c(t)}{y(t)}$ yields:

$$[(1-p)\Phi - d - n]k(t) \frac{c(t)}{y(t)} = c(t)$$

Substituting $-\frac{c(t)}{y(t)} = s_y - 1$ into the above equation gives:

$$[(1-p)\Phi - d - n]k(t)s_y(t) = q^{-1}[(1-p)\Phi - d - n][k(t) - \bar{k}]$$

$$s_y(t) = \frac{[(1-p)\Phi - d - r] k(t) - \bar{k}}{q[(1-p)\Phi - d - n] k(t)} \quad (\text{A3.12})$$

Find the transitional dynamic of growth rate of per capita capital and output

$$\frac{\dot{y}(t)}{y(t)} = \frac{\dot{k}(t)}{k(t)} = [(1-p)\Phi - d - n] - \frac{c(t)}{k(t)} + \frac{f(t)}{k(t)} \quad (\text{A3.13})$$

Chapter 4

MACROECONOMETRIC METHODS AND DATA: FOREIGN AID AND ECONOMIC GROWTH

...The inadequate theoretical foundation of models of aid's impact on saving, in particular their failure to consider economy-wide effects, make them a poor basis for conclusions about aid's impact...

White (1992b, p. 121)

...The transition from theory to empirical work in macroeconomics is not always straightforward. The quality of the data are never as good as one might like, so compromises have to be made in moving from theory to empirical specifications...

Fair (1994, p. 39)

4.1 Introduction

Apart from theoretical shortcomings, the persistence of inconclusive evidence regarding the interaction between aid and policy conditionality and its effect on sustainable economic growth was attributed to the methodological weakness of the aid-growth relationship. Chapters 2 and 3 have indicated that aid has a potentially large effect on various macroeconomic variables such as consumption, savings, investments, imports, exports, prices and real effective exchange rates. This economy-wide effect of aid causes some drawbacks to the econometric methods employed to estimate the aid-growth and aid fungibility coefficients. McGillivray and Morrissey (2001) indicate that aid fungibility models are subject to a number of limitations. Overall, aid fungibility models have both theoretical and methodological problems (*ibid.*). Hansen and Tarp (2000) suggest that the estimation of the aid-growth coefficient obtained from the aid-growth regression has been highly sensitive to the set of control variables. The study also stresses that more research on theoretical work is needed before the aid-growth regression can be used for policy purposes.

To tackle the econometric shortcomings of the aid fungibility and aid-growth regression models, many studies have employed multi-equation models to capture the macroeconomic impact of aid. Gupta and Lensink (1995) construct a macroeconometric model to measure the effect of aid fungibility on economic growth. White (1998) indicates that many studies of aid effectiveness employed computable general equilibrium (CGE) and macroeconometric models to analyse the potential effects of aid on economic growth. Nevertheless, modelling the macroeconomic impact of aid may not be limited to these two approaches. "There are currently five major approaches to macroeconomic modelling: the traditional Cowles Commission structural equations approach, unrestricted and Bayesian VARs, "structural" VARs, linear rational expectation models, and the calibration approach associated with real business cycle theories" (Pesaran and Wickens, 1995, p.1). Selecting one of these approaches requires the model builder to balance between the role of economic theory and statistics. In other words, the model builder should decide whether "to estimate a model derived from formal economic theory, or.. to find a model that accords well with data?" (*ibid.*, p.1).

Due to the limitation of longer time-series data and the lack of a social accounting matrix for the Lao PDR, macroeconometric models are employed. The traditional Cowles Commission structural equations approach is also adopted for the macroeconometric modelling of aid fungibility and the aid-growth nexus in this study. The rest of this chapter is organised as follows: Section 4.2 discusses the limitations of the existing aid fungibility model and presents the specification of the macroeconometric model of aid fungibility. Section 4.3 discusses the shortcomings of the aid-growth regression and presents the macroeconometric model of the aid-growth nexus. Section 4.4 introduces the estimation methods for the macroeconometric model while Section 4.5 presents the sources of data and methods of variable construction. Section 4.6 summarises the discussion in this chapter.

4.2 The aid fungibility model

Aid is said to be fungible at the aggregate level if an increase in aid intended to finance investment does not raise investment to the extent of the value of aid inflow but enables the recipient government to raise government consumption spending and/or lower taxes. The existing empirical studies have mainly employed two distinct methodological approaches to estimate the coefficient of aid fungibility. However, these approaches have both theoretical and methodological shortcomings, which make the estimation of aid fungibility coefficients deficient (Lensink and White 2000, pp. 12-13). This issue is discussed in Section 4.2.1. Section 4.2.2 presents a demand-determined macroeconometric model which has been developed to measure the impact of aid fungibility on domestic investment. The model is also developed to tackle the defects of the existing approaches to aid fungibility issues.

4.2.1 Limitations of the existing aid fungibility model

As discussed in the “fiscal response” literature, there are two main approaches to the estimation of the aid fungibility coefficient. Although the fundamental deficiency of aid fungibility is related to the way in which theoretical models have been established, the limitation of aid fungibility model discussed here focuses on the weakness of empirical models, as this is relevant to the macroeconometric model of aid fungibility developed in the next section.¹ To discuss the shortcomings of these approaches, the empirical framework of aid fungibility discussed in Chapter 2 is reproduced in this section. The first approach is represented by two sets of system equations. The first set captures the recipient government’s fiscal behaviour in response to aid inflow. This is illustrated by equations (4.1) through to (4.4) as follows:

¹ For more detailed discussion of the limitations in both theoretical and empirical model of fungibility, see McGillivray and Morrissey (2001, Sections II and III)

$$DI_t = f_1(DI_t^*, T_t, A_t) \quad (4.1)$$

$$IDI_t = f_2(CG_t^*, IDI_t^*, T_t, A_t) \quad (4.2)$$

$$CG_t = f_3(CG_t^*, IDI_t^*, T_t, A_t) \quad (4.3)$$

$$T_t = f_4(T_t^*, CG_t^*, CG_t, DI_t, A_t) \quad (4.4)$$

where the fiscal-choice variables are direct public investment (DI), indirect public investment (IDI), government consumption spending (CG) and government revenue (T). The variables that influence the fiscal-choice variables are total aid flow (A), which can be classified into grant aid and loan aid. An asterisk (*) denotes the targeted fiscal variables. These variables form the second set, and are defined in equations (4.5) through to (4.8) as follows:

$$DI_t^* = f_5(Y_{t-1}, IP_t) \quad (4.5)$$

$$IDI_t^* = f_6(Enr_t, Y_t, GY_t) \quad (4.6)$$

$$CG_t^* = f_7(CG) \quad (4.7)$$

$$T_t^* = f_8(Y_t, M_{t-1}) \quad (4.8)$$

where Y is real income and GY is growth of real income, IP is private investment, Enr is primary school enrolments and M is imports.

There are two main problems with this approach. The first problem is related to the estimation of the aid fungibility coefficient. This problem will occur if the fiscal-choice variables (Eq. 4.1-4.4) are closely related to the explanatory variables of the regression of targeted fiscal variables (Eq. 4.5-4.8). In this context, if the regression of the targeted fiscal variables has R^2 close to 1, and then the estimation of (Eq. 4.1-4.4) will be regressing the fiscal choice variables on themselves (e.g., if $DI \approx DI^*$, $IDI \approx IDI^*$, $CG \approx CG^*$, $T \approx T^*$). Therefore, any aid fungibility coefficients obtained from the estimation of fiscal choice regressions will provide inconclusive information of the

government's fiscal behaviour in response to aid inflows (White, 1994, pp. 159-160).

The second problem is the lack of dynamic behaviour in the structural equations so the model does not allow for the full effect of the aid on fiscal behavioural variables in the short run and long run. "Even if the feedback effect through the target variables were incorporated, analysis based on this model would remain a partial one since it contains no economic feedback mechanisms" (*ibid.*, 1994, p. 162). Franco-Rodriquez *et al.* (1998) and Franco-Rodriquez (2000) attempt to solve these problems by applying the cointegrating technique to obtain the values of the target variables and using a reduced form of the choice-variable equation system to obtain short-run and long-run fiscal behaviour. However, the model examines the aid fungibility issue by focussing only on the government sector thereby neglecting the economy-wide effects of aid (McGillivray and Morrissey, 2001, p. 30).

The empirical framework of aid fungibility for the second approach is represented by the equation set (4.9) through to (4.12) as follows:

$$T_t = f_9(A_t, Z_t) \quad (4.9)$$

$$CG_t = f_{10}(A_t, Z_t) \quad (4.10)$$

$$IG_{i,t} = f_{11}(A_{i,t}, A_{\neq i,t}, Z_t) \quad (4.11)$$

$$CG_t + \sum_{i=1}^n IG_{i,t} = T_t + A_t + PSBR_t \quad (4.12)$$

where T_t and CG_t are defined as above, IG_t is public investment, $PSBR_t$ is the public sector borrowing requirement, $A_{i,t}$ is aid allocation to sector i at time t , $A_{\neq i,t}$ is aid allocation to other sectors at time t and Z is a vector for control variables. Pack and Pack (1990; 1993) use GDP as the control variable, while Feyzioglu *et al.* (1998) use the infant mortality rate, average years of

schooling in the labour force, average ratio of a neighbouring country's military expenditure to GDP, and ratio of agricultural output to GDP. Equation (4.11) captures the sectoral aid fungibility coefficients so that aid fungibility at the aggregate level can be obtained by summing up the sectoral aid fungibility coefficients. This approach shares a common problem with the first approach, in which the lack of dynamic structure in the model makes it only a partial analysis of the impact of aid inflow on fiscal behaviour. Also, this approach analyses the aid fungibility issue by focusing only on the government sector.

4.2.2 A macroeconometric model of the aid fungibility

To tackle the abovementioned shortcomings of the aid fungibility model, it is necessary to incorporate the economy-wide effects of aid into the macroeconomic framework. In this regard, the interplay between various economic sectors and economic feedback mechanisms can be used to track the potential impact of aid inflows on various macroeconomic variables. Although aid may affect both the demand side and the supply side of the economy, the modelling of the impact of aid fungibility on investment is focused on the demand side of the economy.² This is because aid may have some influence on the decisions relating to demand for consumption, savings and investment in both public and private sectors through the impact of aid inflows on economic prices and income. In this context, a macroeconometric model of aid fungibility for the case of the Lao PDR is developed from the structure of the Keynesian approach to macroeconomic modelling. The model explicitly allows for the interaction between the public and private sectors. Although the external sector is included in the model, it is treated as an exogenous variable and is allowed to affect both the public

² Gupta and Lensink (1995) construct a macroeconometric model of fungibility with heavy emphasis on the impact of aid on the demand side of the economy. The model explicitly allows for interactions between four sectors in response to aid inflows. Those sectors are the non-bank sector, the government sector, the banking sector and the external sector. If in the model, aid is only given to only the government, the simulations show that partial fungibility has a positive effect on public investment and very small effect on GDP. In the same model, the simulations also show that full fungibility has a negative effect on public investment but still has a very small effect on GDP (Gupta and Lensink, 1995, p.66).

and private sectors through the transmission mechanism in the equilibrium condition of the model.

The macroeconometric model of aid fungibility for the case of the Lao PDR consists of eight equations, in which five are stochastic (i.e., equation 4.13-4.17) and three are definitional and equilibrium conditions (i.e., equation 4.18-4.20). The specifications of the model are expressed in a generic form as follows:

Macroeconometric model of aid fungibility

Behavioural equations

Public sector

$$CG_t = f_1(T_t, A_t, INF_t) \quad (4.13)$$

$$IG_t = f_2(T_t, A_t, INF_t) \quad (4.14)$$

$$T_t = f_3(Y_t, A_t, FDI_t, INF_t) \quad (4.15)$$

Private sector

$$IP_t = f_4(IG, YD_t, FDI_t, INF_t) \quad (4.16)$$

$$CP_t = f_5(Y_{d,t}, INF_t) \quad (4.17)$$

Identity equations

$$DI_t = f_1(DI_t^*, T_t, A_t) \quad (4.18)$$

$$YD_t = Y_t + NTR_t \quad (4.19)$$

$$AD_t = AS_t = Y_t \quad (4.20)$$

where *CG*: government consumption spending,
IG: government capital expenditure,
T: government revenue,
IP: private investment,
CP: private consumption,
YD: disposable income,
Y: income,
NTR: net transfer payments,
A: total aid inflows,
FDI: foreign direct investment,
INF: inflation,
NX: trade balance,
AD: aggregate demand, and
AS: aggregate supply,

In the public sector, aid inflow (A) is included in the functions of the fiscal choice variables (i.e., equation (4.13) to (4.15)), to capture the influence of aid on the government's fiscal behaviour. This is in line with the model employed by Pack and Pack (1990, 1993). Apart from aid inflow, the Lao Government has relied on government revenue (T) to finance public consumption (CG) and provided the counterpart funds for public investment (IG). In this regard, T is included as an explanatory variable in equation (4.13) and (4.14). Furthermore, the Lao Government has mainly derived tax revenue from income tax, excise tax and other non-income tax (i.e., profits tax, turnover tax, trade tax, and royalties). Foreign firms have been a main source for non-income tax. Thus, in equation (4.15), foreign direct investment (FDI) is used as a proxy variable for non-income tax, while income (Y) is used as proxy variable for income tax and excise tax. Inflation (INF) is included in equations (4.13) to (4.15) to capture the feed back effect due to inflation tax policy.³

In the private sector, investment function (equation (4.16)) is derived from the accelerator theory, which "asserts that investment spending is proportional to the change in output" (Dornbusch and Fischer, 1994, p.348). Thus, disposable income (YD) is included as a proxy variable for the change in output. It is assumed that the investment function is dominated by fiscal policy, foreign private capital inflow and macroeconomic instability. As discussed in the fiscal response literature in Section 2.3.2, public investment (IG) is therefore included to capture the crowding out (or crowding in) effects. The inflow of foreign direct investment (FDI) is also used as an explanatory variable because private investment in the Lao PDR is dominated by the FDI inflows. Macroeconomic instability may create an uncertain environment for investment decisions, which in turn causes the

³ Inflation tax is an implicit tax levied by the government by means of base money creation (e.g., printing money). Inflation tax has long been recognised as an important source of government revenue in many developing countries. This is no exception for the Lao PDR. Inflation tax can have a positive and negative effect on real government revenue. In this context, inflation is used as an explanatory variable linking the inflation tax and the collection of tax revenue. For further detailed discussions on inflation tax see Agenor and Montiel (1996, pp.111-121).

delay or even the cancellation of investment decisions (Dixit and Pindyck, 1994). To capture the effect of macroeconomic instability on private investment, inflation is used as a proxy variable for macroeconomic instability. With respect to consumption, the consumption function (CP) is derived from the Keynesian consumption function, which asserts that consumption increases in proportion to disposable income (YD). The inflation variable is also used as an explanatory variable because it can have a direct effect on real consumption, as the consumers suffer from money illusion or if money enters a consumer's utility function (see for example Deaton, 1977; Juster and Wachtel 1972a, 1972b; and von Furstenburg, 1980).

Note that the real interest rate could be included in the consumption and investment functions. However, owing to less developed financial and banking system in the Lao PDR, residents would have less opportunity to smooth their consumption path. Moreover, the prevailing informal loan market and the controlling of interest rates by the Lao Government make it hard to observe the impact of the official interest rate on the demand for investment in the private sector. Therefore, the potential effects of real interest rate on consumption and investment have been excluded.

With respect to identity equations, equations (4.18) and (4.19) represent the national account identity for aggregate demand and disposable income, respectively. The final equation (4.20) equates aggregate demand, aggregate supply and income.

4.3 The aid-growth nexus model

Apart from the theoretical critiques of the aid-growth nexus pointed out in the two-gap model, modified aid-growth regressions to tackle the critiques discussed in Chapter 2 have also been problematic because many empirical studies have failed to provide statistically significant aid-growth coefficients. This perceived lack of evidence on the aid-growth nexus has generally been blurred by associated critiques of the econometric methodology applied in

such studies. This issue is discussed in Section 4.3.1. Section 4.3.2 presents the macroeconometric model of the aid-growth nexus for the case of the Lao PDR.

4.3.1 Econometric issues of the aid-growth regression

As discussed in Chapter 2, many of the aid effectiveness studies have derived their empirical frameworks from various growth theories. In many cases the reduced form of the aid-growth equation has been employed to assess the effectiveness of aid. Although many researchers have been aware of the weakness of this approach and have employed more sophisticated techniques to tackle the potential econometric misspecification of the aid-growth regression, the resulting estimation of aid-growth coefficients have still been ambiguous. This controversial result has been seen as a problem arising from the econometric misspecification of the aid-growth model that may have caused the estimated aid-growth coefficient to be biased and unstable. White (1998) claims that the aid-growth regression has been misspecified on three counts: (i) omitted variable biases, (ii) single equation estimations of simultaneous relationships, and (iii) parameter instability (White, 1998, pp. 27-29). The explanations of why these specification errors are likely to be present in the aid-growth regression are presented below. Some of the aid-growth regressions presented in Chapter 2 have been reproduced here for the sake of convenient discussion.

$$\frac{\dot{Y}}{Y} = \mathbf{a}_0 + \mathbf{a}_1 \frac{A}{Y} + \mathbf{a}_2 \frac{S_d}{Y} + \mathbf{a}_3 \frac{OF}{Y} + \mathbf{e} \quad (4.21)$$

$$\frac{\dot{Y}}{Y} = \mathbf{a}_0 + \mathbf{a}_1 \frac{A}{Y} + \mathbf{a}_2 \frac{S_d}{Y} + \mathbf{a}_3 \frac{OF}{Y} + \mathbf{a}_4 Z + \mathbf{e} \quad (4.22)$$

where $\frac{\dot{Y}}{Y}$ is the rate of output growth, $\frac{A}{Y}$, $\frac{S_d}{Y}$, $\frac{OF}{Y}$ are aid inflows, domestic savings and other sources of capital inflow as a percentage of GDP, respectively. Z is a vector for control variables including the growth rate of various factor inputs and policy variables affecting growth.

As indicated in Chapter 2, Section 2.2, equation (4.21) here may be said to be misspecified, and may suffer from omitted variable bias. Levine and Renelt (1991) report that there are over 50 variables found to be significantly correlated with growth. As such the first type of specification error can be due to the correlated variables that have been excluded in the regression equation, clearly the case in equation (4.21).

In an attempt to solve the above specification error more explanatory variables have been added. Many researchers have done this by employing equation (4.22) to isolate the effect of aid on growth from the added explanatory variables.⁴ However, equation (4.22) is likely to suffer from the second case of specification error if the variables included are correlated with both aid and growth. For example, a case in the literacy variable included by Mosley *et al.* (1987) indicates higher literacy, which leads to an increase in growth due to the high quality of labour force. This may result from an increase in government expenditure on education, which in turn is also financed by aid. This implies that aid inflows, literacy and growth are correlated. White (1998) has also pointed out some variables that correlate with aid and growth; i.e. military expenditure, educational indicators and macro-policy variables. Moreover, after 1980, the economic policies of developing countries have been improved as a result of aid expenditure on policy advice. Easterly (2000) demonstrates that proxies for policy variables such as financial depth and real overvaluation as well as policy-related factors like health, education, fertility and infrastructure are highly significant in the growth regression.

It is obvious that attempts to isolate the effect of aid on growth from the added explanatory variables would create simultaneous relationships among

⁴ In the aid-growth model the investment variable is replaced by the ratio of aid to GDP. In this context, the aid variable is perceived as a factor contributing to economic growth via the accumulation of physical capital and the productivity of capital. This is equivalent to the "level effect" and "growth effect" in the theory of economic growth presented by Lucas (1988). Other explanatory variables are employed to capture other factors affecting economic growth via the "level of efficiency" or the "growth effect" (see Sala-i-Martin, 1997a&b for a similar interpretation of the role for other explanatory variables in the growth model).

aid, economic growth and the added explanatory variables. These simultaneous relationships cannot be captured in the aid-growth regression equation. Thus, including more explanatory variables in the aid-growth regression analysis (such as the literacy rate in the Mosley *et al.* (1987) study of policy variables influenced by aid) is a specification error case of single equation estimation of simultaneous relationships.⁵

Lastly, the most serious case of econometric misspecification arises due to the diversity of aid given to developing countries, in which the impact of aid on growth can vary with the types of aid and with its spending on diverse sectors.⁶ This may cause the estimate of the aid coefficient in the aid-growth regression to be unstable. White clarifies this point by asserting that:

the impact of aid will be different if it is used for building primary health clinics rather than for roads, extension services or an industrial line of credit. All these things should be expected to increase growth, but through different channels and certainly with different lag structures.

White (1992b, p. 129)

In addition, White (1998) claimed that “there is no theoretical foundation whatsoever for the assumption that the impact of aid on growth is constant either across countries or across time” (*ibid.*, p. 29). It is obvious that the diversity of the impact of aid on growth mentioned above may also vary across countries and time. Even if the lag structure effect of aid is incorporated in the aid-growth regression, it cannot tackle the diversity of the impact of aid on growth “since the required lag structures will change as the sectoral composition of aid changes” (*ibid.*, p. 29). Therefore, the estimation of the aid-growth regression with a sample of cross-country or panel data may yield unstable aid-growth coefficient.

⁵ The simultaneity issue may arise if aid is endogenous as a result of the process of aid allocation. However, donors may conceivably allocate aid by income per capita or their interests in the recipient country rather than economic growth or income. In this sense, aid will not cause the issue of simultaneity in the aid-growth regression (White, 1992b, p.130).

⁶ Grant aid with tied conditions lowers the transferred value of aid (Cassen, 1994, p.16).

4.3.2 A macroeconometric model of the aid-growth nexus

To measure the influence of the interactive effects that aid and policy conditionality may have on economic growth, the standard neo-classical measure of growth has been modified to integrate several aspects of the impact of capital flow on the economy through its role in financing domestic investment, as explained by the two-gap model. Unlike the typical approach using a single regression equation, the macroeconometric model tracks the dynamic impact of capital flows through the direct and indirect effects on investment, international trade and growth. The impact of policy conditions on economic growth is captured in the short-run and long-run coefficients of the aid-growth nexus. By doing this, the model has an advantage of capturing simultaneous relationships among capital flows and other endogenous variables in the model. It also reduces the potential multicollinearity errors that can occur if the aid-growth regression equation is applied.

The macroeconometric model of the aid-growth relationship consists of five behavioural equations and three identity equations. The model is presented in a generic form as follows:

A macroeconometric model of the aid-growth nexus

Behavioural equations

Output growth

$$GY_t = f_1(IY_t; GLE_t) \quad (4.23)$$

Investment

$$IGY_t = f_2(GY_t; AY_t, INF_t) \quad (4.24)$$

$$IPY_t = f_3(GY_t, IGY_t; FDIY_t, INF_t) \quad (4.25)$$

International trade

$$XY_t = f_4(MKY_t; YF_t, REER_t) \quad (4.26)$$

$$MKY_t = f_5(IY_t; REER_t) \quad (4.27)$$

Identity equations

$$IY_t = IGY_t + IPY_t \quad (4.28)$$

$$MY_t = MKY_t + MCY_t \quad (4.29)$$

$$CAY_t = XY_t - MY_t + U_t \quad (4.30)$$

where *GY*: growth rate of income,
IY: the share of investment in GDP,
IGY: the share of public investment in GDP,
IPY: the share of private investment in GDP,
XY: the share of exports to GDP,
MKY: the share of imports of capital goods in GDP,
MCY: the share of imports of consumption goods in GDP,
MY: the share of imports to GDP,
FDIY: the ratio of total foreign direct investment to GDP,
CAY: the ratio of current account deficit to GDP,
AY: the ratio of total aid to GDP,
INF: the inflation rate,
GLE: the growth rate of effective labour force,
YF: the weighted average by trade share of growth in per capita income of the trading partners,
REER: real exchange rate,
U: the error term including net service transfers.

The behaviour of output growth, as indicated by equation (4.23), is based on the neo-classical growth model modified to include the ratio of total investment to GDP and the growth rate of effective labour force.⁷ Total investment is divided into public investment (equation (4.24)) and private investment (equation (4.25)). The factors determining investment decisions employed in the aid-growth models are similar to those used in the aid fungibility model, except that the growth of output (*GY*) is used as a proxy variable for government revenue (*T*) and the accelerator effect for public and private investment functions, respectively.

⁷ The behaviour of output growth can be derived using the production function $Y_t = Y_t(K_t, LE_t)$ as follows:

Differentiating Y_t w.r.t time gives $\dot{Y}_t = \frac{\partial Y_t}{\partial K_t} \dot{K}_t + \frac{\partial Y_t}{\partial LE_t} \dot{LE}_t$, then dividing both sides of the equation by Y_t and substituting $\dot{K}_t = I$ yields: $\frac{\dot{Y}_t}{Y_t} = \frac{\partial Y_t}{\partial K_t} \frac{I_t}{Y_t} + \frac{\partial Y_t}{\partial LE_t} \frac{LE_t}{Y_t} \frac{\dot{LE}_t}{LE_t} \Rightarrow GY_t = f_1(IY_t, GLE_t)$ where $GY_t = \frac{\dot{Y}_t}{Y_t}$, $IY_t = \frac{I_t}{Y_t}$, $GLE_t = \frac{\dot{LE}_t}{LE_t}$.

With respect to international trade, exports and capital imports are used to capture the potential effects of foreign capital inflows. As mentioned in Chapter 3, the LDCs' ability to raise investment with external viability heavily depends on international trade and foreign capital inflows. This is no exception for the Lao PDR. Thus, the export function, as indicated by equation (4.26), is expected to be dominated not only by economic growth in the Lao PDR trading partners (YF), but also by the ability to import capital goods (MKY). The latter, as indicated by equation (4.27), is determined by total investment (IY) which in turn depends on the inflow of both aid and foreign direct investment as specified in equation (4.24) and (4.25). The real effective exchange rate is included in equation (4.26) and (4.27), to capture the "Dutch disease" effect.

As for the identity equations, equation (4.28) and (4.29) represent total investment and imports, respectively. Equation (4.30) represents the current account balance, set equal to the sum of trade account deficits and net service transfers. In the case of the Lao PDR, net service transfers have less influence on the movement in the balance of payments. For the sake of expository simplicity, net service transfers are assumed to be zero. Therefore, the balance of payments becomes the trade balance. This equation is included in the model to capture any repercussions from international trade. It is also employed to address the potential effects of policy conditionality on the Lao PDR's ability to raise investment with external viability.

4.4 Estimating, testing and analysing the macroeconomic models

Once a macroeconomic model has been specified, the reduced form can be expressed in matrix form as follows.

$$A_0 \mathbf{x}_t = A_1 \mathbf{z}_t + A_2 \mathbf{z}_{t-1} + A_3 \mathbf{x}_{t-1} + \mathbf{e}_t \quad (4.31)$$

In this expression x_t is the $(n \times 1)$ vector of endogenous variables, z_t is the $(m \times 1)$ vector of exogenous variables, x_{t-1} and z_{t-1} are respectively the x_t and z_t vector lagged one period, and e_t is the $(n \times 1)$ vector of residuals. A_0 is the $(n \times n)$ matrix of the coefficients of the endogenous variable; A_1 is the $(n \times m)$ matrix of the coefficients of the exogenous variables. A_2 is the $(n \times m)$ matrix of the coefficients of the lagged exogenous variables. In the A_2 matrix, the entry of intercepts into the structural equations is accommodated by including a variable which always takes the value of unity. A_3 is the $(n \times n)$ matrix of the coefficients of the lagged endogenous variables. It should be noted that equation (4.31) is dynamic, simultaneous and has error terms that may be correlated across equations and with their lagged values.

There are many issues associated with the process of selecting methods to estimate, test and analyse the macroeconomic model. First, the model builder must select methods that can tackle the econometric issues in time series and multiple equations simulation. Second, when individual equations are combined as a system of simultaneous equations, specific criteria are required for testing the goodness of fit and properties of the model. Finally, there are various ways the macroeconomic model can be analysed. These issues are discussed in the following sections.

