ASIA-PACIFIC DEVELOPMENT JOURNAL

Vol. 22, No. 1, June 2015

IN THIS ISSUE:

UNITED NATIONS
ESCAP
Economic and Social Commission for Asia and the Pacific

The secretariat of the Economic and Social Commission for Asia and the Pacific (ESCAP) is the regional development arm of the United Nations and serves as the main economic and social development centre for the United Nations in Asia and the Pacific. Its mandate is to foster cooperation among its 53 members and 9 associate members. It provides the strategic link between global and country-level programmes and issues. It supports Governments of countries in the region in consolidating regional positions and advocates regional approaches to meeting the region's unique socioeconomic challenges in a globalizing world. The ESCAP secretariat is in Bangkok. Please visit the ESCAP website at <www.unescap.org> for further information.

The shaded areas of the map indicate ESCAP members and associate members.

Cover design by Bryan Joseph Granados Sabroso

ASIA-PACIFIC DEVELOPMENT JOURNAL

Vol. 22, No. 1, June 2015

United Nations
New York, 2015

ECONOMIC AND SOCIAL COMMISSION FOR ASIA AND THE PACIFIC

ASIA-PACIFIC DEVELOPMENT JOURNAL

Vol. 22, No. 1, June 2015

United Nations publication
Sales No. E.15.II.F.16

Manufactured in Thailand
November 2015 - 700
ISBN: 978-92-1-120702-6
e-ISBN: 978-92-1-057633-8
ISSN: 1020-1246
ST/ESCAP/2725

Advisory Board

Members

Dr. YILMAZ AKYÜZ
Chief Economist, South Centre (former Director and Chief Economist, United Nations Conference on Trade and Development (UNCTAD)), Switzerland

Dr. RASHID AMJAD
Vice-Chancellor, Pakistan Institute of Development Economics (PIDE), Pakistan

Dr. MYRNA AUSTRIA
Vice-Chancellor for Academics, De La Salle University, the Philippines

PROFESSOR RAJESH CHANDRA
Vice-Chancellor and President, University of the South Pacific, Fiji

PROFESSOR TAKATOSHI ITO
Graduate School of Economics and Graduate School of Public Policy, University of Tokyo, Japan

Dr. MURAT KARIMSAKOV
Chairman of the Executive Body of the Eurasian Economic Club of Scientists, Kazakhstan

Dr. SAMAN KELEGAMA
Executive Director, Institute of Policy Studies, Sri Lanka

PROFESSOR DEEPAK NAYYAR
Jawaharlal Nehru University (former Chief Economic Adviser to the Government of India), India

PROFESSOR REHMAN SOBHAN
Chairman, Centre for Policy Dialogue, Bangladesh

Dr. CHALONGPHOB SUSSANGKARN
Distinguished Fellow, Thailand Development Research Institute, Thailand

PROFESSOR YU YONGDING
Chinese Academy of Social Sciences, China

Editor

Dr. Aynul Hasan
Director, Macroeconomic Policy and Development Division

Editorial statement

The *Asia-Pacific Development Journal* is published twice a year by the Economic and Social Commission for Asia and the Pacific.

Its primary objective is to provide a medium for the exchange of knowledge, experience, ideas, information and data on all aspects of economic and social development in the Asian and Pacific region. The emphasis of the *Journal* is on the publication of empirically based, policy-oriented articles in the areas of poverty alleviation, emerging social issues and managing globalization.

Original articles analysing issues and problems relevant to the region from the above perspective are welcomed for publication in the *Journal*. The articles should have a strong emphasis on the policy implications flowing from the analysis. Analytical book reviews will also be considered for publication.

Manuscripts should be sent to:

Chief Editor
Asia-Pacific Development Journal
Macroeconomic Policy and Development Division
ESCAP, United Nations Building
Rajadamnern Nok Avenue
Bangkok 10200
Thailand
Fax: 66 2 288-3007 or 66 2 288-1000
E-mail: escap-mpdd@un.org

ASIA-PACIFIC DEVELOPMENT JOURNAL

Vol. 22, No. 1, June 2015

CONTENTS

Explanatory notes

References to dollars ($) are to United States dollars, unless otherwise stated.

References to “tons” are to metric tons, unless otherwise specified.

A solidus (/) between dates (e.g. 1980/81) indicates a financial year, a crop year or an academic year.

Use of a hyphen between dates (e.g. 1980-1985) indicates the full period involved, including the beginning and end years.

The following symbols have been used in the tables throughout the journal:

Two dots (..) indicate that data are not available or are not separately reported.

An em-dash (—) indicates that the amount is nil or negligible.

A hyphen (-) indicates that the item is not applicable.

A point (.) is used to indicate decimals.

A space is used to distinguish thousands and millions.

Totals may not add precisely because of rounding.

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

Where the designation “country or area” appears, it covers countries, territories, cities or areas.

Bibliographical and other references have, wherever possible, been verified. The United Nations bears no responsibility for the availability or functioning of URLs belonging to outside entities.

The opinions, figures and estimates set forth in this publication are the responsibility of the authors and should not necessarily be considered as reflecting the views or carrying the endorsement of the United Nations. Mention of firm names and commercial products does not imply the endorsement of the United Nations.

STRONG OR WEAK SUSTAINABILITY: A CASE STUDY OF EMERGING ASIA

*Anamika Barua and Bandana Khataniar**

Sustainability can be weak or strong, depending on the nature of capital accumulation. Weak sustainability is characterized by a non-declining combined stock of capital and assumes that man-made capital can be replaced with natural capital. Strong sustainability, on the other hand, implies that natural capital cannot be replaced by any other capital. Based on this understanding, the present study analysed the growth patterns of 10 emerging Asian economies using time-series data over a 20-year period. For this purpose, the study used genuine savings as an indicator of weak sustainability and ecological footprint as an indicator of strong sustainability. The study found that the selected Asain economies, particularly the middle-income countries, are following a path of weak sustainability. While the high-income countries are gradually making an attempt, through various policy interventions, to move from a path of weak to strong sustainability, despite genuine savings having stabilized their ecological footprint per capita continues to show an increasing trend.

JEL classification: P28, Q01, Q56, Q57.

Keywords: Sustainable development, weak sustainability, strong sustainability, ecological footprint, genuine savings.

* Anamika Barua, Associate Professor (e-mail: anamika.barua@gmail.com; abarua@iitg.ernet.in), and Bandana Khataniar, Research Scholar (e-mail: bandanakhataniar@gmail.com; k.bandana@iitg.ernet.in) are from Department of Humanities and Social Sciences, Indian Institute of Technology Guwahati, Guwahati 781039, Assam, India. The authors are deeply indebted to Dr. Elias Lazarus, Research Scientist of the Global Footprint Network for helping to collect data on ecological footprints and biocapacities for the selected countries under study. The authors are also grateful to the anonymous referees of the *Asia-Pacific Development Journal* for their valuable comments.

I. INTRODUCTION

Economic growth is considered to be a prerequisite for meeting the basic needs of a society. Nevertheless, economic growth alone is not sufficient to enhance well-being, although it plays a pivotal role in increasing the purchasing power of people and thus provides greater opportunity to raise their standard of living. Economic growth depends not only on human capital, but also on environment or natural capital.[1] Continuous economic expansion may lead to a loss of the services provided by natural capital, which in turn may place a limit on growth. However, economists, until recently, held the view that the environment is a subset of the economy and the economy can grow forever. The only role that nature plays in economic growth processes is as a source of raw materials and as a sink to absorb the waste products of economic activities. This narrow view of environment has led to the depletion of natural resources at a rate faster than the replenishment rate, generating pollution beyond the assimilative capacity of nature.

Discussions on the impact of human-led economic activities on the environment started to gain popularity in the 1960s with the works of certain scholars from interdisciplinary fields (Carson, 1962; Boulding, 1966; Daly, 1968; Ayres and Kneese, 1969; Georgescu-Roegen, 1971). Although diverse in nature, all these works suggested an interaction between the economy and the environment. Boulding (1966) pointed out that it is not possible to have limitless growth in a finite world. This is because the economy is part or a subsystem of a whole ecosystem, namely that of the environment (Daly and Farley, 1994; Getzner, 1999). Therefore, the economy cannot grow forever, as growth is limited by the availability of natural resources or the environment (Daly and Farley, 1994; Lawn and Clarke, 2010; Asici, 2013).

These studies have shown that there is reason to be concerned about the future of humankind and a need to put constraints on economic activities that stem from both human and physical interactions of the economy and the environment (Stern, 1997). Hence, sustainable development is concerned with development not only for the present generation, but also for future generations. In other words, this definition of sustainable development emphasizes that for development to be sustainable intergenerational equity is achieved when each following generation has at least as much capital at its disposal as the preceding generation (Figge, 2005). Though this idea has been widely accepted, there is a great deal of debate concerning the question of whether one form of capital (e.g. natural capital) can be substituted for

[1] Natural capital is the range of functions that the natural environment provides for humans and for itself. Traditional economists have defined capital as a produced means of production, where the term “produced” implies “produced by humans” (Costanza and Daly, 1992). Ecological economists have broadened the definition of capital to include the means of production provided by nature.

another form of capital (e.g. human-made capital). Based on this capital approach, two schools of thoughts have emerged: weak sustainability and strong sustainability. Weak sustainability, which stems from the prevailing environmental-economic theories, assumes that the total capital stock is an aggregate stock of man-made and natural capital and so there are no natural resources that cannot be replaced by other forms of capital (Stern, 1997). That is, the theory of weak sustainability is based on the market economy and the whole concept is human centric. This school is strongly opposed and challenged by the strong sustainability school of thought. This school of thought belongs to ecological economics, which does not support the concept of perfect substitutability among capitals. The school believes that substitutability among capitals, especially between natural capital and man-made capital is restricted (Daly, 1990; Gowdy, 2000).

Until now, most studies have analysed one or several countries at one point in time, taking either the weak sustainability indicator or the strong sustainability indicator. For example, Galli and others (2012) have taken the ecological footprint as a strong sustainability indicator for India and China. Lawn and Clarke (2010) used the genuine progress indicator as a weak sustainability indicator to gauge countries' sustainability. You (2011) considered genuine savings as a weak sustainability indicator to measure China's sustainability in terms of energy consumption. In this paper we concentrate on studying the sustainability of a few selected developing Asian economies by considering both weak sustainability and strong sustainability indicators. The reason for choosing both indicators is to enable us to understand the path of development followed by emerging economies. We have used adjusted net savings, also known as genuine savings, as a weak sustainability indicator and the ecological footprint as a strong sustainability indicator to understand which path the selected Asian economies are on. By conducting a trend analysis of the growth patterns using time-series data from 1990 to 2010 for the selected Asian economies, the paper seeks to understand if economic growth is putting pressure on the natural resources of those countries and if resource utilization is related to the increasing size of the economy and population.

The paper is structured as follows: section II discusses the concept of sustainable development; section III describes the study region, data and methodology used to analyse the data; section IV presents the results; and section V concludes with a discussion of the findings.

II. SUSTAINABLE DEVELOPMENT: WEAK AND STRONG

The concept of sustainable development explains the evolution of society from a new perspective. Although the concept took shape in the 1980s, its origin predates that. Natural resources were always considered the primary elements of production and for maintaining a given level of population. However, when population increases, there is an impact on the natural resources themselves, due to increasing demand. In 1798, Thomas Malthus, discussed the effect of population increase on land in his famous book *An Essay on the Principle of Population*. He believed that an uncontrolled increase in population might hamper the development of society (Brander, 2007; Rogers, Jalal and Boyd, 2008). This belief of Malthus can be regarded as the first important step towards the concept of sustainable development. Although current discussions on sustainability are more scientific and include much more important phenomena than Malthus could have included. However, both the present concept of sustainable development and Malthus's view of population growth emphasized the fact that the economy cannot grow forever. The linkage between these two concepts is still relevant for increasing quality of life. Brander, in 2007, revisited this theory in a very scientific way while considering three important elements: the stock of environmental capital; the human use of environmental capital; and population growth. With the help of a formal model of Malthusian demography in the presence of ecological constraints, Brander (2007) concluded that the most fundamental factor in achieving sustainable development was population and the demographic transition to lower fertility.

The next important development was the book entitled *Limits to Growth*, which was commissioned by the Club of Rome and was published in 1972. In its introduction, the authors claimed that if the existing trend continued in the growth of population, industrialization, pollution, food production and resource depletion, then the limits to growth would be reached within 100 years (Meadows and others, 1972). One of the main aims of *Limits to Growth* was to bridge the gap between development and environment. In the same year, the United Nations Conference on the Human Environment was held in Stockholm. This conference turned the environment into a major international issue (Long, 2000). As the result of a recommendation made at that Conference, the United Nations Environment Programme (UNEP) was established in 1972 to focus on environmental action and to coordinate with the United Nations system. Again following the Stockholm Conference, in 1974, a symposium was held in Cocoyoc, Mexico, by UNEP and the United Nations Commission on Trade and Development (UNCTAD) to identify the economic and social factors responsible for environmental deterioration (UNEP, 2003). Right after these seminal works, the first World Climate Conference was held in 1979 in Geneva and in 1980, the World Climate Programme was established to provide a framework for international cooperation on research into important climate issues such as ozone depletion, global warming, etc.

All of the above-mentioned processes increased the need for conservation strategies to incorporate environmental considerations into development planning. In 1980, in an effort to meet one of the objectives of the Stockholm Conference, the World Conservation Strategy was launched by the International Union for Conservation of Nature (IUCN) with the advice, cooperation and financial assistance of UNEP and the World Wildlife Fund (WWF) to address environmental issues where the term "sustainable development" was coined for the first time (Moldan, Janouskova and Hak, 2012). Furthermore, in 1983, the World Commission on Environment and Development (WCED) was formed under the chairmanship of Ms. Brundtland, the then Prime Minister of Norway. The commission published its report in 1987 as *Our Common Future*, which defined sustainable development as "the development that meets the needs of the present generation without compromising the ability of the future generation to meet their needs"(WCED, 1987). It concluded that existing decision-making structures and national-international arrangements could not cope with the demands of sustainable development (WCED, 1987). This definition means that environment[2] is a necessary condition for development. However, how to achieve sustainable development and how to decide whether the present path of development is sustainable or not are still under consideration.

There are many challenges to sustainable development as emphasized by different scholars. *Limits to Growth* identifies population, industrialization, pollution, food production, and resource depletion (Meadows and others, 1972) as some of the challenges to sustainable development. Wackernagel and Rees (1996) argued that the Earth's ecosystem cannot sustain the current levels of human demand for resources and ecological services and they identified the rising levels of carbon dioxide emissions and resource consumption as challenges to sustainable development. Various studies have established that the scarcity of natural resources poses a real constraint on lasting growth. As discussed in the introduction, sustainable development can be looked at from two different points of view. One way is to view the environment in terms of the natural resources or natural capital that are available for wealth creation, and that future generations should have the same ability to create wealth as we have. In other words, future generations will be adequately compensated for any loss of environmental amenity by having alternative sources of wealth creation (Beder, 2000) and hence growth will not stop. This is referred to as "weak sustainability". The weak sustainability concept was the extension of neo-classical theory of economic growth to account for non-renewable or exhaustible natural resources based on the assumption that natural capital can be replaced by man-made capital (Getzner, 1999). According to this view, the total stock of capital must not decline and should remain

[2] Environment refers here to the capacity to supply raw resources and to absorb the end waste products (Daly, 2005).

at least constant for development to be sustainable. The view is based on a belief in technological advancement, which offers the possibility of replacing natural capital with man-made capital. The proponents of weak sustainability looked at environment as a natural resource, which has a monetary value and can be extracted for the benefit of humankind. Economists started looking at sustainable development mostly from the perspective of weak sustainability after the works of some renowned scholars, like Dasgupta and Heal, Hartwick and Solow (see Dietz and Neumayer, 2007). In their works, the authors successfully applied the substitutability assumption of weak sustainability. Furthermore, Hartwick (1978) wrote "no generation short-changes a future generation by depleting the stock of exhaustible resources without providing the future generation with, in some sense, the depleted stock equivalent in the form of reproducible capital". Up until the 1990s, policy discussions and environmental debates focused on this simplified way of understanding economy-environment interaction, namely, that complete substitutability of natural capital with man-made capital is possible.

However, this view was greatly challenged in the 1990s by certain scholars from divergent fields who viewed the environment as offering more than just economic potential that is not substitutable by man-made wealth. They argue that future generations should not inherit a degraded environment, no matter how many extra sources of wealth are available to them. This is referred to as "strong sustainability", and is the second view. The proponents of strong sustainability, such as Daly, Georgescu-Roegen, Ekins, Pearce and Atkinson, who are ecological economists, emphasized that environment performs four categories of functions,[3] for which the total economic value is difficult to calculate. For them the economy is only a "part" of the "whole" ecosystem and hence for sustainable development, both natural and man-made capital must be preserved (Figge, 2005). In 1999, Gowdy and McDaniel (1999) established — by taking the case study of Nauru, a small Pacific Island nation — that weak sustainability is a short-run concept. Nauru has achieved good economic growth at the cost of its natural resource, phosphate. However, as a result of its mining activities, 80 per cent of the island is totally devastated, land has become unusable for habitat, many species have become extinct, many more have become endangered and the nation has become dependent on the global economy (Gowdy and McDaniel, 1999). Beforehand, Pearce (1987) had argued that none of the economic forms could guarantee sustainability. Figge (2005) proved that the theory of

[3] The functions of natural capital can be divided into four categories, namely: (a) a source of raw materials for production and direct consumption, such as food, timber and fossil fuels; (b) a sink to assimilate the waste products of production and consumption; (c) amenity services; and (d) basic life-supporting functions on which human life, as well as the first three categories of functions, depends (Pearce and Turner, 1990; Ekins and others, 2003). Hence, this fourth category is of primary value, whereas the first three categories are of secondary value.

weak sustainability would be applicable only if society were risk neutral, otherwise it would increase the risk for future generations. Dietz and Neumayer (2007) also pointed out that weak sustainability would be true only if there were an abundance of natural resources and their production could be increased by the latest technologies.

However, both the weak and strong sustainability views support the definition of sustainable development given in the Brundtland report and emphasize that development sustains; but the conditions required to achieve strong and weak sustainability are different (Nourry, 2008). The distinction between both is seen mainly in four dimensions, namely: (a) the definition of natural resources; (b) the functions of natural resources; (c) their substitutability; and (d) the relationship between development and the environment.

III. RESEARCH METHODOLOGY

Background of the study region

This section provides a brief discussion of Asia, the economic growth experienced by this region since 1990s and the associated environmental concerns in the region.

The economic miracle in Asia

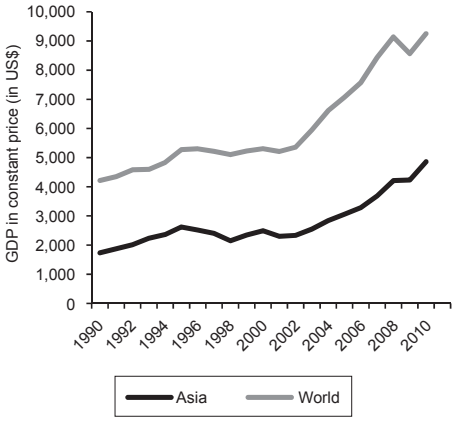
The combined economies of Asia are the third largest in the world after Europe and North America; together they represent the fastest growing region in the world (ESCAP, 2007). Since the 1970s, the economic growth strategies have been very successful in this region where the GDP growth rate over the past two decades has been higher than any other region in the world. During the period from 1990 to 2006, GDP was over $10 trillion (ESCAP, 2007). Consequently, as in 2010, the region has become the engine for global growth, with nearly 20 per cent faster growth than the next fastest growing developing region of the world, Latin America and the Caribbean, by serving as a source of demand for the goods and commodities of other regions (Miller and Plasencia, 2013). The incomparable economic upswing of the region was later referred to as the “Asian miracle” (Weber, 2009). Several factors have been responsible for this miracle (Lee and Hong, 2012), which has been explained by a number of empirical studies. These studies have highlighted factors such as exports, investment, human resources, fertility, and institutional and policy variables, such as trade and globalization (Weber, 2009; Lee and Hong, 2012; Asici, 2013). Economic policies, particularly those relating to openness, have also played a highly significant role in the region’s sustained growth (Lee and Hong, 2012).

As shown in figure 1a below, the region’s average growth rate has increased manifold since 1961, starting from 0.98 per cent in 1961 to 6.6 per cent in 2010,

defying the ongoing global financial crisis (ESCAP, 2012b). The pace of growth has been interrupted twice: in the 1997/98 Asian financial crisis and the 2008/09 global financial crisis. Nevertheless, the region has managed to rebound quickly from both (Lee and Hong, 2012).

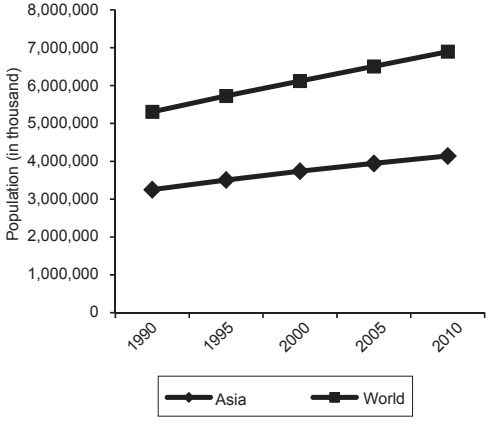
An increasing share of the world's industrial production now takes place within this region; it is also a target market of essential industrial, mining, manufactured and agricultural goods (APFED, 2005). Along with economic growth, population growth is also a major concern in Asia (figure 1b). According to the *Statistical Yearbook for Asia and the Pacific 2011*, approximately 4.2 billion people, 61 per cent of the world's population, lived in the Asian region in 2010 (ESCAP, 2011), an area accounting for only about 30 per cent of the Earth's land mass. Several of the most populous countries in the world are found in the region, including China with 1.35 billion people and India with 1.26 billion (ESCAP, 2012a), together accounting for almost 40 per cent of the world's population (APFED, 2005). According to population projections by the United Nations, a constant increase in population is expected in all subregions of the Asian region.

Figure 1a. Comparison of the global GDP growth rate with the growth rate in Asia, 1990-2010



Source: SEEA (2013).

Figure 1b. Population growth trends in Asia and the world, 1990-2010



Source: ESCAP (2011).

However, the tremendous economic development of the Asian region has largely been driven by adopting a labour-intensive, export-oriented industry development strategy, supported by heavy exploitation of human resources as well as natural resources (APFED, 2005; Jha, 2005). The huge population of the region is also a matter of concern in the region as it is also considered to be a key environmental issue in most of the countries of South Asia and South Pacific (Jha, 2005). Natural resources have been the primary element for production and also for maintaining a given population. However, when population increases, it has some effect on these resources. The "overpopulation school" regards population growth as the main factor behind overuse of natural resources, which leads to environmental degradation (Brander, 2007).

The environmental concerns in Asia

Many researchers, such as Callicot and Ames, Guha, and Pedersen, have established that Asian people are very attached to nature (see Yencken, 2000). According to them, eastern traditions of thought represent nature and the relationship of people to nature, in ways that cognitively resonate with contemporary ecological and environmental ideas. In spite of such a cordial relationship with nature, the Asian Development Bank (1997) claimed that the Asian region had lost half of its forest cover and countless unique animal and plant species during the period from the 1960s to the 1990s and that no other region had as many heavily polluted cities, rivers and lakes as this region had. This is because the economic growth in the region is fuelled by the region's rich natural resources and services. For example, in Thailand, economic activities such as rubber plantations, shrimp farming and cash-crops are contributing to GDP figures at the cost of natural resources, like forests and coastal ecosystems. In the Philippines, mining activities and forest conversion for agricultural expansion are two major economic activities based on its natural resources (Coxhead, 2002). China, India, Pakistan, Indonesia, the Russian Federation, Bangladesh, Thailand, Viet Nam and the Islamic Republic of Iran are the largest consumers of water resources with water withdrawal as high as 70 billion cubic meters per year (ESCAP, 2007). According to the *Statistical Yearbook for Asia and the Pacific 2012*, the region produced more energy than any other region in the world in 2009, accounting for 46 per cent of total global production. At the same time, the region accounted for 50 per cent (up from 38 per cent in 1990) of the world's total carbon dioxide emissions in the same year. China has been the single largest emitter of greenhouse gases worldwide (ESCAP, 2011, 2012a). About 75 per cent of the world's major natural catastrophes between 1970, 1997 occurred in the Asian region, mostly in poverty-ridden developing countries (ESCAP and ADB, 2000). All these catastrophes have increased its effects on the people and the environment due to several factors: high population growth and density, migration and uncontrolled urbanization, environmental degradation and possibly global climate change (APFED, 2005).

Study site selection

The Asian region comprises more than 30 countries. These countries were categorized according to income groups based on the World Bank classification (World Bank, 2011), which states that as of 1 July 2011 (figures for 2010):

(a) Low-income economies are ones in which average income is $1,005 or less;

(b) Middle-income economies, including both upper and lower, are ones in which average income is between $1,006 and $12,275;

(c) High-income economies are ones in which average income is $12,276 or more.

Based on the *Living Planet Report 2012* (WWF, 2012) 20 countries were selected at the first stage[4] (annex I). In the second stage, Japan was excluded since it is a developed country, and the study deals with only developing countries. The other 19 countries were ranked according to the following factors: the intensities of carbon dioxide emissions, ecological deficits,[5] population, urbanization and data availability for the period between 1970 and 2010 (annex II). The following criteria were considered in the third and final stage of selection:

(a) High economic growth rate, which accounts for about 95 per cent of GDP from developing countries in Asia (Lee and Hong, 2012);

(b) High rate of environmental degradation and carbon dioxide emissions;[6]

(c) High population growth rate, which is higher than the world population growth rate of 1.15 per cent in 2010 (ESCAP, 2011);

(d) High rate of urbanization (more than 30 per cent of the total population to be urbanized).

Lack of data for the chosen indicators was a major challenge to consider in all 19 developing Asian countries. Therefore, 10 Asian countries were chosen to take part in the analysis since comprehensive data for the chosen indicators were

[4] The ecological footprint data tables of the ***Living Planet Report 2012*** include footprint data for countries with populations greater than 1 million (WWF, 2012).

[5] Ecological deficit: the gap between 1.0 (the normalized biocapacity) and the country's ecological footprint corresponds to the country's ecological deficit (if the footprint is above 1.0) (Wackernagel and others, 2004b).

[6] For data on carbon dioxide, the ***Statistical Yearbook for Asia and the Pacific 2013*** (Miller and Plasencia, 2013) is relied upon.

available. Therefore, based on the above criteria, 10 developing countries were finally selected — China, India, Indonesia, Malaysia, Pakistan, the Philippines, the Republic of Korea, Singapore, Thailand and Viet Nam. These countries fall under the middle and high-income categories as defined by the World Bank (see above). While China, India, Indonesia, Pakistan, the Philippines, Thailand and Viet Nam are in the middle-income group; Malaysia, the Republic of Korea and Singapore fall under high-income category.

Indicators of sustainable development

In 1992, the United Nations Conference on Environment and Development, which was held in Rio de Janeiro, suggested that sustainable development indicators must be constructed in order to form a useful basis for decision-making (Nourry, 2008). Different scholars describe the necessity and process of measuring sustainable development through indicators. Nourry (2008) states that an indicator of sustainable development must assess human development and sustainability. Many composite indicators have been constructed to measure the sustainability of development. However, the discussion about the best aggregate indicator of sustainability is still ongoing. Until now, no single indicator has done a perfect job to reflect sustainable development (Pillarisetti and van den Bergh, 2007; Nourry, 2008).

Studies have applied various indicators for the purpose of assessing sustainability (for example, Singh and others, 2009; Lawn and Clarke, 2010). Some of the most widely used indicators on the income-environment nexus are genuine savings, otherwise known as adjusted net savings (Hamilton and Clemens, 1999; Nourry, 2008; Mota, Domingos and Martins, 2010; Asici, 2013; Kubiszewski and others, 2013; Greasley and others, 2014); green national net product (Nourry, 2008; Mota, Domingos and Martins, 2010); the system of environmental-economic accounting (Dietz and Neumayer, 2007); the index of sustainable and economic welfare (Nourry, 2008); the ecological footprint (Parker, 1998; Wackernagel and others, 2004a; Lammers and others, 2008; Nourry, 2008; Hubacek and others, 2009; Begum and others, 2009; Galli and others, 2012; Wang, Chou and Lee, 2012); the environmental sustainability index (Pillarisetti and van den Bergh, 2007; Hara and others, 2009); the environmental performance index (Yale Centre for Environment Law and Policy, 2010); the environmental vulnerability index (Kaly, Pratt and Mitchell, 2004; Barnett, Lambert and Fry, 2008), etc.

As discussed in section II, in this study we want to understand the sustainability path that selected emerging Asian economies are following — whether it is a weak sustainability path or a strong one. To do so, two indicators of sustainable development were selected: one is genuine savings and the other is the ecological footprint. The ecological footprint was selected as an indicator of strong sustainability and genuine savings as an indicator of weak sustainability. This is because all the other

indicators mentioned above are either more appropriate to measure quality of life or to assess the likelihood of potential damages caused by environmental problems, or are based on policy performance to reduce environmental stress on human health and to promote natural resource management (Singh and others, 2009). To the best of our knowledge, those two indicators have not been studied together before in any other study using time series data, specifically for the selected Asian countries, to understand the interaction between economic growth and the environment.

Genuine savings: genuine savings, otherwise known as adjusted net savings, were put forward by Pearce and Atkinson in 1993. It is a simple indicator to assess an economy's sustainability. Genuine savings assume that capital stock consists of produced capital, human capital (knowledge, skills, etc.) as well as natural capital (natural resources). Here, all values are monetarized and the aggregation is achieved by simply adding up. Genuine savings are based on the concept of "weak sustainability", which assumes perfect substitutability between physical, natural and human capital (Pillarisetti and van den Bergh, 2007). Out of all the indicators of weak sustainability, genuine savings received considerable recognition for the following reasons: (a) it was developed and published by the World Bank; (b) comprehensive data are available for almost all countries from 1960; (c) it is superior to other indicators in its capacity to represent more broadly the changes in environmental sustainability (Asici, 2013); (d) the natural disinvestment component of genuine savings is measured within the country where extraction/production takes place; and (e) it has considerable scope for future development (Mota, Domingos and Martins, 2010). Therefore, considering genuine savings, it is possible to observe the impact of growth on the domestic environment (Asici, 2013).

Ecological footprint and biocapacity: the concept of the ecological footprint first emerged in the book *Our Ecological Footprint: Reducing Human Impact on Earth*, written by Wackernagel and Rees (1996). In 1997, they attempted for the first time to calculate the ecological footprint and biocapacity systematically. Based on these assessments, an institution, known as Global Footprint Network, started a National Footprint Accounts programme in 2003 (Borucke and others, 2013), which is an accounting framework quantifying the annual supply of, and demand for, key ecosystem services by means of two measures (Wackernagel and others, 2002). The ecological footprint is based on the quantitative land and water requirements to sustain a nation's living standards. The ecological footprint assumes that human extraction of natural resources exceeds the regenerative capacity of the resources, this acts as a limiting factor to economic growth (Borucke and others, 2013). However, the ecological footprint is not a full measure of sustainability as it tracks only one aspect of it, namely: whether humans live within the earth's biocapacity budget. A footprint/biocapacity ratio greater than 1 implies that this aspect of sustainability is not met;

however, a value lower than 1 does not imply that development is sustainable. The ecological footprint has been promoted by the World Wide Fund for Nature (Pillarisetti and van den Bergh, 2007) and its data are also available in its reports. It is based on the same assumptions as the strong sustainability view point. By applying the ecological footprint over time, the progress towards sustainability, or its opposite, can be gauged (Lammers and others, 2008). Biocapacity or biological capacity is a measure of the ecologically productive land available (Ferguson, 2002). Biocapacity is the ability of an ecosystem to produce useful biological materials and to absorb the waste materials generated by humans. The biocapacity of an area is calculated by multiplying the actual physical area by the yield factor and the appropriate equivalence factor. Biocapacity is usually expressed in global hectares.

Population: in the study, population growth was taken as one of the indicators as it is hypothesized that when population increases, consumption also increases and as a result more pressure falls not only on natural resources, but also on human capital. This may hamper the capacity of the environment in the future. The indicator of population is taken as the annual population growth rate.

The hypothesis that this study made was that a country is on a path of strong sustainability if its ecological footprint does not overshoot its biological capacity or biocapacity. If a country's ecological footprint is more than its biocapacity, but its genuine savings indicator has a positive trend then the country will be regarded as weakly sustainable. Otherwise, it will be regarded as not sustainable at all because genuine savings are an extension of the Hartwick rule, where it is assumed that an economy will be sustainable if savings are superior to the aggregated depreciation of human, man-made and natural capital (Hartwick, 1978).

Data and data sources

Time series secondary data have been used in this study. Time series show trends that allow researchers to test the noise in the data (Wackernagel and others, 2004a). It also provides a comparative base for different methodological alternatives. However, in this study a simple trend analysis has been performed using the time series data for a period of 20 years to understand the growth trajectories and related environmental concerns in the selected Asian countries. Various studies have shown that weak sustainability is a prerequisite for strong sustainability (Atkinson and others, 1997; Neumayer, 2003). When a country is weakly sustainable, it has a chance to be strongly sustainable (Mota, Domingos and Martins, 2010). Therefore, the present study has a larger theoretical analysis as it considers both strong sustainability and weak sustainability indicators to understand the present path of development as well as to see whether countries can move from a path of weak sustainability to one of strong sustainability. Hence, unlike other studies we have taken both genuine savings

and ecological footprints and 10 Asian countries. We are also looking at the issues at the policy level, which decides the development path of these countries.

The time series data considered for this study are for the period between 1990 and 2010 for each of the countries under study. Secondary data are taken from the World Bank's World Development Indicators (World Bank, 2013), the Human Development Reports of the United Nations Development Programme (UNDP, 2011), the Global Footprint Network database (GFN, 2012), the Living Planet Reports by the World Wildlife Fund for Nature (WWF, 2012), the *Statistical Yearbook for Asia and the Pacific* by the Economic and Social Commission for Asia and the Pacific (ESCAP, 2007, 2012) and the Asian Development Bank (ADB) reports (ADB, 1997). As discussed in the section on methodology, the indicators considered in this study are: population growth rate, per capita genuine savings (per cent of GNI), per capita ecological footprint in global hectares and per capita biocapacity in global hectares.