4.4.1 Estimation methods

Theoretically, estimation methods for macroeconomic models can be divided into two groups. The first group employs single equation methods that do not take into account the correlation of error terms across equations. These estimation techniques consist of Ordinary Least Squares (OLS), Indirect Least Squares (ILS), Two-Stage Least Squares (2SLS) and Limited Information Maximum Likelihood (LIML). The second group employs system equation methods that do account for the error terms across equations. These estimation techniques consist of Seemingly Unrelated Regression Estimation (SURE), Three-Stage Least Squares (3SLS), and Full Information

Maximum Likelihood (FIML).⁸ When applying the estimation techniques from both groups to time series data, the model builders have to make sufficient stationary assumptions about the variables employed in the model. However, the majority of macroeconometric model builders either explicitly or implicitly assumed variables are trend stationary (cointegrated). A time trend is normally included to test whether the estimation is picking up spurious correlation from common trending variables. If including a time trend in the equation substantially changes some of the estimated coefficients, this is cause for concern.⁹

In practice, if the sample size is small, utilising system methods for the estimation could have more problems than using single-equation methods. The problems could arise if either the number of predetermined variables exceeds the number of sample points or the number of behavioural equations exceeds the number of sample points (Challen and Hagger, 1983, p. 128). To tackle these problems, single equation methods are frequently used. The ILS technique is appropriate, if the structure of a model is just identified while the 2SLS technique is appropriate if the structure of the model is overidentified (Gujarati, 1995, pp. 678-700). The OLS technique is appropriate, if either the structure of the model is recursive or the variables in a behavioural equation turn out to be cointegrated. In the latter case, utilising the OLS technique yields a super consistent estimator for the cointegrating parameters of those variables (Enders, 1995, p. 374). However, there is a danger of small-sample biases in OLS estimates (Banerjee *et al.*, 1993, pp. 214-230).¹⁰

From the above discussion, the estimation problem that is likely to be encountered in this study is the small sample size to estimate the

⁸ For more detailed discussions on estimation methods see for example Challen and Hagger (1983), Pindyck and Rubinfeld (1991).

⁹ The estimation issues with non-stationary data are discussed in Fair (1994).

¹⁰ Although 30 observations are recommended, the suitable sample size also depends on the characteristics of the problem at hand for estimators to display their asymptotic properties. Goldfeld and Quandt (1972, p. 277) report an example in which a sample size of 30 is sufficiently large and another example in which a sample of 200 is required.

cointegrating coefficients of the behavioural equations. This is because only 20 annual observations are employed for the estimation. Also, variables included in the behavioural equations are likely to be cointegrated among themselves through a direct and/or indirect link from either the identity equations or the specification of behavioural equations of those variables. Therefore, the estimation strategy adopted here is an ad hoc technique to handle the abovementioned problems. The autoregressive Distributed Lag (*ARDL*) approach to cointegration developed by Pesaran and Shin (1995) is used to estimate the dynamic structure of behavioural equations.

The *ARDL* procedure involves two stages. In the first stage, each behavioural equation is transferred to the error correction form of the underlying *ARDL* model. The error correction version of the *ARDL* (p, q) in the variables X_t and Z_t is given by:

$$\Delta X_t = \mathbf{a} + \sum_{i=1}^p A_i \Delta X_{t-i} + \sum_{j=1}^q B_j \Delta Z_{t-j} + C_0 X_{t-1} + C_1 Z_{t-1} + u_t \quad (4.32a)$$

where X_t is an endogenous variable, \mathbf{a} is an intercept, Z_t is an explanatory variable and u_t is the random error term.

The F -statistic for the joint test of the coefficients C_0 and C_1 is computed to test for the long-run relationship between X_t and Z_t . The null hypothesis is that the coefficients C_0 and C_1 in equation (4.32a) are jointly equal to zero. In other words, the null hypothesis states that there is no long-run relationship between X_t and Z_t . Then, the computed F -statistic is compared with the critical value bounds of the F -statistic that Pesaran *et al.* (1996) have tabulated. If the computed F -statistic is higher (lower) than the upper (lower) bound of the critical value of F -statistic, the null hypothesis would be rejected (accepted).

In second stage, if variables in each behavioural equation are found to be cointegrated (i.e., the null hypothesis is rejected), the *ARDL* method can be employed to estimate the dynamic structure of the behavioural equations

using the OLS method. The estimations proceed “without needing to know whether the underlying variables are I(0) or I(1)” (Pesaran and Pesaran, 1997, p. 304).¹¹

The dynamic structure of the *ARDL* (p, q) model takes the following form:

$$X_t = \mathbf{a} + \sum_{i=1}^p A_i X_{t-i} + \sum_{j=0}^q B_j Z_{t-j} + \mathbf{m}_t \quad (4.32b)$$

where X_t is an endogenous variable, \mathbf{a} is an intercept, Z_t is a vector of explanatory variable, p and q are respectively a number of the lag length of X_t and Z_t , and \mathbf{m}_t is the random error term.

As mentioned earlier, there is a danger of small-sample biases in OLS estimates. To obtain coefficients that accord well with the models, much experimentation must be performed. For example, different functional forms are tried, and right hand side (RHS) variables are dropped if they have coefficient estimates that are not of the expected sign. Despite the coefficients being statistically insignificant, some explanatory variables are retained in each equation, if they improve the tracking ability of the simulation model.¹² It should be noted that the selection for lag length (i.e. i and j) should take many factors into consideration. For example, the lag length should be consistent with the theory and data admissible (Hendry and Richard, 1983, p. 3-33). Since only 20 annual observations are used for the estimation, the lag length is restricted to one lag. The computer software employed for the estimation is Microfit. For the simulation, SAS and Eview are employed.

¹¹ This method avoids the requirements of pre-testing of the order of integration, which is necessary in other cointegration methodologies. Also, this method avoids the problems of serial correlation that arise in the residual-based cointegration methods by an appropriate augmentation (Pesaran, *et. al.* 1996).

¹² The main purpose of building the macroeconomic models in this study is to measure the magnitude of the impacts of aid on economic growth. In this context, the tracking ability of the models is important. The more the model is able to track the trends of historical data, the better the multiplier analysis is able to capture the Lao PDR's economic behaviour.

4.4.2 Goodness-of-fit testing methods

Once the estimation of behavioural equations is completed and before the model can be used for various analyses, it is subjected to a number of tests. The objective of this step is to determine whether the models reach an acceptable standard of performance. Essentially, when single equations are combined as a system of simultaneous equations, the goodness of fit for each single equation does not always imply that the model will have a good tracking ability for the dynamic path of the historical data. As Pindyck and Rubinfeld pointed out:

In a multiple-equation model each individual equation may have a very good statistical fit, but the model as a whole may do a poor job in reproducing the historical data. The converse may also be true; the individual equations of a simulation model may have a poor statistical fit, but the model as a whole may reproduce the historical time series very closely.

Pindyck and Rubinfeld (1991, p. 332)

In this regard, the goodness-of-fit for the macroeconomic system can be evaluated by using an ex-post simulation or historical simulation (i.e. a comparison of the historical data series with the one that is predicted by the model). To do this requires solving the macroeconomic systems in equation (4.31), by either the stochastic simulation method or the deterministic simulation method. The latter method is applied in this study. Thus, the error term is assumed to be zero (i.e., $E(e_t)=0$). The deterministic simulation solution (the simulated value) is given by:

$$\mathbf{x}_t^s = \Pi_{10}\mathbf{z}_t + \Pi_{11}\mathbf{z}_{t-1} + \Pi_{21}\mathbf{x}_{t-1} \quad (4.33)$$

$$\text{where } \Pi_{10}=\mathbf{A}_0^{-1}\mathbf{A}_1, \Pi_{11}=\mathbf{A}_0^{-1}\mathbf{A}_2, \Pi_{21}=\mathbf{A}_0^{-1}\mathbf{A}_3$$

To indicate the goodness-of-fit for the model and its predictive ability, several statistics will be calculated. In this regard, Simulation Mean Error (*SME*), Simulation Mean Percent Error (*SMPE*), Root Mean Square Error

(*RMSE*), Root Mean Square Percentage Error (*RMSPE*) and Theil's Inequality Coefficient (*U*) are employed. The formula of these statistics are given by:

$$SME = \frac{1}{T} \sum_{t=1}^T (x_t^s - x_t^a) \quad (4.34)$$

$$SMPE = \frac{1}{T} \sum_{t=1}^T \left(\frac{x_t^s - x_t^a}{x_t^a} \right) \quad (4.35)$$

$$RMSE = \sqrt{\frac{1}{T} \sum_{t=1}^T (x_t^s - x_t^a)^2} \quad (4.36)$$

$$RMSPE = \sqrt{\frac{1}{T} \sum_{t=1}^T \left(\frac{x_t^s - x_t^a}{x_t^a} \right)^2} \quad (4.37)$$

$$U = \frac{\sqrt{\frac{1}{T} \sum_{t=1}^T (x_t^s - x_t^a)^2}}{\sqrt{\frac{1}{T} \sum_{t=1}^T (x_t^s)^2} + \sqrt{\frac{1}{T} \sum_{t=1}^T (x_t^a)^2}} \quad (4.38)$$

The numerical value of *U* falls between 0 and 1. If *U* = 0, it means there is a perfect fit. If *U* = 1, on the other hand, the predictive performance of the model is as bad as it possibly could be. In addition, the closer the values of *RMSE*, *RMSPE* and *U* are to zero, the higher will be the tracking ability of the model. Apart from such statistical evaluation, the plot between the actual data (x_t^a) and the simulated values (x_t^s) will be used to check the tracking ability of the turning point of the model's endogenous variables.

4.4.3 Methods for analysing macroeconomic models

A useful way to examine the properties of macroeconomic models is to consider how much the predicted values of the endogenous variables change when one or more exogenous variables change. This exercise is called "multiplier analysis", and there are two types of multiplier analysis. First, the "impact" or "short-run" multiplier is used to measure the change in the period *t* value of the n^{th} endogenous variable per unit increase in the

period t value of the m^{th} exogenous variable, with all other determinants of endogenous variable held constant. Second, the “long run multiplier” is used to measure the total change in the value of the n^{th} endogenous variable per unit maintained increase in the period t value of the m^{th} exogenous variable.

To compute the multipliers requires deriving the reduced form of the linear macroeconomic system and can be done in the following procedure. Rewrite the reduced form of the macroeconomic system obtained from (4.33) as follows:

$$\mathbf{x}_t = \Pi_{10}z_t + \Pi_{11}z_{t-1} + \Pi_{21}\mathbf{x}_{t-1} \quad (4.39)$$

Re-arrange the system into other forms:

$$\begin{bmatrix} \mathbf{x}_t \\ \mathbf{x}_{t-1} \end{bmatrix} = \begin{bmatrix} \Pi_{10} & \Pi_{11} \\ 0 & 0 \end{bmatrix} \begin{bmatrix} z_t \\ z_{t-1} \end{bmatrix} + \begin{bmatrix} \Pi_{21} & 0 \\ \mathbf{I} & 0 \end{bmatrix} \begin{bmatrix} \mathbf{x}_{t-1} \\ \mathbf{x}_{t-2} \end{bmatrix} \quad (4.40)$$

Setting $\mathbf{x}_t^* = \begin{bmatrix} \mathbf{x}_t \\ \mathbf{x}_{t-1} \end{bmatrix}$, $\Pi_{10}^* = \begin{bmatrix} \Pi_{10} & \Pi_{11} \\ 0 & 0 \end{bmatrix}$, $z_t^* = \begin{bmatrix} z_t \\ z_{t-1} \end{bmatrix}$, $\Pi_{21}^* = \begin{bmatrix} \Pi_{21} & 0 \\ \mathbf{I} & 0 \end{bmatrix}$, $\mathbf{x}_{t-1}^* = \begin{bmatrix} \mathbf{x}_{t-1} \\ \mathbf{x}_{t-2} \end{bmatrix}$ gives

$$\mathbf{x}_t^* = \Pi_{10}^*z_t^* + \Pi_{21}^*\mathbf{x}_{t-1}^* \quad (4.41)$$

Lagging (4.41) by one period gives:

$$\mathbf{x}_{t-1}^* = \Pi_{10}^*z_{t-1}^* + \Pi_{21}^*\mathbf{x}_{t-2}^* \quad (4.42)$$

Substituting (4.42) into (4.41) gives:

$$\mathbf{x}_t^* = \Pi_{10}^*z_t^* + \Pi_{21}^*\Pi_{10}^*z_{t-1}^* + (\Pi_{21}^*)^2\mathbf{x}_{t-2}^* \quad (4.43)$$

Lagging (4.42) by one period and substituting the result into (4.43) gives:

$$\mathbf{x}_t^* = \Pi_{10}^*z_t^* + \Pi_{21}^*\Pi_{10}^*z_{t-1}^* + (\Pi_{21}^*)^2\Pi_{10}^*z_{t-2}^* + (\Pi_{21}^*)^3\mathbf{x}_{t-3}^* \quad (4.44)$$

Continuing in this way for $t-1$ substitutions gives:

$$\begin{aligned} \mathbf{x}_t^* = & \Pi_{10}^*z_t^* + \Pi_{21}^*\Pi_{10}^*z_{t-1}^* + (\Pi_{21}^*)^2\Pi_{10}^*z_{t-2}^* \\ & + (\Pi_{21}^*)^3\Pi_{10}^*z_{t-3}^* + \dots + (\Pi_{21}^*)^{t-1}\Pi_{10}^*z_1^* + (\Pi_{21}^*)^t\mathbf{x}_0^* \end{aligned} \quad (4.45)$$

From equation (4.45) the n, m^{th} impact multiplier is defined as the first period of dynamic multipliers and takes the following value:

$$\frac{\partial x_t^n}{\partial z_t^m} = \Pi_{10}^{*nm} \quad (4.46)$$

The long run multiplier is defined as the total sum of dynamic multipliers, which will exist if and only if all of the characteristic roots of Π_{21}^* are less than unity in absolute value. Therefore, the n, m^{th} long run multiplier takes the following value:

$$\frac{\partial x_t^n}{\partial z_t^m} = \lim_{t \rightarrow \infty} \left[\begin{aligned} &\Pi_{10}^* + \Pi_{21}^* \Pi_{10}^* + (\Pi_{21}^*)^2 \Pi_{10}^* \\ &+ (\Pi_{21}^*)^3 \Pi_{10}^* + \dots + (\Pi_{21}^*)^{t-1} \Pi_{10}^* \end{aligned} \right] \quad (4.47)$$

$$\frac{\partial x_t^n}{\partial z_t^m} = \left[(I - \Pi_{21}^*)^{-1} \Pi_{10}^* \right] \quad (4.48)$$

Other interesting and productive methods of analysing the macroeconomic system are counterfactual analysis and Goal-seeking analysis. A counterfactual analysis deals with questions of the “what if” variety (experiments) and solving for right hand side variables (goal-seeking). The “what if” analysis shows how alternative assumptions of the change in exogenous variables could affect a change in endogenous variables. For example, if foreign aid increases by 10 percent from its historical trend what will happen to prices and output? Goal-seeking analysis shows how much the exogenous variables have to change in order to achieve some target change in endogenous variables. For example, what changes in aid inflow could boost economic growth to 7 percent per annum?

It should be noted that the abovementioned techniques are subject to the “Lucas critique” because the coefficients of the specified equation that capture the aggregate relationships could be expected to vary with changes in policy rules and the structure of the economy. Therefore, these techniques could invalidate the policy conclusions derived from the model. As Lucas explains:

...given that the structure of an econometric model consists of optimal decision rules of economic agents, and that optimal decision rules vary systematically with changes in the structure

of series relevant to the decision maker, it follows that any change in policy will systematically alter the structure of econometric models.

Lucas (1976, p. 41)

In avoiding this problem, Lucas proposed including policy coefficients and disturbance variables into a model so that any policy change can be analysed by altering these two variables. While the Lucas policy evaluation critique is a plausible principle, “an extensive search of the literature reveals virtually no evidence demonstrating the empirical applicability of the Lucas critique” (Ericsson and Irons, 1995, p. 301). Sims (1982, 1986) actually ignores the “Lucas critique” by arguing that

...agents with rational expectations understand the choices facing policymakers and so form probability distributions over the range of possible policy stances. Thus, what happens to be regime changes are, in fact, particular draws from probability distributions that have already been integrated into the optimisation problems of individual agent. A true regime change might be the change of the entire distribution. But not only are such changes rare, the range of possible distribution might itself be governed by an even higher-order distribution.

Sims (1982, 1986) cited in Hoover (1995, p. 6).

The counterfactual analysis discussed above will be employed in Chapter 7 in order to assess the macroeconomic management ability of the Lao Government. To avoid the “Lucas critique” the alternative assumptions for policy experiments will be made by allowing the policy variables to vary along the path of their historical trends. By doing this, it is arguable that the policy experiments will not be subject to the “Lucas critique”, as changes in policy variables will not change the economic environment faced by economic agents.

4.5 Data sources and variable constructions

Apart from the Asian Development Bank (ADB), other international organisations like the World Bank, IMF, and United Nations have published macroeconomic data needed for the analysis in this study. However, data on national accounts reported by these organisations often differ and some observations are also not available (see Table A.4.1.1). To ensure that data sets are consistent, it is desirable to avoid using data from many sources. Thus, in this study the data for most of the macroeconomic variables are from the *Key Indicators of Developing Asian and Pacific Countries*, which is published annually by the ADB. Regarding data on aid inflows to the Lao PDR, the World Bank and United Nations have published this information. However, some observations are not available from the World Bank source. To have consistent data, this study only used aid flow data published annually by the United Nations. To convert all variables to 1990 constant price, a GDP deflator and the average exchange rate index are used as the deflator variables. This is due to the lack of time-series data for import prices and export prices as well as the consumer price index (CPI). Data for the period 1978 to 1997 is used for the estimation of the macroeconometric models, while that for 1998 to 2001 is used for the counterfactual analysis.

It should be note that data on income (Y) for the years 1978 to 1979 are not available from the ADB Source. Therefore, data have been obtained from the Bank of Lao PDR. Also, there is a lack of consistent data for the private sector, mainly from 1988 backwards. Variables are therefore constructed for private saving, private investment, private consumption, and disposable income.

To construct the private saving variable, the saving equation used by the World Bank (1994) is employed as follows.

$$SPY = -0.2337 + 0.0508\ln(YPC) + 0.1485(QMY) \quad (4.49)$$

where SPY is the ratio of private saving to GDP, $\ln YPC$ is the natural log of per capita income, and QMY is the ratio of quasi-money to GDP. The ratio of private saving to GDP can be constructed using the available data on YPC and QMY and substituting into equation (4.49). In the next step, the national accounting identity is utilised to derive private investment variable as follows:

$$(S - I) = (X - M) \quad (4.50)$$

$$(SP + SG) - (IP + IG) = (X - M) \quad (4.51)$$

$$IP = (SP + SG) - IG - (X - M) \quad (4.52)$$

where data on SG , IG , X and M are available from both the fiscal and balance of payments accounts. Once both private savings and private investment variable are constructed, private consumption (CP) and disposable income (YD) can be constructed using the national accounting identity as follows:

$$YD = Y - T + TR \quad (4.53)$$

$$CP = YD - SP \quad (4.54)$$

where Y is income, T is government revenue, and TR is transfer payments.

The construction for the growth rate of effective labour force is based on the study by Gounder and Xayavong (2001). The effective labour force is defined as follows:

$$LE_t = SE_t \frac{LF_t}{POP_t} \quad (4.55)$$

$$GLE_t = \frac{LE_t - LE_{t-1}}{LE_{t-1}} \quad (4.56)$$

where LE_t is the effective labour force, SE_t is the total number of student enrolments in secondary and tertiary levels, LF_t is labour force, POP_t is total population, and GLE_t is the growth rate of the effective labour force. Note that the LF_t variable is employed because of the lack of employment data in the

Lao PDR. There will be no distinction between the use of labour force and employment if unemployment is constant or varies within a small range.

The real effective exchange rate index (*REER*) is constructed using the trade-weighted real exchange rate index between the US dollar and the Thai baht. The geometric averaging technique is used. The formula of *REER* expressed in term of foreign currency is given by:

$$REER = \left(\frac{E_{US}}{P_{US}} \right)^{W_{US}} \left(\frac{E_{TH}}{P_{TH}} \right)^{W_{TH}} P_{LAO} \quad (4.57)$$

where the subscript letter *US*, *TH* and *LAO* respectively represents the United States of America, Thailand and the Lao PDR, *E* is the index of the nominal exchange rate defined as units of foreign exchange per unit of domestic currency, *P* is aggregate price index, *W* is the trade-weighted index for multiple trading partners. The sum of trade-weighted index must be equal to one (i.e., $W_{US} + W_{TH} = 1$). An upward movement in the real effective exchange rate index indicates an appreciation of the *REER*.

4.6 Summary

This chapter has presented the macroeconomic methods utilised for analysing the aid-growth nexus. It also has explained the methods of data construction employed in this study. The Keynesian approach to modelling macroeconomic system is selected to solve the existing methodological weakness of aid fungibility and aid-growth models. Unlike the conventional aid fungibility model, which focuses only to the government sector, the macroeconomic model of aid fungibility developed in this chapter allows aid to have direct, indirect and feedback effects on public, private and trade sectors.

Whether or not a stable aid inflow contributes to economic growth depends on the potential effect of aid on investment through the savings-investment channel. In other words, aid fungibility may or may not displace private

investment which depends on whether aid inflow results in an increase in domestic borrowing. Unlike the typical approach of using a single regression equation, the macroeconometric models of the aid-growth nexus allows the tracking of the dynamic impact of capital inflows on economic growth through the potential effects of aid on investments along the external balance channel. Multiplier analysis is introduced to capture the interactive effect of aid and policy conditionality on economic growth. Counterfactual analysis is also introduced to disentangle the effects of the weakness of the aid recipient's state and institutional capability on economic growth from the effect of aid. The issues and methodology discussed here are employed in the next chapters.

Appendix 4.1: Sources and the estimation results of macroeconomic data

This Appendix consists of three tables. Table A4.1.1 presents data comparison between the author's estimation, and the World Bank, the ADB, and the IMF. Table A4.1.2 presents data used for the estimation of the aid fungibility model in Chapter 5, and Table A4.1.3 presents data used for the estimation of the aid-growth nexus model.

Table A4.1.1 Comparing Estimated Data with Other Sources

Year	IMF(2002)	Author's estimation		World bank (1999)			ADB (various issues)		
	Y	IY	SY	Y	IY	SY	Y	IY	SY
1978	n.a.	8.81	-10.18	n.a.	n.a.	n.a.	425600*	n.a.	n.a.
1979	n.a.	6.84	-0.92	n.a.	n.a.	n.a.	429800*	n.a.	n.a.
1980	355868	10.20	-1.53	n.a.	n.a.	n.a.	435080	n.a.	n.a.
1981	410429	9.37	1.79	n.a.	n.a.	n.a.	449850	n.a.	n.a.
1982	429780	17.44	4.84	n.a.	n.a.	n.a.	459850	n.a.	n.a.
1983	442674	12.67	4.06	n.a.	n.a.	n.a.	469500	n.a.	n.a.
1984	471175	11.90	4.40	n.a.	6.18	2.60	480500	n.a.	n.a.
1985	514154	13.89	3.83	n.a.	7.04	1.31	497234	n.a.	n.a.
1986	538983	12.17	6.39	n.a.	6.93	2.84	521342	n.a.	n.a.
1987	533810	12.29	7.56	n.a.	10.19	2.26	515750	n.a.	n.a.
1988	522600	24.77	2.76	624456	13.50	-4.77	506278	14.9	2.2
1989	574221	19.23	2.59	713682	n.a.	n.a.	574172	15.1	1.1
1990	612681	15.20	2.87	761277	n.a.	n.a.	612681	14.8	0.8
1991	637100	14.85	3.66	792718	n.a.	n.a.	637160	15.9	4.6
1992	681700	17.37	5.73	847024	n.a.	n.a.	681798	14.5	5.6
1993	712800	22.12	7.69	897104	n.a.	n.a.	721819	15.2	6.5
1994	780600	25.64	8.56	970299	n.a.	n.a.	780657	n.a.	n.a.
1995	835600	25.20	9.55	1038275	26.00	11.57	835519	24.5	11.5
1996	893200	30.59	10.97	1109730	30.50	11.97	893256	29.0	12.4
1997	955000	28.70	12.16	1182304	28.67	11.35	955009	26.2	9.4

Legend: IY is gross domestic investment as percentage of GDP, SY is gross domestic savings as percentage of GDP, Y is income at constant market price 1990, n.a. indicates data are not available, * data obtained from the Bank of Lao PDR.

Notes: The differences of data on income (Y) reported by the above-mentioned sources may be caused by differences in data compilation, and also the use of different deflation to convert of income to constant prices. With respect to data on gross domestic investment (IY) and gross domestic savings (SY), the author's estimation is not much different from other sources' during the year 1990 to 1997. However, from 1989 backward the author's estimation is higher than other sources'.

Table A4.1.2: Data used for the estimation of the aid fungibility macroeconometric model

Year	Y	CP	CG	IG	IP	X	M	MK
1978	4256	4088	693	340	35	128	949	231
1979	4298	4174	368	226	67	228	828	219
1980	4351	4217	546	397	46	304	996	345
1981	4499	4246	406	366	56	233	1104	385
1982	4599	4311	524	746	56	383	1267	569
1983	4695	4432	419	534	61	380	1394	505
1984	4805	4499	462	477	95	397	1468	408
1985	4972	4749	557	600	91	444	1601	505
1986	5213	4962	621	492	143	419	1413	437
1987	5158	4835	514	432	201	387	1302	285
1988	5063	4459	621	1041	213	525	1353	389
1989	5742	5170	532	885	219	508	1555	646
1990	6127	5485	699	736	195	562	1324	622
1991	6372	5594	723	610	336	654	1151	842
1992	6818	5899	746	664	520	763	1553	929
1993	7218	6035	818	724	872	1311	2353	1162
1994	7807	6404	914	909	1093	1520	2854	1318
1995	8355	6827	902	959	1147	1473	2791	1256
1996	8933	7251	893	1030	1702	1554	3323	1562
1997	9550	7716	878	1080	1661	1513	3085	1776
Average	5941	5268	642	662	441	684	1683	719
Std. Deviation	1648	1099	176	257	546	491	756	463
Year	YD	T	DT	NT	A	FDI	PDF	REER
1978	4156	191	100	91	920	0	0.6	168.4
1979	4253	251	45	205	637	0	1.1	294.6
1980	4299	397	52	345	440	0	1.9	207.7
1981	4342	390	156	234	353	0	2.5	386.8
1982	4419	639	180	459	367	0	4.3	255.6
1983	4545	497	150	347	278	0	7.0	503.3
1984	4618	554	187	367	310	0	8.9	632.2
1985	4890	607	82	524	307	0	17.0	455.3
1986	5140	776	74	702	367	0	23.8	589.3
1987	5094	645	63	581	351	0	31.2	658.9
1988	4587	632	476	156	667	18	45.2	72.2
1989	5377	473	365	108	1163	32	75.1	100.5
1990	5750	610	376	233	1080	43	100.0	100.0
1991	5892	659	480	179	970	54	113.3	108.0
1992	6305	730	513	218	949	52	123.8	112.9
1993	6526	881	692	189	1124	360	131.7	116.0
1994	7005	981	801	179	1102	305	141.9	118.7
1995	7508	1019	847	171	1446	451	171.2	120.8
1996	8004	1120	929	191	1604	769	193.2	115.3
1997	8621	1135	929	206	1671	422	230.4	131.0
Average	5567	659	375	284	805	125	71	262
Std. Deviation	1351	266	316	166	459	216	74	200

Legend: *Y* is income, the letter *P* stands for the private sector and letter *G* stands for the government sector, *C* is consumption, *I* is investment, *X* is total exports, *M* is total imports, *MK* is imports of capital, *YD* is disposable income, *T* is total government revenue, *DT* is tax revenue, *NT* is non-tax revenue, *A* is total aid inflow, *FDI* is total foreign direct investment, *PDF* is GDP deflator, *REER* is real effective exchange rate.

Note: all variables unit are 100 Million Kips at 1990 prices, except the PDF and REER units which are in percentages.

Source: ADB (various), UN (Various) and author's estimation.

Table A4.1.3: Data used for the estimation of the aid-growth nexus macroeconometric model

Year	GY	IY	IGY	IPY	XY	MY	MKY	MCY
1978	0.90	8.81	7.99	0.82	3.01	22.29	5.42	16.87
1979	0.99	6.84	5.27	1.57	5.32	19.26	5.10	14.16
1980	1.23	10.20	9.13	1.06	7.00	22.90	7.94	14.96
1981	3.39	9.37	8.14	1.24	5.18	24.55	8.57	15.99
1982	2.22	17.44	16.22	1.22	8.33	27.54	12.38	15.17
1983	2.10	12.67	11.36	1.31	8.10	29.68	10.75	18.93
1984	2.34	11.90	9.92	1.98	8.26	30.55	8.49	22.06
1985	3.48	13.89	12.06	1.83	8.93	32.20	10.15	22.05
1986	4.85	12.17	9.44	2.74	8.03	27.11	8.38	18.73
1987	-1.07	12.29	8.38	3.91	7.51	25.25	5.52	19.72
1988	-1.84	24.77	20.56	4.21	10.36	26.73	7.68	19.06
1989	13.41	19.23	15.41	3.82	8.85	27.09	11.25	15.84
1990	6.71	15.20	12.01	3.19	9.17	21.61	10.15	11.46
1991	4.00	14.85	9.57	5.28	10.27	18.07	13.21	4.86
1992	7.01	17.37	9.74	7.63	11.19	22.78	13.62	9.16
1993	5.87	22.12	10.03	12.09	18.16	32.60	16.10	16.51
1994	8.15	25.64	11.64	14.00	19.48	36.57	16.88	19.68
1995	7.03	25.20	11.47	13.73	17.63	33.41	15.03	18.37
1996	6.91	30.59	11.53	19.06	17.39	37.20	17.48	19.72
1997	6.91	28.70	11.31	17.39	15.84	32.30	18.60	13.70
Average	4.23	16.96	11.06	5.90	10.40	27.48	11.14	16.35
Std. Deviation	3.61	7.03	3.32	5.92	4.74	5.49	4.15	4.27
Year	SY	TY	AY	FDIY	REER	PDF	GLE	YF
1978	-10.18	4.48	21.63	0.00	168.4	0.6	3.80	1.90
1979	-0.92	5.83	14.82	0.00	294.6	1.1	5.68	2.06
1980	-1.53	9.13	10.12	0.00	207.7	1.9	9.87	2.31
1981	1.79	8.68	7.85	0.00	386.8	2.5	14.50	3.63
1982	4.84	13.89	7.98	0.00	255.6	4.3	4.74	3.24
1983	4.06	10.59	5.91	0.00	503.3	7.0	5.27	3.52
1984	4.40	11.52	6.45	0.00	632.2	8.9	-2.63	5.23
1985	3.83	12.20	6.17	0.00	455.3	17.0	9.65	3.04
1986	6.39	14.89	7.04	0.00	589.3	23.8	2.35	3.79
1987	7.56	12.50	6.80	0.00	658.9	31.2	-0.31	6.18
1988	2.76	12.48	13.17	0.36	72.2	45.2	-0.12	8.55
1989	2.59	8.24	20.25	0.56	100.5	75.1	-1.93	6.07
1990	2.87	9.95	17.62	0.70	100.0	100.0	-1.72	6.25
1991	3.66	10.34	15.23	0.85	108.0	113.3	-3.75	5.26
1992	5.73	10.71	13.92	0.76	112.9	123.8	12.33	5.33
1993	7.69	12.20	15.58	4.99	116.0	131.7	2.23	5.25
1994	8.56	12.56	14.12	3.90	118.7	141.9	12.32	6.51
1995	9.55	12.19	17.31	5.39	120.8	171.2	6.87	6.46
1996	10.97	12.54	17.95	8.61	115.3	193.2	5.26	5.03
1997	12.16	11.88	17.50	4.42	131.0	230.4	-32.54	-0.08
Average	4.34	10.84	12.87	1.53	262.4	71.2	2.59	4.48
Std. Deviation	4.95	2.57	5.14	2.50	200.1	73.9	9.84	2.05

Legend: *GY* is output growth, the letter *Y* is attached to the following variable to indicate the measurement of that variable as a percent of GDP: *IY* is total investment, *IGY* is public investment, *IPY* is private investment, *XY* is total exports, *MY* is total imports, *MKY* is imports of capital, *MCY* is imports of consumption goods, *SY* is gross domestic savings, *TY* is total government revenue, *AY* is total aid inflow, *FDIY* is total foreign direct investment, *REER* is real effective exchange rate, *PDF* is GDP deflator, *GLE* is the growth rate of the effective labour force, *YF* is the weighted average by trade share of growth in per capita income of the Lao PDR's trading partners.

Note: all variables are in percentage units.

Source: ADB (various), UN (Various) and author's estimation.

Chapter 5

AID FUNGIBILITY AND ITS EFFECTS ON INVESTMENT

...Foreign aid in different times and different places has thus been highly effective, totally ineffective, and everything in between... The evidence, however, is that aid is often fungible, so that what you see is not what you get...

World Bank (1998, p. 2 & p. 5)

There is nothing inherently wrong or inappropriate about fungibility; all it indicates is that donors and recipients have differing views about how expenditures should be allocated. The presumption that donors are right need not always hold.

McGillivray and Morrissey (2000, p. 419)

5.1 Introduction

It has been pointed out in Chapters 2 and 3 that a stable aid inflow contributes to economic growth even when aid is fungible, which may imply that aid fungibility posed no concerns for aid allocation. However, the implications of aid fungibility remain a topic of vigorous debate. According to the World Bank policy research report, *Assessing Aid* (World Bank, 1998), foreign aid is largely fungible, indicating that recipient governments are effectively able to avoid donor attempts to target aid flows to specific sectors. *Assessing Aid* reinforces the point that donors should not consider giving aid to governments that are not committed to sectors for which this aid is targeted, as “where donors and governments do not agree on the allocation of expenditure, ...spending is not likely to be effective” (World Bank, 1998, p. 61). This assertion, however, has been challenged on many aspects. Lensink and White (2000, p. 11) criticised such suggestive strategy for aid allocations because while in the donors’ view this may improve the quality of aid and limit sectoral aid fungibility, however it can over-state the effect of aid fungibility. McGillivray and Morrissey (2000) argue that aid fungibility distracts attention from the true issues of fiscal management. Instead of targeting the allocation of foreign aid to a specific sector, they suggest that

more attention should be paid to “how aid impacts on public sector behaviour overall and how fiscal management can be improved” (*ibid.*, p. 413).

There is no doubt that both sides have plausible arguments for the improvement of aid effectiveness. As discussed in the displacement theories in Chapter 2, aid fungibility may lower the effectiveness of aid if aid is allocated to low productive sectors and/or an increase in aid inflow leads to lowering tax revenue. The latter effect may crowd out private investment through the need to raise Public Sector Borrowing Requirement (*PSBR*). It is made clear in *Assessing Aid* that effective aid does not replace private initiative but acts as a magnet and crowds in private investment (World Bank, 1998, p. 3).

To address the issue of aid fungibility mentioned above, this chapter employs the macroeconometric model of aid fungibility to analyse the impact of aid fungibility on investments in the case of the Lao PDR. Before presenting the macroeconometric analysis, Section 5.2 considers the potential impacts of aid and policy conditionality on investment in the Lao PDR. The descriptive analysis is used to assess the potential impact of aid on investment within the saving-investment channel. Section 5.3 reports the estimation results of the behavioural equations and the validity test for the model and also presents the empirical evidence of the aid fungibility-investment nexus. Finally, Section 5.4 provides the conclusion and policy implications.

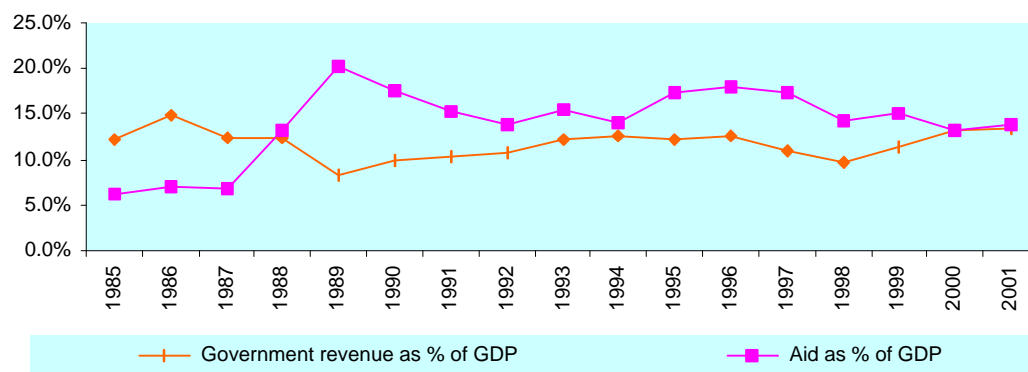
5.2 Foreign aid, policies and the internal balance

According to the displacement theory discussed in Chapter 2, a high level of aid inflow has a potential side effect on investment via the internal balance (i.e., saving-investment channel). In other words, a high level of aid inflow tends to reduce tax efforts, lower domestic savings, increase government consumption, and crowd out private investments. If this is the case, a surge

in foreign aid will not raise investment by as much as the value of the foreign aid inflows. This argument, however, seems to have over-stated the true problems facing the Lao PDR's recent development efforts. An extremely low tax base and weak government institutional capacity limited the ability of the Lao Government to mobilise domestic resources to supplement aid inflow. The discussions in the "fiscal response" literature also indicate that how the potential side effect of an increase in aid inflow affects tax and saving efforts depends on the way in which the aid-receiving government conducts fiscal policy.

Following the implementation of economic reforms in 1989, the Lao Government has been progressive in policy and institutional reforms. These improvements have created favourable environments for supporting domestic resource mobilisation.

Figure 5.1: Aid and government's revenues in the Lao PDR, 1985-2001

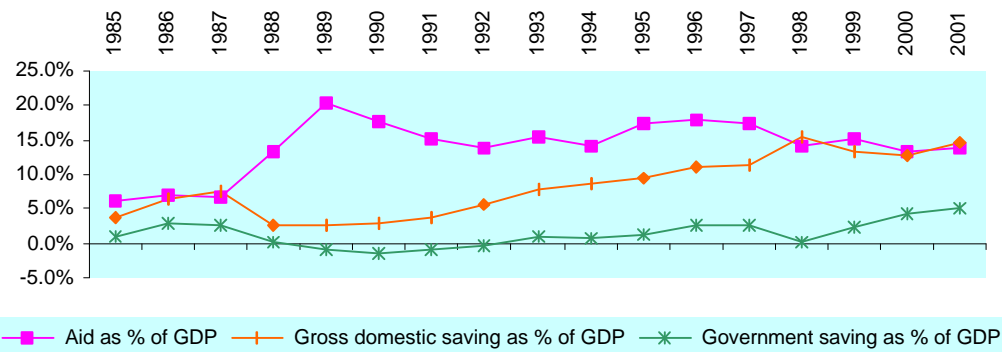


Source: Data extracted from Appendix 5.1, Table A5.1.1.

As illustrated in Figure 5.1, aid increased in the 1988-89 year, two years after the launching of the "adjustment programmes" in 1986. The level of aid inflow as a percentage of GDP was almost tripled from the annual average of about 6 percent in the 1985-88 period to about 16 percent of GDP after 1989. This upsurge in aid inflow has a negative relationship with the government's revenues. However, this does not mean that the increased inflow of foreign aid lowered tax revenue. In fact, tax collections in the Lao

PDR are affected by the nature of the tax base and the lack of institutions. The latter has resulted in the J-curve effect (Bourdet, 2000, pp. 73-75). For example, the introduction of a new tax system in 1988 caused a fall in revenue in the following year. After 1990, revenue, however, rebounded and increased steadily to an average of just less than 12 percent of GDP for the 1990-96 period. In addition, although the Lao Government has taken measures to improve the domestic tax system, “the tax base remains narrow with taxes on foreign trade being the largest revenue contributor” (Lao Government, 2001, p. 10). The heavy dependence on trade taxes was also the main reason used to explain the revenue fluctuation after the Asian financial crisis in 1997, as the decline in external trade and the use of an outdated and overvalued exchange rate to calculate import tariffs resulted in lowered trade tax collections (ADB, 2000, p. 96). The fluctuation in tax collections were attributed to the chronic lack of transparency in the transactions of state and business sectors (Bourdet, 2000, p. 103).

Figure 5.2: Aid and savings in the Lao PDR, 1985-2001



Source: Data extracted from Appendix 5.1, Table A5.1.1.

In Figure 5.2, an increase in aid inflow has been initially associated with the decline in gross domestic saving for the 1988-1992 period. However, this does not necessarily imply that a high level of aid inflow always reduces savings. Under the “adjustment programmes”, the Lao Government was required to stimulate savings in the public sector. As public saving is itself a

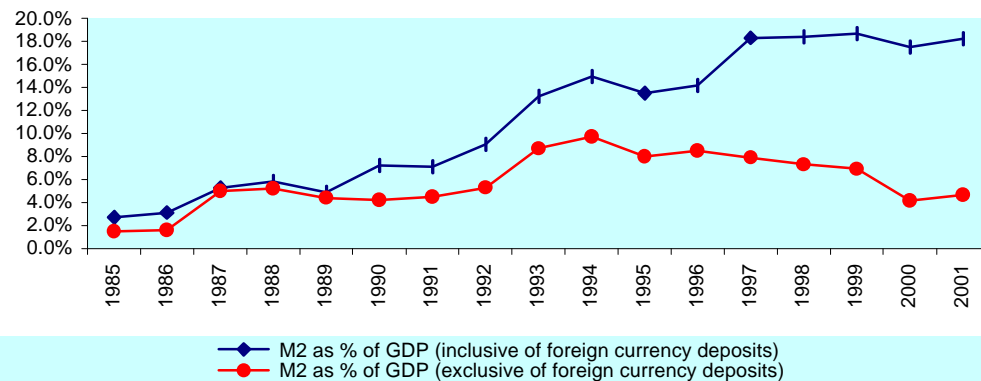
component of gross domestic saving (GDS), this policy directly raised GDS. For example, the level of public saving swung from negative in the 1989-92 period to positive in the 1993-97 period, which led to an escalation in GDS after 1992. The level of GDS as a percentage of GDP doubled from the annual average of about 5.4 percent for the 1985-92 period to about 9.7 percent for the 1993-1997 period. With the surplus of public saving, the Lao Government was able to increase wages in order to replace the food coupon payments to public officials. The Lao Government's adoption of a large wage increase led to an increased level of expenditure on government consumption. Note that the surge of GDS was associated with the increase in private saving that was attributable to income growth during the 1993-97 period. However, the fall in savings in 1999 was attributable to the volatile macroeconomic environment that took place after the Asian financial crisis.

To encourage domestic savings, the government undertook financial reforms to improve competitiveness in the banking sector. The government also permitted foreign currency deposits that allowed depositors, who are uncertain about the value of local currency, to avoid foreign exchange risk while holding deposits in domestic banks. This development helped to bring back the capital that was previously held abroad and thus contributed to increased financial deepening, in which most of the total deposits come from increased foreign currency deposits.¹ As illustrated in Figure 5.3 below, the degree of financial deepening (i.e., the ratio of deposits including foreign currency to GDP) rapidly increased from less than 5 percent in 1986 to almost 20 percent in 1999. The fall in the level of financial deepening during the 1995-96 period was attributed to the enforcing of an administrative restriction on foreign exchange and the crackdown in the parallel exchange market in 1995. This move shook the public's confidence in the local currency and caused capital flight.

¹ The Bank of Thailand reported that there were individual Lao deposit accounts of about \$US 5.45 million in 1991 and \$US 6.54 million in 1992 deposited in Thai border banks. These amounts equal approximately two thirds of total private sector current deposits, savings deposits and foreign currency deposits in the Lao commercial banks at that time (Bank of Thailand, 1992).

To bring back public's confidence, the government adopted a freely floating exchange rate system and lifted all outstanding exchange rate restrictions. This move contributed to increased financial deepening over the 1997-99 period. The decline in domestic currency deposits was attributable to depositors switching their accounts denominated in the domestic currency to the US dollar (IMF, 2000). From this observation, it can be put forward that high aid inflows would not displace domestic savings as long as the Lao Government creates an environment conducive to savings.

Figure 5.3: Financial deepening in the Lao PDR, 1985-2001



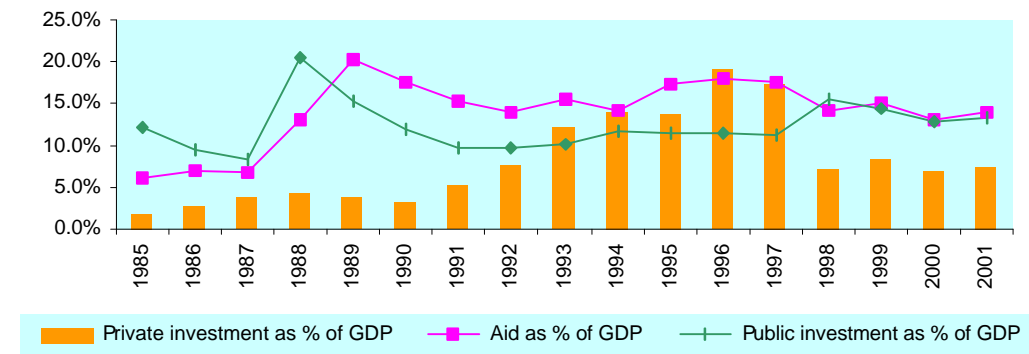
Source: Data extracted from Appendix 5.1, Table A5.1.1.

It should be noted that although domestic savings have increased, the level of saving is still far behind the financing needed to satisfy a rapid growth in domestic investment demand. This is due to the fact that the country is extremely poor. "A survey conducted in 1995 by the World Bank in selected provinces indicated that the Lao PDR had approximately 46 percent and 53 percent of the total and rural population, respectively, living in poverty with per capita income of less than US\$100 per annum" (Lao Government, 2001, p. 4).

With respect to the potential impact of foreign aid on private investment, the possibility that increased public spending may crowd out private investment probably depends on how much the public sector borrowing requirement

(PSBR) changes to supplement aid inflows. Under donors' conditionality, measures to reduce budget deficits and domestic borrowing are often the norm; and in the case of the Lao PDR, most of the public investment programmes are financed by aid inflows. Therefore, this policy tends to reduce the PSBR and leaves the available domestic resources for expanding investment in the private sector. In other words, aid flows are not likely to crowd out private investment.

Figure 5.4: Foreign aid, private investment and public investment in the Lao PDR, 1985-2001



Source: Data extracted from Appendix 5.1, Table A5.1.1.

As illustrated in Figure 5.4, the correlation between the flow of foreign aid, public and private investment appears to be positive for most periods. The level of public investment as a percentage of GDP reached its peak at 20.6 percent in 1988, before declining an average annual rate of about 10 percent of GDP over the 1989-97 period. Approximately 80 percent of the Public Investment Programme (PIP) was financed through foreign aid of which 70 percent of the PIP was allocated to the construction of road, electricity distribution and irrigation networks (Lao Government, 1997). The level of private investment also increased from 1.8 percent of GDP in 1985 to about 22 percent of GDP in 1997. This rapid growth of private investment, especially after 1993, was due to the high level of FDI inflow.

However, in the wake of the Asian financial crisis, the sharp drop in private investment from its peak of 17.5 percent of GDP in 1996 to about 7.3 percent of GDP in 1998 and 8.3 percent of GDP in 1999 was related to the decline in FDI both in value and in number of projects (see for example IMF, 2000, Table 26 and 27). The decline in aid flows since 1997 was related to the IMF and other aid donors withholding financial aid. The ratio of foreign aid to GDP for the 1997-99 period declined by almost 50 percent from its peak level of 18 percent in 1996. The indigenous private sector was also hit hard by this crisis, as many large firms dependent on FDI and government contracts were financed by foreign aid (MPDF, 1997, p. 37). On the other hand, public investment rose more than 30 percent above its peak level in 1997. The increase in public investment was related to the Lao Government's increased spending on ambitious investment in irrigation projects to promote self-reliance in rice production.

5.3 Estimating, validating the model and multiplier analysis of aid fungibility and its impact on investment

The discussions in the preceding section seems to suggest that the potential side effect of an increase in aid inflow on investment through the saving-investment channel can be mitigated by carrying out appropriate macroeconomic policies to stimulate tax reform and increase the mobilisation of domestic savings. In other words, an increased aid inflow is unlikely to lower saving and displaces private investment. To measure the magnitude of aid fungibility and its impact on private investment, the macroeconometric model of aid fungibility developed in Chapter 4 is employed here. It also will be convenient to duplicate this model as follows:

Macroeconometric model of aid fungibility

Behavioural Equations

Public Sector

$$CG_t = f_1(T_t, A_t, INF_t) \quad (5.1)$$

$$IG_t = f_2(T_t, A_t, INF_t) \quad (5.2)$$

$$T_t = f_3(Y_t, A_t, FDI_t, INF_t) \quad (5.3)$$

Private Sector

$$IP_t = f_4(IG_t, YD_t, FDI_t, INF_t) \quad (5.4)$$

$$CP_t = f_5(YD_t; INF_t) \quad (5.5)$$

Identity Equations

$$DI_t = f_1(DI_t^*, T_t, A_t) \quad (5.6)$$

$$YD_t = Y_t + NTR_t \quad (5.7)$$

$$AD_t = AS_t = Y_t \quad (5.8)$$

where *CG*: government consumption spending,
IG: government capital expenditure,
T: government revenue,
IP: private investment,
CP: private consumption,
YD: disposable income,
Y: income,
NTR: net transfer payments,
A: total aid inflows,
FDI: foreign direct investment,
INF: inflation,
NX: trade balance,
AD: aggregate demand, and
AS: aggregate supply,

The behavioural equations are estimated using annual data covering the 1978-97 period. The estimation results and model validations are presented below in Section 5.4.1. Finally, empirical evidence of the impact of aid fungibility on investment is presented in Section 5.4.2.

5.3.1 Estimation results and model validation

Table 5.1 below reports the results of testing for the long-run relationship and the critical value bounds for each behavioural equation employed in the macroeconometric model of aid fungibility. As the computed F -statistic for each behavioural equation exceeds the upper bound of the critical values of F -statistic, a conclusive decision can be made that variables in each behavioural equation are cointegrated. Therefore, the ARDL methodology can be applied to estimate the behavioural equations without requiring the knowledge of whether the underlying variables employed in the behavioural equations are $I(0)$ or $I(1)$.

Table 5.1: Results for Testing the Long-run Relationship of behavioural equations in the macroeconometric model of aid fungibility: F -statistic

Models	Computed F-statistic	Testing the existence of a long-run relationship: critical values of the F-static	
		F-Statistic case 2	Significance level
$EQ (5.1): CG_t = f_1(T_t; A_t, INF_t)$	4.537	3.182-4.126	90%
$EQ (5.2): IG_t = f_2(T_t; A_t, INF_t)$	4.937	3.182-4.126	90%
$EQ (5.3): T_t = f_3(Y_t; A_t, FDI_t, INF_t)$	5.299	2.711-3.800	90%
$EQ (5.4): IP_t = f_4(IG_t, YD_t; FDI_t, INF_t)$	3.902	2.711-3.800	90%
$EQ (5.5): CP_t = f_5(YD_t; INF_t)$	26.674	4.042-4.788	90%

The estimation results of the behavioural equations are presented in Table 5.2 below. Overall, all behavioural equations have a relatively high explanatory power in terms of R^2 . Some explanatory variables are retained in each equation, despite the coefficients being statistically insignificant because they improve the tracking ability of the simulation model. The estimation results support the potential effects that aid may have on various endogenous variables, as discussed in the preceding sections. Especially, an increased aid inflow has not only a positive effect on both government consumption spending (CG) and public investment (IG) but it also has a negative effect on government revenue (T). Public investment, as expected, has a positive effect on private investment (IP), while an increased inflow of foreign direct investment (FDI) has a positive impact on government revenue (T) and private investment (IP).

Table 5.2: Estimation results of behavioural equations

Equation (5.1): Government consumption spending (CG)

$$CG_t = 315.6 - 0.078CG_{t-1} + 0.619T_t - 0.229T_{t-1} + 0.148A_t + 0.015A_{t-1} - 0.920INF_t$$

(104.0)* (0.200) (0.150)* (0.171) (0.094) (0.101) (0.733)

$$R^2 = 0.92, DW = 1.83, \text{Durbin-h statistic} = -0.72$$

Equation (5.2): Government Capital Expenditure (IG)

$$IG_t = 264.5 + 0.038IG_{t-1} + 0.166T_t + 0.061T_{t-1}$$

(206.9) (0.223) (0.403) (0.487)

$$+ 0.828A_t - 0.616A_{t-1} + 1.086INF_t + 112.9D97$$

(0.237)* (0.261)* (1.814) (198.6)

$$R^2 = 0.83, DW = 2.27$$

Equation (5.3): Government Revenue (T)

$$T_t = -669.2 + 0.290T_{t-1} + 0.091Y_t + 0.141Y_{t-1} - 0.307A_t + 0.003A_{t-1}$$

(559.9) (0.331) (0.137) (0.210) (0.135)*** (0.045)

$$+ 0.094FDI_t - 0.257FDI_{t-1} + 1.720INF_t$$

(0.600) (0.569) (0.147)

$$R^2 = 0.95, DW = 2.03$$

Equation (5.4): Private Investment (IP)

$$IP_t = -374.1 + 0.072IP_{t-1} + 0.133DIG_t + 0.110YD_t + 0.003YD_{t-1}$$

(296.3) (0.229) (0.091) (0.075) (0.095)

$$+ 1.042FDI_t + 0.650FDI_{t-1} - 1.217INF_t$$

(0.139)* (0.325)*** (0.928)

$$R^2 = 0.99, DW = 1.75$$

Equation (5.5): Private Consumption (CP)

$$CP_t = 334.1 - 0.591CP_{t-1} + 0.859YD_t - 0.536YD_{t-1} + 0.204INF_t$$

(212.7) (0.234)** (0.299)* (0.181)* (0.447)

$$R^2 = 0.99, DW = 1.97$$

Note: The number in parentheses under the coefficient is the corresponding standard error. Statistical significance of a coefficient at the 1 %, 5%, and 10 % levels, respectively, are represented with *, **, and ***.

Variable List:

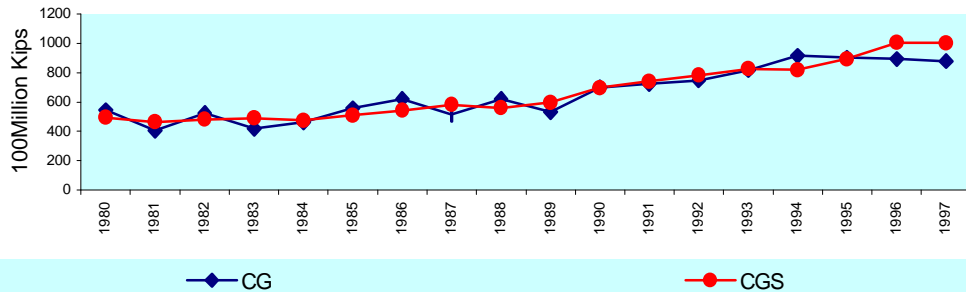
Endogenous Variables consist of: Exogenous and Dummy Variables:

CG: government consumption spending, *AID*: total aid inflows,
IG: government capital expenditure, *FDI*: foreign direct investment,
T: government revenue, *INF*: inflation,
IP: private investment, *D97* dummy variable for the
CP: private consumption, Asian financial crisis takes the
YD: disposable income, and value of 1 for years 1997
Y: income. and 0 otherwise.