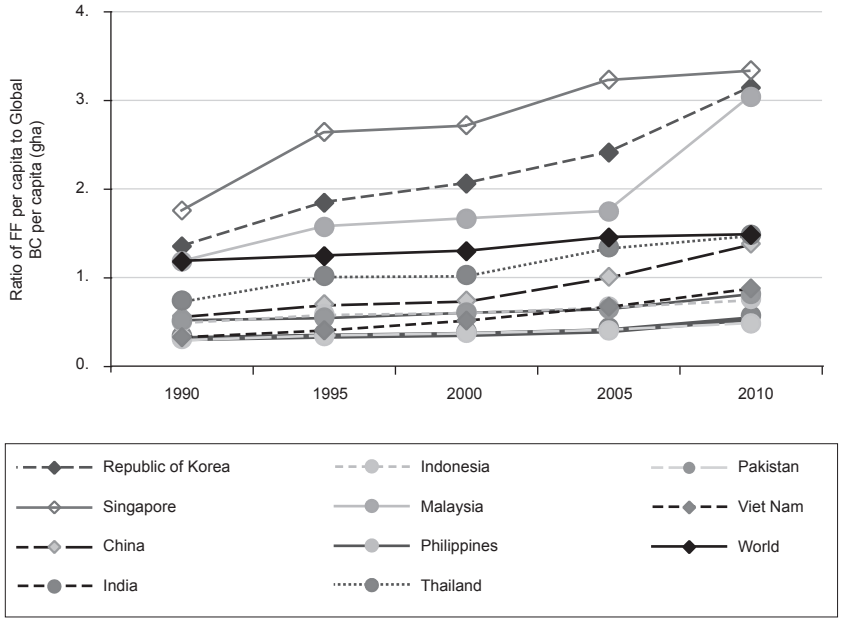
IV. RESULTS

This section discusses the results based on the trend analysis of the secondary data for 20 years (1990-2010) for biocapacity per capita and the ecological footprint per capita for the selected emerging Asian economies. An important caveat is that the results may be biased by the availability of data and the way in which the countries were selected for the study.

Ecological footprint of each income group at the global level

Figure 2 shows the ecological footprint of each country (domestic demand) in comparison with global biocapacity. While at the global level, the per capita ecological footprint has remained largely unchanged since 1990, different patterns of change were found in the two income groups. The high-income countries — Malaysia, the Republic of Korea and Singapore — have high per capita ecological footprints, that is a very high demand for global resources, compared with middle-income countries. In 1990, the average global demand per capita of high-income countries was 3.4 global hectares (gha) and 1.26 gha for middle-income countries. By 2010, the average demand for all the selected countries had increased by a factor of almost 1.5 (an increase of 47.9 per cent).

Figure 2. The ratio of the domestic ecological footprint (per capita) to global biocapacity (per capita), 1990-2010



The interesting thing to note here is that until 1995, the per capita ecological footprint of all the middle-income counties was below the global biocapacity. However, there seems to be a rising trend in these countries, specifically in Thailand and China, where the per capita ecological footprint has increased rapidly since 2000. It is evident from various reports of the Economic and Social Commission for Asia and the Pacific and the Global Footprint Network that the region has posted strong economic growth since 2000, lifting millions of people out of poverty (GFN, 2005; Woetzel, 2014). This holds for both China and Thailand, too. The gross domestic investment rate in Asia also increased in 2010 to 3.9 per cent, up from its negative rate in 2009 (ESCAP, 2012b). The large population and rapidly increasing levels of consumption in Asia and the Pacific make the region a significant contributor to the global ecological footprint. With more than 50 per cent of the world population, rapid economic development and large populations are increasing pressure on different ecosystems of the region, such as coastal, marine and forests. Asia's footprint occupies 40 per cent of available world biocapacity (GFN, 2005). This certainly indicates that there are further pressures on global biocapacity with these developing countries' increasing demand on nature. In short, the general trends include increasing human demand for nature and the transition of middle-income countries from low-footprint

countries to high-footprint countries. This representation also shows how many biospheres would be needed if middle-income countries follow the same pattern of resource consumption as high-income countries.

The ecological footprint by income group at the domestic level

Findings are discussed according to income groups — high and middle (upper and lower) — in the section below.

High-income group

An increase in per capita consumption is the driving variable of natural capital appropriation by high-income countries (see Galli and others, 2012). Malaysia was a middle-income country in 1990. It joined the high-income group in 2002. In 1990 in Malaysia, the ecological footprint per capita was 2.66 gha, which was below its per capita biocapacity of 3.47 gha. However, Malaysia's per capita ecological footprint has now reached 4.86 gha, an 82 per cent increase against a 25 per cent decrease in its per capita biocapacity. This has caused a per capita deficit in biocapacity of 2.25 gha. Genuine savings increased 52 per cent between 1990 and 2010, while GDP rose threefold (figure 3a). However, during the period between 2000 and 2005, Malaysia's genuine savings declined, although they recovered soon after that. The country's population growth slowed from 2.8 per cent in 1990 to 1.6 per cent in 2010. This has happened due to declining birth rates and stabilized death rates over the last two decades (ESCAP, 2007).

The rising share of average per capita ecological footprint is remarkable in high-income countries, particularly in the Republic of Korea, as can be seen from the ecological footprint per capita trend line (figure 3b). Between 1990 and 2010, the trend shifted from 3.04 gha to 4.87 gha per capita. Interestingly, genuine savings in the Republic of Korea showed a 5 per cent reduction in 2010 from its 1990 level. However, total income (GDP) increased almost threefold during the period from 1990 to 2010. In addition, declining birth rates and stabilized death rates made the population growth rate decrease from 1.14 per cent in 1990 to 0.46 per cent in 2010. The same is true for almost all the selected countries — both high income and middle income (ESCAP, 2007).

Figure 3a. Trends of population growth and genuine savings, ecological footprint and biocapacity per capita in Malaysia

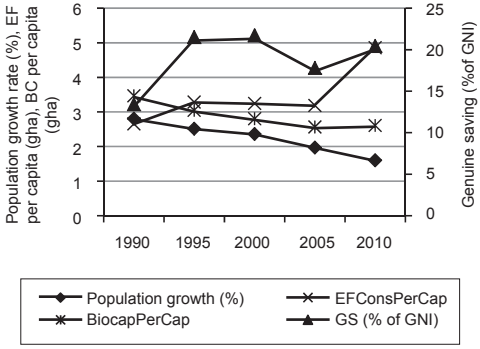
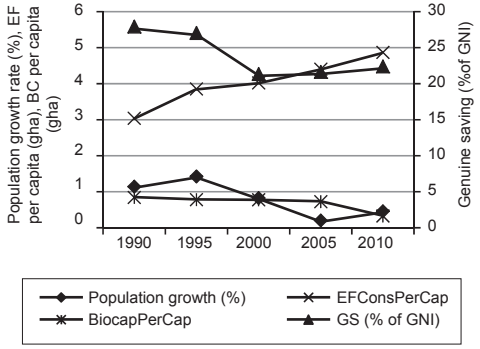
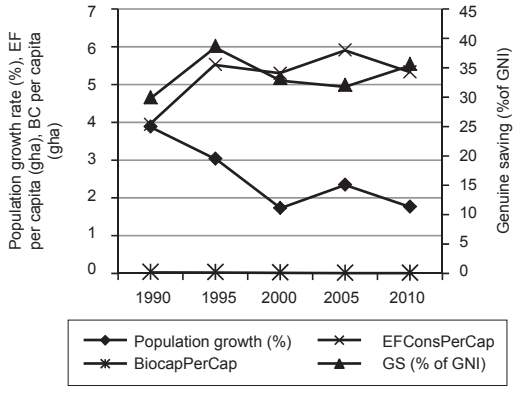


Figure 3b. Trends of population growth and genuine savings, ecological footprint and biocapacity per capita in the Republic of Korea



The ecological footprint of Singapore has increased from 3.95 gha (1990) to 5.34 gha (2010) per capita (figure 3c). Each individual of this country demands 4.8 gha of ecologically productive land, which is higher than the average for high-income countries, that is to say, 3.38 gha per capita (WWF, 2012). There was a 2.11 per cent decline in the overall population growth rate in Singapore during the period from 1990 to 2010. Genuine savings remained more or less steady in Singapore during the study period.

Figure 3c. Trends of population growth and genuine savings, ecological footprint and biocapacity per capita in Singapore



Middle-income groups

All the middle-income countries selected for this study are rich in biocapacity (supply). China (9.9 per cent), India (4.8 per cent) and Indonesia (2.6 per cent) are among the 10 countries that accounted for more than 60 per cent of the Earth's total biocapacity in 2008 (WWF, 2012). The trends show that the selected middle-income countries had more or less the same amount of total average biocapacity during the period from 1990 to 2010. However, in those countries, the increasing trend of the per capita ecological footprint is a matter of real concern. Since 2005, in China (figure 4a) and India (figure 4b) both genuine savings per capita and the ecological footprint per capita have shown increasing trends. Consumption per capita, which is extremely skewed in most of these middle-income countries, with handful of people having access to most of the resources, has played a significant role in increasing the ecological footprint of these nations (Marcotullio, 2001; Galli and others, 2012).

Figure 4a. Trends of population growth and genuine savings, the ecological footprint and biocapacity per capita in China

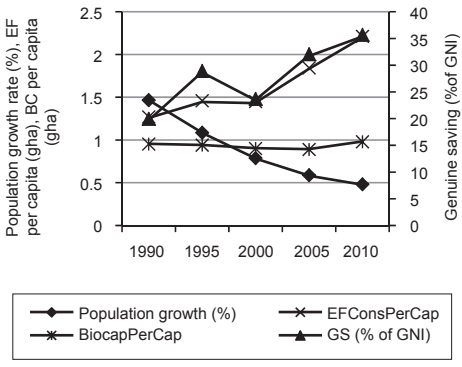
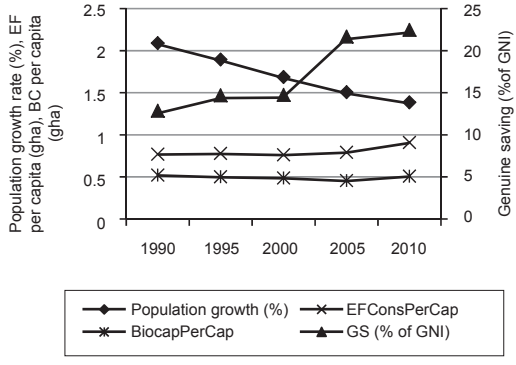


Figure 4b. Trends of population growth and genuine savings, the ecological footprint and biocapacity per capita in India



Indonesia (figure 4c), the Philippines (figure 4d), and Thailand (figure 4e) had very high genuine savings per capita during the period from 1990 to 1995. However, genuine savings started to decline after 1995 and continued on a downward trend until 2000. This was also the time of the East Asian crisis and most of the East Asian countries suffered economic crises. However, this changed after 2000, as all four countries have succeeded in gaining good per capita genuine savings since then. The increase in per capita genuine savings in these countries was accompanied by a significant increase in their per capita ecological footprint.

Figure 4c. Trends of population growth and genuine savings, the ecological footprint and biocapacity per capita in Indonesia

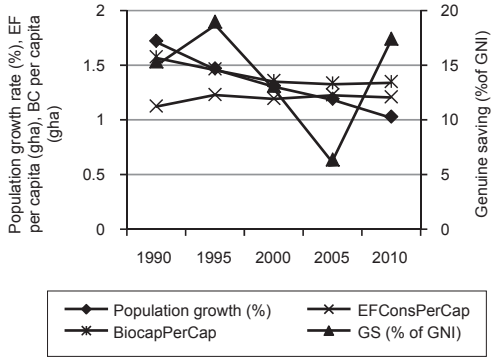


Figure 4d. Trends of population growth and genuine savings, the ecological footprint and biocapacity per capita in the Philippines

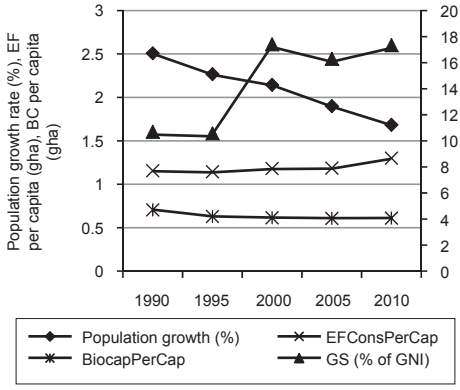
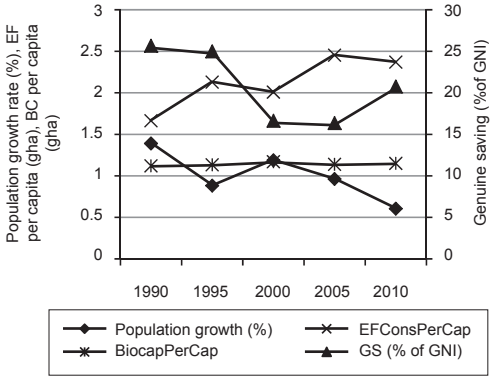


Figure 4e. Trends of population growth and genuine savings, the ecological footprint and biocapacity per capita in Thailand



China and India are the most populous countries among the selected Asian countries, as well as in the world. However, the good news is that population growth rate in all the middle-income countries is on a downward trend (0.86 per cent on average). Pakistan had a biocapacity deficit throughout the study period, during which it saw a significant increase in its population (9 per cent) and a 12 per cent increase in the average ecological footprint. This growing population has to cope with a fixed supply of natural resources, resulting in less available biocapacity per capita. Over the same period, GDP increased almost three times. Pakistan's genuine savings

(figure 4f) increased sharply between 2000 and 2005, after which they declined by 1.3 per cent.

In 1990, Viet Nam had ecological reserves that is the ecological footprint < biocapacity. During that time the country witnessed negative genuine savings rates. Up until this year, Viet Nam had faced a very complicated political situation, which made it difficult for its economy to move forward right after reunification in 1975 (Tho, 2003). In 1986 certain economic reforms were initiated in Viet Nam, in terms of policy measures (known as *Doi Moi*), to create a market economy (Nghiep and Quy, 2000). However, old and thorough steps were taken only after 1990 when the 10-Year Strategy for Socioeconomic Stabilization and Development was adopted for period between 1991 and 2000. Thereafter, by 1995, the country acquired positive genuine savings and gathered momentum. In 1995, the ecological footprint of Viet Nam was 0.84 gha per capita, which increased to 1.4 gha per capita in 2010. Similarly, the genuine savings figure in 1995 was 8.35 (per cent of GNI), which reached 16.3 (per cent of GNI) in 2010. This resulted in a biocapacity deficit. The country, which had a positive ecological reserve in 1990, is now left with deficit ecological reserves after just 20 years, although the country's rate of population growth is declining (figure 4g).

Figure 4f. Trends of population growth and genuine savings, the ecological footprint and biocapacity per capita in Pakistan

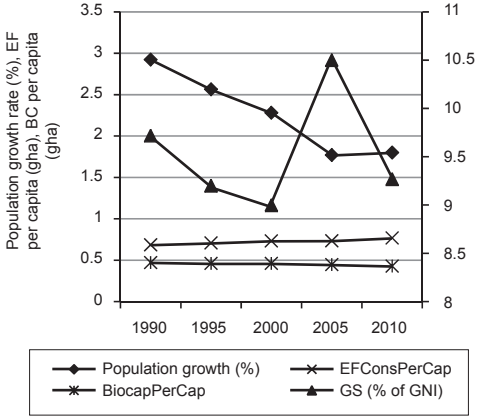
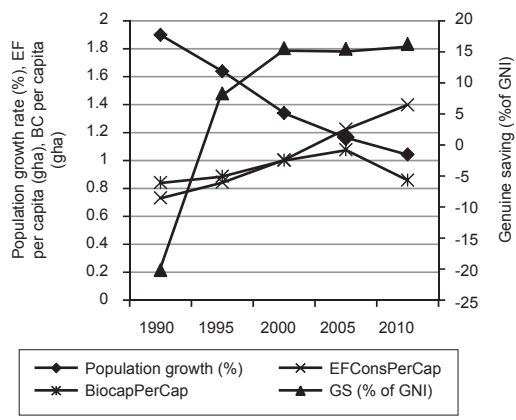


Figure 4g. Trends of population growth and genuine savings, the ecological footprint and biocapacity per capita in Viet Nam



It is important to note here that all the selected middle-income countries are experiencing a slow transition from agricultural economy to industrial economy. According to a recent study conducted by Srinivasan (2013) in six South Asian countries — Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka — during the period from 1995 to 2010, the share of agriculture in GDP declined. According to Akram (2013), there is a strong relationship between urbanization, industrialization and economic growth. Urbanization stimulates industrialization and, consequently, economic growth, and this may have a negative impact on the agriculture sector in the developing countries (Akram, 2013).

V. DISCUSSION AND THE WAY FORWARD

Throughout the period from 1990 to 2010, the average per capita ecological footprint of all the selected developing Asian economies was higher than their average per capita biocapacity, that is, the countries had a significant ecological deficit. This is a clear situation of "overshoot".[7] However, it is important to note that although all 10 countries chosen for the analysis fall into the high- and middle-income groups (as discussed in section III), they are in a state of ecological deficit, with the performance of each group varying with respect to their population growth, ecological footprint, biocapacity and genuine savings per capita.

Performance based on income groups

The high-income countries are characterized by increasing ecological footprints per capita, relatively stable genuine savings per capita, decreasing population growth rates and declining biocapacity per capita. While population growth rates in these countries have remained stable (in fact they have declined), during the study period; the high consumption per capita has resulted in ecological deficits in these countries (Galli and others, 2012). Therefore, the high per capita income of these countries has resulted in high domestic demand for nature.

The middle-income countries are characterized by lower ecological footprints per capita but they have an increasing trend, large populations (with declining growth rates), increasing genuine savings per capita and biocapacity deficits. All the selected middle-income countries, except Indonesia, are facing biocapacity deficits (biocapacity<ecological footprint). As these countries are in a phase of rapid development, mainly through industrialization and trade, they are following the same pattern as high-income countries (Galli and others, 2012). For example, demand for

[7] When the total demand for ecological resources and services exceeds the available supply for a given region, it is called an "overshoot" (Borucke and others, 2013).

nature has increased by 49 per cent, whereas biocapacity has declined by 13.6 per cent. Indonesia is an exception here since there have been increasing demands on its environment in spite of its accelerated economic development between 1990 and 2010. Its genuine savings trend declined (-12.7 per cent) between 1995 and 2005, mainly due to the economic slowdown in recent times. The country is also blessed with large biocapacity (WWF, 2012). However, Indonesia's demand for natural resources since 2005 has started to increase gradually, thus putting pressure on the domestic biocapacity. In 2005, the carbon footprint of the country was 0.09 gha per capita, now it is 0.23 gha per capita, a 156 per cent increase in the last five years, which is definitely a matter of concern (see Weber, 2009; Shrestha, 2013). Shrestha (2013) found that Indonesia had been following an almost market-based economic transformation path and therefore it had been able to reach middle-income status within a short period of time. Pakistan experienced steady growth in genuine savings per capita until 2005 and then a sharp decline between 2005 and 2010. This could be due to the internal conflicts and political instability in this country (Shrestha, 2013). Overall, the trends show that the middle-income countries are currently trying to catch up with the high-income countries; they are also undergoing an economic transformation.

Inferences based on weak and strong sustainability

Based on the time series trend analysis of the variables under consideration (population growth rate, and ecological footprint, genuine savings and biocapacity per capita), it can be claimed that the negative ecological reserves of all the selected countries —high-income and middle-income — make them, in environmental terms, "weakly sustainable nations". It is important to note here that the high-income countries started on a path of weak sustainability by replacing natural capital with man-made capital. This allowed the total stock of capital to grow, which is reflected in increasing genuine savings during the study period. However, in the last decade (since 2000) the genuine savings of these countries has almost remained stable. This could be because these countries have showed a renewed interest in preserving their natural resource base and making efforts to reduce their greenhouse gas emissions. They are working towards achieving "green growth" as they have already achieved high per capita income (ESCAP, 2012a). The Republic of Korea has established a Presidential Commission on Green Growth, which has guided the implementation of its Low Carbon Green Growth development strategy (Marcotullio, 2001; ESCAP, 2012a). Singapore has adopted a series of cleaner environmental campaigns (ESCAP, 1995). "Ecosystem management and biodiversity conservation policies are well developed in Malaysia. Under the Ninth plan (2006-2010), Malaysia has adopted a National Tree Planting Programme for Coastline Protection and some mangrove protection and action plans (Avishek, Yu and Liu, 2012). Adoption of such environmental strategies

has helped these countries in reducing the ecological footprint per capita of these high-income countries.

The middle-income countries started on the path to growth in the 1990s (Shrestha, 2013). Economic development of these countries requires measures to improve their socioeconomic status. These measures may be high investment rates, infrastructure construction, health facilities expansion, adoption of new technologies, innovative practices, job creation inside the economy, etc. (Shrestha, 2013). As such, the focus of these countries seems to be on increasing the total stock of capital, even if it is at the cost of degradation of natural capital. Ewing and others (2008) claimed that human demand had exceeded the global biocapacity in the 1980s. Hence there is a possibility that growth-oriented development of the middle-income countries under study may further widen this gap. However, as Galli and others (2012) have already pointed out, the major concern in these countries is growing population, which has a positive relationship with resource utilization. The high population pressure in these countries has continued to put pressure on natural resources. Due to the large population size these countries may take longer to reach the per capita income of high-income countries and during that time there could be irreversible damage to the natural resources of these countries. Increasing genuine savings per capita and a steady increase in the ecological footprint per capita indicate that they are following a path of weak sustainability. It remains to be seen how long these countries will continue to move on this path, as at present the economies of these countries are mostly dependent on natural resource intense sectors (see Sachs and Warner, 1997; Coxhead, 2004).

Thus, our study found that in the selected Asian countries, in their pursuit of achieving higher economic growth and standards of living, resources have been exploited at a rate much faster than the regenerative capacity of nature. When economies first began on a path of growth, mainly in a rich natural resource region like Asia, natural capital was not scarce. In this "empty world"[8] the opportunity cost of expanding economies was insignificant (Daly and Farley, 1994). However, continued growth of the physical economy into a finite and non-growing ecosystem will eventually lead to a "full world"[9] economy, in which the opportunity cost of growth is significant. It is important to realize that growth has a cost, since an economy is

[8] Empty world: relatively empty of human beings and manmade capital as Daley and Farley (1994) defined. In this situation both natural resources and natural capital were considered comparatively free of costs, except the costs of extraction. Therefore, there seems to be no constraint on the economy.

[9] Full world: in this situation, the world is relatively full of human beings (Daly and Farley, 1994). Daly and Farley wrote that "in the era of full-world economics, this threat is real and is met by liquidating stocks of natural capital to temporarily keep up the flow of natural resources that support the value of manmade capital".

not expanding into a void. Our results show that the selected Asian countries are already approaching such a full-world situation. The results essentially confirmed that the domestic biocapacity of the selected Asian countries is under pressure due to the current growth patterns. Thus, it is important for the countries to understand that human development, whether social, economic or technical, depends upon the health of our ecosystem. Thus, to achieve strong and sustainable economic growth, there is a need to shift from weak sustainability to strong sustainability.

REFERENCES

Asian Development Bank (ADB) (1997). *Emerging Asia: Changes and Challenges*. Manila.

Akram, N. (2013). Empirical examination of debt and growth nexus in South Asian countries. *Asia-Pacific Development Journal*, vol. 20, No. 2, pp. 29-52.

Asia-Pacific Forum of Environment and Development (APFED) (2005). *Final Report Part I: Overview of the Asia-Pacific Region*. Available from www.apfed.net/pub/apfed1/final_report/pdf/final_report.pdf.

Asici, A. (2013). Economic growth and its impact on environment: a panel data analysis. *Ecological Indicator*, vol. 24, pp. 324-333.

Atkinson, G., and others (1997). *Measuring Sustainable Development: Macroeconomic and the Environment*. Cheltenham, Glos, UK: E.Elgar.

Avishek, K.Y., X. Yu, and J. Liu (2012). Ecosystem management in Asia Pacific: bridging science-policy gap. *Environmental Development*, vol. 3, pp. 77-90.

Ayres, R.U., and A.V. Kneese (1969). Production, consumption, and externalities. *The American Economic Review*, vol. 59, pp. 282-297.

Barnett, J., S. Lambert, and I. Fry (2008). The hazards of indicators: insights from the environmental vulnerability index. *Annals of the Association of American Geographers*, vol. 98, No. 1, pp. 102-119.

Beder, S. (2000). Costing the earth: equity, sustainable development and environmental economics. *New Zealand Journal of Environmental Law*, vol. 4, pp. 227-243.

Begum, R.A., and others (2009). An empirical assessment of ecological footprint calculations for Malaysia. *Resources, Conservation and Recycling*, vol. 53, pp. 582-587.

Borucke, M., and others (2013). Accounting for demand and supply of the biosphere's regenerative capacity: the national footprint accounts' underlying methodology and framework. *Ecological Indicators*, vol. 24, pp. 518-533.

Boulding, K. (1966). The economics of the coming spaceship earth. In *Environmental Quality in a Growing Economy*, H. Jarrett, ed. Baltimore: Johns Hopkins University Press.

Brander, J. (2007). Viewpoint: sustainability: Malthus revisited? *Canadian Journal of Economics*, vol. 40, No. 1, pp. 1-38.

Carson, R. (1962). *Silent Spring*. Boston: Houghton Miffin.

Coxhead, I. (2002). *Development and the Environment in Asia: A Survey of Recent Literature*. Madison, Wisconsin: University of Wisconsin-Madison.

_____ (2004). *International Trade and the Natural Resource 'Curse' in Southeast Asia: Does China's Growth Threaten Regional Development*. Madison, Wisconsin: University of Wisconsin-Madison.

Daly, H. (1968). On economics as a life science. *Journal of Political Economy*, vol. 76, No. 3, pp. 392-406.

_____ (1990). Sustainable development: from concept and theory to operational principles. *Population and Development Review*, vol. 16, pp. 25-43.

_____ (2005). *Economics in a Full World.* Scientific American. Available from https://pages.wustl.edu/files/pages/imce/fazz/ad_5_2_daly.pdf.

Daly, H.E., and J. Farley (1994). *Ecological Economics, Principles and Applications*, 1st ed. Island Press.

Dietz, S., and E. Neumayer (2007). Weak and strong sustainabilty in the SEEA: concepts and measurement. *Ecological Economics*, vol. 61, pp. 617-626.

Ekins, P., and others (2003). A framework for the practical application of the concepts of critical natural capital and strong sustainability. *Ecological Economics*, vol. 44, Nos. 2-3, pp. 165-185.

Ewing, B., and others (2008). *The Ecological Footprint Atlas 2008 Version 1.0*. Oakland, CA: Global Footprint Network.

Ferguson, A.R. (2002). The assumptions underlying eco-footprinting. *Population and Environment*, vol. 23, No. 3, pp. 303-313.

Figge, F. (2005). Capital substitutability and weak sustainability revisited: the conditions for capital substitution in the presence of risk. *Environmental Values*, vol. 14, No. 2, pp. 185-201.

Galli, A., and others (2012). Assessing the global environmental consequences of economic growth through the ecological footprint: a focus on China and India. *Ecological Indicators*, vol. 17, pp. 99-107.

Georgescu-Roegen, N. (1971). *The Entropy Law and the Economic Process*. Cambridge, MA: Harvard University Press.

Getzner, M. (1999). Weak and strong sustainability indicators and regional environmental resources. *Environmental Management and Health*, vol. 10, No. 3, pp. 170-176.

Global Footprint Network (GFN) (2005). *Asia-Pacific 2005: The Ecological Footprint and Natural Wealth*. Switzerland: Ropress.

_____ (2012). National footprint accounts, 7 May. Available from www.footprintnetwork.org.

Gowdy, J. (2000). Terms and concepts in ecological economics. *Wildlife Society Bulletin*, vol. 28, No. 1, pp. 26-33.

Gowdy, J.M., and C.N. McDaniel (1999). The physical destruction of Nauru: an example of weak sustainability. *Land Economics*, vol. 75, No. 2, pp. 333-338.

Greasley, D., and others (2014). Testing genuine savings as a forward-looking indicator of future well-being over the (very) long-run. *Journal of Environmental Economics and Management*, vol. 67, pp. 171-188.

Hamilton, K., and M. Clemens (1999). Genuine savings rates in developing countries. *The World Bank Economic Review*, vol. 13, No. 2, pp. 333-356.

Hara, K., and others (2009). Sustainability assessment with time-series scores: a case study of Chinese provinces. *Sustain Sci*, vol. 4, pp. 81-97.

Hartwick, J. (1978). Substitution among exhaustible resources and intergenerational equity. *The Review of Economic Studies*, vol. 45, No. 2, pp. 347-354.

Hubacek, K., and others (2009). Environmental implications of urbanization and lifestyle change in China: ecological and water footprints. *Journal of Cleaner Production*, vol. 17, pp. 1241-1248.

International Union for Conservation of Nature (IUCN), United Nations Environment Programme (UNEP), and World Wildlife Fund for Nature (WWF) (1980). *World Conservation Strategy*. Gland: International Union for the Conservation of Nature.

Jha, R. (2005). Alleviating environmental degradation in the Asia-Pacific region: international cooperation and the role of issue-linkage. In *Regional Integration in the Asia Pacific: Issues and Prospects*, OECD/The Bob Hawke Prime Ministerial Centre at the University of South Australia, eds. OECD Publishing.

Kaly, U., C. Pratt, and J. Mitchell (2004). *Environmental Vulnerability Index (EVI) 2004*. South Pacific Applied Geoscience Commission (SOPAC).

Kubiszewski, I., and others (2013). Beyond GDP: measuring and achieving global genuine progress. *Ecological Economics*, vol. 93, pp. 57-68.

Lammers, A., and others (2008). Ireland's footprint: a time series for 1983-2001. *Land Use Policy*, vol. 25, pp. 53-58.

Lawn, P., and M. Clarke (2010). The end of economic growth? A contracting threshold hypothesis. *Ecological Economics*, vol. 69, pp. 2213-2223.

Lee, J.-W., and K. Hong (2012). Economic growth in Asia: determinants and prospects. *Japan and the World Economy*, vol. 24, pp. 101-113.

Long, B. (2000). *International Environmental Issues and the OECD 1950-2000: An Historical Perspective*. Paris: Organization for Economic Cooperation and Development.

Marcotullio, P. (2001). Asian urban sustainability in the era of globalization. *Habitat International*, vol. 25, pp. 577-598.

Meadows, D.H., and others (1972). *The Limits to Growth*. New York: Universe Books.

Miller, D., and O. Plasencia, eds. (2013). *Statistical Yearbook for Asia and the Pacific 2013*. United Nations publication. Sales No. E.13.II.F.1.

Moldan, B., S. Janouskova, and T. Hak (2012). How to understand and measure environmental sustainability: indicators and targets. *Ecological Indicators*, vol. 17, pp. 4-13.

Mota, R.P., T. Domingos, and V. Martins (2010). Analysis of genuine saving and potential green net national income: Portugal, 1990-2005. *Ecological Economics*, vol. 69, pp. 1934-1942.

Neumayer, E. (2003). *Weak versus Strong Sustainability: Exploring the Limits of Two Opposing Paradigms*. Northampton, MA.

Nghiep, L.T., and L.H. Quy (2000). Measuring the impact of Doi Moi on Vietnam's gross domestic product. *Asian Economic Journal*, vol. 14, No. 3, pp. 317-332.

Nourry, M. (2008). Measuring sustainable development: some empirical evidence for France from eight alternative indicators. *Ecological Economics*, vol. 67, pp. 441-456.

Parker, P. (1998). An environmental measure of Japan's economic development: the ecological footprint. *Geographische Zeitschrift*, vol. 86, No. 2, pp. 106-119.

Pearce, D. (1987). Foundations of an ecological economics. *Ecological Modelling*, vol. 38, Nos. 1-2, pp. 9-18.

Pearce, D.W., and R.K. Turner (1990). *Economics of Natural Resources and the Environment*. Hemel Hempstead: Harvester Wheatsheaf.

Pillarisetti, J.R., and J.C.J.M. van den Bergh (2007). *Sustainable Nations: What Do Aggregate Indicators Tell Us?* Amsterdam: Tinbergen Institute.

Rogers, P.P., K.F. Jalal, and J.A. Boyd (2008). *An Introduction to Sustainable Development*. London: Earthscan .

Sachs, J.D., and A.M. Warner (1997). *Natural Resources Abundance and Economic Growth*. Cambridge, MA: Harvard University.

SEEA (2012). System of Environmental-Economic Accounting. Available from http://unstats.un.org/unsd/envaccounting/seearev/ on 12 July 2012.

Shrestha, P. (2013). Economic development in South and East Asia: empirical examination of East Asian development model. *Asia-Pacific Development Journal*, vol. 20, No. 2, pp. 1-28.

Singh, R.K., and others (2009). An overview of sustainability assessment methodologies. *Ecological Indicators*, vol. 15, pp. 281-299.

Srinivasan, P. (2013). Dynamics of structural transformation in South Asia. *Asia-Pacific Development Journal*, vol. 20, No. 2, pp. 53-88.

Stern, D. (1997). The capital theory approach to sustainability: a critical appraisal. *Journal of Economic Issues*, vol. 31, No. 1, pp. 145-173.

Tho, T.V. (2003). Economic development in Vietnam during the second half of the 20th century: how to avoid the danger of lagging behind. In *The Vietnamese Economy: Awakening the Dorming Dragon*, Binh Tran Nam and Chi Do Pham, eds. Routledge Curzon. Available from www.f.waseda.jp/tvttran/en/recentpapers/E03_Longterm_development_of_Vietnam.pdf. Accessed 14 December 2014.

United Nations Development Programme (UNDP) (2011). *Human Development Report 2011 Sustainability and Equity: A Better Future for All*. New York: Palgrave Macmillan.

United Nations Environment Programme (UNEP) (2003). Integrating environment and development: 1972-2002. In *Global Environment Outlook - 3: Past, Present and Future Perspectives*, Robin Clarke, Robert Lamb and Dilys Roe Ward, eds. London: Earthscan Publications.

United Nations, Economic and Social Commission for the Asia and the Pacific (ESCAP) (1995). *State of the Environment in Asia and the Pacific*. Bangkok.

_____ (2007). *Statistcal Yearbook for Asia and the Pacific 2007*. Sales No. B.08.II.F.1.

_____ (2011). *Statistical Yearbook for Asia and the Pacific 2011*. Sales No. E.11.II.F.1.

_____ (2012a). *Green Growth, Resources and Resilience: Environmental Sustainability in Asia and the Pacific*. Bangkok: United Nations and ADB.

_____ (2012b). *Statistical Yearbook for Asia and the Pacific 2012*. Bangkok.

United Nations, Economic and Social Commission for the Asia and the Pacific (ESCAP), and Asian Development Bank (ADB) (2000). *State of the Environment in Asia and the Pacific 2000*. New York.

Wackernagel, M., and W. Rees, (1996). *Our Ecological Footprint: Reducing Human Impact on the Earth*. Gabriola Island: New Society Publishers.

Wackernagel, M., and others (2002). Tracking the ecological overshoot of the human economy. *Proceedings of the National Academy of Sciences*, vol. 99, No. 14, pp. 9266-9271.

_____ (2004a). Calculating national and global ecological footprint time series: resolving conceptual challenges. *Land Use Policy*, vol. 21, pp. 271-278.

_____ (2004b). Ecological footprint time series of Austria, the Philippines, and South Korea for 1961-1999: comparing the conventional approach to an 'actual land area' approach. *Land Use Policy*, vol. 21, pp. 261-269.