The model's validation is carried out by performing an ex-post simulation, in which a fully dynamic simulation process has been performed for the 1980-97 period in order to evaluate the ability of the model to track the historical path of endogenous variables. As the initially proposed model structure yields unstable dynamic behaviour, the behavioural equation of private consumption is then treated as an exogenous variable.² Exogenising the private consumption variable does not affect the analysis of aid fungibility because private consumption is little directly affected by the aid variable. Figure 5.5 to Figure 5.10 plot the simulated values and the actual values of seven endogenous variables, which show the model's capability in tracking turning points and trends in the endogenous variables.

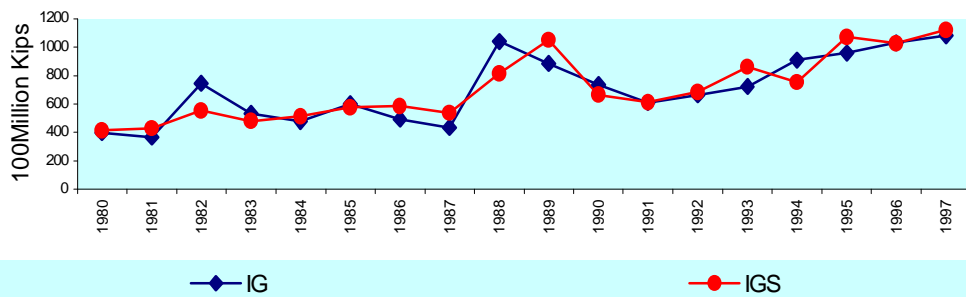
² For the method of tuning and adjusting simulation models, see for example, Pindyck and Rubinfeld (1991, pp. 390-93). It should also be noted that the structure of a model might be such that its dynamic behaviour verges on being unstable. As such, minor changes in the structure might be sufficient to stabilise the behaviour. This method is used throughout this study to improve the simulation of the model.

Figure 5.5: Simulated values of government consumption spending (CGS) and actual value of government consumption spending (CG) at constant 1990 prices (100 million Kips)



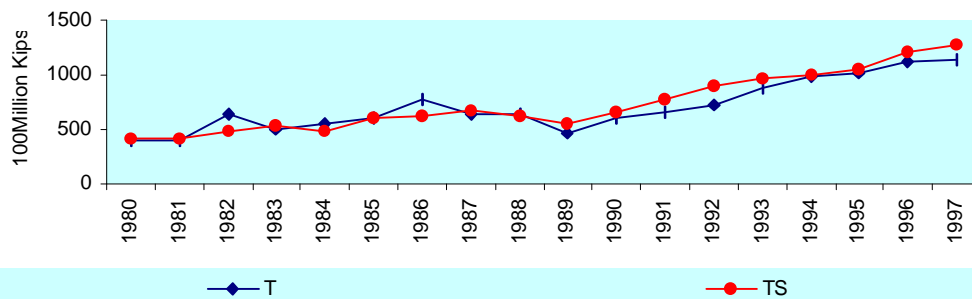
Source: Data extracted from Appendix 5.1, Table A5.1.2

Figure 5.6: Simulated values of government capital expenditure (IGS) and actual values of government capital expenditure (IG) at constant 1990 prices (100 million Kips)



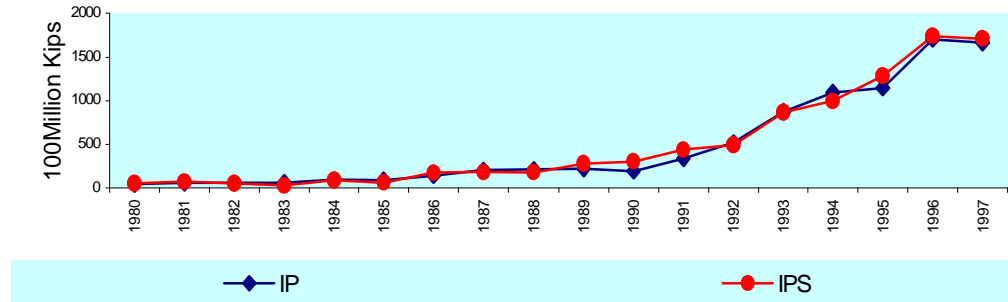
Source: Data extracted from Appendix 5.1, Table A5.1.2

Figure 5.7: Simulated values of government revenue (TS) and actual values of government revenue (T) at constant 1990 prices (100 million Kips)



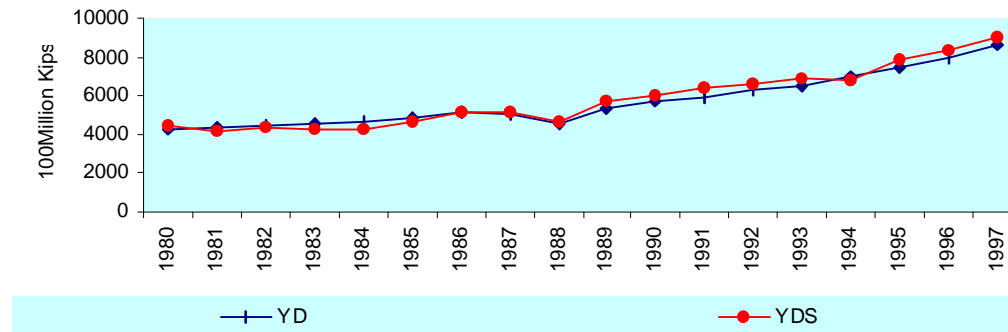
Source: Data extracted from Appendix 5.1, Table A5.1.2

Figure 5.8: Simulated values of private investment (IPS) and actual values of private investment (IP) at constant 1990 prices (100 million Kips)



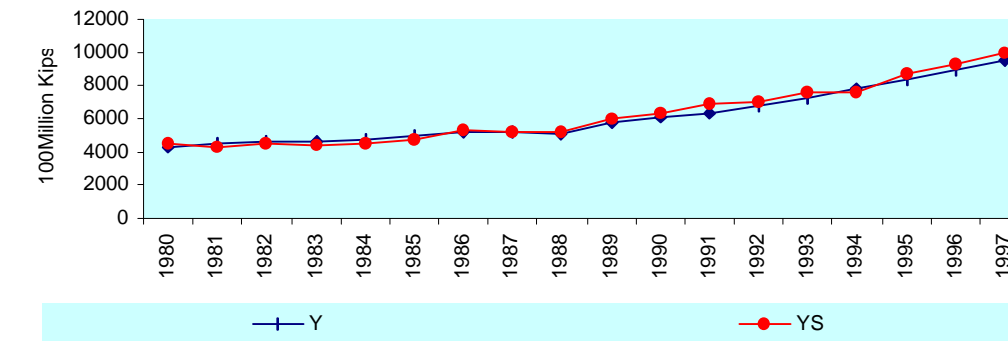
Source: Data extracted from Appendix 5.1, Table A5.1.2

Figure 5.9: Simulated values of disposable income (YDS) and actual values of disposable income (YD) at constant 1990 prices (100 million Kips)



Source: Data extracted from Appendix 5.1, Table A5.1.2

Figure 5.10: Simulated values of income (YS) and actual values of income (Y) at constant 1990 prices (100 million Kips)



Source: Data extracted from Appendix 5.1, Table A5.1.2

The summary of the various statistical tests, computed for the 1980-1997 period, is shown for each endogenous variable in Table 5.3. Some brief comments about the model validation are given below.

Table 5.3: Statistical tests from the model validation

Endogenous variable	Actual mean	Simulated mean	<i>SME</i>	<i>SMPE</i>	<i>RMSE</i>	<i>RMSPE</i>	<i>U</i>
<i>CG</i>	661	674	13.63	2.52	64.10	10.01	0.05
<i>IG</i>	723	725	2.53	2.03	110.70	15.00	0.07
<i>T</i>	726	754	27.66	3.41	92.57	12.90	0.06
<i>IP</i>	510	527	17.14	2.84	61.00	24.80	0.04
<i>YD</i>	5801	5909	107.50	1.29	282.20	4.71	0.02
<i>Y</i>	6231	6338	107.30	1.12	282.20	4.40	0.02

Legend: *C* is consumption, *I* is investment, the letter *P* stands for the private sector and letter *G* stands for the government sector, *T* is government revenue, *Y* is income, *YD* is disposable income, *SME* is the simulation mean error, *SMPE* is the simulation mean percent error, *RMSE* is the root mean square error, *RMSPE* is the root mean square percent error and *U* is the Theil inequality coefficient.

Over all, the ex-post simulation indicates that the model can reproduce the general movements of most actual data quite well. All the endogenous variables have the Theil inequality coefficient (*U*) value almost equal to zero, suggesting that the model for each endogenous variable has a relatively high tracking ability. However, the model does not capture some of the fluctuations in the public sector that occurred mostly in the pre-economic reform period. The systematic bias statistic for each endogenous variable measured by the simulation mean error (*SME*) and simulation mean percent error (*SMPE*), indicates that the model is overestimated by 1.12 to 3.41 percent.³ It should be noted that the *SME* and *SMPE* might be close to zero if large positive errors cancel large negative errors. In this regard, the root mean simulation error (*RMSE*) and the root mean simulation percent error (*RMSPE*) are used to measure the deviation of simulated variable from its actual time path. The deviation of all variables is less than 15 percent, except for the private investment variable (*IP*).

³ For a discussion of systematic bias see Pindyck and Rubinfeld (1991, p. 338). The positive (negative) values of *SME* and *SMPE* suggest that the model is overestimated (underestimated).

5.3.2 Empirical evidence of aid fungibility and its impact on investments

The impact of aid fungibility on investment is measured by aid fungibility coefficients at the aggregate level or the multiplier effect of aid on the fiscal variable (CG , IG , T). These coefficients are summarised in Table 5.4. The figure in each column represents the multiplier effect on each endogenous variable for every 1 unit increase in the exogenous variables. Some comments about the impacts of aid on investment and income growth are made below.

Table 5.4: Short run and long run multiplier effects of foreign aid

Endogenous variable	Short run multiplier for aid variable	Endogenous variable	Long run multiplier for aid variable
CG	0.016	CG	0.110
IG	0.793	IG	0.844
T	-0.214	T	-0.077
IP	0.220	IP	0.134
YD	1.030	YD	1.088
Y	1.030	Y	1.088

Legend: C is consumption, I is investment, the letter P stands for the private sector and letter G stands for the government sector, T is government revenue, Y is income, YD is disposable income.

As pointed out in Section 5.2, an increased aid inflow tends to raise both government consumption spending (CG) and public investment (IG) and also lower government revenue (T). This seems to suggest that aid is fungible. To certify this result, the conditions of aid fungibility discussed in Chapter 2 are applied as follows:

Short-run multiplier

$$\frac{\Delta IG}{\Delta A} = 0.793 < 1$$

$$\frac{\Delta CG}{\Delta A} = 0.016 > 0$$

$$\frac{\Delta T}{\Delta A} = -0.214 < 0$$

Long-run multiplier

$$\frac{\Delta IG}{\Delta A} = 0.844 < 1$$

$$\frac{\Delta CG}{\Delta A} = 0.110 > 0$$

$$\frac{\Delta T}{\Delta A} = -0.077 < 0$$

The estimated multiplier values indicate that aid is fungible on three counts. First, an increase in aid by 1 unit led to a short-run and long-run increase in public investment by 0.793 and 0.844, respectively. This implies that aid intended for public investment did not increase the value of public investment by as much as the value of aid inflow. According to displacement theory, this circumstance would imply that the Lao Government was able to avoid donor attempts to target the allocation of aid for public investment projects. Second, an increase in aid by 1 unit led to a short-run and long-run increase in government consumption spending by 0.016 and 0.110 units, respectively. Third, an increase in aid by 1 unit led to a short-run and long-run decrease in government revenues by 0.214 and 0.077 unit, respectively. The last two counts would indicate that the Lao Government was able to use resources released due to an increase in aid inflow, to increase consumption or reduce tax revenue.

The multiplier analysis supports the preliminary examination carried out in Section 5.2, which suggests that aid is fungible. Although aid is found to be fungible, this does not imply that aid fungibility lowers the effectiveness of aid. As explained in Section 5.2, an increase in spending on government consumption improves the wellbeing of public officials. In addition, the weakness in fiscal institutions and the extreme low income per capita of the Lao PDR have resulted in low tax collections. Thus, it is not surprising to observe an increase in aid associated with a decline in government revenue. From this aspect, it can be argued that there was nothing inappropriate about aid fungibility in the case of the Lao PDR. In fact, the commitments on tax and institutional reforms that the Lao Government has made throughout the period of the “adjustment programmes” have resulted in improved level of tax collection. This improvement can be seen from the long-run increase in the magnitude of government revenue with respect to an increase in aid inflow (i.e., the multipliers of government revenues in response to aid were increased from -0.214 in the short run to -0.077 in the long run).

To clarify the puzzle as to whether aid fungibility issues lower the effectiveness of aid, the analysis is extended to focus on the impact of aid fungibility on private investment. This can be examined using the condition of fiscal response to aid inflow proposed by White and McGillivray (1992), as discussed in Chapter 2. By substituting the long-run multiplier of the fiscal response to aid inflow as suggested in the White and McGillivray conditions, the long-run impact of aid fungibility on private investment is expressed mathematically as follows:

$$\frac{\Delta G}{\Delta A} = \frac{\Delta CG}{\Delta A} + \frac{\Delta IG}{\Delta A} = 0.110 + 0.844 = 0.954 \Rightarrow 0 < \frac{\Delta G}{\Delta A} < 1 \quad (a)$$

$$\frac{\Delta T}{\Delta A} = -0.077 \Rightarrow \frac{\Delta T}{\Delta A} < 0 \quad (b)$$

$$\frac{\Delta G}{\Delta A} - \frac{\Delta T}{\Delta A} = 0.954 - (-0.077) = 1.031 \quad (c)$$

$$\Rightarrow \frac{\Delta G}{\Delta A} - \frac{\Delta T}{\Delta A} > 1 \quad \therefore \frac{\Delta PSBR}{\Delta A} > 0 \quad (d)$$

The conditions indicated in (a), (b) and (d) capture the Lao Government's fiscal behaviour in response to aid inflow. These three conditions are consistent with case 8 expressed in Table 2.2, which implies that the Lao Government's fiscal policy may crowd out private investment. This is because aid inflows, partly used to finance an increase in government consumption expenditure and partly to fund tax reductions, led to an increase in the public sector borrowing requirements (*PSBR*). However, as the magnitude of the difference between the increase in government spending and the decline in government revenue is almost equal to one (i.e., $c \approx 1$), this implies that an increase in *PSBR* is almost equal to zero (i.e., $d \approx 0$). Thus, it can be said that conditions indicated in (a), (b) and (d) are consistent with case 9 expressed in Table 2.2, which indicates no crowding out effect on private investment. As explained in Section 5.2, an increase in

aid inflow is unlikely to crowd out private investment. This indication is supported by the aid multipliers, by which an increase in aid inflow indirectly raises private investment (*IP*) through the direct effect of an increase in public expenditure (i.e., the variable capturing the crowding effect of fiscal policy). As illustrated in Table 5.4 above, an increase of 1 unit in the aid inflow raises private investment to 0.220 units in the short run and 0.134 units in the long run.

Based on the above discussion, it can be concluded that an increase in aid did raise both public and private investment, then it should be expected that aid might contribute to economic growth although aid is fungible in the case of the Lao PDR. Indeed, as illustrated in Table 5.4, aid has a positive effect on income, i.e., every 1 unit increase in aid inflow leads to a short-run and long-run increase in income by 1.030 and 1.088 units, respectively. However, the aid fungibility model developed in this chapter is a demand-driven model, in which the trade sector and the aggregate supply side are treated as exogenous variables. Thus, this interpretation of the impact of aid on growth should be taken with caution because the foreign exchange constraints on either investment or capacity utilisation have not been incorporated into the supply side of the economy.

5.4 Conclusion

This chapter has examined the issue of aid fungibility and its impact on investment in the case of the Lao PDR, using descriptive analysis and a demand-driven macroeconometric model. The findings indicate that though aid was fungible, it did not crowd out private investment. The explanation for this outcome is that an increased aid inflow was associated with the non-increase in the public sector borrowing requirement. This in turn reflects the effectiveness of donors' conditionality on fiscal policy. In this regard, an increase in aid inflow leaves available resources for expanding investment in the private sector. However, the appearance of aggregate aid fungibility is attributed to the lack of domestic resources to supplement aid inflows. The

extreme low income and the weakness of fiscal institutions have made it difficult to implement policies to mobilise domestic resources in the Lao PDR.

From the above point, it would be wrong to use aid fungibility as a way to exclude poor countries from being aid recipients. Instead of targeting the allocation of aid to a specific sector, donors should support poor countries to improve their policies and institutional capacity. Indeed, the analysis in this chapter implies that policy conditionality has mitigated the side effects of aid on investments in the saving-investment channel. The analysis also reveals that a stable aid inflow has enabled the Lao Government to raise investment. This finding is likely to indicate that an increase in aid inflow will boost economic growth through the increase in demand for consumption and investment in both public and private sectors. However, drawing a very confident conclusion about the potential impact of stable aid inflow on economic growth requires the further examination of the potential impact of aid on investment in the supply side model. This subject will be undertaken in Chapter 6.

Appendix 5.1: Selected macroeconomic indicators, and simulation results of aid fungibility model

This appendix consists of two tables. Table A5.1.1 presents some macroeconomic indicators. Table A5.1.2 presents the simulation results of aid fungibility model.

Table A5.1.1: Selected macroeconomic indicators: the Lao PDR, 1985-2001

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993
Gross domestic saving as % of GDP	3.8%	6.4%	7.6%	2.8%	2.6%	2.9%	3.7%	5.7%	7.7%
Government saving as % of GDP	1.0%	3.0%	2.5%	0.2%	-1.0%	-1.5%	-1.0%	-0.2%	0.9%
Government revenue as % of GDP	12.2%	14.9%	12.5%	12.5%	8.2%	9.9%	10.3%	10.7%	12.2%
Public investment as % of GDP	12.1%	9.4%	8.4%	20.6%	15.4%	12.0%	9.6%	9.7%	10.0%
Private investment as % of GDP	1.8%	2.7%	3.9%	4.2%	3.8%	3.2%	5.3%	7.6%	12.1%
Aid as % of GDP	6.2%	7.0%	6.8%	13.2%	20.3%	17.6%	15.2%	13.9%	15.6%
M2 as % of GDP (inclusive of foreign currency deposits)	2.7%	3.1%	5.3%	5.8%	4.9%	7.2%	7.1%	9.1%	13.2%
M2 as % of GDP (exclusive of foreign currency deposits)	1.5%	1.6%	5.0%	5.2%	4.4%	4.2%	4.5%	5.3%	8.7%
Year		1994	1995	1996	1997	1998	1999	2000	2001
Gross domestic saving as % of GDP		8.6%	9.6%	11.0%	11.5%	15.5%	13.4%	12.7%	14.6%
Government saving as % of GDP		0.9%	1.4%	2.5%	2.7%	0.3%	2.3%	4.4%	5.0%
Government revenue as % of GDP		12.6%	12.2%	12.5%	10.9%	9.8%	11.3%	13.2%	13.5%
Public investment as % of GDP		11.6%	11.5%	11.5%	11.3%	15.5%	14.4%	12.8%	13.3%
Private investment as % of GDP		14.0%	13.7%	19.1%	17.4%	7.3%	8.3%	6.9%	7.5%
Aid as % of GDP		14.1%	17.3%	18.0%	17.5%	14.2%	15.2%	13.2%	13.9%
M2 as % of GDP (inclusive of foreign currency deposits)		15.0%	13.5%	14.2%	18.3%	18.4%	18.7%	17.5%	18.2%
M2 as % of GDP (exclusive of foreign currency deposits)		9.7%	8.0%	8.5%	7.9%	7.3%	6.9%	4.2%	4.6%

Source: ADB (various issues), UN (various issues), IMF (various issues) and Author's estimation.

Table A5.1.2: Simulation results of aid fungibility model: 1990-1997

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988
CG	546	406	524	419	462	557	621	514	621
IG	397	366	746	534	477	600	492	432	1041
TS	397	390	639	497	554	607	776	645	632
IP	46	56	56	61	95	91	143	201	213
YD	4299	4342	4419	4545	4618	4890	5140	5094	4587
Y	4351	4499	4599	4695	4805	4972	5213	5158	5063
CGS	495	464	482	489	475	510	541	582	559
IGS	414	428	552	478	511	577	585	537	815
TS	420	406	488	539	477	604	616	680	616
IPS	55	72	54	30	91	60	173	182	179
YDS	4436	4182	4335	4266	4318	4657	5193	5159	4708
YS	4488	4338	4515	4416	4505	4739	5267	5222	5184
Year	1989	1990	1991	1992	1993	1994	1995	1996	1997
CG	532	699	723	746	818	914	902	893	878
IG	885	736	610	664	724	909	959	1030	1080
T	473	610	659	730	881	981	1019	1120	1135
IP	219	195	336	520	872	1093	1147	1702	1661
YD	5377	5750	5892	6305	6526	7005	7508	8004	8621
Y	5742	6127	6372	6818	7218	7807	8355	8933	9550
CGS	596	696	741	782	826	818	893	1004	1002
IGS	1051	663	613	684	862	752	1073	1026	1121
TS	553	656	777	896	971	994	1060	1214	1272
IPS	280	304	439	492	867	996	1283	1739	1711
YDS	5685	6010	6410	6555	6856	6835	7911	8322	9049
YS	6050	6386	6890	7068	7548	7636	8758	9251	9978

Legend: C is consumption, I is investment, T is total revenue government revenues, YD is disposable income, Y is income. The letter P stands for the private sector, letter G stands for the government sector, and letter S stand for simulation.

Note: all variables unit are 100 Million Kips of 1990 prices.

Chapter 6

THE EFFECTS OF A STABLE AID FLOW ON ECONOMIC GROWTH

...We have at best an imperfect understanding of the determinants of growth and perhaps less still of how aid affects those determinants... If it could be demonstrated that aid increases investment or imports... then most economists would accept that these are channels through which aid contributes to higher growth...

White (1992b, p. 133)

...Rather than embarking on a rather fruitless debate on whether or not economic reforms work by comparing differential outcomes between ESAF and non-ESAF countries, it is now more important to understand the mechanisms through which programmes do, or do not, work, and to assess why programmes have had more positive outcomes in some countries than in others, and at certain times rather than others, and whether positive outcomes are sustainable.

UNCTAD (2000a, p. xii)

6.1 Introduction

It has been emphasised in Chapter 3 that it is necessary for aid-receiving countries to mobilise both domestic and external resources, as this effort will enable them to overcome resource and foreign-exchange constraints on capital accumulation and economic growth. Nevertheless, the analysis in Chapter 5 has indicated that the Lao PDR could not raise enough domestic resources and thus foreign capital inflows remained the main resource dominating capital accumulation and economic growth in the Lao PDR. By the same token, it was also expected that a stable aid inflow coupled with the Lao Government's commitment to liberalise the economic system to help boost the demand side of the economy should have created favourable conditions for economic growth.

To examine the effects of stable aid inflows on economic growth in the Lao PDR, the analysis carried out in Chapter 5 is further extended in this chapter in order to take into account any external resource constraints on the supply side of the Lao PDR's economy. The analysis focuses on the interactive effects between a stable aid flow and policy prescriptions on economic growth through the investment channel. The macroeconometric model of the aid-growth nexus developed in Chapter 4 is employed here. Before presenting the macroeconometric analysis, Section 6.2 highlights the potential impacts of aid and policy conditionality on the Lao PDR's ability to raise investment. Whether a high level of aid inflow displaces or supplements investment in the export-import channel is closely examined. Section 6.3 presents the results of the estimation and validation of the macroeconometric model. The empirical results of the interactive effects between aid and donors' conditionality on economic growth are also discussed. Section 6.4 presents the conclusion and policy implication.

6.2 Foreign aid, policies and external balances

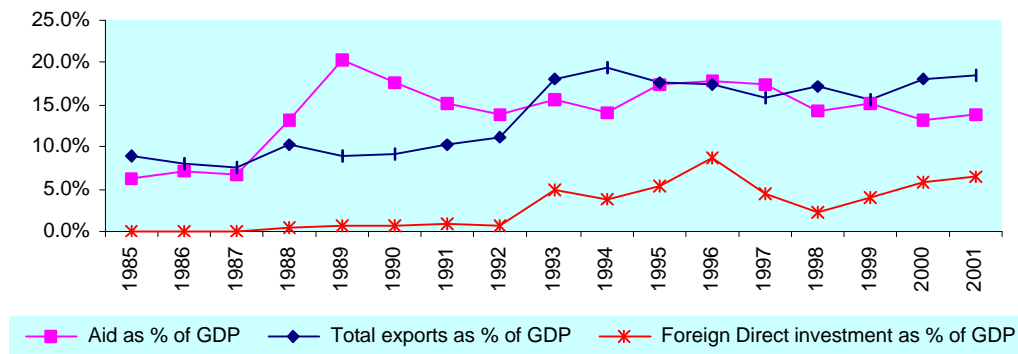
The discussions in the "Dutch disease" literature indicate that aid may lower export earnings (ability to import and ability to raise investment) via the side effect of a high level of aid inflow on the recipient country's external competitiveness. In other words, if an increased aid inflow leads to an appreciation in the real effective exchange rate (*REER*), aid will not raise investment as much as the value of aid inflow. This argument, however, seems to be inadequate for explaining the export performance of the Lao PDR. One of the crucial factors influencing the export performance of the Lao PDR was the improvement in the economic environment bought about by the Lao Government's commitment to undertake the "adjustment programmes". A rapid economic liberalisation and the policies to promote foreign direct investment (FDI) led to greater efficiency of resource uses and a substantial capital inflow. Otani and Pham also add that:

...price and trade liberalisation reduced the costs of imported inputs and eliminated monopoly rents, and widespread privatisation enhanced productivity in the industrial sector. In addition, technological change may have favoured the production of tradables rather than nontradables, as the former benefited from foreign direct investment, competition, and economies of scale.

Otani and Pham (1996, p. 55)

Certainly, if the benefits derived from the “adjustment programmes” are substantial, this tends to outweigh the negative effect of the real effective exchange rate appreciation on export performance. Indeed, as Otani and Pham point out, during the 1988-94 period of a high-level aid and FDI inflow, although the REER appreciated by either about 60 percent (measured by purchasing power parity) or by about 20 percent (measured by terms of trade), export performances remained strong (Otani and Pham, 1996, pp. 52-53). Figure 6.1 below also indicate that the share of exports to GDP grew from about 10 percent during the 1988-92 period to about 20 percent during the 1993-94 period.

Figure 6.1: Aid flows and exports in the Lao PDR, 1985-2001



Source: Data extracted from Appendix 6.1 Table A6.1.1.

The lack of diversity in its export commodities and its reliance on a few select markets also influenced the Lao PDR’s export performance. As illustrated in Table 6.1 below, three groups dominate the composition of

export commodities: electricity exports, agricultural and manufacturing products. Although in the early 1990s FDI inflow was followed by an increase in the share of manufactured products in total exports, the export performance of the Lao PDR remained influenced by the changes in market conditions of the Lao PDR's main trading partners.

Table 6.1: Composition of the Lao PDR's exports, 1988-1999

Year	1988	1989	1990	1991	1992	1993
1, Agricultural Products	73%	56%	51%	49%	40%	33%
2, Manufacturing Products	0%	6%	9%	29%	43%	51%
3, Electricity	19%	24%	24%	22%	13%	8%
4, Other	8%	14%	15%	0%	5%	8%
Year	1994	1995	1996	1997	1998	1999
1, Agricultural Products	37%	39%	52%	40%	32%	33%
2, Manufacturing Products	47%	44%	33%	39%	31%	32%
3, Electricity	8%	8%	9%	7%	20%	26%
4, Other	8%	9%	6%	15%	17%	9%

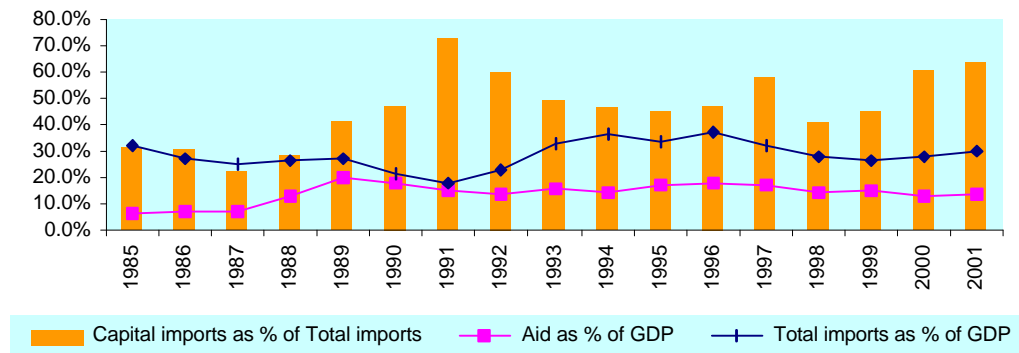
Source: ADB (1991, 1994, 1997, 2001), and IMF (1996, 1997, 1998a, 2000).

For example, the decline in export performance in 1995 was attributed to the decline in the production of wood products and the demand for motorcycles that were exported to Thailand and Vietnam. The loss of the general special preference (GSP) status of garment exports to the EU coupled with a low level of FDI inflow to the tradable sector caused a decline in the performance of the export sector after 1996. Although the Lao PDR regained GSP status in 1997, the performance of the export sector remained broadly unchanged from earlier years, as export demand had been affected by the financial crisis in Thailand. Electricity exports were revitalised by a substantial inflow of FDI into the hydropower industry, and the rise in the level of electricity exports as a percentage of GDP in 1998-99 was due to a new hydroelectricity plant starting transmission. A recovery in wood exports, and

the increased penetration of garments into the European market also contributed to the recovery of the export sector during the 1998-99 period.¹

So far, the above discussions are likely to suggest that the export performance in the Lao PDR was influenced by not only the appreciation of *REER* but also by the changes in demands for the Lao PDR's export commodities. Therefore, caution is needed when evaluating the potential effect of high level aid inflow on export performance in the Lao PDR. In fact, the analysis in Chapter 5 indicates that aid inflow did not displace investment in the saving-investment channel. The above analysis also indicates that aid did not lower export earnings. In this regard, it is expected that aid would also not displace investment in the export-import channel.

Figure 6.2: Aid flows and imports in the Lao PDR, 1985-2001



Source: Data extracted from Appendix 6.1, Table A6.1.1

As illustrated in Figure 6.2, although the share of total import to GDP was declining during the 1989-91 period, an increase in aid inflow after 1989 enabled the Lao PDR to raise the level of capital goods. The explanation for this circumstance is that a large component of aid inflow has always been allocated to the public investment programmes (PIP) that are often linked to imports of capital goods. Thus, the share of imported capital goods in total

¹ For more details of discussion about export performances in the Lao PDR see IMF (1996, 1997, 1998a, 2000).

imports rapidly increased and reached its peak (73 percent) in 1991. Overall, as aid inflow remained high and stable during the 1991-97 period, the shares of capital goods in total imports rose from an annual average of about 30.9 percent during the 1985-89 period to about 53.1 percent during the 1990-97 period.

It should be noted that although an increase in aid inflow enabled the Lao PDR to raise the level of imported capital goods, the structure of imports had a strong bias towards consumption goods (i.e., the share of capital imports is less than 50 percent for most of the time). Thus, apart from the influence of aid, the trends in total imports were dominated by the changes in the imports of consumption goods. For example, the introduction of stabilisation programmes during the 1989-91 period required the Lao Government to reduce the level of budget deficits and control money growth. These policy measures led to a decline in imports of consumption goods and hence the share of total imports. Again, the decline in the share of total import since 1996 was related to the Lao Government imposing import restrictions on consumption goods, and also the weak demand for imported intermediate and capital goods linked to the financial crisis in Thailand and the fall in the investment demands of the hydropower industry. Except for 1997, the rise in capital imports was related to the increased public investment in irrigation projects.

6.3 Estimating, validating the model and multiplier analysis of aid, economic growth and policies

The analysis in the preceding section seems to suggest that the “adjustment programmes” attached to aid has mitigated the side effect of a high level of aid inflow on investment in the export-import channel. In fact, an increased aid inflow has enabled the Lao PDR to raise capital imports and investment. Thus, it is expected that a high level aid inflow should make a contribution to economic growth via investment channel. To see this, the macroeconometric

model of the aid-growth nexus developed in Chapter 4 is employed to measure the interactive effect of aid and policy conditionality on investment and economic growth. Before presenting the analyses, it will be convenient to duplicate this model in this section as follows:

A specification of the aid-growth nexus model

Behavioural Equations

Output Growth

$$GY_t = f_1(IY_t; GLE_t) \quad (6.1)$$

Investment

$$IGY_t = f_2(GY_t; AY_t, INF_t) \quad (6.2)$$

$$IPY_t = f_3(GY_t, IGY_t; FDIY_t, INF_t) \quad (6.3)$$

International Trade

$$XY_t = f_4(MKY_t; YF_t, REER_t) \quad (6.4)$$

$$MKY_t = f_5(IY_t; REER_t) \quad (6.5)$$

Identity Equations

$$IY_t = IGY_t + IPY_t \quad (6.6)$$

$$MY_t = MKY_t + MCY_t \quad (6.7)$$

$$CAY_t = XY_t - MY_t + U_t \quad (6.8)$$

where GY : growth rate of income,
 IY : the share of investment in GDP,
 IGY : the share of public investment in GDP,
 IPY : the share of private investment in GDP,
 XY : the share of exports to GDP,
 MKY : the share of imports of capital goods in GDP,
 MCY : the share of imports of consumption goods in GDP,
 MY : the share of imports to GDP,
 CAY : the ratio of current account deficit to GDP,
 AY : the ratio of total aid to GDP,
 $FDIY$: the ratio of total foreign direct investment to GDP
 INF : the inflation rate,
 GLE : the growth rate of effective labour force,
 YF : the weighted average by trade share of growth in per

capita income of the trading partners,
REER: real exchange rate,
U: the error term including net service transfers.

The behavioural equations are estimated using annual data covering the 1978-97 period. The same estimation method employed in Chapter 5 has been applied here. The estimation results and model validations are presented below in Section 6.4.1 and the empirical evidence of the aid-growth nexus is presented in Section 6.4.2.

6.3.1 Estimation results and model validation

Table 6.3 below reports the results from testing the long-run relationship, and the critical value bounds for each behavioural equation employed in the macroeconometric model of aid fungibility. As the computed *F*-statistic for each model exceeds the upper bound of the critical values of *F*-statistic, a conclusive decision can be made that variables in each behavioural equation are cointegrated. Therefore, the ARDL methodology can be applied to estimate the behavioural equations without requiring the knowledge of whether the underlying variables employed in the behavioural equations are *I*(0) or *I*(1).

Table 6.2: Results for testing the long-run relationship of behavioural equations in a macroeconometric model of the aid-growth nexus: *F*-statistic

Models	Computed <i>F</i> -statistic	Testing the existence of a long-run relationship: critical values of the <i>F</i> -statistic	
		<i>F</i> -Statistic case1	Significance level
<i>EQ (6.1):</i> $GY_t = f_1(IY_t; GLE_t)$	3.4091	2.458-3.342	90%
<i>EQ (6.2):</i> $IGY_t = f_2(GY_t; AY_t, INF_t)$	5.4283	2.180-3.211	90%
<i>EQ (6.3):</i> $IPY_t = f_3(GY_t; IGY_t, FDY_t, INF_t)$	3.7856	2.022-3.112	90%
<i>EQ (6.4):</i> $XY_t = f_4(MKY_t; YF_t, REER_t)$	3.3341	2.180-3.211	90%
<i>EQ (6.5):</i> $MKY_t = f_5(IY_t; REER_t)$	6.9148	2.458-3.342	90%

Table 6.3 below reports the results of the estimation of behavioural equations. Overall, the behavioural equations have a relatively high explanatory power in terms of R^2 , except the public investment equation that has R^2 less than 0.8. Some explanatory variables are retained in each

equation, despite statistically insignificant coefficients because they improve the tracking ability of the simulation model. All coefficients of behavioural equation have the expected signs.

Table 6.3: Estimation results of behavioural equations

Equation (6.1): Output Growth (GY)

$$GY_t = -0.719 - 0.021GY_{t-1} - 0.048IY_t + 0.441IY_{t-1} \\ (2.021) (0.102)** (0.089) (0.100)* \\ + 0.071GLE_t + 0.0008GLE_{t-1} - 6.370DWEA \\ (0.039)*** (0.068) (1.419)*$$

$R^2 = 0.81$, $DW = 1.97$, *Durbin-h statistic* = 0.00

Equation (6.2): Public Investment (IGY)

$$IGY_t = 8.892 - 0.021IGY_{t-1} - 0.157DGY_t + 0.942AY_t - 0.839AY_{t-1} + 0.039INF_t \\ (2.027)* (0.167) (0.131) (0.201)* (0.161)* (0.015)*$$

$R^2 = 0.74$, $DW = 1.57$

Equation (6.3): Private Investment (IPY)

$$IPY_t = 3.151 + 0.427IPY_t + 0.036DIGY_t + 0.050DGY_t \\ (0.831)* (0.206)*** (0.055) (0.054) \\ + 1.044FDIY_t + 0.238FDIY_{t-1} - 0.031INF_t \\ (0.187)* (0.355) (0.010)**$$

$R^2 = 0.98$, $DW = 1.6$, *Durbin-h statistic* = 1.79

Equation (6.4): Total export (XY)

$$XY_t = -11.81 + 0.164XY_{t-1} + 0.991MKY_t + 0.315MKY_{t-1} + 0.006REER_{t-1} + 0.829YF_t \\ (3.11)* (0.194) (0.182)* (0.235) (0.002)** (0.208)*$$

$R^2 = 0.95$, $DW = 2.09$

Equation (6.5): Imported capital goods (MKY)

$$MKY_t = 4.8327 + 0.7019MKY_t + 0.1768IY_t - 0.1352IY_{t-1} - 0.0065REER_{t-1} \\ (0.888)* (0.087)* (0.082)** (0.085) (0.001)*$$

$R^2 = 0.92$, $DW = 2.39$

Note: The number in parentheses under the coefficient is the corresponding standard error. Statistical significance of a coefficient at the 1 %, 5%, and 10 % levels, respectively, are represented with *, **, and ***.

Variable list:

Endogenous variables:

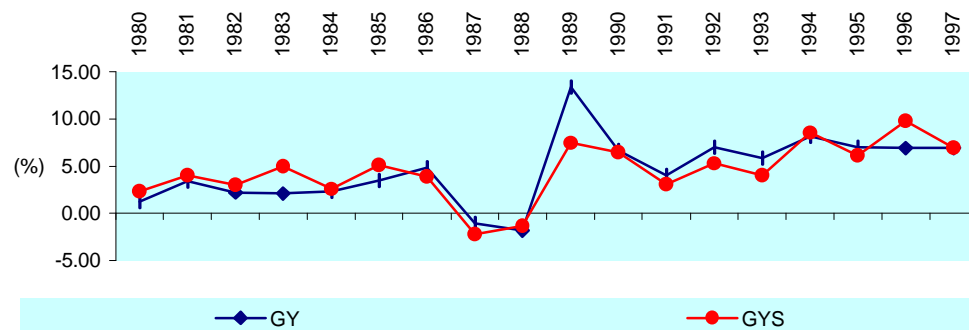
GY: growth rate of real GDP,
IGY: share of public investment in GDP,
IPY: share of private investment in GDP,
XY: share of export in GDP,
MKY: share of imported capital goods
in GDP,
IY: share of total investment in GDP,
MY: share of total import in GDP,
CAY: ratio of current account deficits
to GDP

Exogenous variables:

AY: ration of aid inflows to GDP,
FDIY: ratio of foreign direct
investment to GDP
INF: inflation,
D97: dummy variable for the
Asian financial crisis takes
the value of 1 for 1997
and 0 otherwise,
DWEA: dummy variable for
weather conditions takes
the value of 1 for
years 1987 and 1988
and 0 otherwise.

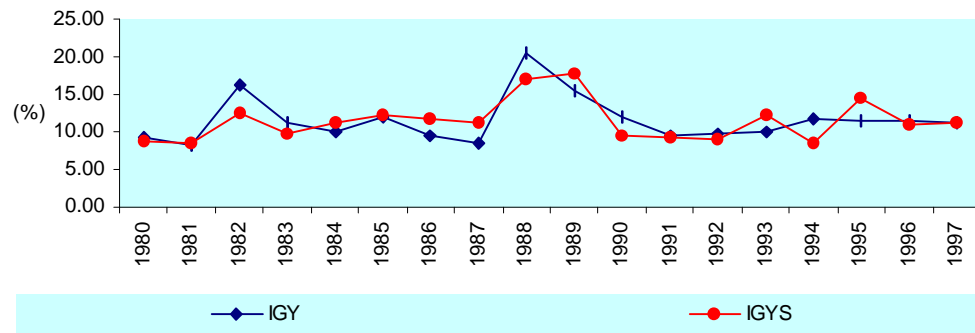
The dynamic simulation process has been conducted for the 1980-97 period for evaluating the tracking ability of the model. Figure 6.3 through to Figure 6.10 plot the simulated values against the actual values of all endogenous variables employed to evaluate the tracking ability of the model. The statistic test of the model validation is reported in Table 6.4. Some comments on the tracking ability of the model are made below.

Figure 6.3: Simulated values of real output growth (GYS) and actual values of real output growth (GY)



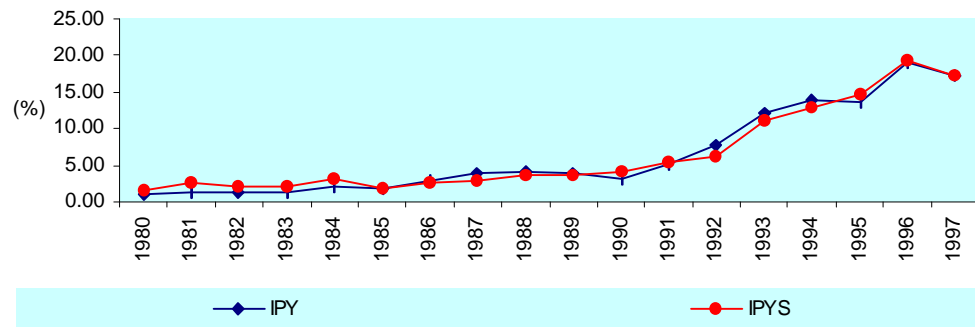
Source: Data extracted from Appendix 6.1, Table A6.1.2.

Figure 6.4: Simulated values of public investment (IGYS) and actual values of public investment (IGY)



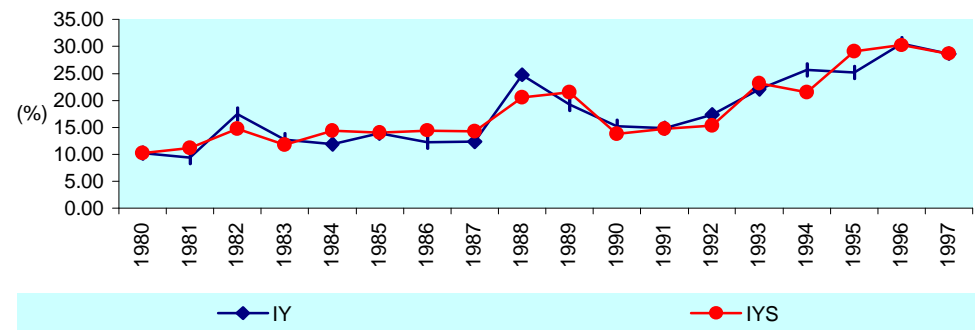
Source: Data extracted from Appendix 6.1, Table A6.1.2.

Figure 6.5: Simulated values of private investment (IPYS) and actual values of private investment (IPY)



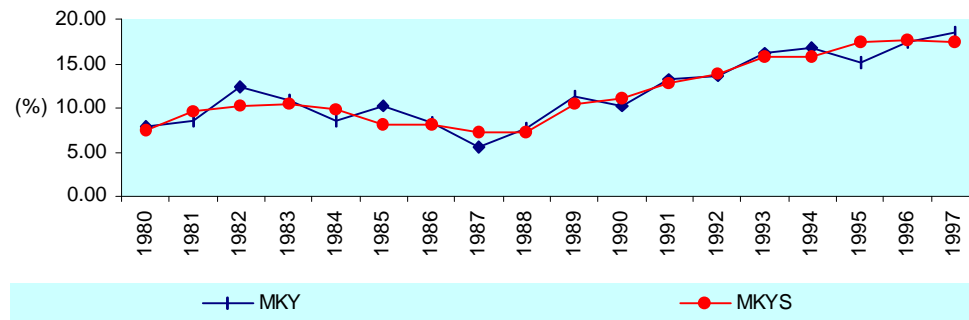
Source: Data extracted from Appendix 6.1, Table A6.1.2.

Figure 6.6: Simulated values of total Investment (IYS) and actual values of total investment (IY)



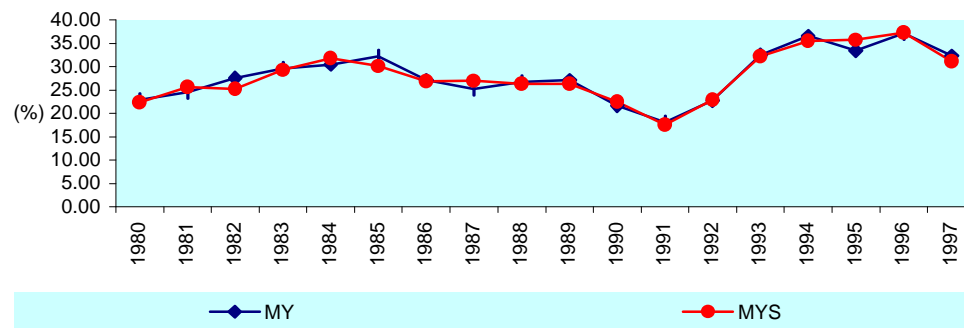
Source: Data extracted from Appendix 6.1, Table 6.1.2.

Figure 6.7: Simulated values of capital imports (MKYS) and actual values of capital imports (MKY)



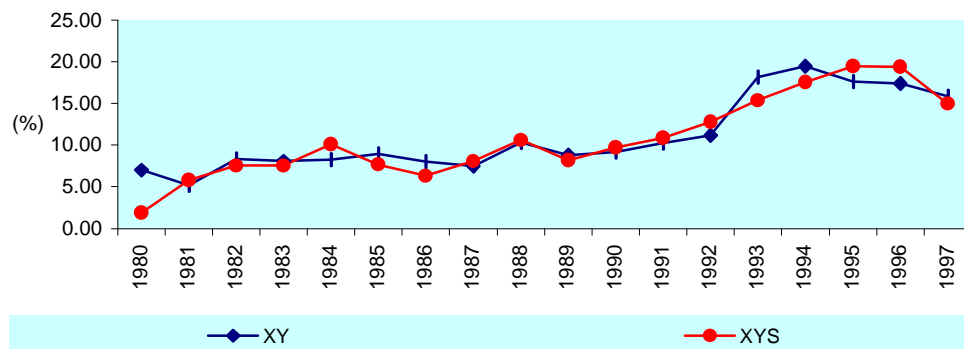
Source: Data extracted from Appendix 6.1, Table 6.1.2.

Figure 6.8: Simulated values of total imports (MYS) and actual values of total imports (MY)



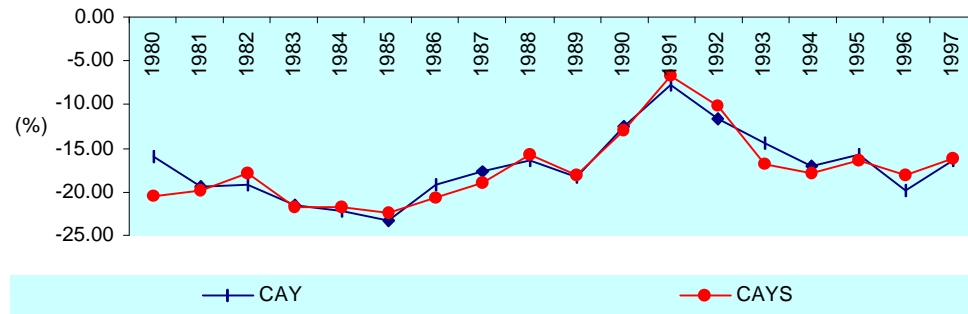
Source: Data extracted from Appendix 6.1, Table 6.1.2.

Figure 6.9: Simulated values of total exports (XYS) and actual values of total exports (XY)



Source: Data extracted from Appendix 6.1, Table 6.1.2.

Figure 6.10: Simulated values of current account deficits (CAYS) and actual values of current account deficits (CAY)



Source: Data extracted from Appendix 6.1, Table 6.1.2.

Table 6.4: Statistical test of the model validation

Endogenous variable	Actual mean	Simulated mean	<i>SME</i>	<i>SMPE</i>	<i>RMSE</i>	<i>RMSPE</i>	<i>U</i>
<i>GY</i>	4.40	4.37	-0.04	26.60	1.94	68.61	0.18
<i>IGY</i>	6.17	6.21	0.04	12.81	0.83	41.79	0.05
<i>IPY</i>	11.22	11.26	0.03	3.64	2.16	20.86	0.09
<i>XY</i>	17.39	17.47	0.08	2.73	2.20	13.51	0.06
<i>MKY</i>	11.44	11.47	0.04	3.02	1.32	17.15	0.05
<i>IY</i>	10.79	10.25	-0.54	-8.03	2.02	27.48	0.09
<i>MY</i>	27.76	27.80	0.04	0.44	1.32	5.19	0.02
<i>CAY</i>	-16.97	-17.54	-0.58	3.67	2.20	15.17	0.06

Legend: *GY* is a growth of output, *IGY* is the share of public investment to GDP, *IPY* is the share of private investment to GDP, *MKY* is the share of imports of intermediate and capital good to GDP, *XY* is the share of total export to GDP, *IY* is the share of total investment to GDP, *MY* is the share of total import to GDP, *CAY* is the ratio of current account deficits to GDP, *SME* is the simulation mean error, *SMPE* is the simulation mean percent error, *RMSE* is the root mean square error, *RMPSE* is the root mean square percent error and *U* is the Theil inequality coefficient.

Overall, the model has captured most of the turning points of all historical endogenous variables. This implies that the model has good tracking ability, which is important for the measure of dynamic multipliers. However, the simulated growth of real output (*GYS*) and the simulated public investment variables (*IGYS*) appear to deviate from its historical trend. This is borne out by the values of two statistics, in which the simulated growth rate of real output deviated from its actual value by 26.6 percent (measured by *SMPE*) and 68.61 percent (measured by *RMSPE*). This result may be attributable to poor estimation of the public investment function which is the main variable entering the real output growth function. The simulated public investment variable deviated from its actual value by 12.81 percent (measured by *SMPE*)

and 41.79 percent (measured by *RMSPE*). The deviation of the public investment variable might be due to inaccurate reporting of public spending. However, other system bias indicators (i.e. *SME* and *U*) for the growth rate of real output and the public investment variables are close to zero. Therefore, the model is still considered to have a good tracking ability for these two variables.

6.3.2 Empirical evidence of the interactive effect of stable aid flow and policy conditionality on economic growth

As mentioned earlier, completing the hard-core conditionality on policy and institutional reforms under the “adjustment programmes” is the prerequisite for the disbursement of aid. In this context, the aid multipliers can be used as a proxy to capture the interactive effect of aid and policy conditionality on economic growth.² To measure this interactive effect, the dynamic multiplier values for all endogenous variables (i.e. *GY*, *IGY*, *IPY*, *MKY*, *XY*, *IY*, *MY*, *CAY*) are computed with respect to the ratio of aid inflow to GDP (*AY*). The dynamic multiplier values of other variables that are expected to dominate the Lao Government’s ability to raise domestic investment with external viability are also computed. Those variables are the ratio of foreign direct investment to GDP (*FDIY*), the real effective exchange rate (*REER*) and the growth rate income of the trading partners (*YF*). The estimation results of the short-run and long-run multipliers are presented in Table 6.5 below. The figures in each column represent the multiplier effect on the endogenous variables for every 1 unit increase of the exogenous variables. Note that the aid multiplier value reveals a positive impact on private investment, implying that aid did not crowd out private investment. Therefore, the estimated result of the supply model is consistent with the estimated result of the demand-driven model. Some comments about the interactive effects between stable aid flow and policy conditionality on economic growth are made below.

² This assumption is based on the view that aid is delivered upon the satisfactory performance of the “adjustment programmes”. A stable aid inflow implies significant changes in policy and institutional reforms have been made in the Lao PDR.

Table 6.5: The Short Run and Long Run Multiplier Effects of Foreign Aid for the 1978-97 period.

Endogenous variables	the short run multiplier of some exogenous variables			
	<i>AY</i>	<i>FDIY</i>	<i>REER_{t-1}</i>	<i>YF</i>
<i>GY</i>	-0.047	-0.051	0.000	0.000
<i>IGY</i>	0.950	0.008	0.000	0.000
<i>IPY</i>	0.032	1.042	0.000	0.000
<i>XY</i>	0.172	0.184	0.000	0.829
<i>MKY</i>	0.174	0.186	-0.007	0.000
<i>IY</i>	0.982	1.050	0.000	0.000
<i>MY</i>	0.174	0.186	-0.007	0.000
<i>CAY</i>	-0.001	-0.002	0.007	0.829
Endogenous variables	the long run multiplier of some exogenous variables			
	<i>AY</i>	<i>FDIY</i>	<i>REER_{t-1}</i>	<i>YF</i>
<i>GY</i>	0.302	0.597	0.000	0.000
<i>IGY</i>	0.923	0.000	0.000	0.000
<i>IPY</i>	0.000	1.825	0.000	0.000
<i>XY</i>	0.201	0.398	-0.026	0.993
<i>MKY</i>	0.129	0.255	-0.022	0.000
<i>IY</i>	0.923	1.825	0.000	0.000
<i>MY</i>	0.129	0.255	-0.022	0.000
<i>CAY</i>	0.073	0.144	-0.004	0.993

Legend: *GY* is the growth of output, *IGY* is the share of public investment to GDP, *IPY* is the share of private investment to GDP, *MKY* is the share of imports of intermediate and capital good to GDP, *XY* is the share of total export to GDP, *IY* is the share of total investment to GDP, *MY* is the share of total import to GDP, *CAY* is the ratio of current account deficits to GDP, *AY* is the ratio of aid to GDP, *FDIY* is the ratio of foreign direct investment to GDP, *YF* is the weighted average by trade share of growth in per capita income of the Lao PDR's trading partners, and *REER_{t-1}* is the lag of the real effective exchange rate.