Wang, Ben-Chaung, Fang-Yi Chou, and Yung-Jaan Lee (2012). Ecological footprint of Taiwan: a discussion of its implications for urban and rural sustainable development. *Computers, Environment and Urban Systems*, vol. 36, pp. 342-349.

Weber, E. (2009). Common and uncommon sources of growth in Asia Pacific. *Journal of the Japanese and International Economies*, vol. 23, pp. 20-36.

Woetzel, J.T. (2014). *Southeast Asia at the Crossroads: Three Paths to Prosperity*. McKinsey Global Institute.

World Bank (2011). Changes in country classification, 1 July. Available from http://data.worldbank.org/news/2010-GNI-income-classifications. Accessed 28 August 2014.

_____ (2013). World Development Indicators. Available from http://data.worldbank.org/data-catalog/world-development-indicators.

World Commission on Environment and Development (WCED) (1987). *Our Common Future*. Oxford: Oxford University Press.

World Wildlife Fund for Nature (WWF) (2012). *Living Planet Report 2012: Biodiversity, Biocapacity and Better Choices*. Gland, Switzerland.

Yale Centre for Environment Law & Policy (2010). *2010 Environmental Performance Index*. Yale Universty.

Yari, M., and R. Duncan (2007). Growth in Asian and Pacific developing countries in a globalizing world. *Asia-Pacific Development Journal*, vol. 14, No. 1, pp. 125-144.

Yencken, D. (2000). Attitude to nature in the East and West. In *Environment, Education and Society in the Asia-Pacific: Local Traditions and Global Discourses*, D.F. Yencken, ed. New York: Routledge.

You, J. (2011). China's energy consumption and sustainable development: comparative evidence from GDP and genuine savings. *Renewable and Sustainable Energy Reviews*, vol. 15, pp. 2984-2989.

Annex I

1. Bangladesh
2. Cambodia
3. China
4. Democratic People's Republic of Korea
5. India
6. Indonesia
7. Japan
8. Lao People's Democratic Republic
9. Malaysia
10. Mongolia
11. Myanmar
12. Nepal
13. Pakistan
14. Philippines
15. Republic of Korea
16. Singapore
17. Sri Lanka
18. Thailand
19. Timor-Leste
20. Viet Nam

Annex II. Ranking of Asia-Pacific countries in various selection criteria of the present study

Sl. No.	Country	CO^2 emissions (metric tons per capita) in 2010	Rank	Demand (ecological footprint (EF)) and supply (biocapacity) of natural resources	Data availability	Total population		Urbanization in 2010		Adjusted net savings	Rank
				EF/ biocapacity ≥ 1	1970-2010	Total	Rank	(Percentage of total population)	Rank		
1	Republic of Korea	11.48681	1	Yes	Yes	49 410 000	9	82.933	2	21.898	5
2	Malaysia	7.667467	2	Yes	Yes	28 401 017	12	72.006	3	17.551	10
3	China	6.194858	3	Yes	Yes	1 337 825 000	1	49.226	7	34.158	1
4	Thailand	4.446856	4	Yes	Yes	69 122 234	8	33.73	10	17.600	9
5	Mongolia	4.243209	5	No	Yes	2 756 001	19	67.567	4	-5.603	15
6	Democratic Republic of Korea	2.92336	6	Yes	No	24 346 229	13	60.21	5	..	-
7	Singapore	2.663192	7	Yes	Yes	5 076 700	18	100	1	33.858	2
8	Indonesia	1.803207	8	Yes	Yes	239 870 937	3	49.924	6	23.378	4
9	Viet Nam	1.728118	9	Yes	Yes	86 927 700	7	30.393	14	11.244	12
10	India	1.666209	10	Yes	Yes	1 224 614 327	2	30.93	13	20.595	7
11	Pakistan	0.932118	11	Yes	Yes	173 593 383	4	35.882	9	4.112	13
12	Philippines	0.873148	12	Yes	Yes	93 260 798	6	48.648	8	12.618	11
13	Sri Lanka	0.621628	13	Yes	Yes	20 653 000	14	15.041	19	20.949	6
14	Bangladesh	0.371564	15	Yes	Yes	148 692 131	5	27.894	16	19.791	8
15	Lao People's Democratic Republic	0.292983	16	No	Yes	6 200 894	17	33.121	11	-8.561	16
16	Cambodia	0.291013	17	No	Yes	14 138 255	15	19.814	17	-4.646	14
17	Myanmar	0.173213	18	No	No	47 963 012	10	32.083	12	..	-
18	Timor-Leste	0.171932	19	No	No	1 142 502	20	27.96	15	..	-
19	Nepal	0.139872	20	Yes	Yes	29 959 364	11	16.656	18	26.435	3

PRODUCTION FRAGMENTATION IN TRADE OF MANUFACTURED GOODS IN INDIA: PROSPECTS AND CHALLENGES

*Sadhana Srivastava and Rahul Sen**

The present paper analyses the phenomenon of production fragmentation in trade of manufactured goods in India, using trade data at the Standard International Trade Classification (SITC) 5-digit product level. It estimates production fragmentation through a decomposition of intra-industry trade in parts and components into horizontal and vertical intra-industry trade over the period 1994-2012. The paper at the product level finds that aircraft parts and automobile parts and the components industry are emerging areas of production fragmentation in manufactured goods trade over this sample period. It further observes that aircraft parts (SITC 79295) is the only parts and component product to undergo product fragmentation at the higher end of the global value chain and that the auto parts and components industry is found to be experiencing this primarily at the lower end of the value chain. The findings are consistent with the existing literature supporting the view that to harness the existing potential of fragmentation that exists in these industries, Indian policymakers need to create a business environment conducive for moving up the quality ladder in the global value chain.

JEL classification: F14, R11, F12.

Keywords: Production fragmentation, India, horizontal and vertical intra-industry trade, VIIT, parts and components, value chain.

* Sadhana Srivastava (e-mail: sadhana.srivastava@aut.ac.nz), and Rahul Sen, corresponding author, Senior Lecturer (e-mail; rahul.sen@aut.ac.nz), are from Department of Economics, Private Bag 92006, AUT Business School, Auckland, New Zealand. We would like to thank Soudachanh Darounphanh for her invaluable research and three anonymous referees for their comments on an earlier version of this paper. The usual disclaimer applies.

I. INTRODUCTION

International production fragmentation broadly refers to the splitting up of a good into its constituent parts, components and accessories that are produced, traded and distributed across spatially dispersed locations on the basis of their comparative advantages.[1] This phenomenon enables multinational firms to specialize by tapping a country's comparative advantage originating in a particular stage of the production sequence along its global value chain, creating international production networks in manufactured goods. Trade involving production fragmentation has contributed to an increasing share of intra-industry trade (IIT) in manufactured goods, involving two-way trade in intermediate goods belonging to a single industry but at different stages of production. This is also referred to as "vertically specialized trade" and "network trade" in the evolving literature on global production fragmentation,[2] that includes trade in parts and components, as well as in final assembly goods. Athukorala (2011) estimates that this trade accounted for nearly a half of total world manufacturing trade in 2007.

While the empirical measurement of production fragmentation is a debatable issue, studies, such as Fukao, Ishido and Ito (2003), Ando (2006), Turkcan and Ates (2010) and, more recently Tewari, Veeramani and Singh (2015) have used vertical intra-industry trade (VIIT) in intermediate goods resulting from production-sharing activities as an appropriate indicator of production fragmentation for a particular industry. VIIT refers to IIT based on product differentiation due to quality differences between exports and imports, and has been measured by the ratio of the unit value of exports to the unit value of imports for each product in the past empirical literature.[3]

Vertically specialized trade has been quite pervasive in East Asia since the 1980s. Studies, such as Fukao, Ishido and Ito (2003), Kuroiwa and Heng (2008), Fujita (2007) and Athukorala (2011, 2013) have observed that multinationals involved in labour-intensive manufacturing industries, such as automobiles and electronics, in East Asian countries have been heavily involved in such production fragmentation-based trade. These studies also argue that the adoption of an export-led growth strategy by most East Asian countries in the 1980s involving foreign direct investment (FDI) contributed to a rapid expansion of their share of intra-industry trade in machinery parts and components.

---

[1] See Rajan (2003); Hummels, Ishii and Yi (2001); Yi (2003); Krugman (1995); Ng and Yeats (2001, 2003); Grossman and Helpman (2005).

[2] See Ando (2006); Fukao, Ishido and Ito (2003); Athukorala (2011); Tewari, Veeramani and Singh (2015); Jiang and Milberg (2012); Turkcan and Ates (2010); and Pittiglio (2014) among others.

[3] See Greenaway, Hine and Milner (1995); Fontagné and Freudenberg (1997); Ando (2006).

The experience of India has been quite distinct to the above phenomenon. In spite of the country's geographic proximity to East Asia, its economy has followed an entirely different growth strategy[4] in which it was largely left out of the global division of labour in the 1990s, particularly with regard to parts and components production.[5] Tewari, Veeramani and Singh (2015) argue that one of the primary reasons for the lack of involvement in global production fragmentation in trade of manufactured goods was because policymakers in India had failed to make adequate efforts to improve the competitiveness of the manufacturing sector and to address major supply side bottlenecks.

Notwithstanding the above policy deficit, the composition of the trade basket of India has changed considerably in recent decades, with traditional resources-based products, such as textiles, clothing, gems and jewelry, which were predominate in the 1980s and 1990s, replaced by skill-intensive-based goods, such as metal and non-metal goods and chemicals, in second-half of the 1990s; the trend since then is moving towards technologically intensive-based goods (Felipe, Kumar and Abdon, 2013). The economy of India is rapidly growing. It is currently the third largest economy in the world in terms of purchasing power parity (PPP)[6] and its rankings in world trade in both merchandise trade[7] and in commercial services[8] have risen dramatically. With the opening up of its economy to foreign investors starting in 1990s and the liberalization of regulatory procedures, including the lifting of quantitative restrictions on imports and tariff reductions, India has deepened its trade and investment linkages with rest of the world over the past decade. It is involved in a number of economic integration initiatives with East Asia through a web of bilateral and multilateral trade and economic cooperation agreements as a part of its "Look East Policy", with the more recent one being the Regional Comprehensive Economic Partnership (RCEP)

---

4 India followed a socialist planning model from independence and focused heavily on self-reliance and import-substitution as a growth strategy up until 1991. It embarked on an outward-oriented growth strategy about a decade later than most East Asian countries.

5 See Rajan and Sen (2002); Tewari, Veeramani and Singh (2015).

6 In 2012, the GDP of India at PPP was about $4.8 trillion (World Bank, 2012).

7 From being one of the relatively insignificant players in global trade in the 1980s (ranked below the 40th position globally), the country's ranking climbed to 19th among the world's merchandise exporters (constituting a share of 1.6 per cent of world's merchandise exports) in 2012 and 10th among the world's merchandise importers, (constituting a share of 2.6 per cent of world's merchandise imports) in the same year.

8 In the area of trade in commercial services, India fared better globally than in merchandise trade, with a ranking of 7th among world exporters and importers of commercial services (constituting a share of 3.0 per cent of world's service exports and imports), in 2012, compared to 34th and 28th, respectively in 1995 (WTO, 2013). Among developing countries, India was ranked as the second largest exporter of commercial services in 2012, behind China (WTO, 2013).

agreement involving India and 15 other member countries.[9] Following the above developments, it is of interest to examine whether production fragmentation has been emerging in the country's trading of manufactured goods since the post-reform period, and if so, in which industries and products.

The empirical evidence in the context of India to date has been quite sparse. The empirical analyses have mainly evolved through the studies on intra-industry trade of manufactured goods in the country or using descriptive statistics that reflect the importance of trade in intermediate goods. For example, studies, such as Veeramani (2002, 2009), Srivastava and Sen (2011, 2012), and Amighini (2012) have investigated production fragmentation using indices of intra-industry trade, but for a shorter time-span up until 2008. However, none of them have separated IIT in parts and components products into horizontal and vertical IIT for capturing the extent of global production fragmentation evolving in intermediate goods trade. Two recent studies, namely Athukorala (2013) and Tewari, Veeramani and Singh (2015), investigate the prospects of global production sharing in India compared with East Asia and ASEAN, respectively. Tewari, Veeramani and Singh (2015) in the context of analyzing production fragmentation in bilateral trade between India and ASEAN during the period 2000-2011, noted that in spite of low volumes, there is evidence of increasing vertically specialized trade between them.

The present paper departs from the earlier works by incorporating a longer sample covering the post-reform time period of 1994-2012 and using product-level disaggregation at the Standard International Trade Classification (SITC) 5-digit level. It focuses on specific product categories in which VIIT in parts and components trade is highly concentrated, involving an inter-temporal comparison over the sample period under study.

The remainder of the paper is organized as follows: section II reviews the theoretical and empirical literature on international production fragmentation, focusing on the specific studies in the Indian context; section III analyses emerging trends in the country's trade of total merchandise and parts and components trade and identifies the top ten exports and imports under the parts and components product categories; section IV details the empirical measurement issues and undertakes an estimation of actual and marginal intra-industry trade in parts and components, decomposing it further into horizontal and vertical IIT that captures the magnitude of product fragmentation in the trade flows; and section V provides policy implications from the above analysis, and concludes the paper.

[9] This includes the 10 ASEAN member States, as well as China, Japan, the Republic of Korea, Australia and New Zealand.

II. LITERATURE REVIEW

Theoretical literature

According to Gereffi (2001), the phenomenon of international production fragmentation can take place through two channels. The first is by subcontracting, which involves arm's length transactions, wherein a firm can contract an overseas supplier to manufacture parts and components, while retaining key service functions, such as research and development and designing.[10] The second involves creating international production networks (via FDI), resulting in vertically specialized trade. FDI-led international production networks are largely driven by multinationals involved in high technology, capital intensive production of customized and specialized parts and components wherein quality considerations and asset specificity[11] are paramount.

Gereffi (2001), therefore, classifies production fragmentation into two categories based on its drivers. The first is buyer-driven production fragmentation, which is more common in industries that exhibit low barriers to entry in production and possibilities of arms-length transactions, such as in garments, footwear, furniture and toys. The related global commodity chains of the above industries are usually controlled by large firms at the design and retail ends of the value added chain, with little or no scope for vertically specialized trade.

The second category is producer-driven fragmentation, which is significant in industries that are characterized by industrial capital and vary in their core competencies and entry barriers (Gereffi, 2001, table 1, p. 1622). In this case, the producer-driven types of commodity chains are controlled by large manufactures at the point of production, research and development, and design and are usually led by multinational corporations playing the central roles of coordinating production networks that include backward and forward linkages. Such linkages create opportunities for vertically specialized trade and are mainly driven by cost and quality considerations based on international division of labour and economies of scale (Helpman, 1984).

It has been observed that industries, such as semiconductors, automobiles and heavy machinery, are typically characterized by producer-driven fragmentation, enabling different countries in the production network to gain from contributing to the global value chain of an industry.

---

[10] An example of this would be Sweden-based IKEA Home Furnishings entering into a contract with Polish and Vietnamese firms to manufacture furniture items for it, while they concentrate on the design of those items (Athukorala, 2013).

[11] Asset specificity involves investment in dedicated physical or human assets unique to the specific production process. An example would be molds in the glass container production process that are custom made to create specific shapes of the containers.

New trade theories (Dixit and Stiglitz, 1977; Helpman and Krugman, 1985) dealt with two-way trade in horizontally differentiated final consumer goods due to economies of scale and product differentiation. More recently, Lüthje (2001) argued that the same can also be applied to intermediate goods as horizontal IIT in intermediate goods occurs since producers buy only a particular variety of intermediate goods that best meets the specific needs of production. This allows the final goods producer to use a specific variety of intermediate goods, such as an "ideal intermediate good", in the production of the specific variety of final goods.

Jones and Kierzkowski (1990) were the first researchers to establish theoretically that vertical specialization-based trade occurs as a result of production fragmentation. They observed that the basis for vertical specialization in intermediate goods arises as a result of the relative differences between factor endowments and factor intensities in the component production, thereby driving vertical two-way trade in intermediate goods.[12] Yi (2003) has further explained how technological and organizational innovations improve the possibilities of slicing up the production process and the global reduction in trade barriers. These, in turn, lead to lower cost of production from the input stage to distribution, and creates incentives for locating different stages of production across countries. Kimura and Ando (2005) further recognize the importance of spatial interdependence (geographical interdependence of production blocks), which reduces service link costs. Ando and Kimura (2009) apply this to East Asia and argue that such sophisticated networks, in turn, provide opportunities for indigenous firms to penetrate into production networks developed by multinational enterprises. This new form of trade and FDI, which has been much observed in East Asia, contributes to the unprecedented phenomenon of production fragmentation.

Empirical literature

In order to yield meaningful estimates of production fragmentation, it is important to qualify as to why the data on parts and components (that proxy for production fragmentation) need to be separated out from the reported overall trade statistics. According to Athukorala and Yamashita (2005), there are primarily two reasons for such segregation: (i) production fragmentation may lead to double-counting of trade data when the same parts and component used as an input for the final good crosses multiple international borders during production stages; and (ii) the calculated trade share can, therefore, provide incorrect inferences as to the relative importance of a "region" vis-à-vis the rest of the world. This has been observed to be particularly significant in the case of East Asia where trade in parts and components and trade in final goods did not follow the same patterns.

[12] Also see Jones and Kierzkowski (2001).

Furthermore, there are important data caveats involved in analysing production fragmentation in international trade. While the data available from the United Nations trade database based on revision 3 of the Standard International Trade Classification (SITC, Rev. 3) are widely used, there are issues with its coverage at the disaggregated product level. For instance, SITC, Rev. 3 data do not cover the entire range of industries involving production fragmentation, apart from products in machinery and transport equipment (SITC 7). In addition, international production fragmentation is not just limited to SITC 7 and SITC 8 (miscellaneous products), but is also prevalent in pharmaceutical and chemical products (SITC 5) and manufactured products (SITC 6), as well as in the assembly of software trade, which is often lumped with the category of "special transactions" under SITC 9. Therefore, one can infer that estimates of trade in parts and components that emerge from SITC, Rev. 3 data will very likely be downward biased. It may be argued that this downward bias is likely to be serious for India because its manufacturing trade is more diversified with a greater share of SITC 5 and SITC 6 that includes gems and jewelry and chemicals. Furthermore, recent studies on India such as Athukorala (2013), drew attention to the fact that the ongoing process of global production sharing and network trade based on parts and components is heavily concentrated in SITC 7 and SITC 8, and that there is virtually no product that is likely to be produced from start to finish, specifically in those two categories. Therefore, analysing the manufacturing of parts and components in these two specific industry groups for estimating production fragmentation is appropriate.

Since production fragmentation involves two-way trade, such as exports and imports, within the same industry and product category, the empirical literature on estimating production fragmentation has largely evolved from that of estimating intra-industry trade. In addition to addressing the methodological issues related to measurement of intra-industry trade, the empirical literature has further argued the need to review IIT based on the nature of product differentiation involved. Studies, such as Greenaway, Hine and Milner (1995) and Fontagné and Freudenberg (1997), have grouped IIT into two types: the first is horizontal IIT, wherein firms in each country would manufacture a subset of the varieties within an industry and export them for final demand, importing the other varieties. This kind of IIT is not based on differences in quality, but instead it is determined by attributes of the final good. The second type is VIIT based on differences in quality and factor endowments, wherein the gap between the unit value of imports and the unit value of exports for each good reveals the qualitative differences between them.

Several empirical studies, such as Fukao, Ishido and Ito (2003), Ando (2006), Turkcan and Ates (2010), Amighini (2012), and more recently Tewari, Veeramani and Singh (2015) have used (VIIT) in intermediate goods resulting from production sharing activities as an indicator of production fragmentation for a particular industry.

They argue that unit-price differentials outside a certain range[13] may reflect not only differences in quality, but also back-and-forth transactions with value-added embodied in vertically fragmented production processes. Therefore, the trade pattern categorized as vertical IIT could partially reflect international fragmentation in the same commodity category, if the ratio of export unit value to import unit value for each parts and components product category is outside the range of 0.75 to 1.25. Furthermore, if these ratios are found to be above 1.25, it suggests that (a) parts and components export prices are higher than parts and components import prices, (b) the quality or processing stage of exports is higher than that of imports; and (c) a country is experiencing a high-quality VIIT that involves product fragmentation in activities concentrated in the higher end of the value chain.

Studies on India

In the Indian context, Veeramani (2002, 2009) extensively conducted research on intra-industry trade for the manufacturing sector, identifying the trends and their key determinants. Veeramani (2002) reviewed trends in the overall intra-industry trade over the time periods 1998, 1995 and 2000, and further analysed the determinants of bilateral IIT of India with its 51 trading partners in 1999. This study estimated IIT using 4-digit Indian Trade Classification (ITC) data at the industry level. It employed the G-L index and an additional measure of marginal IIT, as suggested by Brülhart (1994), to understand changes in levels of IIT. It observed that IIT has grown significantly over these time periods, and that it responded positively to economic reforms that have unleashed a series of trade and investment liberalization measures since the 1990s.

Furthermore, in order to estimate the effect of FDI on IIT, Veeramani (2009) evaluated the effect of trade barriers and multinationals on IIT in India across 75 industries using the same classification over the period 1988-1999 using panel regressions. The analysis suggested that reduced trade barriers influence IIT in a positive way, and that IIT is negatively influenced as a result of a high tariff regime. As a result, this generated more market-seeking FDI, wherein the foreign investor's motive was to serve in the domestic market rather than utilize it as a global export platform.[14] However, Kumar (2003) is among the few studies on FDI that note that

[13] These studies employ a 25 per cent threshold of relative unit values of exports to imports to distinguish between horizontally and vertically differentiated products.

[14] This view of market-seeking motives driving Indian FDI in manufacturing has been empirically established by several studies, including among others, Aggarwal (2001); Kumar and Siddharthan (1994); Kumar (1990); and Pant (1993, 1995). A suitable example would be Honda, a Japanese automobile manufacturer, opening a manufacturing plant in India with a view to specifically target customers in the Indian automobile market.

reforms have prompted foreign multinationals to begin to explore the potential of India as an export-platform production in a modest manner.

More recent studies on production fragmentation in India are Athukorala (2013) and Tewari, Veeramani and Singh (2015). Athukorala (2013) estimated the country's share in global network trade based on production fragmentation compared to East Asia. It was observed that during the periods 1990-1991 and 2010-2011, network goods accounted for only about 22 per cent of the total increment in manufacturing exports from India compared with 70 per cent for East Asia. He argued that this does not lend strong support to India entering into global and regional production networks in electronics and electrical goods, which have been the prime mover of export dynamism in successful export-oriented economies in East Asia. Furthermore, the study noted that there had been a noticeable increase in network trade involving the transport equipment sector, but not in high-tech industries, suggesting that international production fragmentation in India was mainly in the lower end of the value chain. This study did not estimate production fragmentation using intra-industry trade analysis. Instead, it analysed the determinants of such fragmentation for India when compared with East Asia in an applied augmented gravity framework.

Tewari, Veeramani and Singh (2015) confirm some of the above trends identified by Athukorala (2013), and apply detailed intra-industry analysis at the harmonized system (HS)-6 digit level to estimate the production fragmentation in trade of manufactured goods involving bilateral trade between India and ASEAN. This study supplements primary data from firms and argues that while India imported products of a higher value or stage of processing from ASEAN than it exports to the region, there is an urgent need for Indian firms to upgrade on the quality ladder of the global value chain. This study used disaggregated data at the HS-6 digit level, which is not the highest level of disaggregation in the HS classification. Consequently, 6-digit codes may overlap with three or four 8-digit codes under them, and India may be exporting mainly one 8-digit category and importing another 8-digit category. The study notes that the automotive industry appeared to be one of the few sectors in India that is linked to global production networks, and therefore is likely to involve production fragmentation.

Amighini (2012) compares international fragmentation of China and India specifically in this industry during 1995 and 2008 using intra-industry trade analysis as followed in the empirical literature. It concludes that VIIT has dominated exports of India in this industry, and the evidence points towards fragmentation in this industry at the lower quality ladder.

Compared to the above studies on India, this paper attempts to estimate production fragmentation in manufacturing at the highest level of product disaggregation

using SITC classification (SITC 5-digit)[15] and focusing on an extended time period that captures the trends in production fragmentation over nearly the two decades since economic reforms were initiated in India. These reforms were intended to reduce or eliminate trade and investment barriers and make it easier to export and as a result enable the country to participate in global value chains and international production fragmentation.

III. PRODUCTION FRAGMENTATION IN TRADE OF MANUFACTURED GOODS: TRENDS AND PATTERNS

Total manufacturing trade

The manufacturing sector constituted about two thirds of total merchandise exports in India and more than half of the country's merchandise imports from 2005 to 2009 (tables 1 and 2). Exports of manufactured goods were dominated by the increasing share of SITC 6 and 8 products, such as gems and jewelry, and clothing and footwear. In addition, the share of machinery and transport equipment (SITC 7), consisting of parts and components of electronic products and electrical machinery and parts of transport vehicles and equipment, in total manufacturing exports, rose from 9.5 per cent to 13.6 per cent between 1994 and 2008, and then increased further to 21.4 per cent in 2012. This category constituted 20 per cent of total manufacturing imports in 2008 and 31 per cent of it in 2012.

Parts and components trade

The list of parts and components identified at the 5-digit level for SITC 7 and SITC 8 products from the UN Comtrade database (United Nations, 2014) contains 231 SITC five-digit products — 172 products belonging to SITC 7 and 59 belonging to SITC 8.[16] Annex 1 provides the detailed commodity classification for the top 10 products of the parts and components sector in manufacturing exports and imports of India.[17] As trade in parts and components is unlikely to substantially change on an annual basis, an inter-temporal comparison is appropriate. The analysis compares parts and components trade patterns for the years 1994, 2004, 2008 and 2012.

---

[15] It is important to note that when trade data at the 5-digit SITC level are extracted, there may be a risk of eliminating several 4-digit SITC items (for which there are no further disaggregations at the 5-digit level) from the analysis. However, this risk has not been observed for the manufacturing parts and components categories analysed in this study.

[16] This list is adapted from Athukorala (2005, appendix A-5).

[17] The detailed data on all products are available from the authors on request. Most of the remaining parts and components products constituted a share of 1 per cent or less and are hence not reported in these tables.

Table 1. India: composition of manufacturing exports (US$ billion), 1994-2012

Years	SITC 5 Chemicals, related. products, n.e.s.	SITC 6 Manu-factured goods	SITC 68 Non-ferrous metals	SITC 7 Machinery and transport equipment	SITC 8 Miscel-laneous manu-factured articles	Goods not classified by kind	Manu-facturing sector (SITC 5-9 minus 68)	Total (all commodi-ties)	Share of manufac-turing in total (per cent)
1994	2.16 (10.81)	1.51 (52.58)	0.18 (0.90)	1.89 (9.45)	5.61 (28.06)	0.45 (2.25)	19.99 (100.00)	26.33	75.90
1999	3.68 (12.68)	15.22 (52.45)	0.25 (0.86)	2.54 (8.75)	7.83 (26.98)	0.80 (2.76)	29.02 (100.00)	36.67	79.15
2004	9.14 (15.8)	28.38 (49.05)	1.21 (2.0)	7.77 (13.43)	13.78 (23.82)	0.86 (1.49)	57.86 (100.00)	79.85	72.46
2005	11.43 (15.88)	33.73 (46.85)	1.67 (2.32)	10.57 (14.68)	16.81 (23.35)	1.13 (1.17)	72.00 (100.0)	100.35	72.00
2006	14.11 (11.64)	36.82 (30.38)	3.76 (3.10)	13.24 (10.92)	19.33 (15.95)	1.28 (1.06)	81.02 (100.00)	121.2	66.84
2007	16.36 (11.21)	43.13 (29.56)	3.92 (2.69)	16.47 (11.29)	20.93 (14.35)	1.69 (1.16)	94.67 (100.00)	145.9	64.89
2008	20.45 (11.24)	49.76 (27.36)	3.48 (1.91)	24.67 (13.57)	21.80 (11.99)	2.87 (1.58)	116.06 (100.00)	181.86	63.82
2009	18.52 (14.79)	43.82 (35.00)	3.99 (3.19)	27.01 (21.57)	31.88 (25.47)	7.96 (6.36)	125.21 (100.00)	176.77	70.80
2010	23.58 (16.53)	62.44 (43.79)	7.10 (4.98)	31.93 (22.39)	27.17 (19.06)	4.58 (3.21)	142.59 (100.00)	220.40	64.70
2011	31.26 (15.74)	75.68 (38.10)	4.56 (2.30)	41.92 (21.10)	40.03 (20.15)	14.31 (7.20)	198.64 (100.00)	301.50	66.00
2012	34.5 (18.87)	67.16 (36.74)	4.38 (2.40)	39.73 (21.37)	43.17 (23.62)	2.64 (1.44)	182.82 (100.00)	289.60	63.10

Source: Calculated from United Nations (2014).

Notes: n.e.s. refers to not elsewhere specified; figures in parentheses represent percentage share in total manufacturing sector.

Table 2. India: composition of manufacturing imports (US$ billion), 1994-2012

Years	SITC 5 Chemicals, related. products, n.e.s.	SITC 6 Manu-factured goods	SITC 68 Non-ferrous metals	SITC 7 Machinery and transport equipment	SITC 8 Miscel-laneous manu-factured articles	Goods not classified by kind	Manu-facturing sector (SITC 5-9 minus 68)	Total (all commodi-ties)	Share of manufac-turing in total (per cent)
1994	4.21 (29.28)	4.82 (33.52)	0.97 (6.75)	5.45 (37.90)	0.88 (6.12)	2.38 (16.55)	14.38 (100.00)	28.65	50.20
1999	5.75 (25.23)	9.28 (40.72)	1.14 (5.00)	7.15 (31.37)	1.75 (7.68)	5.23 (22.95)	22.79 (100.00)	49.71	45.85
2004	9.78 (19.09)	17.72 (34.58)	1.87 (3.65)	21.57 (42.10)	4.03 (7.86)	11.18 (21.82)	51.24 (100.00)	108.26	47.33
2005	13.56 (9.63)	22.75 (16.15)	2.53 (1.80)	28.22 (20.03)	5.21 (3.700)	13.04 (9.26)	80.24 (100.00)	140.86	57.00
2006	16.09 (9.03)	21.92 (12.30)	2.56 (1.44)	40.79 (22.89)	6.41 (3.60)	15.56 (8.73)	98.21 (100.00)	178.20	55.11
2007	20.6 (9.44)	29.20 (13.33)	4.40 (2.00)	47.90 (21.89)	8.10 (3.72)	19.70 (9.00)	121.10 (100.00)	218.60	55.40
2008	34.38 (10.89)	38.17 (12.09)	5.90 (1.87)	64.65 (20.48)	7.90 (2.50)	31.38 (9.94)	170.57 (100.00)	315.71	54.03
2009	27.23 (17.46)	37.82 (24.24)	5.80 (3.72)	58.14 (39.27)	9.79 (6.28)	28.82 (18.48)	156.01 (100.00)	266.40	58.60
2010	34.45 (16.84)	54.35 (26.57)	5.47 (2.67)	63.75 (31.16)	10.35 (5.06)	47.14 (23.04)	204.58 (100.00)	350.00	58.50
2011	42.24 (16.44)	69.28 (26.97)	10.12 (3.94)	76.68 (29.85)	13.45 (5.24)	65.37 (25.45)	256.9 (100.00)	462.40	55.60
2012	44.50 (17.59)	53.93 (21.32)	7.13 (2.82)	79.00 (31.22)	18.08 (7.14)	64.64 (25.55)	253.02 (100.00)	489.00	51.75

Source: Calculated from United Nations (2014).

Notes: n.e.s. refers to not elsewhere specified; figures in parentheses represent percentage share in total manufacturing sector.

Table 3 identifies the trends in the top 10 parts and components products that were exported during the period 1994-2012. These constituted about 70 per cent of parts and components exports in categories SITC 7 and 8 from India. It is observed that parts for automobiles and other vehicles (categories SITC 784 and SITC 785), as well as those for electrical, electronic and telecommunication equipment (categories SITC 75 to 77) constituted the bulk of the parts and components exports of manufactured goods in India during the decade. Total parts and components exports expanded in volume from $636 million to $13 billion over the period 1994-2012, growing at a compound rate of 18.3 per cent annually and increasing its share in total exports of manufactured goods from 3.2 per cent in 1994 to about 7.0 per cent by 2012. Given that world exports of parts and components in 2008 was worth $1,118 billion, the contribution of India to global parts and components exports is minimal.

The above shares are also significantly lower than the case for exports of other developing economies in Asia (particularly East Asia).[18] Notably, the growth of exports of parts and components in India has been significantly higher than that of total exports of merchandise goods and manufactured goods over the past decade. This is an indication of the increasing importance of parts and components exports over the past decade (figure 1). In spite of the slowdown in world growth with the onset of the global economic crisis in 2008, India registered a phenomenal growth rate of 44.4 per cent in its parts and components exports between 2007 and 2008, while its total manufacturing exports registered negative growth of 1.6 per cent. The compound average growth rate for parts and components exports during the period 2008-2012 was 11.3 per cent compared to 12 per cent for total manufacturing exports.

A similar trend has occurred with regard to parts and component imports in India, particularly during the period 1999-2012 (figure 2).

Table 4 identifies the trends in top 10 products of manufactured parts and components imports during the period 1994-2012. These constituted about 62 per cent of total parts and components imports in categories SITC 7 and 8 by India. Notably, one product, namely other parts and accessories of the motor vehicles of groups 722, 781, 782 (SITC 78439), has been among the most important component of parts and components imports by India. In addition, parts and accessories for data processing machines (SITC 75997) also figure among the important components of parts and components imports. These two products comprised about a quarter of total parts and components imports in 2004. Parts of electrical, electronic and telecommunication equipment (categories SITC 71, 72, 75 to 77) have constituted the

[18] See Athukorala (2011).

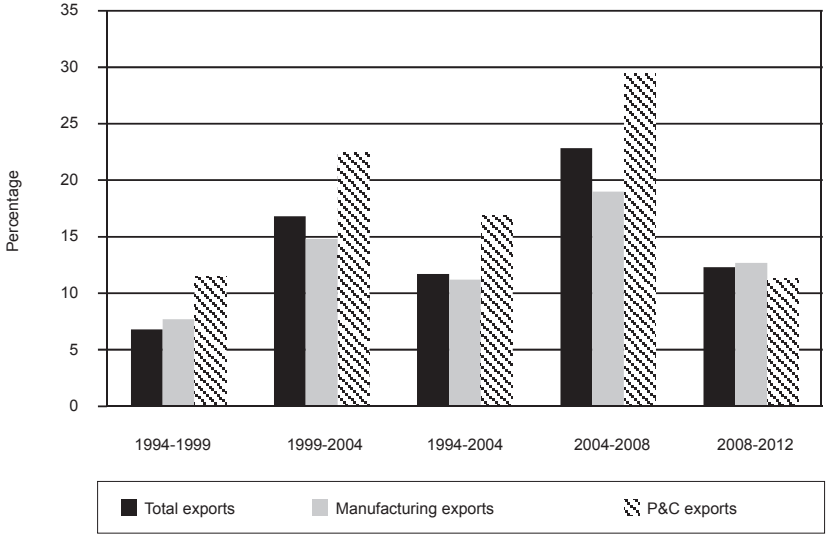
Table 3. India: exports of top 10 products of manufacturing parts and components, 1994-2012

Exports (1994)			Exports (2004)			Exports (2008)			Exports (2012)		
Commodity code	Value (US$ million)	Share in total P&C exports (per cent)	Commodity code	Value (US$ million)	Share in total P&C exports (per cent)	Commodity code	Value (US$ million)	Share in total P&C exports (%)	Commodity code	Value (US$ million)	Share in total P&C exports (%)
78537	101.17	15.90	78439	529.69	17.49	79295	1 119.43	13.13	78439	2 805.3	21.4
78439	100.42	15.78	75997	221.05	7.3	78439	1 085.11	12.73	79295	1 323.7	10.1
75997	66.22	10.40	71392	162.52	5.37	77637	528.79	6.2	71392	483.3	3.7
71392	33.57	5.27	78537	139.11	4.59	71392	505.74	5.93	79297	377.8	2.9
71391	28.01	4.40	72855	133.05	4.39	79297	242.75	2.85	77282	308.6	2.4
77249	13.49	2.12	71391	111.33	3.68	77282	233.92	2.74	77886	302.8	2.3
78431	13.17	2.07	89410	87.11	2.88	78434	206.91	2.43	72399	267	2
74291	12.92	2.03	77637	85.04	2.81	78537	184.43	2.16	71391	223.8	1.7
72855	12.15	1.91	78431	82.65	2.73	76493	175.37	2.06	78537	205.9	1.6
72449	12.05	1.89	77611	80.34	2.65	72855	158.02	1.85	78431	204.4	1.6
Total P&C	636.50		Total P&C	3 027.77		Total P&C	8 526.60		Total P&C	13 082.2	
Share of P&C exports in total mfg. exports (per cent)	3.2		Share of P&C exports in total mfg. exports (per cent)	5.2		Share of P&C exports in total mfg. exports (per cent)	7.3		Share of P&C exports in total mfg. exports (per cent)	7.0	

Source: Calculated from United Nations (2014).

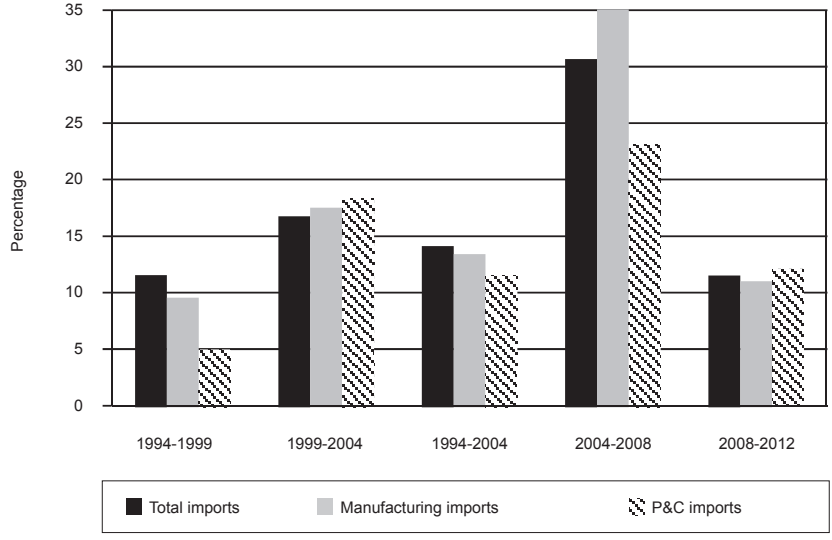
Notes: Please see annex 1 for detailed commodity description; mfg. refers to the manufacturing sector; P&C refers to parts and components.

Figure 1. Growth in merchandise exports from India: 1994-2012



Source: Author's calculations based on United Nations (2014).
Note: P&C refers to parts and components.

Figure 2. Growth in merchandise imports in India: 1994-2012



Source: Author's calculations based on United Nations (2014).

bulk of parts and components imports in the manufacturing sector over the decade. Total parts and components imports more than tripled in volume from $2.3 billion to $7.0 billion over the period 1994-2004, at a compound annual growth rate of 11.6 per cent, and then increased to $25.6 billion in 2012, at a compound annual growth rate of 12.2 per cent over the period 2008-2012. Given that global imports of these parts and components in 2008 was worth $1.044 billion, it can be inferred that the contribution of India to parts and components imports globally (about 0.7 per cent) has been low as well.

A comparison of tables 3 and 4 indicated that over the period 1994-2012, the share of parts and components exports in total manufacturing exports more than doubled while that of parts and components imports declined from 16.3 per cent to 5.3 per cent. This is the result of the gradually easing of reliance on imported intermediate inputs in manufacturing during post-economic reforms by Indian firms. Furthermore, it is notable that several products in which the parts and components category that are both imported by and exported from India, were also above average in size and growth compared to the other parts and components products traded. In 1994, these included five products out of the top 10 parts and components exports and imports, namely SITC 78439, 75997, 71392, 78431, and 72449. In 2008 and 2012, two of those products, namely SITC 78439 and 71392, remained in the top 10 ranking which also included new parts and component products, namely SITC 79295, 77282 and 72399 (tables 3 and 4). By 2012, the share of the top ranked parts and components export and import product SITC 78439 increased its share in parts and components exports to 21.4 per cent compared with 12.7 per cent in 2008.°

The above trend in trading of manufactured parts and components indicates that intra-industry trade is taking place in these product components and accessories, meaning that the import and export of goods pertaining to the same classification are occurring simultaneously. As this category comprises machinery, electronics, and auto parts and vehicle components, further analysis of intra-industry trade is required to ascertain whether product fragmentation is likely being experienced in these sectors in the Indian economy over the chosen sample period.

Table 4. India: imports of top 10 products of manufacturing parts and components, 1994-2012

Imports (1994)			Imports (2004)			Imports (2008)			Imports (2012)		
Commodity code	Value (US$ million)	Share in total P&C imports (per cent)	Commodity code	Value (US$ million)	Share in total P&C imports (per cent)	Commodity code	Value (US$ million)	Share in total P&C imports (%)	Commodity code	Value (US$ million)	Share in total P&C imports (%)
79295	292.12	12.43	75997	1 064.52	15.15	78439	1 834.25	11.3	78439	2 373.10	9.2
78439	156.92	6.68	78439	546.6	7.78	75997	1 242.76	7.66	75997	1 598.90	6.2
75997	129.22	5.50	76493	445.15	6.33	76493	878.84	5.41	79295	1 160.40	4.5
71499	123.14	5.24	79295	396.28	5.64	79295	647.50	3.99	76493	1 098.40	4.3
76493	75.47	3.21	76491	292.79	4.17	77282	503.67	3.10	71323	1 068.10	4.1
72449	73.15	3.11	77643	226.07	3.22	72399	446.55	2.75	77637	871.90	3.4
77643	67.29	2.86	77282	172.57	2.46	77637	420.04	2.59	71392	666.90	2.6
71392	66.21	2.82	72399	139.54	1.99	71392	370.5	2.28	72399	593.00	2.3
78431	64.53	2.75	71392	133.08	1.89	77812	355.86	2.19	77282	563.70	2.2
74494	60.48	2.57	72393	133.00	1.89	73729	350.61	2.16	78434	507.00	2.0
Total P&C	2 349.87		Total P&C	7 027.95		Total P&C	16 233.48		Total P&C	25 756.40	
Share of P&C imports in total mfg. imports (per cent)	16.3		Share of P&C imports in total mfg. imports (per cent)	13.7		Share of P&C imports in total mfg. imports (per cent)	9.5		Share of P&C imports in total mfg. imports (per cent)	5.3	

Source: Calculated from United Nations (2014).

Notes: Please see annex 1 for detailed commodity description; mfg. refers to the manufacturing sector; P&C refers to parts and components.

Estimating production fragmentation in trade of parts and components in India methodology

The methodology involved in empirically estimating production fragmentation in trading parts and components in India involves several steps.[19]

The first step entails applying the methodology of Abd-el-Rahman (1991) and Ando (2006) in order to disaggregate trade of commodity *j* in terms of one-way trade or intra-industry trade. This decomposes total trade of parts and components into one-way trade (inter-industry trade explained by the traditional comparative advantage theory) and two-way trade that involves intra-industry trade associated with fragmented production chains. A certain range of overlapped values of exports and imports are used. Specifically, trade of commodity *j* is regarded as one-way trade when the following equation (1) holds and intra-industry trade otherwise:

$$Min(X_{kj},M_{kj}) / Max(X_{kj},M_{kj}) \leq 0.1 \quad (1)$$

Where X_{kj} represents country *k*'s exports of commodity *j* to the world, and M_{kj} the country *k*'s imports of commodity *j* from the world.

The second step is the application of the Grubel and Lloyd (1975) (G-L) index to the list of two-way products to estimate the degree of IIT in that product. The Grubel-Lloyd (G-L) index measures the ratio of net exports in a product category to its total trade in an index that takes values from 0 to 100. It also calculates the part of balanced trade (overlap between exports and imports) in all trade in a given product j. The index is calculated by the following formula G-L index for a given product j is denoted as

$$G - L_j = 1 - \frac{|X_j - M_j|}{X_j + M_j} \quad (2)$$

Where X_j refers to exports and M_j refers to imports in the same product.

This index takes a value of zero if either X_j or M_j equals zero implying no IIT and if $X_j=M_j$, it implies a value of 100 and signifies complete IIT in that product. However, this index is observed to measure an incorrect level of IIT, especially if trade imbalances are higher. Studies, such as Rajan (1996), have argued that G-L is a degree of measure of IIT rather than the absolute amount. There needs to be a distinction between the level of IIT and the actual amount of IIT that takes place, and the degree or extent of IIT. The level of IIT is estimated separately for these products as

[19] See Srivastava and Sen (2011).

$$L_j = 2 * min\ (X_j, M_j) \quad (3)$$

For the j^{th} product where X_j refers to exports and M_j refers to imports in the same product.

The third step is to analyse the estimates of marginal IIT as suggested by Brülhart (1994) to ascertain whether the change in trade volumes over the time periods analysed are more due to intra-industry or inter-industry trade. This measure, known as Marginal IIT (MIIT), is a transposition of the G-L index using first differences of trade flows, and is measured for the j^{th} product as:

$$MIIT_{jt} = 1 - \frac{|\Delta X_{jt} - \Delta M_{jt}|}{|\Delta X_{jt}| + |\Delta M_{jt}|} \quad (4)$$

Where Δ stands for the first difference operator and measures, the change in values of exports or imports of the j^{th} product in time period t compared to a reference year. This index also takes values from 0 to 1, and in percentage terms goes from 0 to 100 as the G-L index. A MIIT value close to 100 indicates marginal trade over the time period to be of the intra-industry variety and inter-industry if the MIIT index is 0 or closer to it.

The final two steps are applied to the parts and components product groups identified to experience highest levels of two-way IIT trade over this period in order to decompose IIT in these categories into horizontal and vertical IIT, and further into low- and high-quality VIIT to estimate production fragmentation. Following Greenaway, Hine and Milner (1995), Fukao, Ishido and Ito (2003), Ando (2006), Amighini (2012), and Tewari, Veeramani and Singh (2015), intra-industry trade of commodity j is regarded as horizontal IIT when the following equation (5) holds and as vertical IIT otherwise:

$$\frac{1}{1.25} \leq \frac{P_{kj}^{X}}{P_{kj}^{M}} \leq 1.25 \quad (5)$$

Where P_{kj}^{X} expresses the unit value of commodity *j* exported to the world by country *k*, and P_{kj}^{M} the unit value of commodity *j* imported from the world by country *k*.

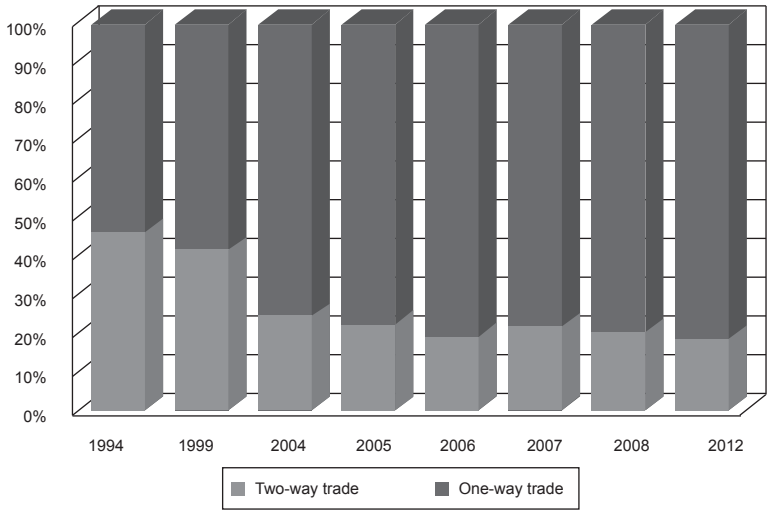
Following the general practice in the empirical literature,[20] if the ratio of the unit value of exports to import is greater than 1.25, then the quality or processing stage of exports is higher than that of imports and thus categorized as high-quality (HVIIT), while ratios below 0.75 may indicate higher quality or processing of imports compared with exports categorized as low-quality (LVIIT).

[20] See Durkin and Krygier (2000); Fukao, Ishido and Ito (2003); Tewari, Veeramani and Singh (2015).

Results

Figure 3 decomposes the pattern of trade of parts and components in India over the period 1994-2012 into one-way and two-way trade. It is observed that the share of two-way trade, which represents IIT, increased from 53.7 per cent to 81.0 per cent over the specified period.

Figure 3. Patterns of trade in parts and componets in India



To ascertain which parts and components products experienced large amounts of two-way trade, the estimates of the degree of IIT (as measured by the G-L index) and the level of IIT for the top 10 parts and components products over the period 1994-2012 are identified in table 5. It is observed that most of these products are identical to those in table 3, suggesting that the products that constitute the top 10 exported products in the parts and components manufactured goods category have also been the elements in two-way trade due to IIT. In 2012, the top three products that involved a high volume of IIT were SITC 78439, 79295 and 71392 (auto parts, parts of data processing machines and parts of power generating machinery), two of which were also ranked the same in 1994. The value of IIT in SITC 78429 increased from $1.059 billion in 2004 to $4.746 billion by 2012. A similar increase was also noted for SITC 71392. Overall, it is observed that the amount of IIT for parts of machinery and automobile and other vehicle parts increased over the past decade, suggesting an increasing level of two-way trade in these products, possibly involving production fragmentation.

Table 5. India: estimates of intra-industry trade of top 10 products involving parts and components trade: 1994-2012

1994				2004				2008				2012			
Com-modity code	IIT (US$ million)	G-L index	Share in total P&C trade* (per cent)	Com-modity code	IIT (US$ million)	G-L index	Share in total P&C trade* (per cent)	Com-modity code	IIT (US$ million)	G-L index	Share in total P&C trade* (per cent)	Com-modity code	IIT (US$ million)	G-L index	Share in total P&C trade* (per cent)
78439	200.84	78.05	6.73	78439	1 059.39	98.43	10.54	78439	2 170.21	74.34	8.76	78439	4 746.2	91.7	12.22
75997	132.43	67.76	4.43	75997	442.11	34.39	4.40	79295	1 295.01	73.29	5.23	79295	2 320.7	93.4	5.98
71392	67.14	67.29	2.25	71392	266.16	90.04	2.65	77637	840.08	88.54	3.39	71392	966.6	84.0	2.49
71391	28.79	67.89	0.96	72855	201.92	86.29	2.01	71392	741.00	84.57	2.99	77282	617.2	70.8	1.59
78431	26.35	33.91	0.88	77611	160.69	86.15	1.60	77282	467.85	63.43	1.89	72399	533.9	62.1	1.37
74291	25.84	54.19	0.87	71391	127.77	72.92	1.27	78434	380.87	95.86	1.54	71391	447.6	89.7	1.15
72855	24.31	43.84	0.81	77429	108.04	88.53	1.07	76493	350.75	33.27	1.42	78537	411.7	84.7	1.06
72449	24.1	28.28	0.81	73591	103.18	96.88	1.03	78537	318.58	92.69	1.29	72393	406.1	82.1	1.05
73591	20.14	81.74	0.67	77637	89.58	69.00	0.89	72855	316.03	64.97	1.28	78434	403.7	57.0	1.04
78535	17.88	94.49	0.60	74291	88.6	63.88	0.88	71391	303.39	88.72	1.23	74291	388.6	80.3	1.00

Source: Calculated from United Nations (2014).

Notes: Please see annex 1 for detailed commodity description; P&C refers to parts and components; * represents share in the total of P&C exports and imports.

It is, however, important to further ascertain whether IIT was driving total trade in those parts and components products over the three time periods, and the extent to which its involvement changed over the years, which can be estimated through the MIIT index.

The MIIT estimates for the top 10 parts and components products involving the highest levels of IIT in 2008 and 2012 are presented in table 6. It is observed that while MIIT estimates were more of the intra-industry variety for seven of those products in 2012 compared to 1994, as well as in 2008, compared to 1994. Over the period 2008-2012, only three products (SITC 71392, 72393 and 78434) involved MIIT of the complete inter-industry variety, with seven products involving marginal trade of the intra-industry type. This is in line with the observation of Veeramani (2002, 2009) that with trade liberalization, IIT of India has expanded in the manufacturing sector.

Furthermore, it is also observed that the product SITC 78439, which involved automobile parts, constituted the highest share of the export of parts and components (21.4 per cent). This product experienced one of the highest levels of IIT over the period 1994-2012, and also showed a continuous increase in marginal IIT over the same period.

The above analysis does not suggest whether the observed marginal IIT in the seven parts and components product categories involve horizontal or vertical trade, and are of high or low quality. Figure 4 analyses this through the estimates of the ratio of unit values of exports to imports, as explained in equation (5) for the seven parts and components products whose MIIT estimates are not of the intra-industry variety. It is observed that all these products involved VIIT, suggesting evidence of production fragmentation in them. With the exception of SITC 79295 (aircraft and helicopter parts), none of the other parts and components products involved high-quality VIIT in 2012. This indicated that with regard to the aircraft and helicopter parts industry, India is exporting higher quality parts and components than it is importing, and thus, moving up the quality ladder of its global value chain.

The products with the second highest in the quality spectrum are SITC 78439 (auto parts), followed by SITC 71391 (parts of spark-ignition internal combustion piston engines). For both of these products, albeit of low-quality VIIT, the unit value ratios of exports to imports improved. This suggests an overall quality improvement in these two products (SITC 78439 and SITC 71391) over the period, exporting lower quality parts and component goods, while importing higher quality ones for its domestic market. Notably, the share of total parts and components exports for SITC 71391 declined from 4.4 per cent to 1.7 per cent over the period 1994-2012, while that of SITC 79295 and SITC 78439 nearly doubled from 16.6 per cent to 32.0 per cent.

Table 6. India: estimates of marginal intra-industry trade in the top 10 products involving parts and components trade in 2008 and 2012

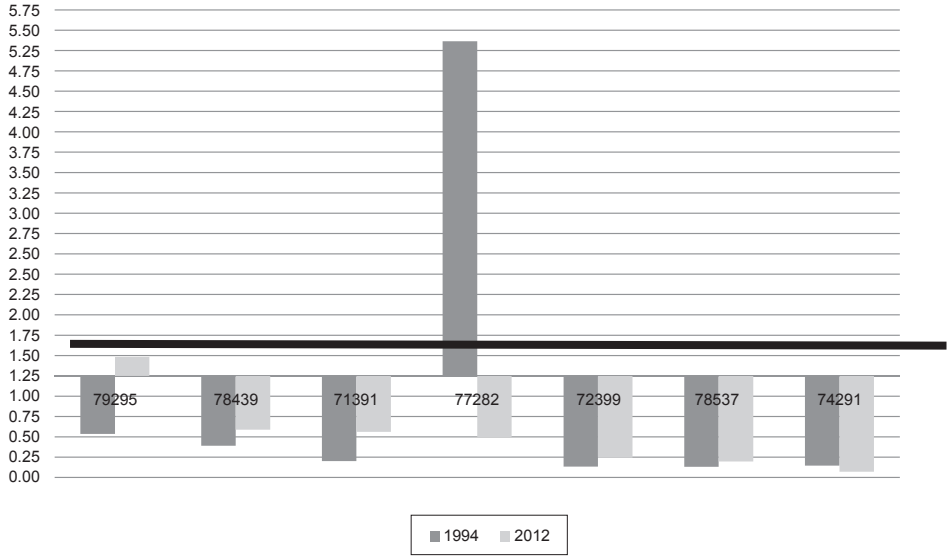
Commodity code	2008 (over 1994)	2008 (over 1999)	2008 (over 2004)
78439	74.0	75.3	48.2
79295	48.4	70.4	40.4
77637	87.3	88.9	91.3
71392	78.4	88.6	98.6
77282	64.9	66.2	77.0
78434	95.5	94.6	0.0
76493	34.4	36.3	28.8
78537	71.2	40.4	55.3
72855	67.7	63.6	42.2
71391	82.6	99.5	65.2

Commodity code	2012 (over 1994)	2012 (over 2004)	2012 (over 2008)
78439	90.1	89.8	47.7
79295	79.4	76.0	57.0
71392	85.6	75.3	0.0
77282	72.2	83.5	89.1
72399	65.3	70.5	95.1
71391	85.8	77.8	92.0
78537	55.6	43.9	30.1
72393	87.2	99.9	0.0
78434	56.9	57.0	0.0
74291	83.1	85.6	94.8

Source: Calculated from United Nations (2014).

Note: Please see annex 1 for detailed commodity description.

Figure 4. Estimates of vertical intra-industry trade in selected parts and components exports over 1994-2012



Source: Author's calculations based on United Nations (2014).

Note: An estimate of vertical intra-industry trade less than 0.75 suggests lower quality VIIT (LVIIT), while that greater than 1.25 suggests higher quality VIIT (HVIIT).

The above results suggest that production fragmentation is emerging in the trade of manufactured goods, which is concentrated in SITC 7 (machinery and transport equipment) and more specifically in aircraft and auto parts and component products, based on evidence seen over the period 1994-2012. Furthermore, while India is a net exporter of aircraft parts and auto parts (tables 3 and 4), the former involves production fragmentation at the higher end of the value chain and quality spectrum than the latter, as argued in the theoretical and empirical literature.

The next step in analysing the trends in production fragmentation in auto parts and components is to decompose auto parts and components specifically into one-way, two-way, horizontal and vertical IIT in order to estimate the extent to which this sector is experiencing production fragmentation over the four time points: 1994, 2004, 2008 and 2012, and to determine the leading product categories extending upon the Amighini (2012) framework. The auto parts and components consist of 30 products, 21 of which are classified in SITC 5-digit categories belonging to SITC 7 and 8 whose intra-industry trends were estimated earlier. The remaining nine

product categories involve parts of tyres and tubes, all of which are confirmed to have experienced two-way trade.[21]

Table 7 summarizes the trends in trade values and trade patterns in the automobile parts and components industry over the sample period. It is observed that while trade volumes have expanded significantly, the trade balance has turned into a deficit, indicating that India had been a net importer in this industry over the past two decades. One-way trade in auto parts and components declined by almost a half over the period 1994-2004, with the share of two-way IIT about 85.4 per cent, which was unchanged in 2012 when compared with 2004.

Decomposing two-way trade, it is further observed that VIIT dominated IIT in this industry, with its share increasing to 84.2 per cent in 2012 compared to 71.6 per cent in 1994. This VIIT was predominantly in the low-quality range, constituting nearly 78.4 per cent of total two-way trade in automobile parts and components, covering 27 out of 30 products.[22] The single largest product category in this industry is SITC 78439. This product, which also experienced VIIT of a low quality and increased IIT at the margin over the period 1994-2012, constituted 44.7 per cent of the total trade in auto parts and components in 2012.

The above, therefore, corroborates the findings of recent studies of Amighini (2012), Athukorala (2013) and Tewari, Veeramani and Singh (2015) that automobile parts and components appear to be the only industry experiencing international production fragmentation due to an increase in vertical IIT, albeit of a low quality. This study also confirms that the production fragmentation is largely restricted to one product category, namely SITC 78439 (other parts and accessories of tractors, and motor vehicles for the transport of goods, persons and special-purpose motor vehicles).[23]

---

[21] See Amighini (2012) for the product list on the auto parts and components industry.

[22] The detailed product level analysis for all 30 individual auto parts and component products are available from the authors on request. These include SITC 62559 (tyres, pneumatic, new and other) which comprised the second highest share of total auto parts trade in 2012. There was no change for this product in the VIIT quality ladder over the period 1994-2012.

[23] This category concords to 8 HS2007 6-digit products (870870, 870880, 870891, 870892, 870893, 870894, 870895 and 870899) that includes auto parts, such as clutches, radiators, exhaust pipes, steering wheels.

Table 7. India: analysis of intra-industry trade in auto parts and components in trade, 1994-2012

	1994	2004	2008	2012
Exports (US$ million)	317.7	944.5	2 577.6	5 440.0
Imports (US$ million)	269.6	904.4	3 578.1	6 138.5
Total value of trade (US$ million)	587.3	1 848.9	6 155.7	11 578.5
Trade balance (US$ million)	48.1	40.1	-1 000.5	-698.5
Trade pattern (% of auto parts and components sector)				
One-way	27.1	14.6	13.2	14.6
IIT	72.9	85.4	86.7	85.4
Horizontal IIT	1.3	10.00	3.2	1.2
Vertical IIT	71.6	75.4	83.5	84.2
Vertical IIT (HQ)	2.22	5.9	3.0	5.8
Vertical IIT (LQ)	69.38	69.5	80.5	78.4
Share of single largest product (78439)	43.8	54.5	47.4	44.7

Source: Calculated from United Nations (2014).

Notes: See Amighini (2012, p. 340, appendix A, table A1) for detailed commodity description of products included in auto parts and components industry.

Anecdotal evidence supports this trend at the firm level.[24] The experience of the TVS group's Sundaram Fasteners Ltd. as the preferred supplier of radiator caps for United States-based General Motors, and that of Toyota Kirloskar auto parts (a joint venture between Toyota of Japan and a local manufacturer in India) in exporting gearboxes from India to assembly plants in Argentina, South Africa and Thailand, confirms this trend at the firm level. While one example involves an arms-length transaction and the other involves FDI, it clearly shows the emergence of production fragmentation in the auto parts industry in recent years. However, India continues to export lower quality auto parts and import higher quality ones for its domestic market, which is exactly the reverse of that of its major competitors in this industry in East Asia and Europe.

There is also increasing evidence to suggest that the aircraft parts and components industry (SITC 79295) is also playing an important role in the emergence of India in global production fragmentation in the trade of manufactured goods. According to Workman (2015), India was the 11th largest exporter of aircraft parts in

[24] See Tewari, Veeramani and Singh (2015); Nag (2011); Athukorala (2013).

2014, with a share of 2.4 per cent of world exports of aircraft parts, compared with a share of 1.2 per cent in 2012. India along with Singapore was the only non-OECD Asian developing country to be among the world's largest aircraft parts exporters. Tatas, UTC Aerospace Systems (UTAS), Hindustan Aeronautics Limited (HAL), Dynamatic, Aequs, and Moog are firms in India that export aircraft parts, to leading aerospace manufacturers, such as Boeing, Airbus, Lockheed Martin and Sikorsky.[25]

Mukherjee (2015) and Singh (2015) note that this sector has contributed to the success of the recently announced "Make in India" initiative by the Indian Prime Minister in 2014. Exports of aircraft parts and components from India grew by 58 per cent growth observed in aircraft parts and components exports from India, mainly involving small and medium enterprises, during the period April-November 2014 compared with the same period in 2013. This export market was expected to be at least $4 billion over the period April-November 2014, compared with $8.13 million in 2012.

More recently, liberalized policies in January 2015, such as the Federal Aviation Administration (FAA) direct approval of two aircraft parts developed in India for use by manufacturers in the United States, provides further opportunities for Indian firms to remain globally competitive in this industry, specifically with regard to higher-quality VIIT products. These products, certified as part of the country's Bilateral Aviation Safety Agreement with the United States, includes a four-person life raft developed by the Indian arm of UTC Aerospace Systems and nickel-cadmium batteries developed by Hyderabad-based HBL Power Systems, which will no longer be subject to multiple checks across borders when shipped and certified to be used directly by United States aircraft manufacturers.

IV. POLICY IMPLICATIONS AND CONCLUDING REMARKS

The study at the product level confirms that the aircraft parts and automobile parts and components industry became an emerging area of production fragmentation in the trade of manufactured goods in India over the period 1994-2012. Aircraft parts (SITC 79295) is the only parts and components product to experience this at the higher end of the global value chain; the auto parts and components industry is found to experience this primarily at the lower end of the value chain. Unlike East Asia, there is no direct empirical evidence to support that FDI has played a role in such production fragmentation in India. This is mainly due to the unavailability of statistics on intra-firm trade that establishes the link between fragmentation and the role of

[25] Aircraft parts exported by India includes floor beams for Boeing, doors for Airbus A320 doors as well as flap track beams and helicopter cabins for other aircraft manufacturers (Mukherjee, 2015).

multinationals. The above identified products are, however, likely to involve more of producer-driven fragmentation through activities of multinationals[26] as argued in the theoretical literature.

The direct policy implication emerging for India is to harness the existing potential that exists in the auto parts industry and develop capabilities to climb the quality ladder in production fragmentation, which is currently experiencing low IIT. A key challenge for policymakers as they increasingly attempt to integrate with East Asia through RCEP and other regional trade and investment agreements, will be to urgently address the existing supply and demand side constraints on moving up the quality ladder in the global value chain of these network manufacturing trade products. The constraints are related to infrastructural bottlenecks that increase the cost of businesses as compared to other Asian economies, inflexibility in labour laws and the need to improve skill development and accumulation of human capital in the manufacturing sector.[27]

This study identifies sector-specific potential product categories wherein production fragmentation is emerging in the manufacturing trade. Future research in this area pertaining to sector-specific, firm level studies should, therefore, be explored in detail. Lessons learned from experiences of other East Asian countries in attracting export-oriented FDI to increase production fragmentation at the higher end of the value chain would also be useful for policymakers in the near future.

[26] See section II and Gereffi (2001).

[27] See Sen and Srivastava (2012); Athukorala (2013); Tewari, Veeramani and Singh (2015).

REFERENCES

Abd-el-Rahman, K. (1991). Firms' competitive and national comparative advantages as joint determinants of trade composition. *Weltwirtschaftliches Archiv*, vol. 127, No. 1, pp. 83-97.

Aggarwal, A. (2001). Liberalisation, multinational enterprises and export performance: evidence from Indian manufacturing. Working Paper, No. 69. New Delhi, India: Indian Council for Research on International Economic Relations (ICRIER). Available from www.eldis.org/vfile/upload/1/document/0708/DOC9489.pdf.

Amighini, A. (2012). China and India in the international fragmentation of automobile production. *China Economic Review*, vol. 23, No. 2, pp. 325-341.

Ando, M. (2006). Fragmentation and vertical intra-industry trade in East Asia. *The North American Journal of Economics and Finance*, vol. 17, No. 3, pp. 257-281.

Ando, M., and F. Kimura (2009). Fragmentation in East Asia: further evidence. ERIA Discussion Paper Series DP-2009-20 (October). Available from www.eria.org/ERIA-DP-2009-20.pdf.

Athukorala, P. (2005). Product fragmentation and trade patterns in East Asia. *Asian Economic Papers*, vol. 4, No. 3, pp. 1-27.

_____ (2011). Production networks and trade patterns in East Asia: regionalization or globalization? *Asian Economic Papers*, vol. 10, No. 1, pp. 65-95.

_____ (2013). How India fits into global production sharing: experience, prospects and policy options. Working Papers in Trade and Development, No. 2013/13 (August). Canberra: Australian National University

Athukorala, P., and N. Yamashita (2005). Production fragmentation and trade integration: East Asia in a global context. *The North American Journal of Economics and Finance*, vol. 17, No. 3, pp. 233-256.

Brülhart, M. (1994). Marginal intra-industry trade: measurement and relevance for the pattern of industrial adjustment. *Weltwirtschaftliches Archiv*, vol. 130, No. 3. pp. 600-613.

Dixit, A.K., and J.E. Stiglitz (1977). Monopolistic competition and optimum product diversity. *The American Economic Review*, vol. 67, No. 3, pp. 297-308.

Durkin, Jr, J.T., and M. Krygier (2000). Differences in GDP per capita and the share of intraindustry trade: the role of vertically differentiated trade. *Review of International Economics*, vol. 8, No. 4, pp. 760-774.

Felipe, J., U. Kumar, and A. Abdon (2013). Exports, capabilities, and industrial policy in India. *Journal of Comparative Economics*, vol. 41, No. 3, pp. 939-956.

Fontagne, L., and M. Freudenberg, (1997). Intra-Industry trade: methodological issues reconsidered. Working Papers, vol. 97, No. 1, Paris: CEPII.

Fujita, M. (2007). The development of regional integration in East Asia: from the viewpoint of spatial economics. *Review of Urban & Regional Development Studies*, vol. 19, No. 1, pp. 2-20.

Fukao, K., H. Ishido, and K. Ito (2003). Vertical intra-industry trade and foreign direct investment in East Asia. *Journal of the Japanese and International Economies*, vol. 17, No. 4, pp. 468-506.

Gereffi, G. (2001). Shifting governance structures in global commodity chains, with special reference to the internet. *American Behavioral Scientist*, vol. 44, No. 10, pp. 1616-1637.

Greenaway, D., R. Hine, and C. Milner (1995). Vertical and horizontal intra-industry trade: a cross industry analysis for the United Kingdom. *The Economic Journal*, vol. 105, No. 433, pp. 1505-1518.

Grossman, G.M., and E. Helpman, (2005). Outsourcing in a global economy. *Review of Economic Studies*, vol. 72, No. 1, pp. 135-159.

Grubel, Herbert G., and Peter J. Lloyd (1975). *Intra-Industry Trade, the Theory and Measurement of International Trade in Differentiated Products*. London: McMillan.

Helpman , E. (1984). A simple theory of international trade and multinational corporations. *Journal of Political Economy*, vol. 92, No. 3, pp. 451-471.

Helpman, E., and P.R. Krugman (1985). *Market Structure and Foreign Trade: Increasing Returns, Imperfect Competition, and the International Economy*. Wheatsheef Books, Harvester Press, MIT.

Hummels, D., J. Ishii, and K. Yi (2001). The nature and growth of vertical specialization in world trade. *Journal of International Economics*, vol. 54, No. 1, pp. 75-96.

Jiang, X., and W. Milberg (2012). Vertical specialization and industrial upgrading: a preliminary note. Capturing the Gains Working Paper, 10. Manchester, United Kingdom: University of Manchester.