Although the interactive effect of aid and policy conditionality on economic growth has been approached from different theoretical and methodological aspects, this issue remains somewhat controversial in the aid effectiveness literature. For example, Connors (1979), Pastor (1987) and Gylfason (1987) reported no effect of the “adjustment programmes” on economic growth; Killick (1995) found ambiguous effects of the “adjustment programmes”, and Conway (1994) reported a negative effect on growth in the first year of the “adjustment programmes” but the negative effects diminish thereafter. The finding in the case of the Lao PDR supports the latter case, in which the impact of aid on economic growth reflects the tradeoffs between the short-run impact of stabilisation policies and the long-run goal of structural adjustment policies to promote economic growth. As illustrated in Table 6.5, in the short run the aid multiplier value (*AY*) shows a negative impact on

output growth (GY); however, in the long run the multiplier value obtained is positive. This outcome can be explained below.

Under the stabilisation programmes the Lao Government was encouraged to pursue demand-reducing policies, which included cutting government expenditure, raising taxation to reduce budget deficits, raising interest rates and restraining domestic credit to improve the current account balance. Although the potential effects of these policy measures on economic growth are not explicitly included in the model, such policy measures have been found in other studies to have a negative impact on economic growth. For example, Khan and Knight (1985), Heller *et al.* (1988) and IMF (1998b) find that an austere fiscal policy often causes a reduction in private income and social spending, and thus reduces economic growth. Blejer and Cheasty (1989) also finds that tightening monetary policy by raising real interest rates can induce good firms to shut down along with bad ones, and can lead to a reduction in economic growth. This effect is embedded in the short-run multiplier of aid with respect to output growth.

On the effect of structural adjustment programmes on economic growth, Heller *et al.* (1988, p. 16) suggest that a negative impact of stabilisation policies in the short run may be offset in the long run by positive consequences from supply-side policies to promote economic growth. Indeed, the positive value of the aid multiplier for the case of the Lao PDR indicates that the “adjustment programmes” attached aid can create a favourable economic environment (i.e. a low inflation, a small deviation of the official exchange rate from the market rate) for economic growth. Indeed, during 1989-91, the success of the Lao Government in implementing the stabilisation programme brought about a stable macroeconomic environment. This favourable economic environment coupled with preliminary success in implementing the structural adjustment programmes contributed to a stable aid inflow and a substantial increase in investment by the private sector (including FDI). Therefore, implementing the structural

adjustment policies created a strong supply-side economy and also accelerated economic growth during the 1990-97 period.³

It should be noted that the estimated magnitude of the aid-growth coefficient found in *Assessing Aid* indicates that increasing aid by 1 percent of GDP (AY) in countries with sound management policies translates to a sustained increase in growth of 0.5 percentage points of GDP (World Bank, 1998, p. 14). However, the magnitude of the aid-growth coefficient found in the case of the Lao PDR is slightly less than the one found in *Assessing Aid*, where an increase in stable aid inflow by 1 percent of GDP (AY) in the Lao PDR during 1989-97 period led to the long-run increase in economic growth (GY) of 0.302 percent. This result is consistent with the study by Gomanee *et al* (2002, p. 20), by which each one percentage point increase in the aid/GNP ratio adds one-third of one percentage point to the growth rate of economic growth in the case of sub-Saharan African Countries (SSA).

Now turning to the Lao PDR's ability to raise investment with external viability, the discussion in Section 6.2 suggests that a high level aid inflow attached to the "adjustment programmes" is unlikely to displace investment in the export-import channel. This indication is consistent with the estimated multiplier values of aid with respect to exports, capital imports and investment. For the export channel, an increase in aid by 1 percent of GDP (AY) led to a short-run and long-run increase in the share of export to GDP by 0.172 and 0.201 percent, respectively. It is obvious that the effect of aid on exports outweighs the negative effect of the *REER* on the share of exports to GDP (i.e., the multiplier values for the share of exports to GDP with respect to the *REER* are equal to 0.000 in the short run, and -0.026 in the long run, which is smaller than the effect of aid on the share of export to GDP). For the import channel, increasing aid by 1 percent of GDP (AY) to

³ For further discussions of the potential impact of stabilisation and structural-adjustment policies see for example Haggard, *et al.*, (1995), IMF (1997b). Otani and Pham (1996) also discuss outcomes of the "adjustment programmes" in the case of The Lao PDR.

finance capital imports led to a short-run and long-run increase in the share of capital imports to GDP (MKY) by 0.174 and 0.129 percent, respectively. Aid-financed capital imports in turn raised the share of total investment to GDP to 0.982 percent in the short run and 0.923 percent in the long run. Therefore, in the case of the Lao PDR it can be concluded that aid attached to the “adjustment programmes” contributed to economic growth via the investment channel.

The discussion in Section 6.2 also suggests that apart from foreign aid, FDI and the changes in demand for and market access conditions of the Lao PDR’s export commodities are a crucial factor that influences export performance. This indication is seen by the estimated positive multiplier values of $FDIY$ and YF . For example, an increase in FDI inflow by 1 percent of GDP ($FDIY$) led to a short-run and long-run increase in the share of export to GDP (XY) by 0.184 and 0.398 percent, respectively. Also, a 1 percent increase in the growth of per capita income of the Lao PDR’s trading partners (YF) raised the share of exports to GDP by 0.829 percent in the short run and by 0.993 percent in the long run, (note that the market access constraints are embedded in this multiplier). It is obvious that the magnitude of $FDIY$ and YF multiplier values with respect to XY are larger than the AY multiplier values with respect to XY . Besides, it should be noted that FDI made a contribution to export growth though its influences on the ability to raise investment and capital good imports (i.e., the channel through which $FDIY$ affects XY is via Equations 6.5 to 6.7. Equation 6.6 also indicates that the per capita income growth of the Lao PDR’s trading partners has direct influences on export growth. This implies that both FDI inflow and the growth in the Lao PDR’s trading partners’ economies are crucial factors that influence the Lao PDR’s ability to raise investment with external viability. For example, although in the short run an increase in FDI inflow by 1 percent of GDP ($FDIY$) worsened the current account deficit by 0.002 percent, in the long run it improved the current account deficit by 0.144 percent. Also, a 1 percent increase in the growth of per capita income of the Lao PDR’s trading

partners (YF) improved the current account deficit by 0.829 and by 0.993 percent of GDP in the short and long run, respectively.

6.4 Conclusion

This chapter has presented the analysis of the aid-growth nexus in the case of the Lao PDR, using descriptive analysis and the supply-side driven-macroeconometric model. The findings indicate that the interactive effect of aid and policy conditionality has a short-run and long-run trade-off between the effects of stabilisation and structural adjustment programmes on economic growth. In other words, aid attached to stabilisation programmes is found to have a negative effect on economic growth in the short run. This short-run outcome reflects the negative effect of demand-reducing policy measures on private income and social spending. Thus, aid attached to stabilisation programmes has retarded economic growth.

With respect to the effects of the structural adjustment programmes on economic growth, after the post-stabilisation period a stable aid flow has been found to have a positive effect on growth, whereby increased aid has contributed to economic growth via the investment channel. Other factors dominating the Lao PDR's ability to raise investment are FDI and export growth. An increase in FDI inflows coupled with strong export growth have released the foreign exchange constraints on capital imports, thus enabling the Lao PDR to raise investment with external viability. However, this favourable condition has been interrupted by the Asian financial crisis of 1997 and the problem of policy mismanagement of the Lao Government. These adverse effects resulted in the Lao PDR's economy leading into a recession, and have put much pressure on the Lao Government to search for corrective policies in order to steer the economy back to the sustainable growth path. Chapter 7 will further explore this issue in detail.

Appendix 6.1: Selected Macroeconomic indicators and simulation results of the aid-growth nexus model.

This appendix consists of two tables. Table A6.1.1 presents some macroeconomic indicators. Table A6.1.2 presents the simulation results of the aid-growth nexus model.

Table A6.1.1: Selected Macroeconomic indicators: the Lao PDR, 1985-2001

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993
Total exports as % of GDP	8.9%	8.0%	7.5%	10.4%	8.8%	9.2%	10.3%	11.2%	18.2%
Total imports as % of GDP	32.2%	27.1%	25.2%	26.7%	27.1%	21.6%	18.1%	22.8%	32.6%
Capital imports as % of Total imports	31.5%	30.9%	21.9%	28.7%	41.5%	47.0%	73.1%	59.8%	49.4%
Foreign Direct investment as % of GDP	0.0%	0.0%	0.0%	0.4%	0.6%	0.7%	0.9%	0.8%	5.0%
Aid as % of GDP	6.2%	7.0%	6.8%	13.2%	20.3%	17.6%	15.2%	13.9%	15.6%
Year		1994	1995	1996	1997	1998	1999	2000	2001
Total exports as % of GDP		19.5%	17.6%	17.4%	15.8%	17.1%	15.5%	18.0%	18.5%
Total imports as % of GDP		36.6%	33.4%	37.2%	32.3%	27.7%	26.2%	28.0%	30.0%
Capital imports as % of Total imports		46.2%	45.0%	47.0%	57.6%	40.9%	45.0%	60.7%	63.3%
Foreign Direct investment as % of GDP		3.9%	5.4%	8.6%	4.4%	2.3%	3.9%	5.9%	6.4%
Aid as % of GDP		14.1%	17.3%	18.0%	17.5%	14.2%	15.2%	13.2%	13.9%

Source: ADB (various issues) UN (various issues) IMF (various issues) and author's estimation.

Table A6.1.2: simulation results of the aid-growth nexus model: 1980-1997

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988
GY	1.2%	3.4%	2.2%	2.1%	2.3%	3.5%	4.9%	-1.1%	-1.8%
IGY	9.1%	8.1%	16.2%	11.4%	9.9%	12.1%	9.4%	8.4%	20.6%
IPY	1.1%	1.2%	1.2%	1.3%	2.0%	1.8%	2.7%	3.9%	4.2%
XY	7.0%	5.2%	8.3%	8.1%	8.3%	8.9%	8.0%	7.5%	10.4%
MKY	7.9%	8.6%	12.4%	10.8%	8.5%	10.2%	8.4%	5.5%	7.7%
IY	10.2%	9.4%	17.4%	12.7%	11.9%	13.9%	12.2%	12.3%	24.8%
MY	22.9%	24.6%	27.5%	29.7%	30.6%	32.2%	27.1%	25.3%	26.7%
CAY	-15.9%	-19.4%	-19.2%	-21.6%	-22.3%	-23.3%	-19.1%	-17.7%	-16.4%
GYS	2.3%	4.0%	3.0%	5.0%	2.6%	5.1%	3.9%	-2.2%	-1.4%
IGYS	8.7%	8.5%	12.6%	9.7%	11.2%	12.2%	11.9%	11.3%	17.0%
IPYS	1.6%	2.6%	2.1%	2.0%	3.1%	1.8%	2.5%	2.9%	3.6%
XYS	1.9%	5.8%	7.5%	7.5%	10.1%	7.7%	6.3%	8.1%	10.6%
MKYS	7.4%	9.6%	10.1%	10.4%	9.8%	8.1%	8.2%	7.3%	7.3%
IYS	10.3%	11.1%	14.7%	11.7%	14.3%	14.0%	14.4%	14.2%	20.6%
MYS	22.3%	25.6%	25.3%	29.3%	31.8%	30.1%	26.9%	27.0%	26.4%
CAYS	-20.5%	-19.8%	-17.8%	-21.7%	-21.7%	-22.4%	-20.6%	-18.9%	-15.8%
Year	1989	1990	1991	1992	1993	1994	1995	1996	1997
GY	13.4%	6.7%	4.0%	7.0%	5.9%	8.2%	7.0%	6.9%	6.9%
IGY	15.4%	12.0%	9.6%	9.7%	10.0%	11.6%	11.5%	11.5%	11.3%
IPY	3.8%	3.2%	5.3%	7.6%	12.1%	14.0%	13.7%	19.1%	17.4%
XY	8.9%	9.2%	10.3%	11.2%	18.2%	19.5%	17.6%	17.4%	15.8%
MKY	11.3%	10.2%	13.2%	13.6%	16.1%	16.9%	15.0%	17.5%	18.6%
IY	19.2%	15.2%	14.9%	17.4%	22.1%	25.6%	25.2%	30.6%	28.7%
MY	27.1%	21.6%	18.1%	22.8%	32.6%	36.6%	33.4%	37.2%	32.3%
CAY	-18.2%	-12.4%	-7.8%	-11.6%	-14.4%	-17.1%	-15.8%	-19.8%	-16.5%
GYS	7.5%	6.5%	3.1%	5.3%	4.0%	8.6%	6.1%	9.8%	7.0%
IGYS	17.8%	9.6%	9.3%	9.0%	12.2%	8.4%	14.4%	10.9%	11.3%
IPYS	3.7%	4.2%	5.4%	6.3%	11.1%	13.0%	14.7%	19.4%	17.4%
XYS	8.2%	9.7%	10.9%	12.8%	15.4%	17.5%	19.5%	19.4%	15.0%
MKYS	10.5%	11.1%	12.7%	13.7%	15.8%	15.8%	17.4%	17.7%	17.4%
IYS	21.5%	13.8%	14.7%	15.3%	23.2%	21.4%	29.1%	30.3%	28.7%
MYS	26.4%	22.5%	17.6%	22.9%	32.3%	35.5%	35.8%	37.4%	31.1%
CAYS	-18.2%	-12.8%	-6.7%	-10.1%	-16.9%	-17.9%	-16.3%	-18.0%	-16.2%

Legend: the letter **S** attached to the following variables stands for their simulated values, **GY** is output growth, the letter **Y** is attached to the following variable to indicate the measurement of that variable in percent of GDP: **IGY** is public investment, **IPY** is private investment, **XY** is total exports, **MKY** is imports of capitals, **IY** is total investment, **MY** is total imports, **CAY** is current account balance.

Chapter 7

THE EFFECT OF UNSTABLE AID FLOW ON ECONOMIC GROWTH

Although significant policy changes have been made in many LDCs, the new policy environment does not deliver sufficiently high growth rates to make significant inroads into poverty except where the external trade environment is favourable and reforms are adequately or stably financed.

UNCTAD (2000a, p. 127).

Institutions affect economic performance by determining (together with the technology employed) the cost of transacting and producing. They are composed of formal rules, of informal constraints and of their enforcement characteristics; while formal rules can be changed overnight by the polity, informal constraints change very slowly.

North (1997, p. 1).

7.1 Introduction

The analysis carried out in Chapters 5 and 6 reveals that a high level and stable aid flow contributes to economic growth. The preliminary success in implementing the “adjustment programmes” has also led to the Lao Government increasingly receiving financial aid. Higher aid inflows have enabled the Lao Government to invest more than their savings. Therefore, it is not surprising that the Lao PDR has achieved a higher growth rate of real income during the 1990-97 period. However, as pointed out in Chapter 1, the decline in the growth rate of real income in the Lao PDR after 1997 has been attributed to the negative impact of the Asian financial crisis and the instability of aid and FDI inflows. This unfavourable effect on economic growth has raised concern as to whether the economic development achieved in the Lao PDR can be sustainable.

As explained in Chapter 3, the weakness of policy conditionality and the lack of state and institutional capability of the recipient country are the main factors that cause economic volatility and unstable aid inflow. This unfavourable environment in turn caused the LDCs to fail to achieve economic growth with external viability. This chapter applies this explanation to examine the effect of unstable aid flows on economic growth in the case of the Lao PDR. The linkage between various types of political regimes and economic growth is also explained here. By doing this, some light could be shed on how adopting and implementing the policy and institutional reforms may affect the Lao Government's ability to maintain economic growth with external viability. The macroeconometric model employed in Chapter 6 is modified to use for the counterfactual analysis. The rest of this chapter is organised as follows. Section 7.2 briefly explains the role that states and institutions play in the process of economic growth. Section 7.3 examines key institutional issues and the influence on the Lao Government's ability to raise investment with external viability. Section 7.4 applies the counterfactual technique to disentangle the potential effects of unstable aid flow from the effect of the Asian financial crisis on economic growth. The chapter ends with some concluding remarks in Section 7.5.

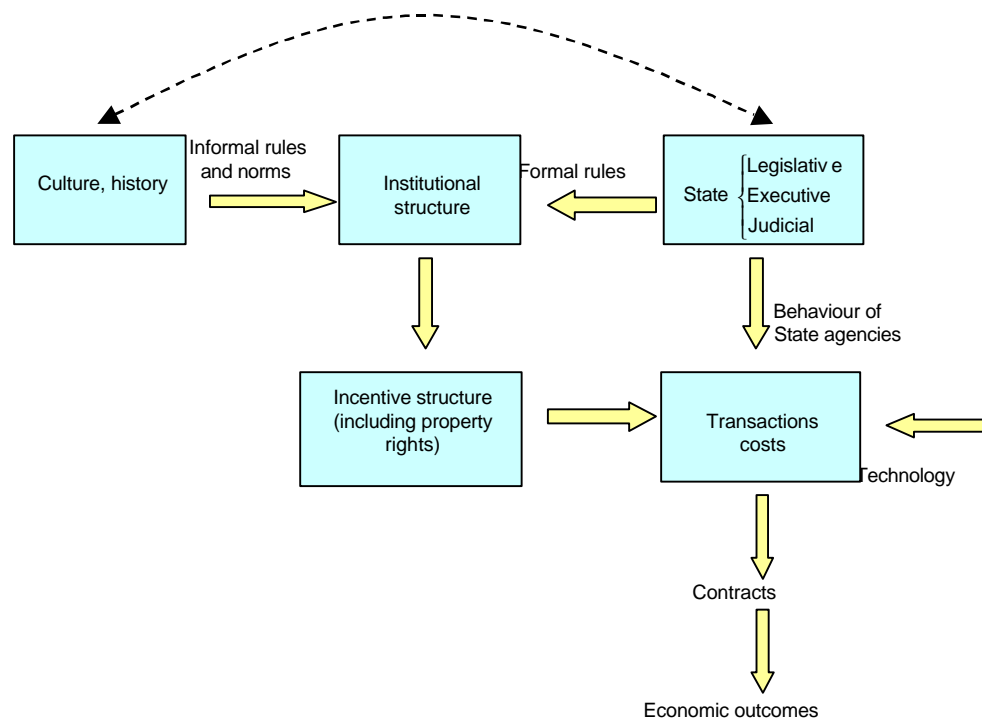
7.2 States, institutions and economic growth

In an effort to become creditworthy, developing countries have altered their economic policies and moved decisively in the direction of economic liberalisation. Countries entering the "adjustment programmes" have done quite well in terms of policy reform, in that the LDCs "have kept up with the reform of public enterprise. In the areas of pricing and marketing reform, the LDCs have gone further than the other developing countries" (UNCTAD, 2000a, p. 103). However, according to the *World Development Report 1997* (World Bank, 1997) many governments in developing countries have failed "to ensure law and order, protect property, and apply rules and policies predictably" (*ibid.*, p. 5). Many governments in developing countries also found "it difficult to achieve the strong fiscal and monetary discipline required

for economic stability” (*ibid.*, p. 46). Therefore, rather than trying to evaluate whether or not the policy changes make a contribution to economic growth, it is now more important to question whether such policy changes are effectively enforced by the recipient country. With this question, it is also useful to examine the problems of policy mismanagement posed by the lack of state and institutional capability. These problems have attracted much attention in the development literature recently. The interest in exploring the observed unevenness in implementing policy reforms under the Washington consensus strategy is mainly focused on the problems of the lack of state and institutional capability (Wallis and Dollery, 2001, p. 1).

According to the *World Development Report 1997*, states and institutions are a crucial factor in determining economic outcomes (World Bank, 1997). Figure 7.1 below illustrates how states, institutions and economic outcomes are related.

Figure 7.1: The state, institutions, and economic outcomes



North (1990, p. 4) defines institutions as “any form of constraint that human beings devise to shape human interaction”. Essentially, institutional structures can be determined by both formal and informal rules. Formal rules are laws and regulations governing the interaction between individuals, businesses and organisations in societies including ministries, city councils, universities, trade unions, churches, firms, foreign investors and the like. Examples of formal rules include laws covering constitutions, property rights, contracts, budgets, taxation, foreign investment, regulations governing the operation of the central bank and the like. Informal rules are not legally codified; they include socio-religious and cultural norms and values. Examples of informal rules include norms and values related to honesty, hard work, respect for chiefs and the like (*ibid.*).

Institutions are designed to facilitate human beings to produce and to exchange goods and services within societies. According to North (1997, p. 6) “a basic function of institutions is to provide stability and continuity by dampening the effects of relative price changes. It is institutional stability that makes possible complex exchange across space and time”. Other functions of institutions as specified by the World Bank (2001, p. 8) are as follows:

- (i) They channel information about market conditions, goods and participants. A country that provides good information flows helps businesses to identify partners and find high return activities. The information flows also help governments to regulate well.
- (ii) They define and enforce property rights and contracts, determining who gets what and when. With property right assignments and the ability to protect these rights, institutions can reduce the potential for disputes and help enforce contracts.
- (iii) They help to increase or decrease competition in markets. This function gives people and businesses incentives to do better and promote equal opportunities.

The state or the government is normally defined in three distinct sets of powers. “One is the *legislature*, whose role is to make the law. The second is the *executive* (sometimes referred to as government), which is responsible for implementing the law. The third is the *judiciary*, which is responsible for interpreting and applying the law” (*ibid.*, 1997, p. 20). As can be seen from Figure 7.1, state agencies together with the institutions and technology employed determine the economic outcomes through their interactive effects on transaction costs and contracts. In this respect, a country needs both effective institutions and capable state agencies to ensure that sound economic management can be promoted and that sustainable economic growth can be achieved (i.e., good economic outcomes).

However, the conundrum remains as to which political regime can promote such abovementioned economic outcomes. The past development experiences of developing countries have revealed that a democratic or authoritarian regime cannot reasonably claim to have any comparative advantage when it comes to effective institutions and capable state agencies. Hutchcroft (1994) demonstrates that one can find weak states in both democratic and authoritarian regimes.¹ Nevertheless, the past development experiences of developing countries have also revealed that cultural and historical differences across countries resulted in a diversity of institutions and state regimes. Therefore, there can be many institutional and political alternatives for managing the development process soundly. The type of political regimes deemed the best for promoting sound economic management often varies and depends on the values and cultural backgrounds of the declaimer. As Weder points out:

Somebody with Anglo-Saxon background would probably think in terms of constitutions, and checks and balances. The Swiss will be tempted to think that direct democracy and federalism would be the solution for unstable countries. A follower of the

¹ Siermann (1998) finds no causal relationship exists between political freedom and economic growth in a sample of 121 countries. On the other hand, Nelson and Singh (1998) cross-sectional study of 167 countries notes that a lack of democracy and political freedom seriously hurts a nation's economic performance. Gounder's (2002) time-series study of Fiji points out that Fiji's non-democratic political environment and uncertain economic policies severely damaged its growth prospects.

Asian way would probably plead for strong bureaucracies and corporatist structures.

Weder (1998, p. 354)

While there remains controversy about the linkage between different types of political regimes and their influence on sustainable economic growth, the emerging consensus on this issue is that state agencies have an important role to play in promoting good governance in order to maintain sustainable economic development.² According to the World Bank (1997, p. 5) “the state is essential for putting in place the appropriate institutional foundation for market”. For institutions to be effective and meaningful it requires a capable state to set the rules that facilitate collective actions between individuals, businesses and organisations within the society, and to ensure that the rule of law is strictly and consistently enforced (*ibid.*, p. 34).

The interlinkage between states, institutions and the elements of good governance tends to be mutually supportive and reinforcing. State capability cannot be assured in the absence of accountability. As a lack of accountability tends to reduce the credibility of states, this makes it hard to predict the government’s decision making on policy changes and the way it will respond to external shocks. Participation can be related to accountability to some extent. For instance, if citizens are allowed to select their representative through the electoral process, this participation principle will encourage public officials to be accountable to the electorate, making states more accountable in turn. Transparency cannot be assured in the absence of an effective institutional framework that balance the right of disclosure

² In recent years, the promotion of good governance is high on the policy dialogue agenda between donors and recipients. According to ADB (1995, pp.8-12), four basic elements of good governance are defined as follows: (i) *Accountability* is imperative to make public officials answerable for government behaviour and responsive to the entity from which they derive their authority. It also means establishing criteria to measure the performance of public officials, as well as oversight mechanisms to ensure that the standards are met. (ii) *Participation* is a principle to foster a “bottom-up” approach to economic and social development. In this context, individuals, various associations and organisations are allowed to give voice through letters to newspaper editors, participating in radio and television talkshows, and voting in order to improve the design and implementation of public programmes and projects. (iii) *Predictability* refers to the existence of laws, regulations and policies to regulate society. It also refers to their fair and consistent application. It requires the state and its subsidiary agencies to be as much bound by, and answerable to, the legal system as are private individuals and enterprises. (iv) *Transparency* refers to the availability of information to the general public and clarity about government rules, regulations and decisions. Transparency in government decision-making and public policy implementation reduces uncertainty and can help inhibit corruption among public officials.

against the right of confidentiality. Predictability in the functioning of the effective institutional framework could be useful to ensure the accountability of the public sector. Predictability also requires ensuring that civil societies adhere to the rule of equality before the law.³

Given the pivotal role of states, institutions and their interlinkage among the four basic elements of good governance, it is hardly surprising that the lack of state and institutional capability to enforce the rule of law has retarded economic growth in many developing countries. The *World Development Report 1997* remarks on this viewpoint as follows:

...States that change the rules frequently and unpredictably, announce changes but fail to implement them, or enforce rules arbitrarily will lack credibility, and markets will suffer accordingly.

World Bank (1997, p. 34)

According to the *World Development Report 1997*, the lack of predictability, which tends to reduce the credibility of states over time, affects not only the business environment but also the environment for the implementation of development projects. The lack of credibility reduces investment, growth and the return on development projects as a result of which “entrepreneurs choose not to commit resources in highly uncertain and volatile environments, especially if those resources will be difficult to recover should the business environment turn unfavourable” (*ibid.*, 1997, p. 36).

Similarly, without effective political institutions to run countries it tends to create incentives for corruption. The institutional failure in this regard hampers the effective delivery of public services, impedes the efficient use of government revenues, discourages private investment and hence limits economic growth (Mauro, 1997). In addition, as corruption is the antithesis of accountability and transparency, the World Bank (2001) indicates that political institutions that advocate free and fair elections tend to reduce

³ The issues of governance and sound development have been discussed in detail by the ADB (1995).

corruption. In democracies, citizens who are faced with cronyism and corrupt politicians can influence the individual politician's accountability through the ballot box. In contrast, political institutions that restrain press freedom tend to create an opportunity for misconduct in the public sector. Without detailed information on government services, citizens are vulnerable to bureaucratic harassment and public officials may arbitrarily act for their own benefit in terms of overcharging fees or demanding bribes.⁴

Turning to the problems of policy mismanagement posed by the lack of states and institutional capability, the *World Development Report 1997* remarks that "although the recipe for good policies is well known, too many countries still fail to take it to heart and poor performance persists. This often signals the presence of political and institutional incentives for maintaining bad policies" (World Bank, 1997, p. 49). In countries with some form of democracy, the mismanagement of macroeconomic policy could take place in the presence of inefficient political cycles or political instability. The public-choice school claims that democratic decision-making influences the outcomes of budget deficits (Siermann, 1998).

According to the "opportunistic theory" (Nordhaus, 1975), as well as the "partisan theory" (Hibbs, 1977), politicians use their monetary and fiscal powers to manipulate the economy to their own benefit or to help their constituency. Right wing governments, despite a stated preference for low levels of government spending, tend to run budget deficits by increasing government spending in order to increase the probability of staying in office (Persson and Svensson, 1989). Left wing governments tend to undertake ambitious programmes and give priority to distributive objectives. This political behaviour is likely to lead to the problem of macroeconomic populism which result in large government deficits, high inflation and an unsustainable external imbalance (Hossain and Chowdhury, 1998). In countries with coalition governments, Siermann (1998) argues that internal

⁴ See World Bank (2001, pp. 108-109) for a detailed discussion of this issue.

policy conflicts are likely to take place more frequently. Therefore, “the greater the internal political conflicts, the more difficult it will be to enact deficit-reduction measures” (*ibid.*, p. 2). Using a sample of 123 countries, Shi and Svensson (2000) show that budget deficits increase by an average rate of about 1 percent of GDP in the election year and that these deficits persist for several years after the election. Using a sample of 60 countries, Persson and Tabellini (2000) find that countries with coalition governments have budget deficits about 1.5 to 2 times larger than other types of government.