Jones, R.W, and H. Kierzkowski (1990). The role of services in production and international trade: a theoretical framework. In *The Political Economy of International Trade: Essays in Honor of Robert E. Baldwin*, Ronald Jones and Anne Krueger, eds. Blackwells.

_____ (2001). A framework for fragmentation. In *Fragmentation: New Production Patterns in the World Economy*, S.W. Arndt and H. Kierzkowski, eds. New York: Oxford University Press.

Kimura, F., and M. Ando (2005). Two-dimensional fragmentation in East Asia: conceptual framework and empirics. *International Review of Economics and Finance*, vol. 14, No. 3, pp. 317- 348.

Krugman, P. (1995). Growing world trade: causes and consequences. Brooking Papers on Economic Activity 25th Anniversary Issue, No. 1, pp. 327-377.

Kumar, N. (1990). *Multinational Enterprises in India: Industrial Distribution, Characteristics and Performance*. London and New York: Routledge.

_____ (2003). Liberalization, foreign direct investment flows and economic development: the Indian experience in the 1990s. Research and Information System for Developing Countries (RIS) Discussion paper, 65. New Delhi.

Kumar, N., and N.S. Siddharthan, (1994). Technology, firm size and export behaviour in developing countries: the case of Indian enterprises. *The Journal of Development Studies*, vol. 31, No. 2, pp. 289-309.

Kuroiwa, I., and T.M. Heng, eds. (2008). *Production Networks and Industrial Clusters: Integrating Economies in Southeast Asia*. Singapore: Institute of Southeast Asian Studies.

Lüthje, T. (2001). Intraindustry trade in intermediate goods. *International Advances in Economic Research*, vol. 7, No. 4, pp. 393-408.

Mukherjee, S. (2015). Boost for make in India as FAA clears two plane parts. *Indian Express*, 12 January.

Nag, B. (2011). Trade liberalization and international production networks: experience of the Indian automotive sector. In *Fighting Irrelevance: The Role of Regional Trade Agreements in International Production Networks in Asia - A Study by the Asia-Pacific Research and Training Network on Trade*, Mia Mikic and Mochamad Pasha, eds. Bangkok: ESCAP.

Ng, F., and A. Yeats (2001). Production sharing in East Asia: who does what for whom, and why? In *Global Production and Trade in East Asia*, L.K. Cheng and H. Kierzkowski, eds. Boston: Kluwer Academic Publishers.

_____ (2003). Major trade trends in East Asia: what are their implications for regional cooperation and growth? Policy Research Working Paper, No. 3084, Washington D.C.: World Bank. Available from http://elibrary.worldbank.org/doi/pdf/10.1596/1813-9450-3084.

Pant, M. (1993). Export performance, transnational corporations and the manufacturing sector: a case study of India. Indian *Economic Review*, vol. 28, No.1, pp. 41-54.

_____ (1995). *Foreign Direct Investment in India: The Issues Involved*. New Delhi: Lancer Books.

Pittiglio, R. (2014). An essay on intra-industry trade in intermediate goods. *Modern Economy*, vol. 5, pp. 468-488. Available from http://dx.doi.org/10.4236/me.2014.55045.

Rajan, R., and R. Sen (2002). A decade of trade reforms in India: how it compares with East Asia. *World Economics*, vol. 3, No. 4, pp. 1-14.

Rajan, R.S. (1996). Measures of intra-industry trade reconsidered with reference to Singapore's bilateral trade with Japan and the United States. *Weltwirtschaftliches Archiv*, vol. 132, No. 2, pp. 378-389.

_____ (2003). Production sharing in East Asia: implications for India. *Economic and Political Weekly*, vol. 38, No. 36 (September), pp. 3770-3772.

Sen, Rahul, and Sadhana Srivastava (2012). Asia's international production networks: will India be the next assembly centre? ARTNeT Working Paper Series, No. 118 (August). Bangkok: ESCAP. Available from www.artnetontrade.org.

Singh, A. (2015). Aircraft, spacecraft parts exports grow 58%. *Deccan Herald*, 21 January.

Srivastava, S., and R. Sen (2011). Is production fragmentation emerging in India's manufacturing trade? *ASCI Journal of Management*, vol. 40, No. 2, pp. 73-100.

Tewari, M., C. Veeramani, and M. Singh (2015). The potential for involving India in regional production networks: analyzing vertically specialized trade patterns between India and ASEAN. ICRIER Working Paper, No. 292. Available from http://icrier.org/pdf/Working_Paper_292.pdf.

Turkcan, K., and A. Ates (2010). Structure and determinants of intra-industry trade in the US auto-industry. *Journal of International and Global Economic Studies*, vol. 2, No. 2, pp. 15-46.

United Nations (2014). The United Nations Commodily Trade Statistics Database (UN Contrade). New York. Available from comtrade.un.org/. Accessed 5 February 2014.

Veeramani, C. (2002). Intra-industry trade of India: trends and country-specific factors. *Weltwirtschaftliches Archiv*, vol. 138, No. 3, pp. 509-533.

_____ (2009). Trade barriers, multinational involvement and intra-industry trade: panel data evidence from India. *Applied Economics*, vol. 41, No. 20, pp. 2541-2553.

Workman, D. (2015). Aircraft parts exports by country, November. Available from www.worldstopexports.com/aircraft-parts-exports-country/3340.

World Bank (2012). *World Development Indicators 2012*. Washington D.C.

World Trade Organization (2013). *International Trade Statistics*. Geneva.

Yi, Kei-Mu (2003). Can vertical specialization explain the growth of world trade. *Journal of Political Economy*, vol. 111, No. 1, pp. 52-102.

Annex 1

Detailed commodity description of selected products in trade of parts and components in India[a]

Commodity code	Description
71323	Compression-ignition engines (diesel or semi-diesel engines)
71391	Parts, n.e.s., suitable for use solely or principally with spark-ignition internal combustion piston engines
71392	Parts, n.e.s., suitable for use solely or principally with compression-ignition internal combustion piston engines
71499	Parts for gas turbines, n.e.s.
72393	Parts for boring or sinking machinery
72399	Parts, n.e.s., of civil engineering etc. machinery, including mining and public works machinery parts (Heading 723) and cranes etc. (Heading 744.3)
72449	Parts and accessories of textile machinery designed for use in the preparation and production of textile fibers and yarns
72855	Parts, n.e.s., of machinery for public works etc., preparing animal or fixed vegetable fats and oils, and specialized for particular industries, n.e.s.
73591	Parts, n.e.s., and accessories suitable solely or principally for use with metalworking machine tools working by removing metal or other material
74291	Parts of pumps for liquids
74494	Parts of lifting, handling, loading or unloading machinery, n.e.s.
75997	Parts of automatic data processing machines and units thereof, magnetic or optical readers, and machines for transcribing and processing data, n.e.s.
76491	Parts of electrical apparatus for line telephony or line telegraphy (including apparatus for carrier-current line systems)
76493	Parts of television receivers, radiobroadcast receivers, transmission apparatus for radio telephony, telegraphy, broadcasting or television etc.
77249	Electrical apparatus for switching or protecting electrical circuits, or making connections to or in electrical circuits, n.e.s., exceeding 1,000 volts
77282	Parts of electrical apparatus for switching or protecting electrical circuits for making connections to or in electrical circuits, n.e.s.
77611	Television picture tubes, colour
77637	Photosensitive semiconductor devices; light emitting diodes
77643	Non-digital monolithic integrated units
77812	Electric accumulators (storage batteries)
77885	Parts of electric sound or visual signaling apparatus, n.e.s. (including parts of indicator panels, burglar and fire alarms)

Annex 1 *(continued)*

Commodity code	Description
77886	Carbon electrodes, carbon brushes, lamp carbons, battery carbons and other carbon articles, with or without metal, of a kind used for electrical purposes
78431	Bumpers and parts thereof, for tractors, motor cars and other motor vehicles, etc.
78434	Gear boxes
78439	Parts and accessories n.e.s. for tractors, motor cars and other motor vehicles, trucks, public-transport vehicles and road motor vehicles, n.e.s.
78537	Parts and accessories for bicycles and other cycles (except motorcycles and mopeds), n.e.s.
79295	Parts of airplanes or helicopters, n.e.s.
79297	Other parts of the goods of group 792
89410	Baby carriages, and parts thereof, n.e.s.

Source: United Nations (2014).

Note: [a] Represents only those parts and components commodities that constituted the top 10 items of exports from India (see table 3); imports (see table 4), intra-industry trade (see table 5) and intra-industry trade (including vertical intra-industry trade – see figure 4) during the chosen period of the study; for a complete description of all parts and components traded goods, see Athukorala (2005); n.e.s. refers to not elsewhere specified.

THE ROLE OF THE FINANCIAL SECTOR IN ENHANCING ECONOMIC GROWTH IN THE LAO PEOPLE'S DEMOCRATIC REPUBLIC

*Kristina Spantig**

The financial sector of the Lao People's Democratic Republic has been developing rapidly in recent years in terms of financial depth, intermediation and distribution. A developed financial sector is the basis for dynamic economic growth. Yet, unsustainable financial liberalization and growth poses risks to financial sector stability. The present report scrutinizes the role of the financial sector in enhancing economic growth in the Lao People's Democratic Republic and aims to answer the question of adequate financial sector supervision with respect to the economy's development. It is argued that only a prudentially supervised financial sector can enhance the economic growth performance of the country in the medium and long term.

JEL classification: G01, G32, O11, O16, O49.

Keywords: Finance-growth nexus, financial sector development, supervision.

I. INTRODUCTION

If and how the financial sector can promote economic growth, the so-called finance-growth nexus, is widely discussed in literature. In particular, the issue of causality – whether finance drives growth or vice versa – is controversial topic of discussion.[1] However, there is a broad consensus that a sustainably developed and supervised financial sector enhances economic growth.

* PhD, University of Leipzig, Institute for Economic Policy, Grimnasche Spafbe 12, 04109 Leipeig, Germany (Tel: +49 341 9733565; e-mail: k.spantig@gmail.com). Barend Frielink, Phantouleth Louangraj and Soulinthone Leuangkhamsing provided valuable recommendations throughout the study. I also thank Gunther Schnabl for valuable advice.

[1] See Levine (2004) for an overview of the theoretical and empirical research concerning the connections and relationship of finance and growth.

In the late 1980s, the Lao People's Democratic Republic initiated a transition process to liberalize its goods and financial markets. Despite this process, the financial sector remains underdeveloped and shallow. In developed economies the financial sector comprises various sources of funding, while in the Lao People's Democratic Republic, the sector is mainly bank-based. Currently, only three companies (Banque pour le Commerce Exterieur Laos Public (BCEL), EDL-Generation Public Company and Lao World Public Company)[2] are listed on the stock market, which opened in 2011.

The financial sector is bank-centred and dominated by State-owned commercial banks. It only began to be gradually liberalized in the mid-2000s[3] and following the enactment of the new Law on Commercial Banks 2007,[4] a considerable number of private and foreign banks have entered the market. Since then, the development of the financial sector has made a great leap forward in terms of financial deepening, intermediation and distribution. However, from an historical perspective, financial liberalization in South-East Asia appears to be closely linked to financial turbulence. To ensure sustainable economic development in the medium and long term, financial liberalization must be accompanied by prudential financial sector supervision.

The aim of the present report is to show the empirical and causal relationship between financial market development and economic growth. It has already been shown that sustainable long-term growth must be achieved through qualitative loan growth and investment. Previous boom and bust cycles have revealed that pure quantitative and widely unregulated growth of the financial sector is likely to harm the economy. Thus, the report focuses on the importance of a sound and efficiently supervised financial sector development in order to gain long-term growth.

The remainder of the study is organized as follows. Section II reviews the theoretical and empirical literature on the finance-growth nexus and the functions of the financial sector. Possible transmission channels from the financial sector to growth based on financial development indicators are analysed. In section III,

---

[2] BCEL is the largest State-owned commercial bank, EDL Generation Public Company is a public electricity company and Lao World is a public company that builds and maintains convention halls, entertainment centres and shopping malls (Lao Securities eXchange, www.lsx.com.la/info/stock/listedCompany.do? lang=en).

[3] In 2004 the Government issued the Law on Promotion of Foreign Investment, which has facilitated capital inflows. In 2007, two joint venture banks, two private banks and six foreign bank branches, in addition to the four State-owned commercial banks, operated in the country's financial sector (BOL, 2007). Five years later, the number of private banks had risen to ten and the number of foreign bank branches to sixteen (BOL, 2013).

[4] Decree of the President of the Lao People's Democratic Republic, No. 02/PO, on the Promulgation of the Law on Commercial Banks.

challenges and the impact of the currently large capital inflows, as well as recent developments of the financial sector are assessed. In section IV, attention is drawn to prudential financial sector regulation and the supervision capacity of the Bank of the Lao People's Democratic Republic (BOL). Section V summarizes and concludes.

II. FINANCE-GROWTH NEXUS THEORETICAL BACKGROUND

The debate on whether the financial sector development contributes to economic growth and if so how it does is not new. Schumpeter (1912) argued that the banker was an intermediary who brings the entrepreneur with a new business idea together with the financier. This stimulates economic development. Mises (1953) comprehensively analysed the functions of the banking system, its role as credit intermediary on the one side and as credit creator on the other. He stated that by accumulating and efficiently allocating voluntary savings, the financial sector had supplied the funding for investments which, in the classical theory, was directly associated with growth. This idea was reflected in early growth models that explain economic growth by the rate of savings and capital productivity (Harrod, 1939; Domar, 1946). Later models accounted for productivity growth by adding technological progress (Solow, 1956).[5]

The finance-growth nexus has been subject to various empirical investigations. In 1969, using financial asset to gross national product (GNP)[6] ratios as proxies for financial development, Goldsmith (1969) found correlations between financial development and growth. Subsequent work in this field was strongly influenced by King and Levine (1993). Using financial market indicators (financial depth, intermediation and distribution) and economic growth indicators (level of investment, per capita gross domestic product (GDP) growth rates and the capital stock), they provided empirical evidence that financial development promoted growth. The evidence indicated that economies with a deeper financial sector and high levels of intermediation and distribution tended to grow faster than economies with less developed financial markets. King and Levine (1993) concluded that financial development had contributed considerably to economic growth as increasing capital accumulation and allocation efficiency promoted technological progress.[7]

Furthermore, Greenwood and Jovanovic (1990) emphasized the financial sector's role to collect and evaluate information and allocate capital to the most

[5] For a detailed overview of the theoretical literature, see, for example, Koivu (2002); Zhuang and others (2009); Stolbov (2013).

[6] In contrast to the GDP, GNP also accounts for net income from assets/income abroad.

[7] This result was approved by numerous subsequent studies (see, for example, Levine, Loayza and Beck (1999); Levine (2004); Demirgüç-Kunt and Levine (2008); Čihák and others (2013)).

profitable investment projects. Rajan and Zingales (1998) found that a developed financial sector had reduced the external costs of finance. This directly benefited existing firms but also encouraged new firms to enter the market, which spurred innovation, competition and growth.[8]

With a specific focus on emerging and developing economies, IMF (2012a) finds that undeveloped financial markets do not provide a sufficient shock absorption mechanism to external shocks. Deeper financial markets foster growth as they reduce volatility arising from liquidity constraints. The study pays particular attention to the surveillance of the financial sector, as unsustainable growth of the financial sector creates new sources of instability. Barajas, Chami and Yousefi (2013) confirm the positive relationship of financial development and growth in developing countries, but emphasize that the magnitude of the effect is heterogeneous across regions, national income levels and between oil exporting and non-oil exporting countries. The authors stress that limited access to financial services, lacking competition and insufficient financial supervision in low income countries hinder growth despite financial deepening.

Korner and Schnabel (2010) show that a State-owned bank dominated financial sector in combination with a shallow financial market and poor institutional quality has negative growth effects. Law, Azman-Saini and Ibraham (2013) find that due to the lack of institutional quality, until a certain development threshold, the finance-growth nexus is non-existent.

Estrada, Park and Ramayandi (2010) focus on the finance-growth nexus in developing Asia. The main result from the empirical analysis is a positive and significant effect of financial sector development on real GDP per capita growth. The authors find that the effect for developing Asia is stronger than for the rest of the world. However, the experience of the Asian financial crisis shows that medium- and long-term growth can only be achieved with a stable and developed financial sector.

The "more finance, more growth" hypothesis must be revised to "better finance, more growth" by shifting the focus from purely quantitative credit growth to efficiently channelling funds into high-quality investments (Estrada, Park and Ramayandi, 2010; Beck, 2013; Law, Asman-Saini and Ibraham, 2013).

Finance-growth transmission channels

The task of a financial sector is to mobilize funds for investment and to support economic activity. As an intermediary, it transforms and allocates capital from market

[8] For a broad review of the empirical literature, see, for example, Moshin and Senhadiji (2000); Thiel (2001); Levine (2004); Fink, Haiss and Mantler (2005); Zhuang and others (2009).

participants to investment projects (IMF, 2004). To fulfil this purpose, Demirgüç-Kunt and Levine (2008) identify five core functions of the financial sector. The first is to accumulate savings from individuals and pool them for investments. Second, information about potential investments must be collected and capital must be allocated to its most productive use (selection and screening process). The third task is to monitor if the provided capital is used in the intended way. Fourth, the financial sector provides knowhow and opportunities to reduce and manage risks, such as liquidity risks, diversified portfolios and better loan management. Finally, it facilitates the exchange of goods and services by lowering transaction costs (Demirgüç-Kunt and Levine, 2008).

By developing and executing those functions, the financial sector can enhance medium- and long-term economic growth. The transmission channels from finance to growth can be derived from a simple growth model, where output is dependent on capital productivity and the capital stock.

$$Y_t = AK_t \tag{1}$$

(Y_t – output; K_t – capital; A – capital productivity) (Pagano, 1993). The capital stock is assumed to depreciate at a constant rate (d). Investment (I_t) in period t is determined by the difference of the capital stock in two subsequent periods.

$$I_t = K_{t+1} - (1 - d)K_t \tag{2}$$

But due to inefficiency reasons, Pagano (1993) assumes that a certain fraction ($0 \leq ð \leq 1$) of savings (S) is lost during the process of financial intermediation.

$$I_t = ð * S \tag{3}$$

Given the growth rate from (1) $g_{t+1} = Y_{t+1}/Y_t - 1$ and assuming that in the steady state output and the capital stock grow at the same rate $Y_{t+1}/Y_t - 1 = K_{t+1}/K_t - 1$. Inserting transposed equation (1) ($1/K_t = A/Y_t$) and equation (2) ($K_{t+1} = I_t + (1 - d)K_t$) in $g = (K_{t+1}/K_t - 1)$ yields the steady state growth rate (g):

$$g = A * I/Y - d \tag{4}$$

Which, with aggregate savings rate S/Y being denoted as s, can be approximated as

$$g = A * ð * s - d \tag{5}$$

Based on equation (5), three possible transmission channels from finance to growth can be derived. The term ð, which determines the loss of resources while savings are transformed into investment, the capital productivity A and the savings rate s. The first transmission channel (ð) concerns the financial sector's ability to efficiently channel savings into investments. Competition and advanced technologies

reduce banking service fees, overhead costs and thereby the interest rate spread. As during the transformation process costs are reduced and, more savings can be transformed into investments (Pagano, 1993).

The capital productivity A stresses that a developed financial sector is able to collect sufficient information to evaluate investment projects and allocate capital to the projects with the highest marginal productivity. A larger number of financial intermediaries allow for better risk sharing by depositors (Pagano, 1993). In contrast to the first two channels, the effect of financial development on the savings rates is ambiguous. Due to risk reduction and reduced liquidity constraints, the savings rate might decline. In contrast, McKinnon (1973) and Shaw (1973) argue that a liberalized financial sector increases the savings rate by the removal of repressive interest rate ceilings on deposits. Liberalized interest rates are likely to generate higher deposit revenues and thus stimulate savings.

Following the approach of King and Levine (1993), (i) financial depth, (ii) intermediation and (iii) distribution are used as development indicators to evaluate the development of the financial sector in the Lao People's Democratic Republic. (i) A deeper financial sector benefits from economies of scale, as fixed costs are reduced (Fitzgerald, 2006). Financial sector participants profit from network externalities as more market information can be gathered by the financial intermediaries, which improves capital allocation (Greenwood and Jovanovic, 1990). A deep and diversified financial sector reduces capital constraints, external shock exposure and risks (Fitzgerald, 2006). Thus, size is a crucial indicator for the degree of development of the financial sector. (ii) However, from quantitative financial sector development alone, one cannot conclude whether the sector is functioning effectively.[9] Therefore, as a proxy for the quality of lending, the ratio of private to public financial intermediaries is used. It can be assumed that private financial intermediation is more market oriented than that of public institutions and thus capital allocation will be more efficient (Demirgüç-Kunt and Levine, 2008; Kawai and Prasad, 2011). (iii) Similarly, Kawai and Prasad (2011) argue that credit channelled to the private sector is more productive than lending to State-owned enterprises. In particular for transition economies with a tradition of politically biased lending, the distribution criterion is an important development indicator. Due to a lack of microeconomic data the analysis is limited to the macroeconomic level. The data used are mainly provided by BOL which, according to the report of World

[9] Demirgüç-Kunt and Levine (2008) argue that if the banking sector expands too quickly, a boom is likely to be followed by a bust. It is important to differentiate between the banking sector serving as credit negotiator, which is associated with economic growth and the banking sector as credit creator, which contains potential destabilizing risks (Mises, 1953). In the latter case, a rapidly expanding financial sector is not an indicator for positive growth impulses but implies potential overheating and distortions.

Bank (2009, p. 13) on observance of standards and codes, lacks the "most basic requirements of modern accounting and financial reporting" with issued statements being "hardly useful for decision-making".[10]

III. FINANCE AND GROWTH IN THE LAO PEOPLE'S DEMOCRATIC REPUBLIC

Capital inflows

Despite the transition process, the Lao People's Democratic Republic political system is still characterized as being a one-party system. The country's political and economic development is widely based on the politburo's decisions. As its northern and eastern neighbours, China and Viet Nam, the Lao People's Democratic Republic is governed in a top-down fashion with little civil society engagement. The financial as well as the real sector are dominated by State-owned enterprises (Andriesse, 2014). Despite an increasing amount of investments flowing in the country, in particular, small- and medium-sized private enterprises face difficulties accessing formal sources of finance. A GIZ (2014) report states that less than half (41.61 per cent) of the small and medium enterprises have access to external finance. Main obstacles are the complex documentation, high collateral requirements, insufficient accounting records and an often unclear legal status. Alternative sources of finance are family and friends, money lenders, traders and traditional *houay*.[11] The obstacles regarding access to financial services and the legal inadequacy are also reflected in a World Bank report on doing business (2014). The Lao People's Democratic Republic overall rank is 148 out of 189 rated countries. In the category "getting credit", the Lao People's Democratic Republic ranks 116, whereas its neighbours Cambodia, Thailand and Viet Nam rank 12, 89 and 36, respectively. Only, Myanmar, which is undergoing an economic transformation, ranks worse (171). In particular the investors' protection is a problem (rank 178) in the Lao People's Democratic Republic (World Bank, 2014).

An important driver for financial sector development in emerging and developing economies is capital inflows. According to IMF (2012a), capital inflows reduce interest rates, enhance investment, diversify financial risks and facilitate technology

[10] Due to the lack of reliable data, the study is limited in coverage and depth. For background information, expert interviews and secondary data are used. Furthermore, given the data constraint of the study, only the development of financial depth, intermediation and distribution are covered. Other important factors for a sustained financial development are access, efficiency and stability. As the financial system is multidimensional, the exclusive analysis of the quantitative development does not entirely cover the issue (Čihák and others, 2013).

[11] A traditional form of informal finance between colleagues and friends. A free translation is "lending with interest".

and managerial knowhow spillovers. However, capital flows also bear potential risks as they tend to be pro-cyclical and volatile. Periods of inflows are often followed by sudden stops and capital flow reversals (Kaminsky, Reinhart and Végh, 2005; Balakrishnan and others, 2012; Forbes and Warnock, 2012; Ghosh, 2012).

Kawai and Lamberte (2010) argue that capital flows are likely to cause macroeconomic and financial instability. During the inflow period excess capital supply is likely to lead to overheating, credit booms, inflation and (real) currency appreciation (Hoffmann and Schnabl, 2014). Financial instability is caused by a currency and/or maturity mismatch as due to shallow financial markets developing countries can neither borrow in their domestic currency nor long term on international capital markets (Eichengreen and Hausmann, 1999).[12]

The domestic financial sector, as the intermediary, transforms short-term foreign-currency-denominated debt into longer term investments, often denominated in domestic currency. The financial sector bears the maturity and currency risk in case of a shock (exchange rate depreciation and/or a sudden stop). Balakrishnan and others (2012) show that more than 60 per cent of capital inflow periods to emerging Asian countries ended in a sudden stop. Risks associated with capital flows amplify with increasing international financial market integration, as capital flows are becoming larger and increasingly volatile due to the expansive monetary policy stances of large industrialized countries (Balakrishnan and others, 2012; Forbes and Warnock, 2012).

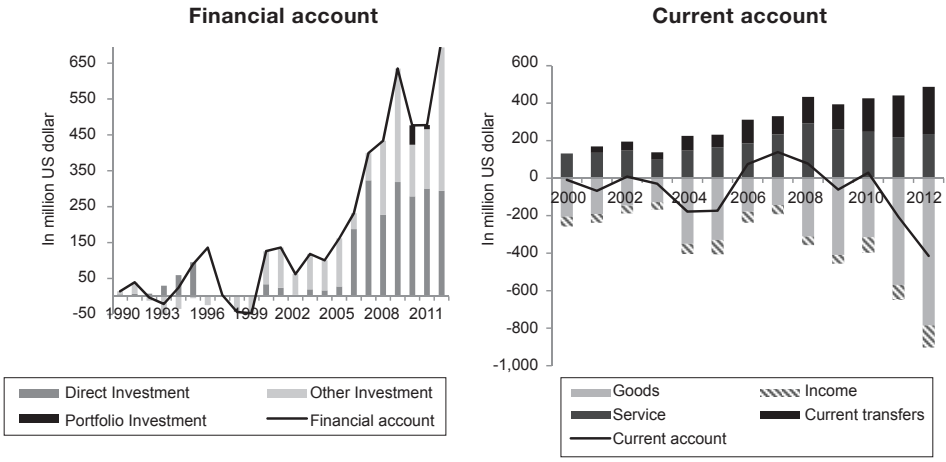
In contrast to most other South-East Asian economies, the Lao People's Democratic Republic has a positive financial and negative current account. The financial account is driven by foreign direct investment (FDI) and other investment[13] inflows. Due to the underdeveloped financial market and limited investment opportunities, portfolio capital inflows are negligible (left hand panel of figure 1). More than 70 per cent of FDI inflows are invested into large mining and hydropower projects (IMF, 2013). Other investment flows to the country are mainly (about 90 per cent in 2012) "bank related", which is often short-term and volatile capital (BOL, 2012b; IMF, 2012c). The other investment position contains official development assistance (ODA) credits which are not captured as current transfers. ODA is largely used to finance trade and government budget deficits (BOL, 2012a, p. 18).

[12] Foreign capital inflows are mainly denominated in foreign currency and are targeted at short-term investment, as long-term investment is often considered to be too risky in immature and instable financial markets. Domestic banks convert the short term foreign investments into long-term credits denominated in local currency and lend to domestic borrowers. Thus, domestic banks bear the risk of sudden investment stops and/or reversals and of exchange rate changes.

[13] Other investment is a residual category of the financial account covering trade credits, loans to the central government, monetary authorities and banks (IMF Balance of Payments Manual).

The negative current account balance is mainly driven by the negative trade balance as imports exceed exports. Services and current transfers, which include workers' remittances and ODA, are positive and stable (right hand panel of figure 1).

Figure 1. Current and financial account of Lao People's Democratic Republic



Source: IMF (IFS).

Note: Current and financial accounts are balanced by the change in reserves and errors and omissions. In particular, since 2006, errors and omissions are unusually large (accounting for about 25 per cent of the balance of payments in 2012). This might be an indicator for unrecorded capital flows and/or the inaccuracy of the data in general.

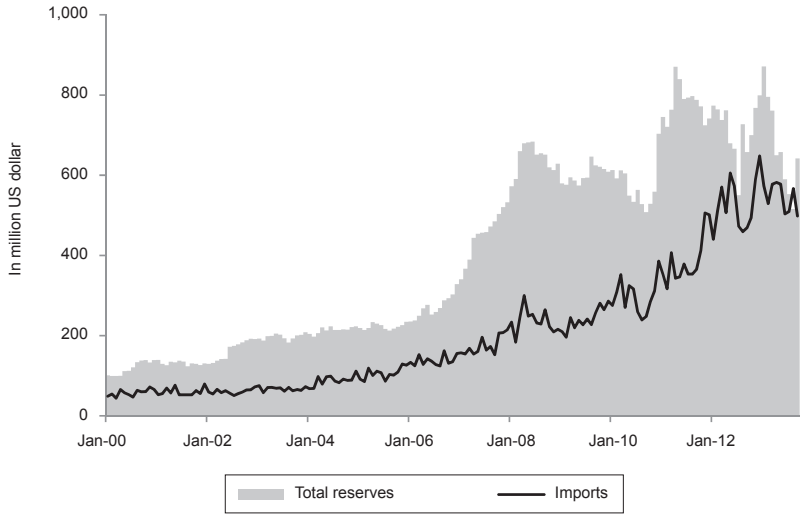
The relatively high capital inflows to the Lao People's Democratic Republic since the early 2000s have put appreciation pressure on the Lao kip. To stabilize the exchange rate, BOL has frequently intervened in the foreign exchange market and accumulated foreign reserves. Figure 2 shows that, in particular, the amount of foreign reserves strongly increased between 2006 and 2008.[14] During the subprime crisis, reserves fell slightly and increased again in 2011 and 2012. The bank's foreign exchange purchases have led to an increased monetary base. Through the commercial bank's money multiplier function, this is likely to lead to an expansion of the total amount of money and thus, according to the quantity theory of money,[15] to inflation and undue credit growth.

[14] The increase in foreign reserves is also reflected in the rising net foreign asset position in the BOL balance sheet shown in figure 3.

[15] Assuming the velocity of money relatively constant and the increase of output less than the increase in money supply.

Figure 2 shows the declining coverage of imports by foreign reserves. The reserves to months of imports ratio is a common measure to assess an economy's ability to absorb external shocks. Reserves to months of imports hit a low of about 0.8 months of imports in June 2013. With the decline of reserves to months of imports ratio, macroeconomic vulnerability is increasing. IMF (2013) is of the view that the foreign exchange reserves of the Lao People's Democratic Republic's foreign reserves are inadequate for precautionary measures and raises concerns about a foreign currency liquidity shortage.[16]

Figure 2. Foreign reserves and import expenditure



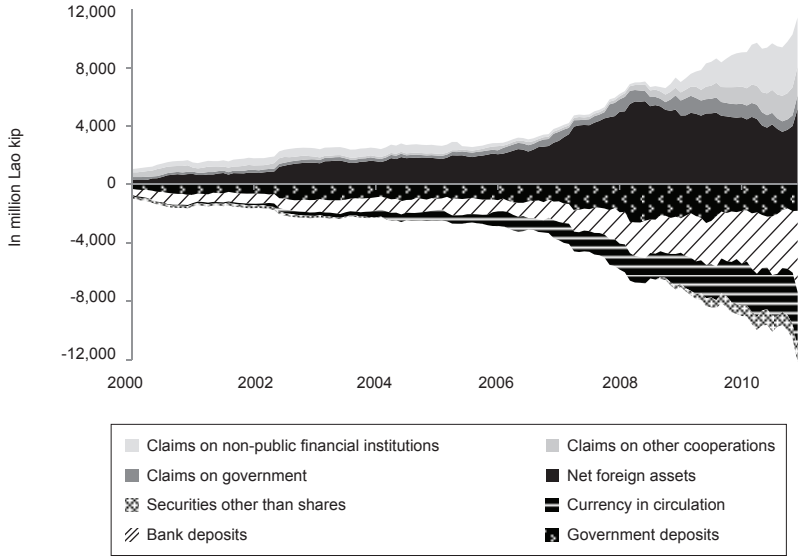
Source: IMF (IFS) and IMF Article IV (various issues).
Note: 2013 up to June only.

To partially sterilize the monetary effects of foreign reserve accumulation, BOL among other things, has sold Lao kip-denominated bonds to the domestic banking sector. This is reflected in the central banks' expanding position in securities that are classified as "shares". The accounting exchange on the liability side enables BOL to keep the increasing currency in circulation under control (figure 3). To not stifle growth, BOL did not follow the advice of IMF (2013) to raise commercial banks' reserve

[16] An appropriate stock of reserves would cover three to four months of imports. In comparison with other South-East Asian low income countries, the Lao People's Democratic Republic ranks last in terms of reserves in months of imports (IMF, 2013).

requirements to further slow money supply growth. When, between 2008 and 2010, net foreign assets declined, pressure for sterilization eased. However, at the same time, the claims of BOL on non-public financial institutions considerably rose. This can be explained by new commercial banks entering the financial sector. A prerequisite to operate a bank or a bank's branch in the country is a minimum of registered capital of no less than 100 billion Lao kip (KN) ($12 million) and KN50 billion, respectively (BOL, 2007, Article 13). Of the registered capital, 25 per cent must be deposited with BOL (BOL, 2001a). In return for the commercial banks' reserve deposits BOL provides liquidity through open market operations, which supply the banks with capital to not suppress lending.

Figure 3. The Bank of the Lao People's Democratic Republic balance sheet



Source: IMF (IFS).

The resulting increase in the claims on non-public financial institutions is mirrored on the passive side of the BOL balance sheet in bank deposits, which reflect the new commercial banks' minimum reserve deposits. The overall liquidity stance of the reserve depositing and subsequent open market operations is neutral, but the measure supports lending in Lao kip and thereby de-dollarization.[17] New

[17] The government and BOL widely promote the Lao kip as the "only currency used in Lao PDR" to further stimulate de-dollarization.

(mainly foreign) banks and branches entering the Lao People's Democratic Republic financial sector are likely to fulfil their reserve requirements in part by depositing foreign-currency-denominated capital at BOL.[18] In return, BOL supplies the banks with Lao kip by conducting open market operations.

All in all, capital inflows and an increasing number of commercial banks have led to an increase in money supply and lending. On the one hand, this is due to domestic money creation as reflected in the BOL balance sheet. On the other side, in a highly dollarized country, it is possible that foreign-currency-denominated capital inflows do not fully accumulate in the central bank, but instead are directly channelled into the private sector as foreign-currency-denominated credit.

A decreasing reserves to months of imports ratio in combination with rising foreign debt, a comparatively high public debt to GDP ratio of about 50 per cent (including publicly guaranteed) (IMF, 2013) and a negative current account makes the Lao People's Democratic Republic vulnerable to exchange rate fluctuations. The appreciation of the currency would deteriorate the trade balance further and foreign debt service would become more difficult while on the other hand, the depreciation of the currency would considerably increase the external debt burden in terms of domestic currency. Thus, to stabilize financial markets and growth, BOL has to keep the exchange rate relatively stable.[19]

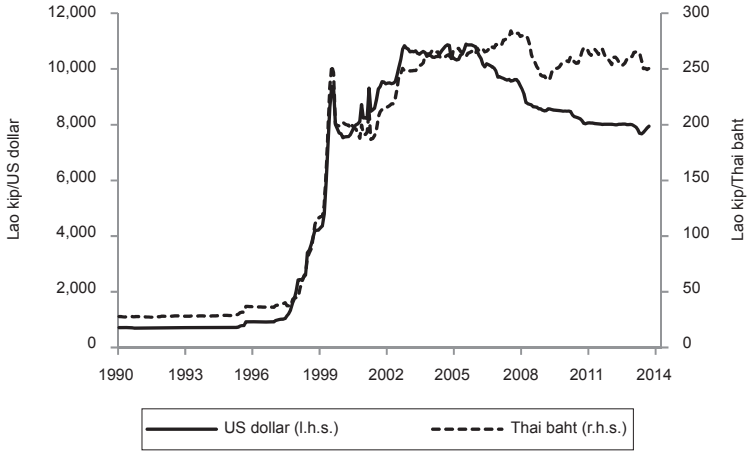
Given the important role of the Thai baht and the United States dollar in the economy of the Lao People's Democratic Republic, the exchange rates against both currencies are of particular importance. Figure 4 shows the exchange rate of the Lao kip against the dollar and the Thai baht since 1990. Before the Asian financial crisis, the Lao kip (as the Thai baht) was tightly pegged to the dollar. During the Asian financial crisis, the Lao kip and the Thai baht depreciated strongly against the dollar. In the early 2000s, the exchange rates stabilized. Since mid-2006, the Lao kip has followed an appreciation path against the dollar whereas the exchange rate against the Thai baht has fluctuated between 240 and 280 Lao kip.

[18] New banks entering the financial sector are mainly foreign banks and branches with their parent banks operating in the neighboring countries, such as Thailand, Cambodia, Viet Nam and China.

[19] In the Lao People's Democratic Republic exchange rate stabilization is a particularly critical issue as the country faces a multicurrency problem. In 2010, about 50 per cent of the currency in circulation were Lao kip, 30 per cent were Thai baht and 20 per cent were US dollars (Klär and Kooths, 2010). The high share of foreign currencies limit monetary policy independence and the central bank's ability to act as lender of last resort (Menon, 2010). The money supply in the Lao People's Democratic Republic at least partly depends on the monetary policy decisions in the United States and Thailand.

While most South-East and East Asian currencies strongly depreciated against the dollar during the turmoil of the subprime crisis, the Lao kip continued to appreciate. From early 2011 to late 2012, the Lao kip/US dollar exchange rate was kept relatively stable, before it started to appreciate again. Within half a year the value of the Lao kip gained about 4 per cent against the US dollar. In June 2013 the trend reversed and since then the Lao kip has lost value. The real exchange rate on the other hand continues to appreciate due to increasing labour costs and inflationary pressure (IMF, 2013).

Figure 4. Exchange rate of the Lao kip against the United States dollar and the Thai baht



Source: IMF (IFS).

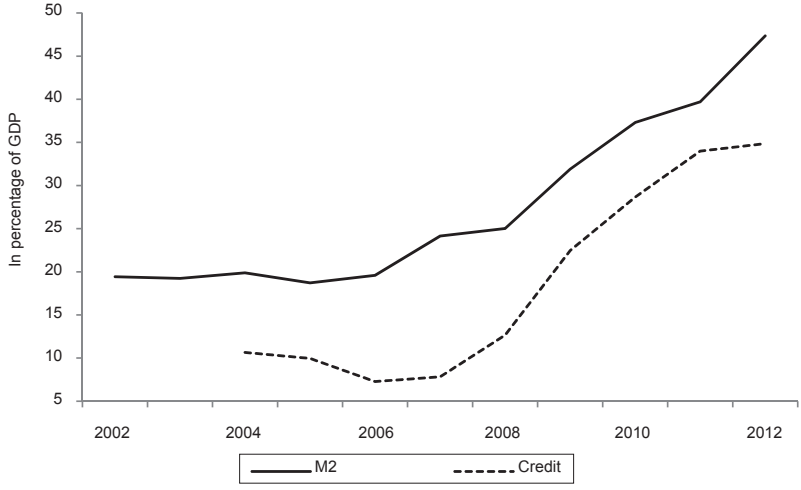
Financial sector development

Sustained capital inflows and the market entry of private and foreign commercial banks after the introduction of the Law on Commercial Banks in 2007 accelerated domestic money supply growth. Starting from a very narrow base of broad money, the money supply (M2)[20] in percentage of GDP expanded from 20 per cent in 2006 to almost 50 per cent in 2012 (figure 5). A higher M2 to GDP ratio indicates financial deepening and higher monetization of the economy, as a relatively high rate of money and quasi-money can be easily transformed into investment and consumption. The

[20] M2 is defined as broad money supply and consists of the currency in circulation and Lao kip and foreign-denominated deposits (BOL, 2012a).

increased money supply went along with rapid credit expansion. Between 2007 and 2012, the average annual credit growth rate clearly exceeded 20 per cent. Overall credit (from the central bank and commercial banks to the economy) increased from 11 per cent of GDP in 2004 to 35 per cent of GDP in 2012.

Figure 5. Money supply and credit to the economy (private and public sectors)

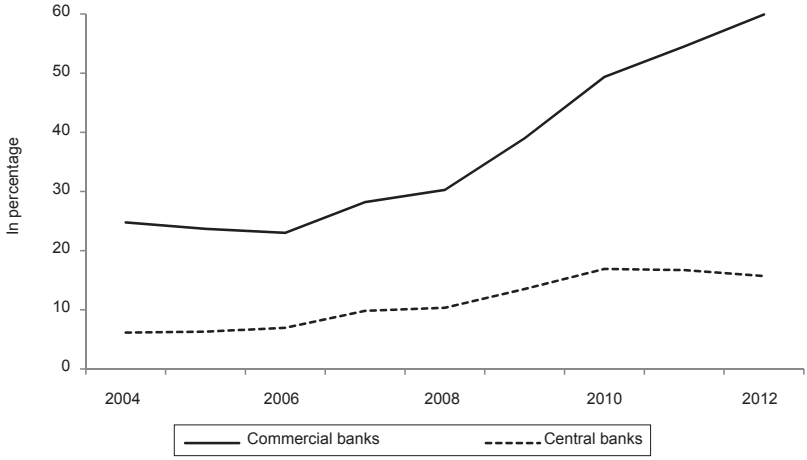


Source: BOL, ***Annual Economic Report*** (various issues) (M2); and IMF (GDP).

The ratio of central bank assets and commercial banks assets to GDP is another important indicator of financial depth as a broader base of banking assets reflects less credit constrains (Beck, Demirgüç-Kunt and Levine, 1999). On the other hand, the ratio between the two types of assets sheds light on the sector's efficiency. A higher commercial bank share is assumed to indicate higher efficiency as private capital allocation prevails over political considerations and thus lending can be assumed to be channelled to more productive investments (Demirgüç-Kunt and Levine, 2008; Kawai and Prasad, 2011). Figure 6 shows that since 2008, the commercial bank asset to GDP ratio rose considerably more than the central bank asset to GDP ratio, reflecting the market entry of (mainly) foreign private commercial banks and thereby increasing efficiency. However, as the three biggest commercial banks in Lao People's Democratic Republic – with a market share of 50-60 per cent[21] – are State-owned, this indicator must be treated with caution.

[21] The market share relates to the asset, deposit and loan share of the State-owned commercial banks in relation to quasi-private banks (BOL Monetary Statistics, various issues).

Figure 6. Central and commercial bank assets



Sources: BOL Monetary Statistics (various issues) (assets); and IMF (GDP).

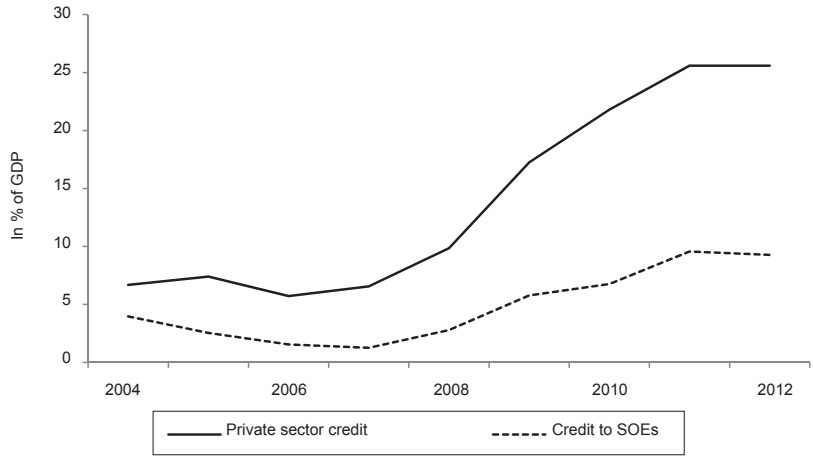
Besides depth and intermediation, the distribution of capital – between the private and public sector – is an important factor in evaluating the development of the financial sector (for example, King and Levine, 1993). Credit to the private sector to GDP ratio is particularly interesting for transition economies, which have a tendency to lend to State-owned enterprises. Figure 7 shows that since 2007, credit to the private sector in relation to credit to State-owned enterprises increased significantly.[22] Since then, the gap between credit to the private sector and credit to State-owned enterprises gradually widened, indicating rising efficiency in credit allocation.

In the past, the Lao People's Democratic Republic financial sector was characterized to a large extent by government directed lending to State-owned enterprises, mainly through State-owned banks. Those loans followed political interest rather than efficiency considerations, which resulted in high non-performing loan (NPL) ratios[23] (Unteroberdoerster, 2004). The increase in lending to State-owned enterprises since 2008 raises questions concerning the sustainability and the performance of the loans (IMF, 2012b).

[22] The onset of the rise reflects again the promulgation of the new Law on Commercial Banks and the resulting increase in new private and foreign commercial banks.

[23] The ratio reflects the share of NPLs to overall loans.

Figure 7. Lending to the private sector versus lending to State-owned enterprises

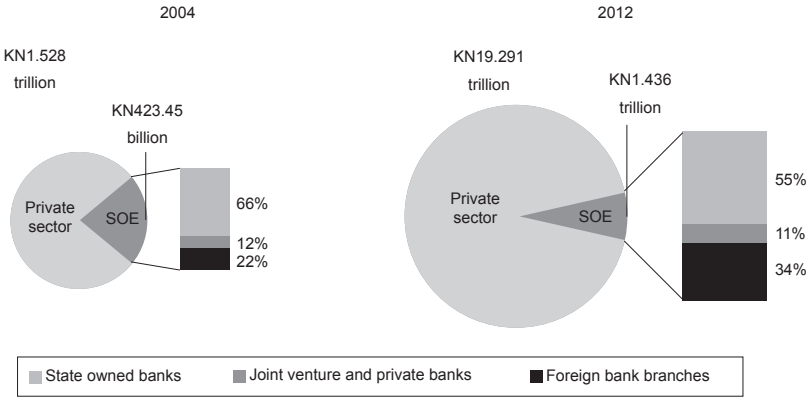


Sources: BOL Monetary Statistics (various issues) (credit); and IMF (GDP).

Figure 8 shows the size of lending to the private sector compared with the size of lending to State-owned enterprises, as well as to State-owned enterprises by bank ownership. Overall lending increased by a factor of ten from KN1.95 trillion in 2004 to KN20.7 trillion in 2012. The share of lending to the State-owned enterprises of overall lending declined from 22 per cent to 7 per cent. Striking is the change in the composition of the type of bank which is lending to State-owned enterprises. The share of the State-owned banks declined by 11 percentage points, whereas the share of foreign bank branches increased by 12 percentage points. Foreign bank branches now account for one third of commercial bank lending to State-owned enterprises.[24]

[24] Reportedly, one reason is that many of the foreign bank branches have just recently entered the market which is becoming more competitive and thus they finance investment projects that are not necessarily top tier. This could also be a possible explanation for the high NPL ratio of foreign bank branches (see figure 10).

Figure 8. Lending to private versus lending to State-owned enterprises by bank type

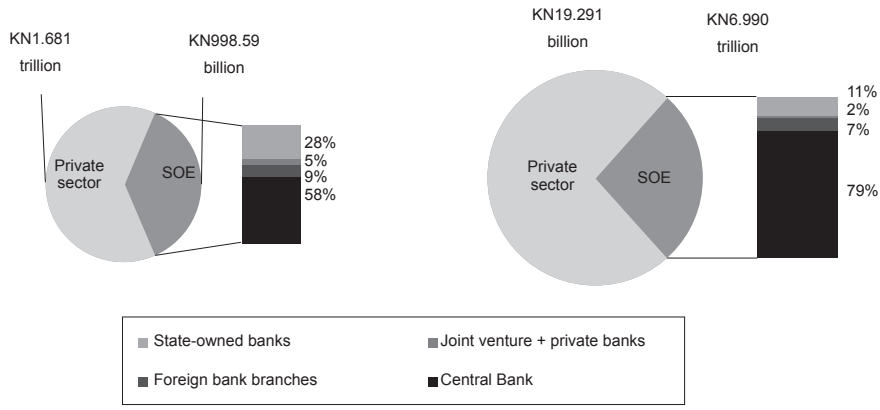


Source: BOL Monetary Statistics (various issues).

The structure of lending to the private sector versus lending to State-owned enterprises, as well as the composition of the ownership of banks that lend to State-owned enterprises has changed considerably, when taking into account central bank lending (figure 9). Although the share of credit to State-owned enterprises out of overall credit decreased by 10 percentage points, it still accounts for more than a quarter of total lending in 2012. In absolute terms, lending to State-owned enterprises increased by a factor of seven (from about KN1 trillion to KN7 trillion). Notably, the share of the commercial banks (especially the State-owned commercial banks) in financing State-owned enterprises was halved (from 40 per cent to 20 per cent). Commercial bank lending was replaced by an increasing share of direct central bank lending, which accounts for almost 80 per cent (or KN5.550 trillion) of lending to State-owned enterprises.

The Government increasingly uses BOL to directly finance Government projects. Between 2006 and 2012, Government priority projects worth 8.4 per cent of GDP were financed by BOL. About 75 per cent of public funding went into infrastructure projects. By the 2015, public investment is planned to be further increased and to account for at least 12 per cent of GDP (Ministry of Planning and Investment, 2011, p. 207, p. 111).

Figure 9. Lending to private versus lending to State-owned enterprises by bank type including the Central Bank

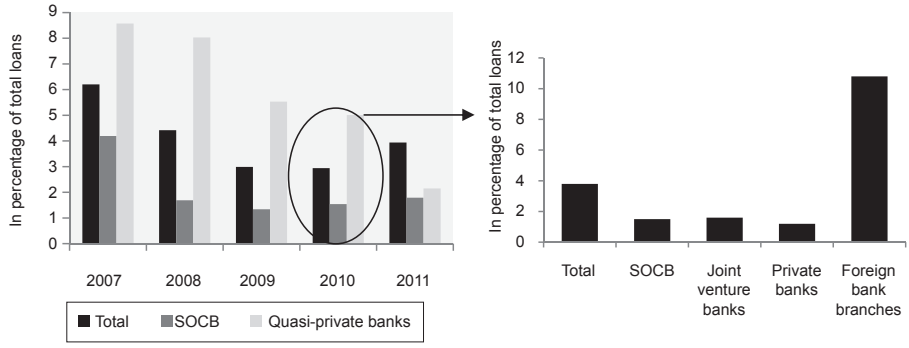


Source: BOL Monetary Statistics (various issues).

Increased direct central bank lending is argued to be due to the fact that State-owned Commercial Banks increasingly operate based on efficiency considerations and are less willing to lend to unprofitable investments. To fulfil the Government's socioeconomic plan, BOL has to step in. In the case of loan default, NPLs would not show up in the balance sheets of the State-owned commercial banks, but account as a central bank loss and as Government expenditure in case BOL has to be recapitalized.

The NPL ratio in the Lao banking sector declined from about 70 per cent in 2004 to below 6 per cent since 2007 (IMF, 2008, 2012b). The decline is due to large publicly financed write-offs during the bank restructuring process. As a result, the NPL ratio of State-owned commercial banks is considerably lower than the ratio of quasi-private banks. In particular, foreign bank branches show a comparatively high NPL ratio (figure 10). In addition to the write-offs, the currently relatively low overall NPL ratio is likely to be due to a credit boom (see figure 7). Excessive risk taking and deteriorated banks' balance sheets only become apparent with a time lag when capital flows are reversed (Ocampo, 2003; IMF, 2012b).

Figure 10. Non-performing loan development and composition



Sources: BOL (2012c); and IMF Article IV 2012 (composition).

IV. CRISIS RISKS AND PREVENTION

The Asian financial crisis as a wake-up call

In the wake of the Asian financial crisis, Stiglitz (1998, p. 32) argues that "financial market liberalization preceding the development of adequate regulatory capacity is likely to lead to an enhanced likelihood of a financial crisis". The experiences of the Asian financial crisis are of particular relevance for the financial sector development and liberalization process of the Lao People's Democratic Republic as the current development of the financial sector to some extent resembles development in other South-East Asian economies in the run-up to the Asian financial crisis.

The causes for the Asian financial crisis are many. A broad consensus exists that the combination of buoyant capital inflows, financial sector liberalization and poor financial sector supervision contributed to the unsustainable development (for example, Brownbridge and Kirkpatrick, 1999; Stiglitz, 1998; Corbett, Irwin and Vines, 2001; Estrada, Park and Ramayandi, 2010). In the late 1980s, many South-East Asian countries began to liberalize their financial markets by opening up capital accounts, reducing constraints on banking activities and liberalizing foreign bank entry (Brownbridge and Kirkpatrick, 1999). High growth rates in South-East Asia and

low interest rates in large industrial economies as in Japan and the United States led to large-scale carry trades[25] (Hoffmann and Schnabl, 2008).

The South-East Asian economies recorded strong capital inflows during the first half of the 1990s (BIS, 1997). Driven by capital inflows domestic lending expanded rapidly but due to limited knowhow and inadequate risk assessment, the underdeveloped financial markets were not able to allocate capital efficiently (Estrada, Park and Ramayandi, 2010). Lending was directed to privileged domestic firms (mainly export oriented) and insufficient collateral was compensated by government guarantees (either implicit or explicit) (Corbett, Irwin and Vines, 2001). This led to an investment structure which was characterized by high volumes but low quality (Estrada, Park and Ramayandi, 2010).

Overinvestment and increasing competition in the financial sector had led to deteriorating returns on investment. Deregulation had enabled banks to expand their activities to riskier sectors with potentially higher returns, such as real estate investments. To maximize profits, banks have tended to undertake riskier projects than depositors would have approved. This was possible because of the following: (i) depositors lacked correct and complete information[26] about the banks' investment projects; (ii) banks implicitly assumed a public bailout in case of bank failure (to protect the depositors and to prevent contagion effects) (BIS, 1997; Brownbridge and Kirkpatrick, 1999); and (iii) financial sector supervision was insufficient.

The rapid financial development has outpaced the regulators' capacity to efficiently oversee the sector. Thus, economic optimism during the boom and inadequate risk evaluation led to the underestimation of financial risks by borrowers, banks and regulators alike (Ocampo, 2003). When foreign capital inflows slowed down (and later reversed) unprofitable investment projects and rising NPLs put pressure on bank balance sheets. The maturity and currency mismatch of loans increased the

[25] Carry trading is an interest rate and currency speculation. Investors borrow in countries with low interest rates and invest in countries with high interest and growth rates. The investors' profit is the spread between borrowing and lending costs. Carry trades to South-East Asian economies were particularly attractive as the exchange rates were pegged to the US dollar which nullified the exchange rate risk. Carry trades are highly speculative, volatile and mainly for a short period. Capital can be transferred quickly in and out of a country.

[26] Asymmetric information results if one party has better information than the other. In this case, banks can select investment projects adversely as the lender cannot distinguish between low-risk and high-risk projects. As riskier projects offer higher returns and possible losses are borne by the lender, banks have an incentive to engage in riskier projects. Asymmetric information is in particular an issue in underdeveloped financial markets as information costs are higher due to a lack in transparency (weak disclosure policies) and low legal enforcement standards (Brownbridge and Kirkpatrick, 1998). Another issue is the free rider problem as due to the typically large number of small depositors of a bank it is rational for a depositor not to pay to gain information as costs would outrun the profit (Mishkin, 2001).

banks' distress (McKinnon and Schnabl, 2004). In 1997 the "Asian Miracle" ended with numerous bankruptcies of banks, large-scale currency depreciations and depressed growth.

Driven by large capital inflows, the Lao People's Democratic Republic financial sector is growing rapidly; however, it remains underdeveloped and vulnerable to external shocks. If financial sector liberalization and deepening continue to outpace the capacity of the regulating authorities, financial fragility may increase with potential negative effects as experienced during the Asian financial crisis. In particular, the rapid credit expansion is viewed critically as it could cause vulnerabilities to the financial sector (IMF, 2012b).

Table 1 compares the credit expansion in South-East Asian economies six years prior to the outbreak of the Asian financial crisis with developments in the Lao People's Democratic Republic over the last six years. With respect to annual real growth, annual loan growth and loan growth to GDP growth, the development of the Lao People's Democratic Republic financial sector exhibits similar characteristics to the South-East Asian economies prior to the Asian financial crisis. Domestic credit to GDP is, however, considerably smaller than in the other South-East Asian economies, which suggests a different level effect (at a lower level of financial development, credit to the private sector grows more rapidly).

Table 1. Credit growth in South-East Asia 1990-1996 and the Lao People's Democratic Republic 2006-2012 (in percentage)

Country	Annual GDP growth	Annual credit growth	Annual credit growth/ annual GDP growth	Domestic credit/GDP	
				1990	1996
Indonesia	17	20	118	45	55
Republic of Korea	14	17	121	68	79
Malaysia	13	18	138	80	136
Philipines	13	33	254	26	72
Thailand	14	24	171	84	130
Lao People's Democratic Republic (2006-2012)	**15**	**38**	**254**	**7 (2006)**	**35 (2012)**

Sources: Brownbridge and Kirkpatrick (1999); BOL Monetary Statistics; and ADB estimations (Lao People's Democratic Republic data).

Note: The data for the Lao People's Democratic Republic comprise loans denominate in Lao kip, Thai baht and US dollar.

The rapid credit expansion and an increasing number of new borrowers pose a challenge to commercial banks to evaluate future returns of investment projects, process credit applications and monitor the use of funding. If credit growth was to outpace the ability of commercial banks to evaluate the risk of projects and monitor their clients, rising NPLs would become likely. Furthermore, the increasing number of new commercial banks increases competition. To gain market share and to fulfil the loan to deposit ratio requirement of 60-80 per cent set by BOL, financing of projects with lower profitability becomes likely. This, on the one hand, reduces the individual bank's returns on investment as observed by Keovongvichith (2012), but on the other hand, it deteriorates the loan portfolio quality.[27]

The increasing number of commercial banks and the rapid credit expansion also require that the supervision authority exercise more diligence in overseeing the financial sector. However, despite BOL requiring regular public disclosure statements of the commercial banks' balance sheets and business operations (BOL, 2007, Article 57), data disclosure remains poor (Kronenberg, 2011; IMF, 2013). Poor commercial bank data, limited capacities and its broad spectrum of tasks makes it difficult for BOL to efficiently supervise the rapidly expanding financial sector. In addition, plans of the Lao People's Democratic Republic to join the ASEAN Economic Community, will put a further burden on this. Two points on the agenda of the ASEAN Economic Community are free investments flows and the freer flow of capital. The former comprises the ASEAN Investment Agreement, which provided for general liberalization of investment and improved investors protection. The later aims to strengthen the ASEAN capital market development and integration by allowing greater capital mobility, such as in the form of FDI, but also portfolio investment liberalization (ASEAN, 2008). Region-wide operating banks are more difficult to supervise for national regulators, particularly for branches of banks headquartered in advanced economies, such as Malaysia or Singapore, that offer more complex and sophisticated financial products as to what is up to now common in Lao People's Democratic Republic.

The Asian financial crisis serves as a painful reminder of the threat of capital account liberalization without sufficient regulations. In particular, an underdeveloped,

[27] This could, as in the South-East Asian economies before the crisis, raise the incentive of banks to expand their activities to more profitable but also riskier activities. This is not only the case for private banks but also for State-owned banks as the increased competition threatens their market share. To attract customers, new products and services comparable to those of private banks must be offered. Furthermore, the increased risk and potential loses of the large State-owned banks are implicitly backed by the government. So far, the Lao People's Democratic Republic financial sector offers only limited investment products beyond traditional banking operations. However, this situation could change in 2015 when the country joins the ASEAN Economic Community. With the opening up of the financial sector, new financial products and opportunities are likely to arise, exceeding national regulators' capacities.

bank-centred financial sector, as in the Lao People's Democratic Republic, is prone to rising macroeconomic instability due to increased capital flows. The shallow financial market cannot efficiently absorb increased capital inflows. Because of limited investment opportunities and inefficient financial institutions, excess funds are likely to be channelled into real estate, which, in turn, could result building up a bubble. Capital flows tend to be pro-cyclical. In the case of deteriorating business sentiments, they might stop or even reverse. The effects on the financial and real markets would be destructive as witnessed during the Asian financial crisis.

Structural distortions in the Asian financial markets became obvious as capital inflows slowed downed. More recently, when the former chairman of the U.S. Federal Reserve, Ben Bernanke (2013), in June 2013 hinted a possible ending of the its quantitative easing some South-East Asian economies went under fierce depreciation pressure when capital flows started to reverse. Kawai and Lamberte (2010) argue that countries with current account deficits, high inflation rates and foreign currency-denominated debt are particularly vulnerable to capital outflows. In Asia, in particular India, Indonesia and the Lao People's Democratic Republic match these characteristics. All three faced fierce currency depreciation pressure after the announcement.[28] The Lao kip devaluated from about KN7.700 per US dollar in June to almost KN8.000 per US dollar in September 2013 (see figure 4).

The IMF (2013) risk assessment for the Lao People's Democratic Republic states that there is a high likelihood that the end of the unconventional monetary policy measures in the United States will trigger a capital flow reversal, which would increase the foreign currency liquidity strains. Shrinking foreign reserves would help build devaluation pressure on the Lao kip. Foreign capital drain and a devaluation of the Lao kip would negatively affect banks' and companies' balance sheets. Financial sector distress is likely to lead to a loss of confidence in the domestic banking system, capital flight and a reacceleration of dollarization (IMF, 2013).

Propositions for improved financial sector supervision

Financial sector development is often accompanied by financial liberalization, which includes, among other things, the opening up of the capital account, the dismantling of restrictions on private or foreign banking operations and the removal of interest rate ceilings, (Brownbridge and Kirkpatrick, 1998). In particular, with regard

[28] All three countries have current account deficits, which were sustained by hot money inflows prior to the crisis, but with the prospect of an imminent end to U.S. quantitative easing, investors' confidence in the sustainability of the economies is shrinking and capital is withdrawn. The Indian rupee and Indonesian rupiah lost more than 15 per cent within four months after the announcement of Bernanke.

to the formation of the ASEAN Economic Community in late 2015,[29] the Lao People's Democratic Republic faces severe challenges concerning financial development and supervision. To achieve a stable structure, the member States of the ASEAN Economic Community must establish common licensing standards for financial institutions, a cross-border payment settlement scheme and deposit insurance system, a regional credit rating scheme and an enhanced system for consumer protection. To efficiently supervise the financial activities, a regional financial supervisory authority is advisable (Lee and Takagi, 2014). However, given the heterogeneous character in terms of the development stage and the political and economic systems of the ASEAN member countries, common standards and regulatory frameworks are difficult to implement. To gradually close the gap to the more advanced economies, the Lao People's Democratic Republic has to deepen and liberalize its financial market. Financial liberalization, however, has its drawbacks. The frequent occurrence of banking crises in the aftermath of the financial liberalization in several developing economies in the 1980s and 1990s indicate a link between financial liberalization and financial fragility (for example, Stiglitz, 1998; Rossi, 1999; Kaminsky and Reinhart, 1999; Rajan, 2005).[30] To ensure sound financial sector development, Mishkin (2001) proposes several measures to ensure prudential supervision. For the still underdeveloped Lao People's Democratic Republic financial sector, some measures, such as restrictions on risky asset holdings or the separation of the banking sector from other financial services, are not yet crucial. Instead, capital and disclosure requirements, as well as bank examination practices are of particular importance.

Capital requirements aim to prevent excessive risk taking as an increase in the share of equity capital rises, the bank owners' loss in case of bankruptcy.[31] In line with Basel I, commercial banks operating in the Lao People's Democratic Republic financial sector are required to maintain a capital adequacy ratio of at least 8 per cent (total capital to total risk weighted assets) and a 5 per cent ratio of the tier I capital to total risk weighted assets (BOL, 2001b, Article 4). Despite far reaching

[29] Given the current development and commitment of the ASEAN economies it is unlikely that the ASEAN Economic Community's goal of a single market will be achieved by that time (Lee and Takagi, 2014).

[30] Rossi (1999) and Demirgüç-Kunt and Detragiache (1998) find a significant positive relationship between financial liberalization and financial crises, in particular in developing economies with weak banking sector regulation. The link does not only apply for developing countries. A major reason for the subprime crisis in the United States and Europe was the combination of new complex investment products with insufficient regulation (Financial Crisis Inquiry Commission, 2011).

[31] Capital requirements can be based on the leverage ratio (equity capital divided by assets) or on risk associated with certain off-balance-sheets activities. International recommendations for capital requirements are covered under the Basel Accords where banks are required to hold certain minimum requirements according to their risk-weighted asset holdings and activities.

recapitalization measures and ongoing financial support, two of the four State-owned commercial banks remain below the regulatory minimum (Kronenberg, 2011).[32] Furthermore, reportedly many assets held by the commercial banks do not comply with the regulations as they are difficult to liquidate in case of a shock (for example, domestic government bonds). Overall, the capital adequacy of commercial banks (measured by loan to capital ratio) has deteriorated since 2007 (Keovongvichith, 2012).

For the supervision authority as well as for stockholders, creditors and depositors of commercial banks, a regular and comprehensive disclosure of information on the bank's portfolio, activities and risk exposure is crucial for monitoring it. The disclosure of information reduces the banks' advantages of asymmetric information and increases market discipline and financial stability. Currently, the enforcement of the disclosure policy in the Lao People's Democratic Republic financial sector is very weak. While BOL requires regular disclosure of the financial statements of all commercial banks (BOL, 2007, Article 57), public access to that information is limited. Also, national auditing standards do not meet international requirements and data released are of poor quality and inadequate for market decision making (World Bank, 2009). Kronenberg (2011) argues that if international recognized standards were to be applied, the overall picture of the health of the banking sector could change considerably.

In addition to the public disclosure of banking information, regular bank examinations are important to strengthen banking supervision and monitoring. Although on- and off-site examinations[33] in the Lao People's Democratic Republic are conducted, risks are not addressed adequately as examinations are mainly compliance based and not risk-focused (Kronenberg, 2011; IMF, 2013). On-site examinations take place annually with the same number of staff and timeframe for every bank regardless of the bank's size or risk exposure. Data gathered are insufficient as they lack a risk focused quality assessment. Given limited risk management capacity, exchange rate risks or interest rate risks are not evaluated, while others such as liquidity risks are insufficiently addressed. The time lag between examination and the use of the data is too long for efficient decision making. Off-site examinations are also seen as being insufficient, owing to inexperienced and the limited number of staff (Kronenberg, 2011).

---

[32] The State-owned commercial banks receive "capitalization bonds" and "bonds for settlement of defaulted LC" (letter of credit) issued by the Ministry of Finance. For instance, in 2010, BCEL (the largest State-owned commercial bank) received KN608 billion/KN40 billion, respectively (BCEL Annual Report 2011).

[33] On-site examination refer to BOL staff visiting the premises of commercial banks, to assess their business operations and the state of the property. Off-site examination imply the monitoring and analysis of the financial condition of the commercial banks on the basis of regularly business reports.

In the Lao People's Democratic Republic, the financial sector supervision falls to BOL: "The Bank of the Lao People's Democratic Republic shall review and comment on the regulations on credit and other regulations of the commercial banks and financial institutions under its supervision including the implementation of these regulations" (Lao People's Democratic Republic, 1995, (new) Article 42). To enhance the supervision of the financial sector, BOL has reorganized and strengthened its banking supervision.[34] Despite improvements, its supervisory ability is still limited, in particular given the current financial sector development with an increasing number of banks, strong capital inflows, rapid credit expansion and the upcoming accession to the ASEAN Economic Community. Furthermore, supervising the financial sector is not the only task of BOL. Kronenberg (2011) argues that BOL might face conflicting interests carrying out its assigned tasks (maintaining the stability of the Lao kip, supporting the government's development goals and supervising the financial sector). This is the case when the BOL channels credit to State-owned enterprises to finance government projects as discussed above and is critical for two reasons. First, direct lending is closely related to NPLs as decision making on credit provision is not based on efficiency reasoning but is politically motivated. This has caused unsustainable high NPL levels in the country. Those had to be written off at high costs to the government (Unteroberdoerster, 2004). Second, with BOL being the supervising authority, direct central bank lending (which accounts for about 15 per cent of GDP) is not subject to any further control.

V. HOW TO MOVE FORWARD

With respect to financial depth, intermediation and distribution, the financial sector in the Lao People's Democratic Republic has seen a rapid catch-up in recent years. Money supply increased the market share of commercial banks in comparison with that of the central bank rose and credit is increasingly being channelled to the private sector.

However, financial development and credit growth are to a large extent driven by high foreign capital inflows, State-owned commercial banks – which still dominate the banking sector – and by direct central bank lending. Politically biased lending and overinvestment are likely to lead to declining returns on investments and a rising NPL ratio. The large share of credit denominated in foreign currency makes the country vulnerable to exchange rate depreciations. With its comparatively

[34] In November 2010. the former Financial Institution Supervision Department was split into two departments, which are independent of each other: the Commercial Bank Supervision Department and Financial Institutions Supervision Department. The objective is to increase the effectiveness of supervision in each market segment (BOL, 2012d).

low level of international reserves, BOL may not be able to stabilize the exchange rate if confronted with sustained devaluation pressure. As the current financial sector development is driven by quantitative rather than qualitative factors, the financial development may outpace the regulators' capacity, which would increase the risk of macroeconomic instability. Thus, it is of utmost importance to enhance prudential financial sector regulation.