It is now widely recognised that persistent large budget deficits in developing countries are the root cause of external imbalances (Hossain and Chowdhury, 1998). However, whether the external imbalance gives rise to a balance-of-payments crisis is not straightforward. This effect depends on how budget deficits are financed, the country’s savings level, the effectiveness of financial institutions and the government’s ability to use fiscal measures to handle the shocks that affect their budgets.⁵ The combination of policy conditionality aiming to reduce domestic borrowing and the extremely low rate of domestic savings in LDCs makes the LDCs heavily reliant on foreign borrowing to finance budget deficits. Therefore, persistent large budget deficits could lead to balance-of-payments crises, as “over reliance on foreign borrowing can cause appreciating real exchange rates, widening current account deficits, unsustainable external indebtedness and dwindling foreign exchange reserves” (*ibid.*, p. 132).

So far, the problems attributed to the way the lack of a country’s state and institutional capability may affect investments and economic growth has been drawn from the weakness of democratic political regime. Findings indicate that a country’s state and institutional capability is a crucial factor in determining economic development. A country that failed to ensure law and order and failed to apply predictable policy tends to undermine its creditability. A country that failed to prevent politicians from manipulating

⁵ See Hossain and Chowdhury (1998, pp. 146-152) for further detailed discussions on the linkage between budget deficits and balance-of-payment crises.

fiscal and monetary expansion tends to create persistent budget deficits. Therefore, a country with a weak state and institutional capability tends to create the aforementioned development failures, reducing investments and also creating an unsustainable level in the balance of payments. From this point of view, it can be said that the lack of state and institutional capability can be a predominant factor impairing the developing countries' ability to maintain economic growth with external viability. The next section examines the state and institutional problems under the Lao PDR's authoritarian political regime.

7.3 Foreign aid, the state, institutions and economic performances in the Lao PDR

Unlike many other transition economies, the Lao PDR carried out economic reform without abandoning a one-party political regime. This led to both various opportunities and obstacles. To analyse this, Section 7.3.1 examines the key governance issues focusing on the factors that undermined the state and institutional capacity. Section 7.3.2 addresses the problems of the lack of state capacity to deal with the trade-off between the need to boost economic growth and the need to maintain external viability.

7.3.1 Key governance Issues in the Lao PDR

Since the establishment of the Lao PDR in 1975, the Lao People's Revolutionary Party (LPRP) has functioned without a written constitution. In the absence of fixed and knowable law, this situation has added to the reluctance of international development agencies to invest in the country. This led to the Supreme People's Assembly to adopt a constitution in 1991 (Savada, 1994, p. 219). Although the newly adopted constitution outlines a system composed of the executive, legislative and the judicial branches, in practice the LPRP continued to influence the governance and the choice of leaders through its constitutional "leading role" at all levels (Savada, 1994,

p. 224). Accordingly, the Party Congresses have been an important forum for policy making and consensus building.⁶ The processes of policy formulation are made through lengthy periods of internal debate, especially at the upper echelons of the party. In this regard, the policy consensus building has facilitated the implementation of the “adjustment programmes” without causing political instability, and helped the Lao Government to quickly stabilise the economy and moved the country in the direction of a liberal economic regime.

Although the Lao Government had made progressive changes in the process of the “adjustment programmes”, the enforcement of those policy changes was held back by its lack of state and institutional capacity (World Bank, 1996). Attempts by the Lao Government to translate policy conditionality into administrative actions faced the lack of legal systems and regulation frameworks necessary to promote good governance. Wescott (2001, p. 26) points out that these constraints exist at the individual, institutional and organisational level. At the individual level, low wages do not motivate civil servants to perform their jobs effectively. According to Wescott, this problem is exacerbated by poor incentives in recruitment and promotion policies. Also, recruitment and promotion tend to be based on clan ties, seniority and political patronage rather than merit, talented staff tends to be marginalised through transfers and assignment to low priority tasks. He further notes that at the institutional level, there are no proper job descriptions, no clarification of roles and responsibilities and no grievance resolution mechanisms. Without these regulations, bureaucrats tend not to take risks and pass even minor decisions to their superiors (*ibid.*). At the organisational level, Wescott points out that the lack of co-ordination in public administration is due to the

⁶ As in other one-party states, the Party Congress generally provides good indications for the direction of policy and institutional changes. The Fourth Party Congress in 1986 endorsed the New Economic Mechanism that aimed to transform the centrally planned economic system to the market economy. The Fifth Party Congress in 1991 consolidated the political power of the advocates of economic reforms. Institutions were established to secure the maintenance of the one-party state. The Sixth Party Congress in 1996 reaffirmed the commitment to economic reform, but preferred a slower reform path (Bourdet, 2000, pp.2-3). The Seventh Party Congress in 2001 set the development strategy for getting the country out of the state of underdevelopment by the year 2020. The congress also emphasised the need to apply the systematic state-managed market economy in order to gradually shift a fundamental economic structure towards an industrialised and modern economy (Lao People’s Revolutionary Party, 2001).

application of the bottom-up reporting system without institutionalised channels for interministerial communication. In addition, silence about the party's functions and powers in the constitution runs parallel to the legislative, executive and judiciary branches that limit the independence of these three powers from each other.

As indicated in the preceding section, the interlinkage among the state, institutions and the four basic elements of good governance are mutually supportive and reinforcing. However, it is important to indicate that the capacity constraint at the institutional level may undermine the Lao Government's ability to create a governance system with accountability, transparency and predictability. Indeed, Wescott (2001) regards the system of administration in the Lao PDR as an opaque regime where "nepotism and patronage are endemic within the party and the bureaucratic system. The lack of transparency makes it extremely difficult for outside observers to fully understand the political decision-making structure" (*ibid.*, p. 25). In addition, the lack of accountability and transparency creates rampant corruption at all levels of officialdom. "This behaviour reduces government revenues, misallocates expenditure, reduces foreign investment and erodes public trust" (*ibid.* 30).

Similarly, it is arguable that the capacity constraints at the individual and organisational levels together with the domination of the LPRP could undermine the Lao Government's administrative capacity to deliver its functions. For example, "the 1990 Central Bank Law gave the Central Bank formal autonomy over monetary and exchange rate policy, [however] the bank works under strict political control" (Wescott, 2001, p. 28). The domination of the LPRP in the Central Bank's decision-making process coupled with the lack of co-ordination within interministerial administration "made the impact of the regional economic downturn on the macroeconomic situation in the Lao PDR considerably worse than it could have been" (Bourdet, 2001, p. 166).

7.3.2 Foreign aid and the Lao Government's ability to raise investment with external viability

The above discussions indicate that the monopoly power of the Lao People's Revolutionary Party has significantly influenced the pace and progress of the "adjustment programmes". This opportunity has facilitated the elaboration, adoption and implementation of economic reform. However, the failure to regulate economic and political interactions posed by the lack of state and institutional capacity has undermined the Lao Government's ability to maintain sustainable economic growth. These issues are further examined in this section in order to have a clear understanding of how the abovementioned opportunities and obstacles may affect the Lao PDR's ability to maintain economic growth with external viability.

To start with, the opportunities created by the Lao Government during the implementation of economic reforms, after entering the "adjustment programmes" in 1989, moved the country decisively in the direction of economic liberalisation. The Lao Government's commitment to reducing budget deficits and tightening monetary policy at the outset of the "adjustment programmes" quickly brought stability to the macroeconomic environment. As can be seen from Table 7.1 below, the ratio of budget deficits to GDP reduced from its peak level of an annual average of about 15 percent during the 1989-90 period to 10 percent during the 1990-96 period. Money growth has also fallen from its peak level during the 1986-88 period at an annual average of about 86 percent to about 49 percent during the 1989-90 period and remained low at about 34 percent for the 1990-96 period. Inflation was gradually brought down from an annual average of about 50 percent during the 1989-90 period to 12 percent during the 1991-96 period. The exchange rate stabilised, with depreciation of the exchange rate declining from an annual average rate of about 50 percent during the 1989-90 period to 5 percent during the 1991-96 period.

Table 7.1: Selected macroeconomic indicators 1978-96

Year	1978-85	1986-88	1989-90	1991-96
Money Growth	36%	62%	49%	34%
Public Investment Growth	27%	65%	-16%	6%
Budget Deficits	-13%	-11%	-15%	-10%
Foreign Aid/GDP	12%	9%	19%	16%
FDI/GDP	0%	0%	1%	4%
Foreign Currency Reserve*	-	1.7	3.7	3.3
Inflation	73%	39%	50%	12%
Exchange rate Depreciation	66%	50%	33%	5%
Real GDP growth	2%	1%	10%	6%

Note: * equivalent months of imports

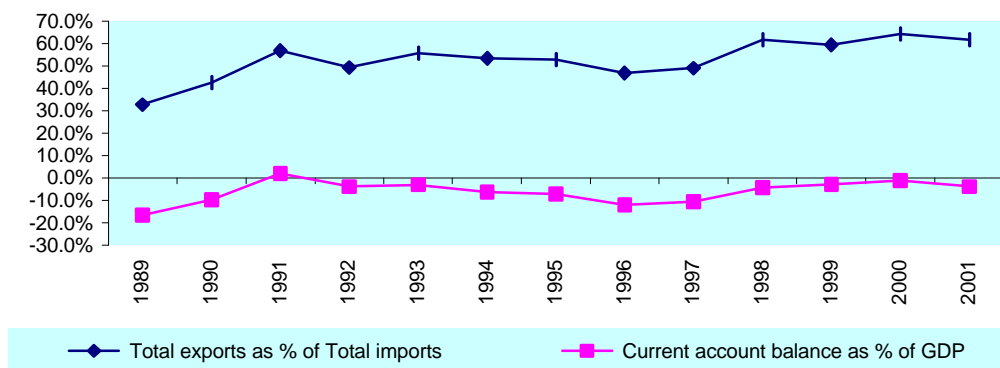
Source: ADB (various issues) and IMF (various issues)

As the disbursement of aid is subject to the performance of conditions in the “adjustment programmes”, success in implementing the stabilisation programmes in the early 1990s led to a surge of aid inflow. The ratio of aid to GDP almost doubled from the pre-“adjustment programmes” level to remain at about 16 percent for the 1991-96 period. The other sources of capital inflow such as foreign direct investment (FDI) were also increased, as foreign direct investment has been promoted since 1988. The ratio of FDI to GDP increased sharply from 0.4 percent in 1988 and reached its peak at 8.6 percent in 1996. Consequently, the growth rate of real GDP increased fivefold from an annual average rate of about 2 percent during 1978-85 period to 10 percent for the 1989-90 period. The real economic growth rate remained strong at an annual average rate of about 6 percent for the 1991-96 period.

It should be noted that economic growth during the 1991-96 period was also accompanied by expansionary fiscal and monetary policy to satisfy an increase in the demand for domestic investment. An annual average rate of money growth was about 34 percent. The growth rate of public investment also increased from a negative annual rate of about 16 percent in the 1989-90 period to a positive annual rate of 6 percent for the 1991-96 period. This led to a rapid increase in the demand for both capital and consumption goods. Accordingly, the current account deficit also gradually deteriorated from -3.8 percent of GDP in 1992 to -11.9 percent to GDP in 1996. As illustrated in Figure 7.2 below, the deterioration of the current account

balance in this period reflects the fact that the growth in export earnings was unable to keep pace with a rapid surge in imports of both capital and consumption goods. As part of the external account deficit had been financed by foreign aid and other sources of foreign capital inflows, the country's foreign exchange reserves and foreign exchange earnings must be utilised to finance the remainder of the external account deficit in order to maintain external viability. However, as demonstrated in Chapter 6, the Lao PDR's ability to raise foreign exchange earnings from exports is subject to its access to markets and the demand for its export commodities. In fact, efforts to raise foreign exchange earnings were often blocked by complex international trade barriers and the volatile economic environments of the Lao PDR's trading partners. Therefore, export earnings are a crucial factor dominating the Lao Government's ability to raise investment with external viability, as well as foreign exchanges from foreign aid and FDI inflow.

Figure 7.2: Trade and current account balance, 1989-2001



Source: Data extracted from Appendix 7.1, Table A7.1.1

The need to promote economic growth by running an expansionary fiscal and monetary policy often creates the deterioration of external balance in developing countries (Hossain and Chowdhury, 1998). To maintain external viability, the government needs to borrow money from the IMF to finance the deficit. Such borrowing allows the government more time to undertake the necessary adjustment. Under the IMF's policy prescription, a country needs to devalue its nominal exchange rate along with implementing prudent fiscal

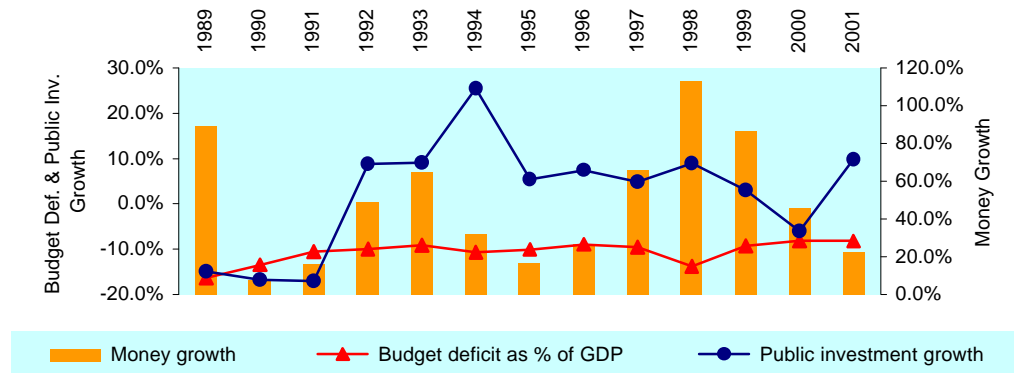
and monetary policy to ensure that the external current account balance is viable. However, the obstacles facing the Lao PDR's efforts in implementing policies to adjust the external balance are rooted in the lack of state and institutional capabilities. These issues are discussed below.

From 1996, the central bank has periodically attempted to slow down money growth but it failed to prevent the growing level of credits extended to the private sector and state enterprises. This failure was a consequence of the lack of institutional capability in the financial system of the Lao PDR, as the banking system "remains underdeveloped and weak", and "the banking supervision framework has not been able to correct major bank weakness in a timely manner" (IMF, 1998b, p. 2). In the wake of the Asian financial crisis in 1997, the fluctuations in tax collection mainly caused by the weakness of fiscal institutions and a chronic lack of transparency in the state and businesses made it hard for the government to meet expenditure targets (i.e., counterpart funds required to implement projects financed by aid agencies). Despite this, the government did not adjust its expenditure plans but increased investment in an irrigation project in order to promote self-sufficiency of rice production. In addition, the decline in export earnings since 1995 led to a deterioration in the current account balance. This situation became worse during the Asian financial crisis, as the Lao PDR faced unsustainable balance-of-payment positions. The IMF's decision not to provide financial support during the crisis was because there were no contingency measures for unexpected events. The IMF also disagreed with the irrigation investment plan, as the expansionary fiscal policy involved could worsen the external account imbalance.⁷ Other aid donors also cut their financial aid because the pace of economic reform in the Lao PDR slowed down.

⁷ The "adjustment programmes" is designed to support external account deficits at the level that could be financed by normal capital inflow. Expansionary fiscal policy in the wake of the Asian financial crisis conflicted with this objective. Therefore, it was not surprising that the IMF did not provide the financial support.

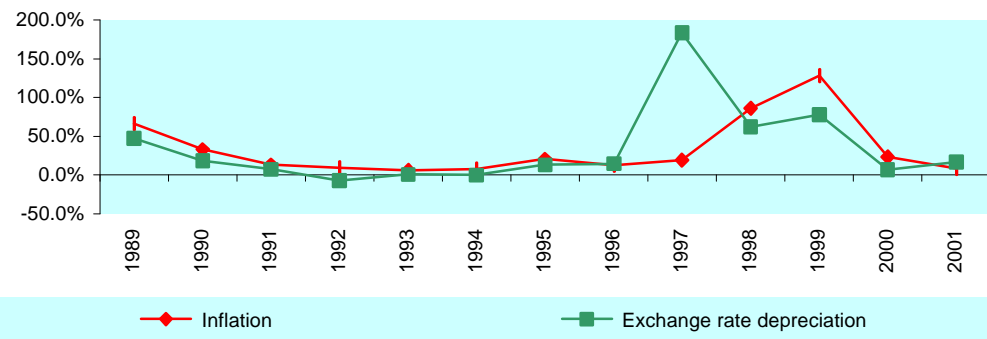
Given financial shortfalls in both internal and external revenues, the Lao Government financed increased public spending by money creation and the drawing down of foreign reserves. Expansionary fiscal and monetary policy thus widened the budget deficit.

Figure 7.3: Fiscal and monetary policy and budget deficits, 1989-2001



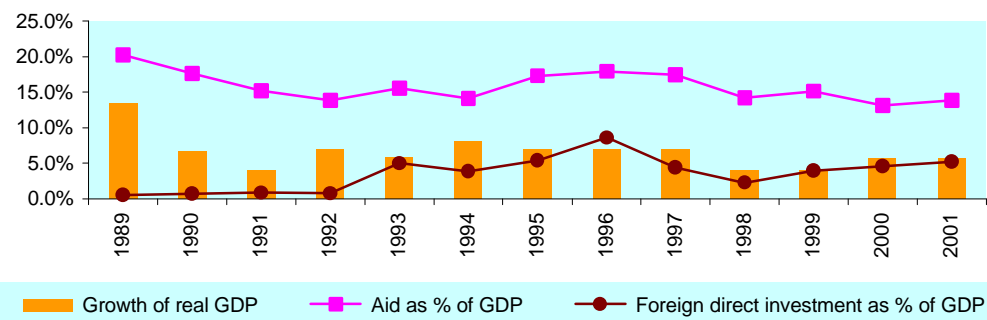
Source: Data extracted from Appendix 7.1, Table A7.1.1

As illustrated in Figure 7.3, the growth rate of money and public investment reached their peaks at about 113 percent and 9 percent per annum, respectively. The budget deficit increased from 5 percent of GDP in 1997 to 9 percent of GDP in 1998. Given the high degree of currency substitution in the Lao economy where people preferred to hold the Thai Baht and the US dollar to the local currency, expansionary fiscal and monetary policy had multiplied the already volatile macroeconomic environment (Iweala, *et al.*, 1999). By the end of 1997, the Lao currency has lost about 183 percent of its value against the US dollar, while inflation increased by 19.3 percent (see Figure 7.4 below).

Figure 7.4: Inflation and exchange rates variation 1985-2001

Source: Data extracted from Appendix 7.1, Table A7.1.1.

In an attempt to stabilise the macroeconomic environment without financial supports from the IMF, the Lao Government encountered difficulties due to the lack of legal and regulatory frameworks necessary for the effective functioning of fiscal and monetary institutions. This exacerbated the “lengthy consensus building in the decision-making process [at the upper echelons of the party], making it difficult for the country’s authorities to react quickly to the deteriorating macroeconomic situation” (Iweala, *et al.*, 1999, p. 2).

Figure 7.5: Foreign capital inflows and current account balance 1985-2001

Source: Data extracted from Appendix 7.1, Table A7.1.1.

Essentially, after the recovery of Thai Baht in 1998, the Lao Kip depreciated 60 percent in 1998 against the US dollar, while the inflation rate reached its peak at 86.1 percent. Efforts to tighten fiscal and monetary policy had been made in late 1998 and early 1999. This led to a decline in annual inflation to

51.2 percent in 1999, while the Lao currency lost another 77.8 percent of its value against the US dollar. The instability of aid inflows and the decline in FDI since 1997 led to a decline in the annual growth rate of real GDP at 4 percent for the 1998-1999 period. The rate of economic growth after the Asian financial crisis represents about half of the annual average growth rate during the 1991-97 period. This unfavourable circumstance raised concerns over sustainable development in the Lao PDR.

7.4 Counterfactual analysis: the effect of unstable aid inflow on economic growth in the case of the Lao PDR

The preceding sections have demonstrated that the failure to ensure viable balance of payments was not only caused by the weakness of the IMF's policy design but also by the Lao Government's policy mismanagement exacerbated by the lack of state and institutional capacity. These problems led to the instability of foreign aid and FDI inflows and in turn worsened the adverse effects of the Asian financial crisis. The following sections examine the effects of unstable aid inflows on economic growth in the macroeconomic framework. The counterfactual technique is employed to disentangle the potential effects of unstable aid flow from the effects of Asian financial crisis on economic growth. Section 7.4.1 explains the model specification and the alternative assumptions of how to evaluate the effects of unstable aid inflow on economic growth. The results are discussed in Section 7.4.2.

7.4.1 The model and policy experiments

To assess the potential effects of unstable aid inflow on economic growth, the supply side macroeconomic model employed in Chapter 6 is modified, in which public investment is treated as policy variable (exogenous variable). In this context, the model has four behavioural equations and three identity equations. The specifications of the model in the generic form are as follows:

A specification of the aid-growth nexus model

Behavioural Equations

Output Growth

$$GY_t = f_1(IY_t; GLE_t) \quad (7.1)$$

Investment

$$IPY_t = f_3(GY_t, IGY_t; FDIY_t, INF_t) \quad (7.2)$$

International Trade

$$XY_t = f_4(MKY_t; YF_t, REER_t) \quad (7.3)$$

$$MKY_t = f_5(IY_t; REER_t) \quad (7.4)$$

Identity Equations

$$IY_t = IGY_t + IPY_t \quad (7.5)$$

$$MY_t = MKY_t + MCY_t \quad (7.6)$$

$$CAY_t = XY_t - MY_t + U_t \quad (7.7)$$

where *GY*: growth rate of income,
IY: the share of investment in GDP,
IGY: the share of public investment in GDP,
IPY: the share of private investment in GDP,
XY: exports to GDP ratio,
MKY: the share of imports of capitals in GDP,
MCY: the share of imports of consumption goods in GDP,
MY: the share of imports to GDP,
CAY: the ratio of current account deficit to GDP,
AY: the ratio of total aid to GDP,
INF: inflation rate,
GLE: the growth rate of effective labour force,
YF: the weighted average by trade share of growth in per capita income of the trading partners,
REER: real exchange rate, and
U: the error term including net service transfers.

As mentioned earlier, the weakness of the IMF's conditionality and the lack of state and institutional capability of the Lao PDR are the main factors leading to unstable aid and FDI inflows. To evaluate the adverse effects of unstable aid flow on economic growth, it is necessary to create a baseline

model and perform policy experiments. The baseline model is used to generate an approximate actual outcome for all endogenous variables during the 1998-2001 period. As such, it is required to employ actual data of all exogenous variables for the same period to perform the ex-post simulations. This approach has a minor problem due to the lack of unemployment and student enrolment data for the 1997-2001 period to compute the growth rate of in the effective labour force.⁸ This problem has been solved by using the goal-seeking technique, i.e. the growth rate in the effective labour force has been used to generate the approximation of the historical trends for all endogenous variables. Therefore, the solution for the growth rate of in the effective labour force will implicitly capture the side effect of unstable aid and FDI inflows and the Asian financial crisis on output growth and on current account deficit for the 1998-2001 period.⁹

Policy experiments are used to examine how the improvement of donors' conditionality and the Lao PDR's state and institutional capability may have an impact on current account deficits and output growth. Thus, the experiments are designed to simulate the effects of stable aid flows in order to capture the adverse effects of unstable aid flow. They are carried out under different assumptions as follows:

- Experiment (e1) aims to answer the question, "What would have been the outcome of output growth and external account deficits if the IMF had bailed out the Lao Government from the Asian financial crisis?"¹⁰ This experiment is carried out under the assumption that the IMF includes the contingency measure in the "adjustment programmes", which enables the IMF to provide financial support for the balance-of-payments adjustment to the Lao Government during the Asian financial crisis. Also assuming

⁸ As explained in Chapter 4, the growth rate of effective labour force was constructed by assuming that the rate of unemployment is constant. This assumption does not hold for the 1998-2001 period, as it is expected that unemployment will rise during the Asian financial crisis.

⁹ See Table A7.2.1 for detailed data employed in this simulation.

¹⁰ This experiment is based on a recent reconsideration to modify conditionality under the policy-based lending by the International Monetary Fund (IMF) and World Bank from the "conditionality" to the "partnership" principle. This move has been seen as an appropriate approach that could improve the effectiveness of aid. Unlike being under "conditionality", the proposal to carry out "partnership" principle lets the aid recipient take the lead in the process of policy formulation and in the pace of policy implementation. It also allows for differences in perspectives and provides room for partners to learn from mistakes. It is likely that the implementation of the "partnership" principle will reduce the tension over national sovereignty issues and help to create a stable aid flow. See UNCTAD (2000a) for detailed discussions about the conflict between donors' conditionality and recipient country's national sovereignty issues.

that other donors provides financial support for irrigation projects to help the Lao Government to achieve the promotion of self-sufficiency in rice production. With this financial support (i.e. a stable aid inflow), not much pressure would be put on the Lao Government to use inflation tax or to draw foreign reserves to finance the budget deficits. Also, this financial support would allow the Lao Government to adjust the exchange rate in line with the Thai currency, which is freely circulated along with the US dollar in the Lao economy.¹¹ After the Asian financial crisis the Lao Government can maintain a stable macroeconomic environment and expand credit to satisfy investment demands from the indigenous investors without facing difficulty in the balance-of-payments. As such the experiment is carried out under the following assumptions: Inflation is set to follow its actual trend for the 1997-1998 period, and grows at 12 percent annually for the 1999-2001 period. The real effective exchange rate is set to follow its alignment (i.e., REER=100 for each year). Foreign direct investment and public investment variables are set to follow their historical paths.¹² Finally, the growth rate in the effective labour and other exogenous variables follow the same path as in the baseline experiment.¹³

- Experiment (e2) aims to answer the question, “What would have been the outcome of output growth and the external account balances, if the Lao Government had managed to raise investment with external viability?” As explained in the preceding section, a country’s state and institutional capability plays a crucial role in improving the country’s ability to raise investments with external viability. It is arguable that strengthening the institutional capacity could help the Lao PDR to better cope with external shocks. Strengthening the institutional capacity could also increase the Lao PDR’s credibility and make the Lao administration more effective. This in turn could help the Lao PDR to attract foreign investment through creating a favourable economic environment.¹⁴ Therefore, foreign direct

¹¹ Note that after the Lao Government regained control over fiscal and monetary policy in the late 1999, it relied on a free interest loan from China together with the promotion by the Lao Government to use local currency for bilateral trade with China and Vietnam, to stabilise the Lao currency. Thus, inflation was gradually stabilised by the year 2000 which enabled the Lao Government to reaccess financial support from the IMF in early 2001.

¹² Basically, the Lao Government has adopted a five-year plan to implement the public investment programmes (PIP). Thus, it is plausible to assume that the Lao Government might try to finance the public investment either from foreign aid or other sources to achieve the five-year plan for PIP, as it was surely the case that the Lao Government financed the public investment by printing money and drawing down foreign reserves during the 1997-98 period, when they did not receive financial aid to finance the irrigation project. Then, it will be plausible to assume that the public investment will not deter from its historical trend, if the Lao Government could have used financial aid to finance the irrigation project in order to achieve the five-year plan for PIP.

¹³ See Table A7.2.2 for detailed data employed in this simulation.