To avoid an Asian financial crisis-like scenario in the Lao People's Democratic Republic and to transform the developments of the financial sector into a sustainable medium to long-term growth, the sequencing and pace of financial development and regulation are crucial. In response to the Asian financial crisis, Brownbridge and Kirkpatrick (1999) drew four lessons for prudential regulation which are of particular interest for the Lao People's Democratic Republic. First, given increased capital inflows, regulators must constrain financial institutions' foreign currency exposures to limit the vulnerability to exchange rate changes and foreign capital outflows. For the Lao People's Democratic Republic, this point is of particular concern due to its relatively high capital inflows and the multicurrency problem. Second, BOL must enforce existing regulations. Supervision regulations are in place, but are poorly enforced. Third, financial institutions should be encouraged to use international standards of credit classification to reveal their financial situation. This would provide BOL with the necessary data basis for financial sector supervision. It would also be an important step, with regard to the accession to the ASEAN Economic Community, to harmonize banking and reporting standards in the region. Fourth, to reduce the moral hazard of banks, a government bailout in the case of failure must be credibly ruled out. This is especially important for the Lao People's Democratic Republic financial sector as the largest banks are State-owned and thus face an implicit bailout guarantee which could raise the incentive for riskier actions.

REFERENCES

Andriesse, Edo (2014). Laos: frontier capitalism. In *The Oxford Handbook of Asian Business Systems*, M. Witt and G. Redding, eds. Oxford: Oxford University Press.

Asian Development Bank (ADB) (2012). Enhancing financial sector supervision. Technical Assistance Report TA 7500-LAO. Available from www.adb.org/sites/default/files/project-document/74061/42224-012-lao-tcr.pdf.

Association of Southeast Asian Nations (ASEAN) (2008). *ASEAN Economic Community Blueprint*. Jakarta.

Balakrishnan, Ravi, and others (2012). Surging capital flows to emerging Asia: facts, impacts, and responses. Working Paper, WP/12/130. Washington, D.C., IMF.

Bank for International Settlements (BIS) (1997). *67th Annual Report*. Basel.

Bank of the Lao People's Democratic Republic (BOL) (2001a). Regulation on use of registered capital, 16 May. Vientiane.

_____ (2001b). Regulation on the commercial banks' capital adequacy, 28 August. Vientiane.

_____ (2007). *Financial Statistics*. Vientiane[0].

_____ (2012a). *Annual Economic Report*. Vientiane.

_____ (2012b). *Monetary Statistics*. Vientiane.

_____ (2012c). Notice to ADB. Vientiane.

_____ (2013). Monetary Statistics, Q1-2. Vientiane.

Banque Pour Le Commerce Exterieur Lao Public (BCEL) (2011). *Annual Report*. Vientiane.

Barajas, Adolfo, Ralph Chami, and Seyed Reza Yousefi (2013). The finance and growth nexus re-examined: do all countries benefit equally? Working Paper, WP/13/130. Washington, D.C., IMF.

Beck, Thorsten (2013). Finance for development: a research agenda. DEGRP Research Report.

Beck, Thorsten, Asli Demirgüç-Kunt, and Ross Levine (1999). A new database on financial development and structure. Financial Sector Discussion Paper, No. 2. Washington D.C.: World Bank.

Bernanke, Ben (2013). Transcript of Chairman Bernanke's press conference of June 19, 2013. Washington, D.C. Available from www.federalreserve.gov/mediacenter/files/FOMCpresconf20130619.pdf.

Brownbridge, Martin, and Colin Kirkpatrick (1999). Financial sector regulation. *The Lessons of the Asian Crisis, Development Policy Review*, vol. 17, No. 3, pp. 243-266.

Čihák, Martin, and others (2013). Financial development in 205 economies, 1960 to 2010, *Journal of Financial Perspectives, EY Global FS Institute*, vol. 1, No. 2, pp. 17-36.

Corbett, Jenny, Gregor Irwin, and David Vines (2001). From Asian miracle to Asian crisis: why vulnerability, why collapse? In *Financial Market Integration and International Capital Flows*, Gregor Irwin and David Vines, eds. Cheltenham: Edward Elgar Publishing.

Demirgüç-Kunt, Asli, and Enrica Detragiache (1998). Financial liberalization and financial fragility. Paper prepared for the Annual World Bank Conference on Development Economics. Washington, D.C.

Demirgüç-Kunt, Asli, and Ross Levine (2008). Finance, financial sector policies, and long-run growth. Policy Research Working Paper, No. 4469. Washington D.C.: World Bank.

Domar, Evsey (1946). Capital expansion, rate of growth, and employment. Econometrica, vol. 14, No. 2, pp. 137-147.

Eichengreen, Barry, and Ricardo Hausmann (1999). Exchange rates and financial fragility. Working Paper, No. 7418. Cambridge, MA: National Bureau of Economic Research.

Estrada, Gemma, Donghyun Park, and Arief Ramayandi (2010). Financial development and economic, growth in developing Asia. Economics Working Paper Series, No. 233. Manila: ADB.

Financial Crisis Inquiry Commission (2011). *Final Report of the National Commission on the Causes of the Financial and Economic Crisis in the United States*. Washington, D.C.

Fink, Gerhard, Peter Haiss, and Hans Christian Mantler (2005). The finance-growth nexus. Market economies vs. transition countries. Europainstitut Working Paper, No. 64. Vienna: Vienna University of Economics and Business.

Fitzgerald, Valpy (2006). Financial development and economic growth: a critical view. Background Paper for *World Economic and Social Survey*.

Forbes, Kristin, and Francis Warnock (2012). Capital flow waves: surges, stops, flight and retrenchment. *Journal of International Economics*, vol. 88, No. 2, pp. 235-251.

Ghosh, Atish, and others (2012). Surges. Working Paper, WP/12/22. Washington, D.C.: IMF. Available from www.imf.org/external/pubs/ft/wp/2012/wp1222.pdf.

GIZ (2014). HRDME enterprise survey 2013 for Lao PDR. Vientiane. Available from www.giz.de/en/downloads/giz2014-en-hrdme-enterprise-survey-2013.pdf.

Goldsmith, Raymond (1969). *Financial Structure and Development*. New Haven, Connecticut: Yale University Press.

Greenwood, Jeremy, and Boyan Jovanovic (1990). Financial development, growth, and the distribution of income. *The Journal of Political Economy*, vol. 98, No. 5, pp. 1076-1107.

Harrod, Roy (1939). An essay in dynamic theory. *The Economic Journal*, vol. 49, No. 193, pp. 14-33.

Hoffmann, Andreas, and Gunther Schnabl (2008). Monetary policy, vagabonding liquidity and bursting bubbles in new and emerging markets – an overinvestment view. *The World Economy*, vol. 31, No. 9, pp. 1226-1252.

Hoffmann, Andreas, and Gunther Schnabl (2014). Monetary policies of large industrialised countries, emerging market credit cycles and feedback effects. Working Paper, No. 4723. München: CESifo.

International Monetary Fund (IMF) (2004). *Compilation Guide on Financial Soundness Indicators*. Washington, D.C.

_____ (2008). Lao People's Democratic Republic: 2008 Article IV consultation - staff report; staff supplement; staff statement; and public information notice on the Executive Board discussion. Washington, D.C.

_____ (2012a). *Enhancing Financial Sector Surveillance in Low-Income Countries: Financial Deepening and Macro-stability*. Washington, D.C.

_____ (2012b). Lao People's Democratic Republic 2012 Article IV consultation. Country Report, No. 12/286. Washington, D.C.

_____ (2012c). The liberalization and management of capital flows: an institutional view. Washington, D.C.

_____ (2013). Lao People's Democratic Republic 2013 Article IV consultation. Country Report, No. 13/369. Washington, D.C.

Kaminsky, Graciela, and Carmen Reinhart (1999). The twin crises: the causes of banking and balance of payments problems. *The American Economic Review*, vol. 89, No. 3, pp. 473-500.

Kaminsky, Graciela, Carmen Reinhart, and Carlos Végh (2005). When it rains, it pours: procyclical capital flows and macroeconomic policies. In *NBER Macroeconomics Annual 2004*, Mark Gertler and Kenneth Rogoff, eds. Cambridge, Massachusetts: MIT Press.

Kawai, Masahiro, and Mario Lamberte (2010). Managing capital flows: emerging Asia's experience, policy issues and challenges. In *Managing Capital Flows the Search for a Framework*, Masahiro Kawai and Mario Lamberte, eds. Cheltenham: Asian Development Bank Institute and Edward Edgar Publishing.

Kawai, Masahiro, and Eswar Prasad (2011). *Financial Market Regulation and Reforms in Emerging Markets. – the Search for a Framework*. Asian Development Bank Institute and Brookings Institution Press.

Keovongvichith, Phetsathaphone (2012). An analysis of the recent financial performance of the Laotian banking sector during 2005-2010. *International Journal of Economics and Finance*, vol. 4, No. 4, pp. 148-162.

King, Robert, and Ross Levine (1993). Finance and growth: Schumpeter might be right. *Quarterly Journal of Economics*, vol. 108, No. 3, pp. 717-737.

Klär, Erik, and Stefan Kooths (2010). Incentives, initiatives, and obstacles to monetary cooperation. In *Dealing with Multiple Currencies in Transitional Economies: The Scope for Regional Cooperation in Cambodia, the Lao People's Democratic Republic, and Viet Nam*, Giovanni Capannelli and Jayant Menon, eds. Manila: ADB.

Koivu, Tuuli (2002). Does financial sector development affect economic growth in transition countries? Discussion Paper, No. 14. Helsinki: Bank of Finland's Institute for Economies in Transitiond.

Korner, Tobias, and Isabel Schnabel (2010). Public ownership of banks and economic growth – the role of heterogeneity. Discussion Paper, No. 8138. London: Centre for Economic Policy Research.

Kronenberg, Roger (2011). Lao People's Democratic Republic: enhancing financial sector supervision. Technical Assistance Consultant's Report, Project No. 42224. Manila: ADB.

Lao People's Democratic Republic (1995). *Decree Law No. 5, On the Bank of the Lao People's Democratic Republic, Amended on 14 October and Promulgated on 20 October 1999*. Unofficial translation. Vientiane.

Law, Siong Hook, W.N.W. Azman-Saini, and Mansor H. Ibraham (2013). Institutional quality thresholds and the finance – growth nexus. *Journal of Banking and Finance*, vol. 37, No. 12, pp. 5373-5381.

Lee, Choong Lyol, and Shinji Takagi (2014). Assessing the financial landscape for the Association of Southeast Asian Nations Economic Community, 2015. *Asia and the Pacific Policy Studies*, vol. 2, No. 1, pp. 116-129.

Levine, Ross (2004). Finance and growth: theory and evidence, handbook of economic growth. In *Handbook of Economic Growth*, Philippe Aghion and Steven Durlauf, eds. Elsevier.

Levine, Ross, Norman Loayza, and Thorsten Beck (1999). Financial intermediation and growth, causality and causes. Policy Research Working Paper, No. 2059. Washington, D.C.: World Bank.

McKinnon, Ronald (1973). *Money and Capital in Economic Development*. Washington, D.C.: Brookings Institution.

McKinnon, Ronald, and Gunther Schnabl (2004). The East Asian dollar standard, fear of floating and original sin. *Review of Development Economics*, vol. 8, No. 3, pp. 331-360.

Menon, Jayant (2010). Monetary policy issues in multiple-currency economies. In *Dealing with Multiple Currencies in Transitional Economies: The Scope for Regional Cooperation in Cambodia, the Lao People's Democratic Republic, and Viet Nam*. Giovanni Capannelli and Jayant Menon, eds. Manila: ADB.

Ministry of Planning and Investment (2011). *The Seventh Five-Year National Socio-Economic Development Plan (2011-2015)*. Vientiane.

Mises, Ludwig von (1953). *The Theory of Money and Credit*, 1912 edition enlarged with an essay on monetary reconstruction. New Haven: Yale University Press.

Mishkin, Frederic (2001). *Prudential Supervision*: *What Works and What Doesn't*. Chicago, Illinois: University of Chicago Press.

Ocampo, José Antonio (2003). Capital-account and counter-cyclical prudential regulations in developing countries. In *From Capital Surges to Drought: Seeking Stability for Emerging Markets*. Ricardo Ffrench-Davis and Stephany Griffith-Jones, eds. London: Palgrave/ Macmillan.

Pagano, Marco (1993). Financial markets and growth: an overview. *European Economic Review*, No. 37, pp. 613-622.

Rajan, Raghuram, and Luigi Zingales (1998). Financial dependence and growth. *American Economic Review*, vol. 88, No. 3, pp. 559-586.

Rajan, Raghuram Govind (2005). Has financial development made the world riskier? Working Paper, No. 11728. Cambridge, MA: National Bureau of Economic Research.

Rossi, Marco (1999). Financial fragility and economic performance in developing economies: do capital controls, prudential regulation and supervision matter? Working Paper, WP/99/66. Washington, D.C.: IMF.

Schumpeter, Joseph A. (1912). *Theorie der Wirtschaftlichen Entwicklung*, 1st ed. Berlin: Duncker und Humblot.

Shaw, Edward (1973). *Financial Deepening in Economic Development*. New York: Oxford University Press.

Solow, Robert (1956). A contribution to the theory of economic growth. *Quarterly Journal of Economics*, vol. 70, No. 1, pp. 65-94.

Stiglitz, Joseph (1998). Knowledge for development: economic science, economic policy, and economic advice. Paper prepared for the Annual World Bank Conference on Development Economics. Washington, D.C.

Stolbov, Mikhail (2013). The finance-growth nexus revisited: from origins to a modern theoretical landscape. *Open-Assessment E-Journal*, vol. 7.

Thiel, Michael (2001). Finance and economic growth: a review of theory and the available evidence. Economic Paper, No. 158. European Commission.

Unteroberdoerster, Olaf (2004). Banking reform in the lower Mekong countries. Policy Discussion Paper, No. 04/5. Washington, D.C.: IMF.

World Bank (2009). Lao PDR - report on the observance of standards and codes: accounting and auditing (ROSC). Washington, D.C.

_____ (2014). *Doing Business 2015: Going Beyond Efficiency*, 12th ed. Washington, D.C.

Zhuang, Juzhong and others (2009). Financial sector development, economic growth and poverty reduction: a literature review. Economics Working Paper, No. 173. Manila: ADB.

THE IMPLEMENTATION OF SMALL AND MEDIUM-SIZED ENTERPRISE DEVELOPMENT IN THE RICE SECTOR OF MYANMAR: EMPIRICAL RESEARCH FINDINGS

*Naylin Oo**

This study has three objectives in assessing the implementation of small and medium-sized enterprise (SME) development in the rice sector of Myanmar. This study attempted to (a) assess the current status of SME development in the rice sector; (b) identify the level of perceptions of the factors affecting the implementation of SME development in Myanmar; and (c) study the impact of policy implementation on different types of businesses in the rice sector of Myanmar.

The factors include policy implementation, market access, financing accessibility, technology acceptance, entrepreneurial capability and internationalization. The conceptual framework was prepared and a questionnaire was designed based on these factors. Thirteen hypotheses were proposed in order to ascertain the factors. The study used active agents of SMEs in three top rice-growing regions of Myanmar as the target population for the primary data. In addition, the representatives of government agencies and business associations as well as relevant experts were alternative sources of data.

All of the hypotheses were successfully tested and only 3 out of 13 were accepted. The findings revealed that the capability of implementers and local market access had a highly significant relationship with the income generation aspect of SME development, while financing accessibility and entrepreneurial capability exhibited strong significant influences on the employment generation aspect of SME development. The findings are applicable for policymakers, practitioners, implementers of SME development, and entrepreneurs in Myanmar and other developing countries.

* Economic Affairs Officer, United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), Bangkok, Thailand. PhD candidate at Graduate School of Public Administration of the National Institute of Development Administration, Thailand (e-mail: naylinoo@yahoo.com).

JEL classification: L53, O13, O53, Q13.

Keywords: SME development, small and medium-sized enterprises, implementation factors, rice sector, Myanmar.

I. INTRODUCTION

Myanmar is currently going through a triple transition: "(1) from authoritarian military system to democratic governance; (2) from a centrally directed, closed economy to a market-oriented, open one; and (3) from 60 years of conflict to peace in the border areas" (World Bank, 2014). Emerging from half a century of isolation, Myanmar has been undertaking historic political and administrative reforms and has worked to open up its economy through trade and investment liberalization. Now Myanmar is in the process of instituting a series of policy and strategic reforms with the aim of achieving national development goals. Myanmar has instituted wide-ranging reforms as part of the ongoing economic, social and political transformations, including the introduction of new law for small and medium-sized enterprises (SME).

Myanmar is still an agriculture-oriented economy. While the government has done much to lay the building blocks for a market economy, particularly in the area of agricultural sector development, much more needs to be done, especially in the area of SME development in that sector to successfully complete the transition.

While their individual contributions to the economy may be small, the accumulated contribution of SMEs has tended to be quite significant for the entire economy. The contribution of SMEs to the creation of jobs, innovation and economic dynamism has been recognized by developing countries, including Myanmar (Abe and others, 2012). Prior studies documented that SMEs play a significant role in the economy of a country. Consequently, the effective implementation of SME development is closely associated with the economic development of the nation. "Promoting SME development is a very difficult task and complex. It depends not only on policy or external conditions, but also on SMEs' characteristics and how SME perform" (Oum, 2013).

The success of SME development depends on various external factors (namely, policy and regulatory environment, infrastructure, corruption, access to finance, governance, bureaucratic hurdles, business development services, among others) and internal factors (namely, experience, capacity, organizational culture, technology, among others). From another point of view, the success of SMEs can be influenced by the following factors: political, economic, social and technological.

SMEs play an important role in the economic development of developing economies (Kayanula and Quartey, 2000). They are the growth drivers of Myanmar and account for more than 99.4 per cent of all enterprises, with approximately 130,000 registered and an estimated 620,000 unregistered (United Nations, 2013). In particular, agriculture remains the backbone of the economy, and the agricultural sector of Myanmar, from which 70 per cent of population derives its income, accounts for approximately 32 per cent of GDP, more than 60 per cent of employment and 20 per cent of exports (OECD, 2014b).

Myanmar used to be known as the "rice bowl of Asia" because it was the largest rice exporter in the 1950s, but during the central planning period, rice production and exports decreased owing to low quality and high consumption. This is partly due to the fact that the whole economy "went down"; Myanmar, once a country with a lot of potential, became one of the least developed countries after the dictatorial socialist governments in the period from the early 1960s to the late 1980s and the subsequent military governments from the late 1980s to 2010.

As a result, in general, private sector development, and more specifically SME development, stagnated for many years. International sanctions also put more pressure on market access, foreign direct investment (FDI), financing, and the transferring or updating of modern technology. There was a generation gap caused by a brain-drain of skilled workers and eventually a shortage of unskilled labourers due to mass migration to other countries that continues to affect Myanmar to this day. Thus, it is important to strengthen an enabling business environment. Otherwise, the growth of the SME sector could consequently be slow, which in turn would affect the socioeconomic development of Myanmar.

This study presents information on the real situations within which key policy implementation factors have to be adopted and their impact on effective SME development. This study also provides an understanding of how SME development policy should be effectively implemented, by looking at various factors affecting the implementation of SME development. Based on the findings, lessons and conclusions will be presented, and recommendations for policy formulation will be provided. The study aims to contribute to the existing literature on SME development, including that related to the Myanmar context, and to fill the gap that exists in the knowledge about SMEs in developing countries, particularly in Myanmar.

Research objectives

This study aims to ascertain the role of SME development in income generation and employment creation in the rice sector of Myanmar, including the important

factors affecting that development based on levels of perceptions. Thus, this study identified the following overall objectives:

- To assess the current status of SME development in the rice sector.
- To identify the level of perception of the factors affecting the implementation of SME development in Myanmar.
- To study the impact of policy implementation on different types of businesses in the rice sector of Myanmar.

This study focuses on the external factors affecting SME development in Myanmar as well as on one internal factor (namely, entrepreneurial capability). Given the various factors of policies and regulatory frameworks, economic and social conditions, technology and entrepreneurial capability, the study specifically explores the implementation aspects of policy processes that affect SME development in different types of businesses in the rice sector of Myanmar. In addition, this study explores the roles of SMEs in generating income and creating jobs. SMEs in the rice sector of Myanmar are the target population. In terms of limitations, due to some physical barriers, such as transportation, and administrative barriers, research was conducted at 32 locations in three main rice growing regions where the majority of SMEs in the rice sector are located.

While Myanmar has attracted substantial interest from the international community, there are still many gaps in the knowledge of and a lack of in-depth information about the conditions SMEs face and the perspectives of the private sector. This study provides two key dimensions for an effective SME development policy framework:

- Policymakers, practitioners and implementers – policymakers, practitioners (including business owners) and implementers understand key factors affecting the implementation of SME development and prioritize appropriate and practical implementation approaches.
- Theoretical contribution to academics – further study on other aspects of policy frameworks for SME development and on the effective policy implementation of other development programs through various policy analyses conducted.

The findings regarding a practical framework can provide policy options for policymakers to make strategic decisions to further strengthen the growth of the SME sector for income generation and employment creation.

II. LITERATURE REVIEW

To study the implementation of SME development in Myanmar, the literature on various studies of the current socioeconomic conditions in Myanmar, including its reform process, implementation theories on the promotion of SME development, and the roles of SMEs in income generation and job creation, were reviewed. The result, a comprehensive theoretical model of the implementation of SME development, was then tested and the relationships between the factors affecting the implementation of SME development in the rice sector of Myanmar were examined.

Myanmar's strategic location between China and India and the Association of Southeast Asian Nations Economic Community (AEC) offers Myanmar and its businesses new opportunities to reach out to the more than 500 million people living in neighbouring countries and the closest provinces of China and India (Chhor and others, 2013). Myanmar has a young population which provides enormous potential for future growth and development.

Since the new government took power in March 2011, Myanmar has introduced several ambitious reform programmes to open up its economy in order to integrate with the international community and to improve its deteriorating economy, which is characterized by low levels of industrialization and employment and inefficiencies (International Crisis Group, 2012). The government has set up four-step reform programmes for political reforms, economic reforms, administrative reforms and private sector reforms. Although some progress has been made since the various reforms began, poverty remains the biggest challenge in Myanmar because it is a country with a low income mainly generated from agriculture. To some extent, international sanctions are still hampering the development even though there have been ambitious changes in the political and economic paradigm of the country.

Economy of Myanmar

Myanmar has very recently moved up to the category of low middle-income developing countries with a gross national income per capita of between $1,045 and $4,125, according to the World Bank (2015e). During the military regime, GDP of Myanmar had grown at an average rate of 2.9 per cent annually. However, real GDP growth has been rising; it was estimated at 5.9 per cent in 2011/12, 6.4 per cent in 2012/13, 7.8 per cent in 2013/14 and 8.5 per cent in 2014/15, according to the Asian Development Bank and International Monetary Fund.

The major economic sectors of Myanmar are agriculture, trade and services, industry and mining. Agro-based industries, wood-based industries, the textile industry and heavy industries are the major industries; and the major export products are

rice, teak, beans and pulses, rubber, coffee, minerals, gems and marine products. Myanmar is still an agriculture-oriented economy, although the share of agriculture in the GDP declined during the first decade of the 21st century. The composition of main sectors by GDP is as follows, based on 2012 estimates: agriculture (34.2 per cent), industry (27.5 per cent) and services (38.3 per cent). In these sectors, the official labour force is about 37.35 million. According to 2011 government estimates, 65 per cent of the labour forces is in the agriculture sector, 12 per cent in industry and 23 per cent in services, respectively (Nwe, 2013).

Table 1. Share of GDP by sectors in Myanmar (2002-2012)

Years	Percentage of GDP		
	Agriculture	Industry	Service
2002-2003	52.9	12.8	35.3
2003-2004	51.9	13.6	34.5
2004-2005	50.5	14.6	34.9
2007-2008	48.3	19.9	36.7
2010-2011	36.2	26.0	37.8
2011-2012	34.2	27.5	38.3

Source: Hlaing (2014, table 2).

Reforms in Myanmar

During the second wave (economic reform) and third wave (administrative reform) of the reform process, the Government sought a high economic growth rate, targeting a 1.7 fold rise in per capita GDP after the five-year plan. In 2012, the President announced a four-point economic policy: sustained industrial development to catch up with global economies while keeping up the momentum of agricultural reforms and attaining poverty alleviation and rural development; equitable sharing of resources, both budgetary and foreign aid, among regions and states while promoting foreign and local investments for regional development; effective implementation of people-centred development through community-driven, participatory approaches to improvements in education, health and living standards; and reliable and accurate gathering of statistical data and other information to better inform public policy decisions (Myanmar, 2012). Reform measures for economic development include fiscal policy reform (tax reforms), financial reform (foreign exchange market liberalization), trade policy reform (trade liberalization), investment policy reform (new FDI law), infrastructure reform (deep seaports and special economic zones) and institutional

reform (formation of the National Economic and Social Advisory Council and the Foreign Aid Management Central Committee).

The Government of Myanmar developed the Framework for Economic and Social Reforms in consultation with senior officials of various ministries and departments of the Government as well as the development partners of Myanmar. The Framework is an important tool for both short-term and long-term policy development in Myanmar. However, Myanmar still lacks transparency and proper implementation in its regulatory and legal environment. While the Government has implemented a number of reform measures and has introduced many new laws to increase the fairness and transparency of the regulatory environment, implementation has been slow, and little progress has been reported.

Small and medium-sized enterprises

Previous studies dealing with private sector development have focused on large enterprises rather than SMEs. However, in recent years studies have focused more on the promotion of SMEs because of "the perceived failure of large enterprises in creating adequate productive jobs to absorb a significant share of the rapidly growing labour force in many developing countries" (Huang, 2003). Entrepreneurs start businesses for various purposes. "Some start businesses driven by necessity … while others are opportunity-driven" (Global Entrepreneurship Monitor Thailand, 2012). Regardless of the reasons for entrepreneurs to start businesses, the government needs to take positive steps and measures towards introducing regulatory measures, to help to cope with the new and changing environments and to address emerging challenges faced by SMEs so that their development will lead to the economic and social development of the country.

It is important to consider the definition of SMEs. SMEs are "smaller than big business in such terms as number of employees, asset base, annual revenue and ownership structure" (IBON International, 2014). Although the term "small and medium-sized enterprise" has various definitions across different economies, such definitions are generally based on the size of the economy and the level of economic development of the country. More than 90 per cent of enterprises (99 per cent for China (2003); 98 per cent for Thailand (2003); 99 per cent for Viet Nam (2002)) belong to the SME category. More than 60 per cent of private sector jobs (75 per cent for China (2003); 65 per cent for Thailand (2003); 77 per cent for Viet Nam (2002)) come from SMEs, which contribute about 20-30 per cent of the GDP (65 per cent of industrial output (China); 47 per cent of the GDP (Thailand) and 55 per cent of exports (Thailand); and 20 per cent of exports (Viet Nam) (2003)) (Abe and others, 2012).

Table 2. SME contribution to the economy

(Percentage)

	Malaysia	Thailand	Republic of Korea	Japan	China	Indonesia	India
SME establishments	94	98	99	99	99	99	95
Employment	40	56	69	88	74	99	80
Value added	26	47	46	56	60	63	40

Source: Abe and others (2012).

SMEs are a very heterogeneous group of businesses usually operating in various sectors, "from traditional, small and family-owned enterprises to dynamic, innovative and growth-oriented enterprises" (Kyaw, 2008). In many developing countries, most SMEs have 10 employees or fewer and operate in an informal setting without legal status or registration and with limited or no access to proper regulation and insurance.

For much government policy research, as well as management and economics sources, SME development is measured in terms of increases in SME employment. Vice President U Nyan Tun said "SMEs are key to boosting the economy and creating job opportunities, stressing the need to enhance entrepreneurial skills through a strong policy that will guarantee continuous growth of the enterprises" (Myanmar, President Office, 2014). SMEs are a key source of employment as they invigorate local economies and stimulate competition.

SMEs hold enormous promise for the competitiveness of a country, particularly in terms of higher income growth, fuller employment of domestic resources, more gainful integration though global and regional trade and investment, and greater equity in access, distribution and development. However, SMEs are usually most interested in financial performance, which can be measured by the growth of sales or turnover growth and profitability, since this focuses on their earnings -- in other words, income generation. In many developing countries, the absolute values of these measurements are difficult to research and record over a specific period of time due to unreliable sources and non-standard data collection procedures.

Small and medium-sized enterprise development in Myanmar

It is difficult to research the background of enterprise development in Myanmar because of the scarcity of literature on the subject. Throughout their history, Myanmar enterprises have not had an opportunity to reach their fullest potential relatively except from 1948 to 1962 (Kyaw, 2008). Due to mismanagement of the economy under the socialist economic system from 1962 to 1988, only a few institutional reforms were

made. To boost private sector development, the Right of Private Enterprises Law was promulgated in September 1977. However, "private investments throughout the socialist period were confined to small-scale activities, concentrating on processing natural resources" (Kyaw, 2008). The military government declared the adoption of a market-oriented economic system in 1988, and the Private Industrial Enterprises Law of 1990 and the Promotion of Cottage Industrial Law of 1991 were promulgated. The Myanmar Citizen Investment Law was enacted in March 1994 to promote indigenous businesses. As a result, the number of private business establishments has drastically increased since 1988 (Kyaw, 2008).

According to the Ministry of National Planning and Economic Development, the number of enterprises in Myanmar in 1999 was 55,523. Of that number, SMEs made up 99.2 per cent. The total number of enterprises registered as private industrial enterprises has increased yearly, from 28,848 in fiscal year 1991 to 41,475 in fiscal year 2005 (Myint, 2006). From 2002 to 2003, 89.6 per cent were private enterprises, 8.6 per cent were state-owned and 1.6 per cent were cooperatives (Myint, 2006). According to information released by the Ministry of Information, the number of registered private industrial enterprises reached 43,374 by end of 2006 (Kyaw, 2008).

After the new Government took power in 2011, it immediately realized the importance of reliable data in order to address development challenges and to formulate appropriate national policies and strategies. The latest published information shows that SMEs make up 99.4 per cent of all enterprises, with approximately 130,000 registered and another estimated 620,000 unregistered (table 3).

Table 3. Composition of enterprises in Myanmar

	Number	Percentage
Formal sector	126 958	17
Large enterprises	721	0.6
SMEs	126 237	99.4
Informal sector	620 000	83

Source: U Thein Sein (2013).

An estimation shows that Myanmar has 2.6 SMEs per 1,000 people (Abe and Dutta, 2014). Table 4 compiles the data collected from various sources. It shows that a lack of proper statistics remains a major challenge for conducting research on trends and outlook on enterprise development in Myanmar. In other words, Myanmar had been in a position where the implementation of enterprise development, let alone SME development, was like "an elephant in the room", meaning that there were

obvious problems that people did not want to talk about and try to solve. Now SME development in Myanmar is one of the top priorities for the Government. It is better late than never. However, many challenges remain.

Table 4. Number of enterprises in Myanmar

Year	Enterprises	Percentage of SMEs	Source
1991	28 848	-	Myint (2006)
1999	55 523	99.2	Ministry of National Planning and Economic Development
2005	41 475	-	Myint (2006)
2006	43 374	-	Ministry of Information
2013	126 958	99.4	Ministry of Industry (U Thein Sein, 2013)

Definitions of small and medium-sized enterprises in Myanmar

One of the remaining challenges, in addition to the lack of reliable data, is the proper categorization of enterprises in Myanmar. During the course of this research, the Government undertook various measures to improve SME development in Myanmar. The new Small and Medium Enterprise Development Law, which was drafted and passed by the parliament in April 2015, classified enterprises in Myanmar in six broad categories based on the number of employees and the value of the enterprise's capital investment (table 5).

Table 5. New SME definitions, 2015

Category	Small		Medium	
	Employees	Capital (millions, kyat)	Employees	Capital (millions, kyat)
1. Manufacturing, mining, construction	Up to 50	Up to 500	51-300	501-1 000
2. Labour intensive manufacturing	Up to 300	Up to 500	301-600	501-1 000
3. Wholesale business	Up to 30	Up to 100	31-60	101-300
4. Retail business	Up to 30	Up to 50	31-60	51-100
5. Service business	Up to 30	Up to 100	31-100	101-200
6. Others	Up to 30	Up to 50	31-60	51-100

Source: Small and Medium Enterprise Development Law of 9 April 2015.

Note: US$1 = 1,000 kyats approximately.

Historically, the criteria used to define SMEs in Myanmar have varied according to the country's economic condition. According to the Private Industrial Enterprise Law of 1990, the classification of business enterprises in the private sector into small-, medium- and large-scale enterprises is based on four criteria; namely, power usage, number of workers employed, capital invested and annual production. A definition of SMEs can also be found in the Promotion of Cottage Industries Law of 1991, which classifies the size of cottage industries. The Ministry of Cooperatives is the focal point for cottage industry promotion.

Having different definitions for SMEs generates problems. For example, it is difficult to classify a business as to whether it is large or small if it employs 15 workers and uses less than 2.237 kw of electricity but invests more than five million kyat. It is also extremely difficult to obtain data based on the actual total number of employees in SMEs as well as the total value of capital investment. Consequently, the distribution of SMEs in different types of businesses or sectors cannot be determined according to the number of employees or the value of capital investment.

Status of small and medium-sized enterprises in Myanmar

SMEs share the biggest part of the Myanmar economy in terms of number, contribution to employment, output and investment. Economic growth in Myanmar is thus totally dependent on the development of SMEs. Recently, the President of Myanmar said that "Myanmar is giving priority to carrying out the task of SME development" (Qin, 2014). He encouraged the SME Development Working Committee to review relevant laws, rules and regulations to protect SMEs from challenges generated by Association of Southeast Asian Nations (ASEAN) free trade agreements and to build capacity for technology transfer, market development and human resource development, among others (U Thein Sein, 2013).

The Government is focusing on a comprehensive approach to SME development by increasing their access to capital, providing greater access to business services and improving their business enabling environment. The Government established an institutional and policy framework for SME development through the following main measures after 2010: establishment of the Central Department of SME Development (SME Development Centre) at the Ministry of Industry to coordinate and develop policy and strategies; drafting of an SME policy that includes SME access to credit, technology adoption and capacity development; and carrying out capacity development with SMEs through workshops and seminars (Myanmar, Ministry of Industry, 2013).

In Myanmar as in many developing countries, government policies and regulatory measures can have a strong influence on the ability of SMEs to grow. The new SME law has redefined SMEs and has created a range of new committees

and promotion mechanisms. The Government of Myanmar works through more than 30 ministries with sometimes overlapping responsibilities and poor inter-ministerial coordination (OECD, 2014b). This affects not only policy effectiveness but also the overall confidence of businesses and investors. Foreign investment approvals sometimes require approval by a number of ministries and departments. As stated, there are a number of parallel ministries that supposedly regulate the business sector, but coordination between these entities is insufficient (Abe and Dutta, 2014) even though the President is head of the SME Central Committee for their development, supported by two Vice-Presidents and 20 union ministers. The "weak coordination among agencies responsible for SME policy formulation and implementation, absence of SME development strategy and weak facilitation in formalizing SMEs remain as stumbling blocks in the development of SMEs in Myanmar" (ERIA, 2014).