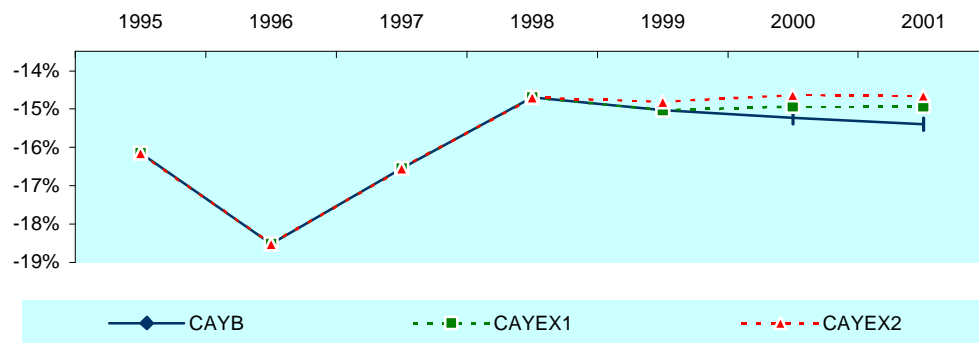
¹⁴ There are volumes of economic literature that provide the explanation for factors determining the movement of FDI inflow across countries. Among others, these factors include the neoclassical theory of capital mobility, the industrial organization approach, the transaction cost or internationalisation theory, Dunning’s eclectic theory and Komima’s macroeconomic theory of FDI (Sun, 1998). However, the assumption of factors determining the FDI inflows in this experiment is based on the view that policy conditionality attached to aid could help the recipient country to attract foreign private capital. Krueger (1998, p.2010 & p. 2007) remarks on this view that “the present [IMF] programme provides important signals for private creditors” and that “private creditors are often unwilling to extend credit lines unless the [World Bank] and the [IMF] have first signalled their acceptance of economic policies”.

investment is assumed to increase from its historical trend by 5 percent. Other variables follow the same path as in experiment (e1).¹⁵

7.4.2 Counterfactual simulation results

The simulation results are shown in Figures 7.6 and 7.7 below. Figure 7.6 shows that the modification of IMF' conditionality and the strengthening of the Lao PDR's state and institutional capability leads to the improvement of the current account balance. These outcomes are captured by CAYEX1-curve and CAYEX2-curve, respectively. As explained in Section 6.3.2, aid and FDI inflows have contributed to export growth through the investment channel. Therefore, an increase in aid and FDI inflow could have enabled the Lao Government to increase export earning and improve the current account balance.

Figure 7.6: Simulation of the impact of various experiments on current account deficits



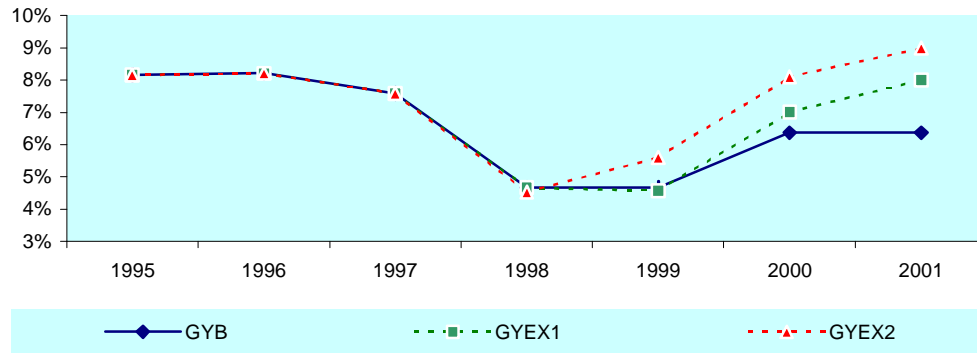
Source: Data extracted from Appendix 7.1, Table A7.1.2.

Figure 7.7 below also illustrates that the modification of the donors' conditionality and the strengthening of the Lao PDR's state and institutional capability make a contribution to output growth. In experiment (e1), the GYEX1-curve captures the benefits of the IMF's financial bailout in the form of a stable aid and FDI inflows, and also in the form of the stability of

¹⁵ See Table A7.2.3 for detailed data employed in this simulation.

macroeconomic environment. With this financial support, the Lao Government would have been able to boost domestic investment. Thus, the economy should have been better off than in the situation without the IMF's financial support. In experiment (e2), the GYEX2-curve captures the benefits of strengthening the state and institutional capacity that could have helped the Lao Government to attract more FDI inflow. This favourable circumstance would have helped the Lao PDR to achieve a rapid growth of real income.

Figure 7.7: Simulation of the impacts of various experiments on output growth



Source: Data extracted from Appendix 7.1, Table A7.1.2.

It is obvious from the counterfactual analysis that the IMF's conditionality and the Lao PDR's state and institutional capability are important for promoting sustainable economic growth. However, as mentioned earlier, the decline in real income and the difficulties to maintain external account balance after the Asian financial crisis were attributed to the weakness of the IMF's policy design and the lack of state and institutional capability in the Lao PDR. In fact, the approximations of actual outcomes of the current account balance and output growth are respectively represented by the CAYB-curve in Figure 7.6 and by the GYB-curve in Figure 7.7. As such, the adverse effect of unstable aid flow on output growth can be measured by comparing the simulation results of the baseline model with the simulation

results of policy experiments. The gap between the GYB-curve and the GYEX1-curve captures the adverse effect of unstable aid flow on output growth arising from the weakness of donors' conditionality. The gap between the GYB-curve and the GYEX2-curve captures the adverse effect of unstable aid flows on output growth arising from the weakness of the Lao PDR's state and institutional capability. The same measure can be applied for current account deficits. As such, the gaps between the CAYB-curve and the CAYEX1-curve and between the CAYB-curve and the CAYEX2-curve capture the adverse effect of unstable aid flows on the current account deficits.

From the above analysis it can be said that the negative effects of unstable aid inflow and a volatile macroeconomic environment have impaired the favourable impact of aid on economic growth. This adverse effect took place due to lack of contingency measures in the IMF's policy designs. This unfavourable situation triggered the instability of aid flow, which was intensified by the Lao PDR's policy mismanagement posed by the lack of state and institutional capacity. Therefore, the instability of aid and FDI inflow could continue to affect the Lao PDR to achieve sustainable economic growth.

7.5 Conclusion

This chapter has analysed the effect of how unstable aid inflow may affect the sustainability of economic growth for the case of the Lao PDR. The weakness of policy conditions designed for aid delivery and also the problems posed by the lack of state and institutional capability for policy implementation have been applied to explain the effectiveness of aid. The analysis carried out here suggests that many symptoms of development failures such as poor quality public services, rampant corruption, fiscal and monetary indiscipline, uncontained current account deficits and the failure to apply the rules and policies predictably can be attributed to the failure to build good governance. This failure decreased the authority and legitimacy

of the government and increased conflict over “rules of the game” for economic and political interactions. These problems in turn have resulted in many developing countries failing to maintain economic growth with external viability. It has occurred regardless of the political regime. There is no exception for the Lao PDR where a one-party political regime has the “leading role” in policy formulation. Although the Lao PDR’s governance system has ensured political stability during the implementation of the “adjustment programmes”, the lack of a legal system and regulatory frameworks remains at individual, institutional and organisational levels. These constraints have retarded the Lao Government’s attempts to translate policy conditionality into administrative actions. The silence of the LPRP’s functions and powers in the constitution, coupled with the LPRP’s interference into the legislative, executive and judiciary branches has also damaged the Lao Government’s administrative capacity to deliver its functions, and helped to trigger the instability of aid and FDI inflows. The Asian financial crisis when combined with the aforementioned problems had a drastic adverse effect on economic growth.

The effects of the problems caused by the weakness of policy conditionality and the lack of state and institutional capacity of the Lao PDR have been examined using the counterfactual analysis framework. The simulation results show that the failure to improve the policy conditions designed for aid delivery and also the problems of policy mismanagement posed by the Lao PDR’s lack of state and institutional capability, have impaired the country’s ability to raise investment with external viability. This failure in turn impedes the Lao PDR’s efforts to maintain sustainable economic growth. These findings also suggest that the instability of aid inflow tends to create macroeconomic instability at the same time that the “adjustment programmes” was designed to reduce it. The controversy between the policies designed for aid delivery and the “adjustment programmes” played a significant part in reducing aid effectiveness and in disrupting the development process in the Lao PDR. These findings suggest that allowing the recipient country to take the lead in the process of policy formulation and

the pace of policy implementation, and also urging the recipient country to strengthen their state and institutional capability would have reduced the instability of aid flows and improved the effectiveness of aid.

Appendix 7.1: Selected macroeconomic indicators and simulation results of counterfactual analysis

This appendix consists of two tables. Table A7.1.1 presents some macroeconomic indicators. Table A7.1.2 presents the results of policy experiments to disentangle the negative effect of adverse effects of unstable aid inflow from the adverse effect of the Asian financial crisis on economic growth.

Table A7.1.1: Selected macroeconomic indicators: the Lao PDR, 1989-2001

Year	1989	1990	1991	1992	1993	1994	1995
Total exports as % of Total imports	32.7%	42.4%	56.8%	49.1%	55.7%	53.3%	52.8%
Current account balance as % of GDP	-16.6%	-9.7%	2.1%	-3.8%	-3.0%	-6.4%	-7.1%
Budget deficit as % of GDP	-16.4%	-13.5%	-10.6%	-10.0%	-9.2%	-10.8%	-10.1%
Public investment growth	-15.0%	-16.8%	-17.1%	8.8%	9.1%	25.5%	5.5%
Money growth	89.7%	7.5%	15.8%	49.0%	64.6%	31.9%	16.4%
Inflation	66.4%	33.1%	13.3%	9.3%	6.4%	7.7%	20.6%
Exchange rate depreciation	47.4%	18.4%	7.5%	-7.1%	0.7%	0.0%	13.0%
Growth of real GDP	13.4%	6.7%	4.0%	7.0%	5.9%	8.2%	7.0%
Aid as % of GDP	20.3%	17.6%	15.2%	13.9%	15.6%	14.1%	17.3%
Foreign direct investment as % of GDP	0.6%	0.7%	0.9%	0.8%	5.0%	3.9%	5.4%
Year	1996	1997	1998	1999	2000	2001	
Total exports as % of Total imports	46.8%	48.9%	61.7%	59.2%	64.3%	61.7%	
Current account balance as % of GDP	-11.9%	-10.5%	-4.4%	-2.9%	-1.2%	-3.8%	
Budget deficit as % of GDP	-9.0%	-9.6%	-13.9%	-9.3%	-8.2%	-8.2%	
Public investment growth	7.5%	4.9%	9.0%	3.0%	-6.0%	9.8%	
Money growth	26.7%	65.8%	113.3%	86.3%	45.7%	22.6%	
Inflation	12.8%	19.3%	86.1%	128.4%	23.2%	8.4%	
Exchange rate depreciation	14.6%	183.3%	62.2%	77.8%	7.1%	16.6%	
Growth of real GDP	6.9%	6.9%	4.0%	4.0%	5.7%	5.7%	
Aid as % of GDP	18.0%	17.5%	14.2%	15.2%	13.2%	13.9%	
Foreign direct investment as % of GDP	8.6%	4.4%	2.3%	3.9%	4.6%	5.2%	

Source: ADB (various issues), UN (various issues), IMF (various issues).

Table A7.1.2: Simulation results of counterfactual analysis: 1995-2001

Year	1995	1996	1997	1998	1999	2000	2001
GY	7.0	6.9	6.9	4.0	4.0	5.7	5.7
GYB	8.2	8.2	7.6	4.67	4.67	6.37	6.37
GYEX1	8.2	8.2	7.6	4.67	4.57	7.01	8.01
GYEX2	8.2	8.2	7.6	4.54	5.61	8.11	9.00
CAY	-12.4	-17.6	-21.4	-10.6	-10.7	-10.0	-11.5
CAYB	-15.6	-18.0	-16.1	-14.2	-14.5	-14.7	-14.9
CAYEX1	-15.6	-18.0	-16.1	-14.2	-14.5	-14.4	-14.4
CAYEX2	-15.6	-18.0	-16.1	-14.2	-14.3	-14.1	-14.1

Legend: GY is output growth, CAY is current account balance, B is baseline model, EX1 is simulation result of experiment 1, and EX2 is simulation result of experiment 2.

Appendix 7.2: Data used in the counterfactual analysis

This appendix consists of three tables. Table A7.2.1 presents data used to create the baseline model. Table A7.2.2 presents data used for the policy experiment to disentangle the effect that the improvement in donors' conditionality may have on output growth and the current account deficit. Table A7.2.3 presents data used for the policy experiment to disentangle the effect that the improvement in the state and institutional capability of the Lao PDR may have on output growth and the current account deficit.

Table A7.2.1: Data used for creating the baseline model

Year	IGY	GLE	DWEA	YF	MCY	FDIY	REER	INF
1998	15.5	-61.5	0	1	12	2.3	80	12.8
1999	14.4	-73.4	0	1	12	3.9	80	71.2
2000	12.8	-30.8	0	1	12	4.6	80	120.4
2001	13.3	-5.7	0	1	12	5.2	80	36.1

Legend: *IGY* is public investment, *GLE* is the growth rate of effective labour force, *DWEA* is dummy variable *YF* is the weighted average by trade share of growth in per capita income of the Lao PDR's trading partners, *MCY* is imports of consumption goods, *FDIY* is total foreign direct investment, *REER* is the real effective exchange rate, *INF* is inflation rate.

Table A7.2.2: Data used for experiment 1

Year	IGY	GLE	DWEA	YF	MCY	FDIY	REER	INF
1998	15.5	-63.5	0	1	12	2.3	80	12.8
1999	14.4	-56.8	0	1	12	3.9	100	12
2000	12.8	-12.3	0	1	12	4.6	100	12
2001	13.3	-5.8	0	1	12	5.2	100	12

Legend: *IGY* is public investment, *GLE* is the growth rate of effective labour force, *DWEA* is dummy variable *YF* is the weighted average by trade share of growth in per capita income of the Lao PDR's trading partners, *MCY* is imports of consumption goods, *FDIY* is total foreign direct investment, *REER* is the real effective exchange rate, *INF* is inflation rate.

Table A7.2.3: Data used for experiment 2

Year	IGY	GLE	DWEA	YF	MCY	FDIY	REER	INF
1998	15.5	-63.5	0	1	12	4.8	80	12.8
1999	14.4	-56.8	0	1	12	5.3	100	12
2000	12.8	-12.3	0	1	12	5.9	100	12
2001	13.3	-5.8	0	1	12	6.4	100	12

Legend: *IGY* is public investment, *GLE* is the growth rate of effective labour force, *DWEA* is dummy variable *YF* is the weighted average by trade share of growth in per capita income of the Lao PDR's trading partners, *MCY* is imports of consumption goods, *FDIY* is total foreign direct investment, *REER* is the real effective exchange rate, *INF* is inflation rate.

Chapter 8

SUMMARY AND FURTHER RESEARCH

The evidence over the long term shows that when per capita income increases in LDCs, there is strong domestic savings effort... if growth can be sustained, therefore, significant increases in domestic resource mobilization may be expected which would, in due time, reduce dependence on external finance and usher in the possibility of a more self-sustained growth process.

UNCTAD (2000a, p. iii)

...States can improve their capabilities by reinvigorating their institutions. This means not only building administrative or technical capacity but instituting rules and norms that provide officials with incentives to act in the collective interest while restraining arbitrary action and corruption. An independent judiciary, institutional checks and balances through the separation of powers, and effective watchdogs can all restrain arbitrary state action and corruption. Competitive wages for civil servants can attract more talented people and increase professionalism and integrity...

Stiglitz (1998, p. 29)

8.1 Introduction

The belief that foreign aid promotes sustainable economic growth in developing countries has permeated much thinking in international development co-operation throughout the past decades. Particularly since the 1980s, aid donors have attached policy conditionality to aid that aimed to support the aid-receiving country to achieve economic growth with external viability. The quests for the effectiveness of aid have been focused on the link between economic growth and the internal and external balances, as explained in the two-gap model. A number of aid effectiveness studies have also incorporated variables for policy indices, institutional quality and political instability into the analytical framework in order to ascertain the effectiveness of aid. However, there remains no clear-cut explanation as to

why policy conditionality attached to aid might not always promote sustainable economic growth in many developing countries.

To a great extent the perceived lack of evidence on the effectiveness of aid has generally been blurred by an incomplete theory of the aid-growth nexus, and by the associated econometric methodologies applied. As such, this study has developed a theoretical model of the aid-growth nexus to include the problems of policy conditions designed for aid delivery and policy mismanagement in the recipient country caused by the lack of state and institutional capability. The aid-growth theory has been empirically tested for the case of the Lao PDR using two macroeconomic models. The hypothesis relates to whether policy conditionality attached to aid does or does not help the recipient country to raise investment with external viability. A summary of the contributions to knowledge on the effects of foreign aid on economic growth, and the implications for policy makers are provided in Section 8.2. Some suggestions for further research in this area are discussed in Section 8.3.

8.2 Summary and implications

The discussions in Chapter 1 indicate that sound economic management and the quality of state and institutional capability in the recipient country do matter for the improvement of aid effectiveness. Chapter 2 has clarified this point by surveying the literature on aid effectiveness. It is obvious from this survey that there remains no clear-cut explanation for the interactive effect of aid and policy conditionality on economic growth in two strands of aid effectiveness studies. The first strand of aid effectiveness studies focused on the effects of aid on economic growth within the framework of growth theories. Many aid effectiveness studies have drawn on a flourishing empirical growth literature to employ sophisticated models to address some of the theoretical and econometric weaknesses of earlier aid effectiveness studies. In these aid effectiveness studies, attention has been paid to the changes in recipient country's policies and institutions that may influence

economic growth. The studies also regard political stability, a stable macroeconomic environment, an open trade regime, protection of property rights and the improvement in the quality of public services as factors necessary to maintain sustainable economic growth. However, the studies have failed to explain why these factors had more positive outcomes in some countries than others, and some circumstances rather than others. The studies have also failed to explain why these same positive outcomes may or may not be sustainable. In other words, little attention has been paid to the heterogeneous nature of the developing world. The presumption that all economies are similar and thus will respond in a similar manner to the same policy changes does not always hold.

The second strand of aid effectiveness studies has focused on the possibilities that higher aid inflows may not always raise investment, as assumed in the “two-gap” theory. One possibility is that an increase in aid inflow may displace domestic savings and/or “crowd out” private investment. This circumstance could be related to the behaviour of the recipient government in conducting fiscal policy to accommodate aid inflow. In other words, if an increase in aid inflow is used to invest in low productivity sectors and/or to increase government consumption spending and/or to reduce tax revenue, that would make aid less effective and discourage domestic savings and investment. This is due to the issue of aid fungibility. Another possibility is that foreign aid may impair economic growth via the impact of a high level of aid inflow on the real effective exchange rate. This impact could erode export earnings, which in turn reduces the ability to import capital goods. Thus, the recipient country might be unable to increase investment as required. This is also the well-known issue of the “Dutch disease”. However, the aid effectiveness studies have failed to question the quality of policy design to mitigate the side effects arising from the crowding-out effect of fiscal policy and the issue of “Dutch Disease”. In fact, the set of policy prescriptions propagated through the “adjustment programmes” has overlooked the underdeveloped nature of the Least Developed Countries

(LDCs) economies. Essentially, this set of policy prescriptions has neglected the structural constraints faced by many LDCs, such as an extremely low level of domestic savings, a lack of legal and regulatory frameworks, a vulnerable indigenous private sector, a lack of market access for their export commodities and a high degree of vulnerability to external shocks. Therefore, it was often the case that policy prescriptions under the Washington Consensus could only solve parts of the problems facing the LDCs' development efforts.

To clarify the aforementioned problems of aid effectiveness, a theoretical model of the aid-growth nexus has been developed in Chapter 3. The analytical framework has been derived from the development issues facing LDCs. The problems of policy conditionality and policy mismanagement in the recipient country have been included in the analytical framework. It has been argued that the interruption of the "adjustment programmes" often relates to inadequate policy design (i.e., lack of contingency measures to deal with external shocks, and tensions between policy conditionality and the recipient country's national sovereignty) and the problems caused by the lack of state and institutional capability (i.e., lack of enforcement of the rule of law and problems of policy mismanagement).

The interruption of the "adjustment programmes" in turn leads to the instability of aid flows. Two testable propositions have been demonstrated to explain why policy conditionality attached to aid might not always promote sustainable economic growth in the LDCs. First, the model has simulated that a stable aid flow contributes to economic growth even when aid is fungible. Second, the model has also simulated that unstable aid inflow impairs the favourable effect of stable aid inflow. The theoretical analysis undertaken here makes a contribution to the knowledge of aid effectiveness in the LDCs. It is suggested that the contribution of aid to economic growth depends not only on the ability of aid to increase investment in the recipient country but also the quality of policy conditionality and the state and

institutional capability of the recipient country to implement policy conditionality.

To test the hypothesis established above, in Chapter 4 two macroeconometric models have been developed for a case of the Lao PDR. These macroeconometric models are developed to test the economy-wide effects of aid resulting from the imposition of policy conditionality by aid donors. This analysis therefore departs from the traditional aid fungibility and aid-growth models. The macroeconometric technique has been utilized to solve the methodological weakness in the aid fungibility and aid-growth models makes a contribution to knowledge. As the conventional model of aid fungibility confines itself only to the government sector, the macroeconometric model of aid fungibility model developed here allows aid inflows to have direct, indirect and feedback effects on public investment, private investment and external trade. As applied to the case of the Lao PDR, the effects of stable aid inflows on economic growth have been assessed through the potential side effects of aid fungibility on domestic investment. The Lao Government's fiscal behaviours in response to aid inflows have been captured through the coefficient of aid fungibility.

Regarding the macroeconometric model of the aid-growth nexus, the standard neo-classical growth model has been modified to integrate several aspects of the potential effects of capital flows on the Lao PDR's economy, as explained by the two-gap model. The contribution here for the aid-growth nexus is that the model is analysed to track the dynamic impact of capital inflows through the direct and indirect effects of capital inflow on the investment and trade sectors. The dynamic multiplier analysis is employed to measure the interactive effect of aid and policy conditionality on economic growth. In this context, the aid-growth coefficient implicitly represents the interaction between aid and the state and institutional capability and the effect of this interaction on the Lao PDR's economic growth. This technique avoids the weakness of including policy and institutional indices as generally encountered in the traditional aid-growth regression.

The macroeconometric model of aid fungibility employed in Chapter 5 addresses the issue of selective strategies for aid allocation in the case of the Lao PDR. The analysis in this Chapter provides an empirical contribution to knowledge of aid effectiveness literature. The empirical finding in Chapter 5 reveals that aid was fungible but it did not crowd out private investment in the Lao PDR. In displacement theory, the existence of aid fungibility has always been attributed to malicious intent by the aid-receiving country. However, the empirical finding in this chapter implies that aid fungibility is associated with the lack of institutional capacity and the extreme poverty of the country. For example, the observed decline in tax revenue was rooted in the country's extremely low tax base and the lack of fiscal regulatory framework to ensure the efficiency of tax collection. From this viewpoint, it would be wrong for the donors to use the aid fungibility issue to exclude poor countries from receiving aid. As for the effect of aid fungibility on investment, the indication that aid fungibility did not crowd out private investment may be evidence of the improvement in fiscal discipline. In fact, as policy conditionality attached to aid often requires the recipient country to reduce its domestic borrowing, this leaves more resources available for increased investment by the private sector. Therefore, imposition of the donors' conditionality on fiscal policy reforms makes an increase in aid inflow complementary to, and reduces the potential side effects of, aid fungibility on private investment.

Given that a high level of stable aid inflow did not crowd out private investment, a macroeconometric model of the aid-growth nexus has been employed in Chapter 6 to further explore the effects of stable aid flow on economic growth. The analysis carried out in this Chapter involves an empirical contribution to knowledge of the aid effectiveness literature. The finding indicates that aid does contribute to economic growth through public investment. The effect of the "adjustment programmes" on economic growth also reflects the trade-off between short-run stabilisation measures and long-run structural adjustment measures to support economic growth. In other

words, the stabilisation measures, including budget cuts and inflation reduction, are found to have a negative effect on private income and social spending. Thus, stabilisation programmes retarded economic growth in the short run. However, the success in restraining the demand side of the economy at the outset of the “adjustment programmes” in the early 1990s brought about stability in the macroeconomic environment. This favourable environment enabled the Lao PDR to make progress in implementing the structural adjustment programmes during the 1990-97 period. A large amount of stable aid and FDI inflows in this period released the foreign exchange constraints on capital imports, which in turn contributed to strong growth in the export sector and enabled the Lao PDR to achieve higher economic growth with external viability.

The analysis carried out in Chapters 5 and 6 reveals that stable aid inflows contribute to economic growth even when aid is fungible. This implies that the success in implementing policy conditionality along with stable aid flows improves the effectiveness of aid. However, whether this outcome is sustainable relies not only on improved and appropriate policy conditionality but also on building good governance through strengthening state and institutional capacity. Therefore Chapter 7 has evaluated the role of state and institutional capability (i.e. good governance) in implementing policy conditionality. The findings seem to suggest that lack of state and institutional capacity creates many symptoms of development failures such as poor quality public services, a lack of fiscal and monetary discipline, an unsustainable current account deficit and rampant corruption. These symptoms occur regardless of the political regime. These problems, coupled with an inadequate policy design for aid delivery clearly reflect the impossibility of rigorously enforcing policy conditions.

Chapter 7 also contributes to the knowledge of aid effectiveness by demonstrating that while a stable aid flow has an overall favourable effect on economic growth, the existence of temporary unstable aid flows impairs this effect. To capture the effect of an unstable aid inflow on economic growth,

counterfactual analysis is employed. In the case of the Lao PDR, the interruption in the “adjustment programmes” was due to forward-looking investment disagreements over the irrigation project, as well as a large current account deficit at the time of the Asian financial crisis that led to the withholding of financial aid by the IMF and other donors. Interruption in aid flows has resulted in economic volatility, which in turn reduced investment and led to a slow down in economic growth. This finding implies that policy conditionality in the form of an “adjustment programmes” when attached to aid can tend to conflict with its stated objective in promoting the stability of a country’s macroeconomic environment and the sustainability of its economic growth. This could be an explanation as to why policy conditionality attached to aid might not always promote sustainable economic growth. To improve the effectiveness of aid, it is necessary to ensure that the diagnosis for policy formulation for each LDCs is right. This demands a constructive policy dialogue between the donor and recipient countries. There is nothing wrong in allowing the recipient country take the lead in the process of policy formulation and the pace of policy implementation. In addition, promoting national sovereignty, increasing aid coordination and urging the recipient country to build good governance are certainly the right way to improve the effects of international development cooperation in the 21st century.

8.3 Further research

It is important to recall that this study emphasised strategies for maintaining economic growth with external viability which is at the heart of any successful development for developing countries. Development success depends on establishing a virtuous circle between investment, exports and savings to ensure that a country is able to raise investment with external viability.

It is obvious from this study that the Lao PDR’s ability to raise investment remains heavily reliant on the stability of foreign capital inflows and adequate reforms in the state and institutions. However, the analysis carried

out in this study did not elaborate on ways to strengthen state and institutional capability to ensure that the country could achieve sustainable economic growth. Particularly, issues of maintaining the external viability are often related to adopting a prudent macroeconomic policy, attracting foreign aid and foreign direct investment and access to international trade. These are some very complex issues still to be evaluated. How to advance the capacity and capability of the state and institutions to improve the macroeconomic environment deserves further study.

In addition, the main contribution of this study lies in the application of macroeconometric modelling to analyse the potential effects of foreign aid on economic growth. Although the models are capable of explaining how aid inflow may influence economic performance in the Lao PDR, the model developed in this study is in the aggregate form. It would be more interesting if the impact of aid on economic growth can be desegregated in at least three major sectors: (i) the agricultural sector, (ii) the industrial sector and (iii) the services sector. By doing this, the channels through which aid may affect economic growth could be highlighted.

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