In terms of financing, according to *Myanmar Investment Climate Assessment*, published by the World Bank (2015c), "merely 1 per cent of fixed-asset investment costs are financed by bank borrowing, while 92 per cent of firms rely on their own funds – a percentage higher than that of any other comparable country". According to the 2014 survey of the United Nations Capital Development Fund, the "take-up of credit from either regulated or unregulated financial services providers is low for formal enterprises, with 74 per cent of formal enterprises reporting to not use any form of credit" (Chamberlain and others, 2014). Most SMEs rely mainly on personal savings and family and friends for financing owing to unfavourable financing conditions such as "tight collateral requirement (only real estate), limitation of loan amount based on appraised value of collateral property (up to 40 per cent), unavailability of long-term loans from the banks and lack of international funding agencies that provide financial assistance to SMEs" (Kyaw, 2008).

Due to international sanctions during the military regime, access to international markets has been a major obstacle for businesses in Myanmar. Consequently, most exports are natural resource-based products. As presented in table 6, the total export values of Myanmar have been relatively very low compared to other developing countries, for example, Thailand. Only in recent years there has been relaxation of international sanctions by major trading partners in North America and Europe, which opened up their markets to Myanmar products.

In terms of technology acceptance, SMEs in Myanmar tend to be technologically backward, and their productivity and quality standards are low. They use obsolete machines and equipment for production, some dating back to the colonial period, before 1948, which badly constrains productivity enhancement and quality upgrading. Much of the essential equipment and technology is made locally by small workshops with imported parts. A new Telecommunications Law was recently enacted. Its approval paved the way for the issuance of operating licenses to two foreign companies to

provide telecommunications services in Myanmar. According to recent reports, the telecommunications sector is booming and many opportunities opened up for businesses.

Table 6. Export figures for Myanmar (2007-2011)

(US$ in millions)

	2007	2008	2009	2010	2011
Non-natural-resource exports	1 734	1 900	2 293	2 409	3 351
Total exports of Myanmar	4 970	6 321	5 896	6 335	7 947
Total exports of Thailand	**153 571**	**175 907**	**152 497**	**195 311**	**228 824**

Source: Kubo (2014).

In terms of entrepreneurs' capability, Myanmar already has a culture of entrepreneurship. Many people create their own start-up businesses (alone or with family support) rather than work in low-paying jobs in the public sector. However, "over 9 per cent of businesses in Myanmar cited inadequate workforce skills as the main obstacle to operations" although the level of skill required to run a business is not very high (World Bank, 2015d).

As mentioned earlier, in terms of internationalization, due to international sanctions and self-imposed isolation, Myanmar barely received official development assistance (ODA) or attracted FDI during the period of the military regime from 1988 to 2010 compared to other developing countries such as Cambodia and the Lao People's Democratic Republic.

Factors in small and medium-sized enterprise development

The overall objectives of SME development are to (a) create jobs and generate income, (b) improve SME performance and competitiveness, and (c) increase their participation in and contribution to the national economy (Abe and others, 2012). There are several approaches that can generate jobs and increase income, including creation of business opportunity and promotion of entrepreneurial spirit, among others. These approaches are in fact in line with the priority areas or factors that are the foundation of SME development identified by international scholars. These are (a) the creation of an enabling business environment, (b) promotion of entrepreneurship, (c) financing, (d) promotion of business development services, (e) promotion of innovation and technology, and (f) creation of market access (Abe and others, 2012). Therefore, in this study, six main factors are considered as important in affecting the implementation of SME development: (1) enabling policy and regulatory environment, (2) market access,

(3) financing accessibility, (4) technology acceptance, (5) entrepreneurial capability, and (6) internationalization.

Policy implementation

Having a policy and institutional framework to tackle SME needs is an important pre-condition towards creating a favourable policy and regulatory environment in which SMEs can thrive. "The way the institutional framework is designed plays an important role in how effectively the policy is implemented" (OECD, 2014a). In addition, "efficient policy and regulatory directives, with adequate implementation and operation modalities, would result in building confidence among SME entrepreneurs and strengthen their capacity to improve linkages with other enterprises" (United Nations, 2011). Coordination and management in plan implementation are not only the responsibilities of certain ministries; they are also needed to direct cross-ministry cooperation and within-ministry operations. There must be effective coordination between central agencies and line ministries, between ministries, and within them. Capable and motivated staff and flexible institutions are then needed to implement plans because policy formulation is a complex undertaking that often lacks consistency and is subject to frequent changes over short periods of time.

Market access

The onset of regional economic integration in the context of realizing AEC by 2015 has further intensified the pressure for competition on SMEs in Myanmar in both domestic and international markets. Key success factors for market access include, but are not limited to, the ability to access market information, the capacity to join a business network and low non-tariff barriers. Within this context, market access can generally be of two types: local and international markets. Since domestic markets are limited, these SMEs need to join international markets by accessing global and regional value chains, which provide a wide range of value-added business activities in international trade. "The ability of SMEs to capture new markets beyond domestic ones is highly limited as they lack market information and intelligence. SMEs also find it difficult to network with other institutions beyond their home market" (Yao, 2014).

Financing accessibility

The opportunity to access small amounts of financing can be an important catalyst for SMEs to get access to the resources they need to gain a foothold in the market. Limited access to financing is a major obstacle for the creation and growth of SMEs (United Nations, 2014; Theingi and Mon, 2010). SMEs usually face serious challenges in securing financing, in particular at the beginning of forming their

businesses. Difficulty in financing accessibility has generally been attributed to "(a) misconception that SMEs are high-risk borrowers; (b) inadequate/poor financial records; (c) high administrative/transaction cost of lending; and (d) the failure of providing the right legal and regulatory infrastructure supports" (Hang, 2009). However, financial institutions need to be more responsive to their needs (ERIA, 2014). SMEs heavily rely on internal funds and funds from the informal sector. "Almost 60 per cent of Asia-Pacific exporting SMEs rely exclusively on internal financing, while only 40 per cent do so globally" (United Nations, 2014).

Technology acceptance

Technology is revolutionizing the way SMEs conduct business and compete in the international market. "Increased connectivity and greater, cheaper processing power are opening up new opportunities to acquire customers, transforming SME business models" (Yao, 2014). Rapid development in technology, in particular mobile technology, has far-reaching implications for SME development and the integration of SME activities in Myanmar. For SMEs, technology acceptance through inter-firm technology transfer to enhance their competitiveness and growth is critically important. Technology has contributed significantly to higher productivity and boosted the economic growth of many developing countries. SMEs are usually constrained by the small scale of their operations and cannot afford expensive new technology.

Entrepreneurial capability

According to Abdelgawad and others (2013), entrepreneurial capability refers to an entrepreneur's "capacity to sense, select and shape opportunities and to synchronize their strategic moves and resources in pursuit of these opportunities". There is a general perception that entrepreneurs in Myanmar are confident they have the necessary skills to start a business. However, the perception of true entrepreneurial capability may not match the reality in Myanmar. "The 'fear of failure' is not simply an internal mindset; it is influenced by the following socioeconomic and cultural factors: (a) negative peer pressures (e.g. parents, relatives and friends); (b) no respectable exit route without economic punishment; (c) social stigma; (d) lack of confidence due to inadequate skills and knowledge; (e) and low aspirations" (Abe and others, 2012).

Internationalization

It is hard to find a single definition of internationalization that suits well for this study. Scholars have defined internationalization in diverse ways. This research concerns outward internalization in relation to international measures, such as ODA, and international trade and investment, such as FDI. These two aspects have been affected by international sanctions imposed on Myanmar. Donor countries

are sometimes reluctant to give ODA to least developed countries like Myanmar because (a) Myanmar is viewed as not having the capacity and/or quality of policies and institutions to effectively use the assistance and (b) emerging market economies, and not least developed countries, are considered to be important markets for advanced donor countries. The net ODA received per capita in Myanmar was last measured at US$7.40 in 2010, according to the World Bank (2015f). The level of ODA for Myanmar had been on a downward trend following Cyclone Nargis in 2008 until the new Government was elected in 2011. "Foreign investment in Myanmar has continuously increased over the last four years, as foreign investors are permitted to lease state-owned land in addition to private property, to transfer ownership of businesses to foreigners under the guidance of the Myanmar Investment Commission and to transfer money with few restrictions" (Kyaw and Deboonme, 2015).

Agricultural sector of Myanmar

Myanmar is still an agriculture-oriented economy. However, one alarming phenomenon is that "the share of agriculture in the GDP declined during the first decade of the 21st century. Myanmar's industrial sector has shown a rise in its share of the GDP for the last decade" (Kudo and Kumagai, 2013). Nevertheless, agriculture remains the backbone of the economy, with nearly 70 per cent of the population living in rural areas and with the sector accounting for approximately 38 per cent of the GDP and more than 70 per cent of employment (Abe and Dutta, 2014).

Table 7. Average percentage share of gross domestic product

	1952-1954	1961-1963	1970	1980	1990	2000	2010
Agriculture	46.0	32.5	49.5	46.5	57.3	57.2	36.4
Manufacturing/industry	10.4	14.8	12.0	12.7	10.5	9.7	26.0
Others/services	43.6	52.7	19.9	38.5	32.2	33.1	37.6

Sources: United Nations, *Yearbook of National Accounts Statistics*; national sources; and ADB, *Key Indicators for Asia and the Pacific 2011*.

The increase in the share of industry as emphasized in present industrial policy is still linked to the agricultural sector, as it focuses on the promotion of agro-based industries and agro-based raw material-oriented industries. As far as agricultural SMEs are concerned, the Government envisages that they can play the role of import substitution by shifting from a traditional approach to a modern and commercial production approach. The principal crops include rice, beans and pulses, oilseeds, vegetables and chilies, and other crops (ADB, 2013).

Why the rice sector?

As stated, Myanmar used to be the largest rice exporter in Asia, but during the central planning period, rice exports decreased over time because of their low quality, high consumption, and command and control policies regarding rice. Then, after the new rice policy of 2003, the Government stopped buying rice paddies directly from farmers at below the market price and the ban on private rice exports was lifted. Nevertheless, rice exports did not noticeably increase. Myanmar is now the world's sixth-largest rice-producing country. According to the United States Department of Agriculture, it is estimated that "Myanmar will produce 18.98 million tons of paddy rice (around 12.15 million tons, milled basis) and export around 1.4 million tons of rice in fiscal year 2014/15" (Oryza, 2015a).

The Government of Myanmar is planning to increase export of rice, as part of its National Export Strategy, from approximately 2.5 million tons in fiscal year 2015/16 (April-March) to 3 million tons in the next few years, compared to an estimated 1.5 million tons in fiscal year 2014/15 and 1.2 million tons in fiscal year 2013/14 (Oryza, 2015b). In order to support the National Export Strategy, the Myanmar Rice Federation, which is an independent private sector organization, is implementing a market-based mechanism to ensure supply and price stability, to modernize and upgrade processing and storage facilities, to incentivize producers and stakeholders, and to ensure national food security (Myanmar Rice Federation, 2015).

Rice value chains

In the densely populated delta area, seasonal monsoon rains and easy access to water sources make rice production the major agricultural enterprise. The dry zone in the middle of Myanmar, however, lies in a rain shadow zone, so that productive agriculture is principally in river valleys, where a mix of rain-fed upland paddies and crops are produced. Regardless of geographical location, the current performance of the rice sector of Myanmar is relatively lower than that of rice-exporting countries such as Thailand and Viet Nam, as previously stated. The "underperformance of agriculture is a challenge, but it also presents an immense opportunity, since much of the underperformance has resulted from constraints that can be addressed with straightforward interventions" (ADB, 2014).

A value chain management approach to agriculture, which moves beyond a production-based approach, can provide a means for accelerating SME development in the sector. This approach would help to identify the supporting needs of SMEs operating along the value chains, such as input suppliers, foundries, mechanization service providers, collectors, processors, millers, packers, transporters, wholesalers and traders.

The rice value chain in Myanmar has two channels consisting of several functions, actors and activities. The first channel is mainly contract or salary-based farmers associated with large plantation-based businesses collecting and processing rice that is targeted primarily towards export. The farmers provide all or a large portion of their output to the collectors, millers and exporters, who provide the farmers with stable demand, credit for inputs and technical training in return. The second channel consists of a majority of farmers, which includes smallholders producing rice along with other crops. They sell rice mostly to wholesalers or directly to small-scale processors. Alternatively, they may process rice from paddies at home and then sell finished rice to retailers.

III. RESEARCH FRAMEWORKS AND METHODOLOGY

This section looks at the theoretical frameworks of previous studies and theories, the conceptual frameworks that were derived from the theoretical frameworks, the related hypotheses and the operationalization of variables. Based on the preceding section, this section draws on the key arguments from various examples in the literature and presents a theoretical framework prior to the construction of the conceptual framework. The conceptual framework was then refined to meet the objectives of the study.

Theoretical framework

SME development policies have been explored by several researchers and academics. The results are controversial despite the universally accepted belief that SME development leads to economic growth in terms of income generation and employment creation. Within this context, SME development policy does not automatically or effectively lead to the spread of SMEs, and thus economic growth; there are other intervening variables or factors such as policy, financing, coordination, technology, and types of SMEs, among others.

The implementation of SME development involves policy dimensions, socioeconomic conditions, technology and entrepreneurial capability. Therefore, the level of perception of the implementation of SME development depends on six factors: (1) effective policy implementation, (2) market access, (3) financing accessibility, (4) technology acceptance, (5) entrepreneurial capability and (6) internationalization.

According to the World Bank (2015a), there are 15 obstacles in the business environment of enterprises that can be grouped under the above-mentioned six factors: (1) access to finance, (2) competition from informal sectors, (3) electricity, (4) corruption, (5) crime, theft and disorder, (6) inadequately educated workforce, (7) labour regulations, (8) business licensing and permits, (9) political instability, (10) tax

administration, (11) tax rate, (12) transportation, (13) customs and trade regulations, (14) courts and (15) access to land.

Similarly, the *Myanmar Business Survey* conducted by the Economic and Social Commission for Asia and the Pacific and the Organization for Economic Cooperation and Development (OECD) also has six broadly-categorized groups: (1) access to markets, labour, supplies and technologies; (2) regulations and taxation; (3) conditions for international business; (4) access to financing; (5) infrastructure and utilities; and (6) corruption (ESCAP and OECD, 2014).

These six groups can further be divided into 34 obstacles businesses face in Myanmar. In no particular order, they are: (1) skilled labourers, (2) technology, (3) corruption, (4) access to space, (5) access to capital, (6) political instability, (7) administrative procedures, (8) inflation, (9) working capital, (10) electricity supply, (11) foreign competition, (12) sanctions, (13) labour regulations, (14) external finance access, (15) tax burden, (16) fees, (17) foreign exchange availability, (18) exchange rate, (19) export market information, (20) domestic competition, (21) tax collection, (22) property rights, (23) unskilled labourers, (24) domestic market information, (25) low demand, (26) interest rates, (27) foreign input supply, (28) relationships with authorities, (29) local input supply, (30) petroleum supply, (31) customs and trade regulations, (32) transport and logistics, (33) water supply and (34) telecommunications (ESCAP and OECD, 2014).

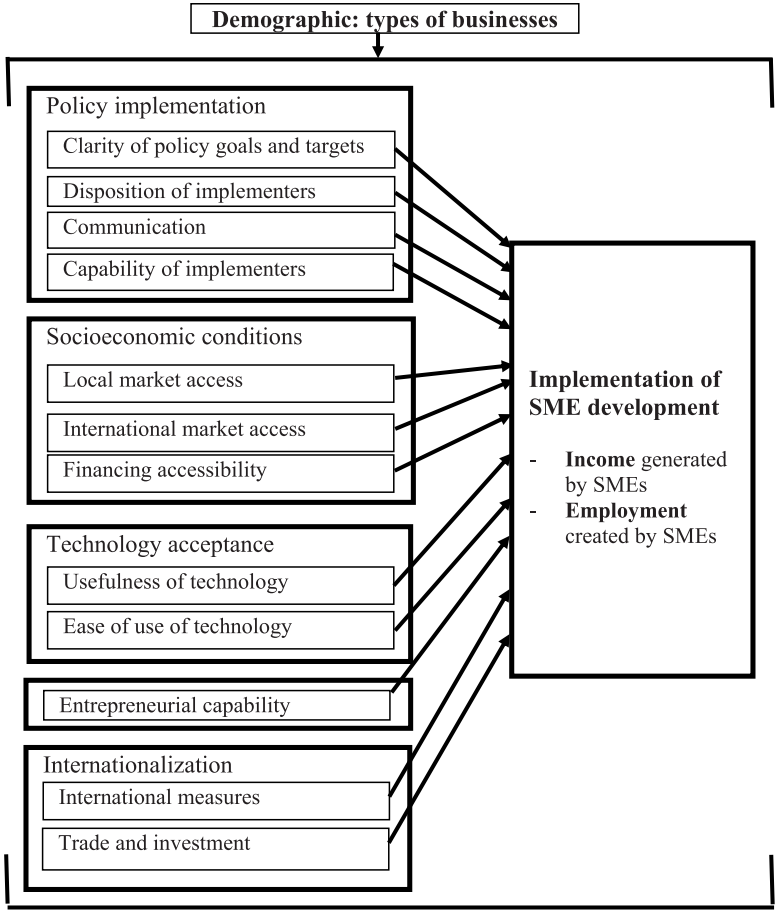
One set of rankings of the World Bank (2015b) also gives a different perspective on business or SME development. The rankings are based on 10 broad topics with multiple indicators for each topic. These topics include (1) starting a business, (2) dealing with construction permits, (3) getting electricity, (4) registering property, (5) getting credit, (6) protecting minority investors, (7) paying taxes, (8) trading across borders, (9) enforcing contracts and (10) resolving insolvency.

Extracting from the previous theoretical arguments and study findings, there are six major constructs regarding the implementation of SME development in the rice sector of Myanmar: (1) policy implementation, (2) market access, (3) financing accessibility, (4) technology acceptance, (5) entrepreneurial capability and (6) internationalization.

Conceptual framework and research hypotheses

This study specifically focuses on the implementation of SME development, measured by the income generated by SMEs and the number of labourers employed by SMEs, in relationship with various factors and policy implementation, in different types of businesses in the rice sector of Myanmar (figure 1).

Figure 1. Conceptual framework



The factors can be grouped into five areas: (1) the policy implementation factor, (2) socioeconomic factors (or conditions) comprising market access and access to finance, (3) the technology factor, (4) the entrepreneurial factor and (5) the internationalization factor.

Under policy implementation, the study focuses on four subfactors, namely: (1) clarity of policy goals and targets;[1] (2) disposition of implementers;[2] (3) effective communication (and coordination) among policymakers and policy implementers; and (4) the capability of implementers.

The technology factor will focus on the level of technology acceptance by SMEs. The entrepreneurial factor will focus on entrepreneurial capability. Internationalization, in terms of international measures and trade and investment, will be considered.

Demographic differences

There are generally five distinctive types of businesses among SMEs along the value chain of the rice sector: input supplier, production, collection, processing and trading (wholesale, retail and export). Although these SMEs belong to the rice sector, their primary business may not be within the rice sector or even under the umbrella of the agricultural sector. Thus, for the implementation of SME development in the rice sector of Myanmar under demographic differences, in terms of types of SME businesses, the study offers one hypothesis.

Hypothesis 1: There are differences in the implementation of SME development among different types of SME businesses.

Direct effects between factors and implementation of small and medium-sized enterprise development

Regarding the implementation of SME development under various factors, the study looked at twelve hypotheses. The first construct that affects the implementation of SME development is policy implementation. As shown in the figure above, policy implementation consists of clarity of goals and targets, disposition of implementers, communication and capability of implementers. Thus, the following four hypotheses are proposed:

Hypothesis 2a: The perceived clarity of policy goals and targets has a positive impact on the implementation of SME development.

Hypothesis 2b: The perceived disposition of implementers has a positive impact on the implementation of SME development.

---

[1] "The study of implementation requires that goals and objectives be identified and measured since implementation cannot succeed or fail without a goal to judge it" (Pressman and Wildavsky, 1984).

[2] Disposition "arises from the fact that human groups find [implementation] difficult to carry out effectively acts for which they have no underlying belief" (Petrick, 1968).

Hypothesis 2c: The perception of better communication has a positive impact on the implementation of SME development.

Hypothesis 2d: The perception of the capability of implementers has a positive impact on the implementation of SME development.

Socioeconomic conditions or factors can be divided into two factors: market access and financing accessibility. Market access can be further divided into local market access and international market access. Improved market access and financing accessibility improve the implementation of SME development. Thus, the following three hypotheses are introduced:

Hypothesis 3a: The perception of improvements to local market access has a positive impact on the implementation of SME development.

Hypothesis 3b: The perception of improvements to international market access has a positive impact on the implementation of SME development.

Hypothesis 3c: The perception of improvements to financing accessibility has a positive impact on the implementation of SME development.

Technology acceptance improves the implementation of SME development, particularly in terms of the usefulness of technology and the ease of use of technology for SMEs.

Hypothesis 4a: The perceived usefulness of technology has a positive impact on the implementation of SME development.

Hypothesis 4b: The perceived ease of use of technology has a positive impact on the implementation of SME development.

Strong capability of entrepreneurs improves the implementation of SME development.

Hypothesis 5: The perceived capability of entrepreneurs has a positive impact on the implementation of SME development.

Increased internationalization, which consists of international measures and trade and investment, improves the implementation of SME development.

Hypothesis 6a: The perception of an increase in positive international measures has a positive impact on the implementation of SME development.

Hypothesis 6b: The perception of an increase in trade and investment has a positive impact on the implementation of SME development.

Research methodology

This section offers the methodology used in testing the causal relationships between the independent variables and dependent variable of the implementation of SME development in the rice sector of Myanmar. The section discusses the research methodology, which includes the research design and selection of key informants, sampling plan, methods of data collection, variables measurements, and analytical procedures and techniques.

The research strategy for this study was to gather and study background information regarding the situation of SME development in Myanmar, particularly in the rice sector, and then to decide the research questions. The questions for the interviews and questionnaires were structured based on research from the literature on SMEs. This study used both exploratory and descriptive research designs in combination. The research questions in this study are: "What is the current status of SME development in the rice sector in three regions of Myanmar?", "What are the levels of perceptions of the factors affecting the implementation of SME development in Myanmar?", and "How do the factors in SME development vary in different types of businesses in the rice sector Myanmar?" the inclusion of "what" and "how" indicate exploratory or descriptive forms.

The study, which is an explanatory type of research, also questions the impact of perceptions of the factors on the implementation of SME development. Since theoretical and empirical studies in the areas of SME development in the rice sector of Myanmar have not been extensively conducted, this study recognizes that the descriptive parts of the study are of more importance.

Target population and sampling

The choice of the "general population" was initially based on the research questions. The general population of this study was small and medium-sized enterprises. The "operational population", selected on the basis of the research framework, comprised small and medium-sized enterprises in the rice sector of Myanmar. Then the research sample was selected from the operational population by using a standard sampling method.

A few townships in the regions of Yangon, Ayeyarwady and Sagaing were chosen for conducting the interviews. The Yangon region contains the commercial capital Yangon (former capital of Myanmar), Ayeyarwady was once the "rice bowl of Asia" and most agricultural activities are located there, while Sagaing is a major agricultural region in the dry zone. Because there is a thin line between formal and informal business sectors, the research focuses on SMEs in both those sectors, and the interviews were conducted with SMEs in both sectors as well. Specifically, the

scope of the study encompassed all registered and non-registered SMEs in the rice sector of Myanmar. Different types of SMEs along the rice value chain were targeted.

According to the Ministry of Agriculture and Irrigation and information that the researcher received, there are more than 100,000 enterprises involved in agro-based businesses in the rice sector of Myanmar and 75 per cent are located in the three regions: Ayeyarwady (45 per cent), Yangon (19 per cent) and Sagaing (11 per cent) (International Trade Centre, 2015). Thus, the estimated targeted population of SMEs in the rice sector of Myanmar was over 100,000. The sample size was calculated based on the sample size determination equation of Yamane (1967). Therefore, the total number of respondents participating [N] in this study was 398 SMEs in the rice sector of Myanmar. Thus, it was decided that the unit of analysis for this study was a total of 400 businesses (SMEs) in three selected regions. In addition, a total of 17 government officials, representatives of business organizations and SME experts were interviewed for further analysis.

Research instruments/questionnaires

This research used a uniform questionnaire survey in order to accommodate the integrative nature of the research. The questionnaire had two parts. The first part collected information about the characteristics of the SMEs themselves, while the second part asked the owners and managers of SMEs about their perception of the importance of some factors regarding the implementation of SME development identified in earlier studies. The dependent variable of the study was the implementation of SME development. Likert scales, with two subjective measures, were used to measure the perceptions of the implementation of SME development. There are 12 independent variables under 6 factors: (1) clarity of policy goals and targets, (2) disposition of implementers, (3) communication, (4) capability of implementers, (5) local market access, (6) international market access, (7) financing accessibility, (8) usefulness of technology, (9) ease of use of technology, (10) entrepreneurial capability, (11) international measures and (12) trade and investment.

Data collection

According to the requirements of the study and the nature of the research problems, primary data were collected from the field from the targeted population. A total of 405 questionnaires were distributed, and interviews were conducted. The primary data were collected from interviews in several towns in the selected regions. The questionnaire was divided into two sections; the first section was developed to gather information on the demographic and business profiles, and the second section was used to determine the factors affecting the effective implementation of SME development in rice the sector of Myanmar. Using a five-point Likert scale ranging

from 1 to 5, the respondents were asked to answer the prepared statements. Data collected were then analysed using both descriptive and factor analyses.

IV. DATA ANALYSIS AND RESEARCH RESULTS

This section includes a descriptive analysis of the respondents, the exploratory factor analysis, the reliability test, the exploratory factor analysis, the regression analysis, the hypothesis testing and the means comparison analysis.

Data availability and reliability are a significant problem in Myanmar, making it difficult to analyse the situation on the ground. Most of the data were not readily available through the relevant organizations' websites or other publications. Sources were deemed not credible and the data were not complete. While perception-based indicators like those applied in the analysis discussed here are useful, quantitative indicators provide a more accurate picture of the business environment and the implementation of SME development. SMEs within the same business sector of Myanmar may have different perceptions of the same factor, and SMEs in different sectors have different frames of reference. Four hundred SMEs in the rice sector of three regions were used for the data analysis. The results from the primary data collected were analysed and discussed in order to identify the most important results. Moreover, a discussion on the findings and conclusions will be made based on the results associated with the research questions.

Descriptive analysis for respondents

This section is devoted to a descriptive analysis of the survey findings, which includes the entrepreneurs' profiles, the general profile of the SMEs and a brief picture of the rice sector of Myanmar. The main objective is to provide a broad picture of the sample and the current status of SMEs in the rice sector of Myanmar prior to the main analyses.

Age: The age range used in this study followed the pattern of the *Myanmar Business Survey* (ESCAP and OECD, 2014). The majority of the respondents, 64.3 per cent, ranged from 36 to 55 years of age or mid/late adult, while 21.8 per cent were 56 years of age or older, or senior adults, and 14.1 per cent were 35 years of age or younger, or young adults, on the day of the survey.

Gender: In terms of gender, the percentage of male respondents at 81.0 per cent dominated the interviews. This is understandable as the formal agricultural sector is normally dominated by males.

Education level: For education level, 35.8 per cent had been to college or university, 24 per cent of the respondents had at least a high school diploma, and

5 per cent had a master's degree. Interestingly, only 2 respondents had no school education and 29.5 per cent had completed either primary or middle school.

Table 8 presents the distribution of age, gender and level of education of the respondents.

Table 8. Demographic profile of entrepreneurs/representatives

Characteristic	Frequency (N)	Percentage
Age		
25 or younger	13	3.3
26-35	43	10.8
36-45	108	27.0
46-55	149	37.3
56-65	63	15.8
65 and older	24	6.0
Gender		
Male	324	81.0
Female	76	19.0
Education		
No school education	2	0.5
Less than primary school	5	1.3
Primary school	32	8.0
Middle school	86	21.5
High school	96	24.0
University education	143	35.8
Master's degree and above	20	5.0
Others	16	4.0

Based on the categorization of enterprises in the Small and Medium Enterprise Development Law of 2015, of the 400 entrepreneurs that participated in this study, 99.0 per cent of the sample could be classified as small enterprises. Small enterprises are those with fewer than 30 full-time employees with a sales turnover of not more than 100 million kyats per year. The remaining respondents – 1 per cent or 6 enterprises – were classified as medium enterprises with up to 60 employees and a sales turnover of not more than 300 million kyats per year. Although most enterprises were able to provide the market values of their businesses, they were reluctant to provide the details on their annual revenue. The majority of companies were registered or considered under sole proprietorship (94.5 per cent) followed by partnerships (4.5

per cent), and the rest represented less than 1 per cent. Meanwhile, 69.0 per cent of respondents registered their business entity as a formal business entity, as shown in table 9.

Table 9. Demographic profile of SMEs

Characteristic	Frequency (N)	Percentage
Size		
Small	394	99.0
Medium	6	1.0
Business entity		
Sole proprietorship	378	94.5
Partnership	18	4.5
Company	2	0.5
Non-profit Corporation	1	0.3
Cooperative	0	0.0
Other	1	0.3
Registered (formal) SMEs	276	69.0
Age of business		
Less than 1 year	4	1.0
1-2 years	14	3.5
3-5 years	38	9.5
6-10 years	77	19.3
11-15 years	74	18.5
More than 15 years	193	48.3
Type of business		
Inputs supplier	52	13.0
Production	97	24.3
Collection	16	4.0
Processing	176	44.0
Trading (wholesale/retail/export)	58	14.5
Others	1	0.3

Almost half (48.3 per cent) of the sample had been in business for more than 15 years while 19.3 per cent of the respondents were in business between 6 and 10 years and 18.5 per cent had been in business for more than 11 years but less than 15 years. Another interesting aspect of this finding was that approximately 86 per cent of the sample had been operating for more than 6 years and only 14 per cent of the respondents had been in business for 5 years or less.

The majority of SMEs in the rice sector followed in the family business. Another common reason for starting their businesses was due to background experience, knowledge and interests. Many also wanted to generate income and only a small group of businesses were there to create employment. Approximately 10 per cent depended on their business to pay for living expenses. It is also important to note that some of the respondents gave more than one reason for starting their business. Only 23 per cent said that they had more full-time employees than at the time when they started their businesses. The rest of the respondents did not have more employees or had even fewer employees than at the time they started their businesses. Table 9 also shows the distribution of business types. From the total of 400 businesses, most (44 per cent) were in the processing segment of the rice sector dealing with activities such as drying, storing, milling, grading and selling. Based on the interviews, the second largest group belonged to the production segment, representing 24.3 per cent (97 businesses out of 400).

Policy environment

A little over half of the sample or 52 per cent said that it was good to do business in Myanmar, while 34.3 per cent marked "no" and 11.8 per cent of respondents were neither optimistic nor pessimistic. Two percent of respondents were very pessimistic about the business environment in Myanmar. In terms of the level of difficulty related to government policies, regulations and procedures, more than half the respondents answered that the policy environment was easy in these three aspects.

Market access

The primary market for the SMEs from the sample was the local market, in terms of local township-based and national (domestic) markets. It accounted for 98 per cent, representing 66.7 per cent for township-based market and 31.3 per cent for the national market. About half the respondents perceived that none of the aspects of market access was difficult but one third found them difficult.

Financial accessibility

The largest group of respondents from the sample, 236, said that their major source of finance was from personal savings, followed by 51 respondents, who borrowed from family and friends. Interestingly, a very small portion of respondents (8.25 per cent) received financing of 50 per cent or more from a bank or other financial services and 20.5 per cent of that group answered that they needed to put up collateral for their loans. From the findings, it can be interpreted that some aspects of financing accessibility were difficult and some were easy.

Technology acceptance

Approximately half the respondents said that although telecommunication services are not good, it did not create difficulties for their business. Many of them answered that technology acceptance had a bigger impact than telecommunications services on reducing costs and improving customer satisfaction.

Entrepreneurial capability

On average, the sample perceived that they were not in a position to either agree or disagree with the points raised in the questionnaire. More than half the respondents agreed that they were ready to start a business but their production capacity was limited.

Internationalization

The study asked the respondents questions regarding their level of perceptions of various aspects of internationalization. Most respondents "agreed" that the current level of liberalization of the economy was good (283 respondents) and trade and investment liberalization will improve their business (256 respondents). More than one third of the respondents seemed to lack knowledge of the new FDI law and the majority were neutral on the Government's support of FDI activities. Most of the respondents either "disagreed" or were "neutral" on the current level of international support measures such as ODA for SME development.

Effectiveness of factors related to business

The research also looked at the perceptions of SMEs regarding the effect of six factors on their businesses in terms of overall importance, the importance of income and employment, and improvement of income and employment. According to the findings, "entrepreneurial capability" was "very important" or "important" for the improvement of their business, followed by "market", "financing", "technology", "internationalization" and "policy". In terms of the importance of factors regarding income creation, "entrepreneurial capability" came on top, followed by "market", "financing", "technology", "policy" and "internationalization". The research also found that "entrepreneurial capability" was the most important factor for employment generation, followed by "market", "financing", "policy", "technology" and "internationalization." In 2012-2015, "entrepreneurial capability" was the most important main factor that improved income creation for SMEs, while "financing" was least helpful for income creation. At the same time, in terms of employment generation, once again "entrepreneurial capability" ranked first among the factors, while "financing" ranked lowest among all factors.

Hypothesis testing

In past studies, regression analysis, which is a statistical process for estimating the relationships among variables, has been the general tool used to evaluate the causal relationship between the independent variables and dependent variable.

Hypothesis 1: That there are differences in the implementation of SME development among different types of SME businesses was tested by using analysis of variance with post hoc analysis.

In order to examine whether there were differences in the implementation of SME development among different types of SME businesses, namely input supplier, production, collection, processing and trading, the mean implementation outcomes of these businesses were calculated. The results of the analysis of variance are presented in table 10.

Table 10. Mean of implementation of SME development comparison analysis results

Implementation of SME development	Types of businesses in rice value chains					ANOVA
	Input supplier	Production	Collection	Processing	Trading	Significant difference (p)
Income generation	3.04	3.12	2.94	2.94	3.02	No
Employment creation	2.83	2.40	2.31	2.65	2.59	No

Note: ANOVA, analysis of variance.

The results of the analysis of variance show that there were no differences among the five sectors of agriculture business types regarding the implementation of SME development. Thus, a post hoc test did not need to be carried out. The results showed that there were equal treatments among all five sectors of the rice business. The following multiple regression equation was used to test hypotheses H2 to H6.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \ldots + \beta_n X_n + € \quad (1)$$

Y represented SME development in terms of income generation and employment creation in this study and X_1, X_2, ..., X_n were independent variables and β_1, β_2, ..., β_n were their corresponding coefficients. β_0 is the intercept and € is a disturbance term.

Equations 2 and 3 exhibit the relationships under study.

$$Y \text{ (income generation)} = \beta_0 + \beta_1 \text{ (clarity)} + \beta_2 \text{ (disposition)} + \beta_3 \text{ (communication)} + \beta_4 \text{ (capability)} + \beta_5 \text{ (local market access)} + \beta_6 \text{ (international market access)} + \beta_7 \text{ (financing accessibility)} + \beta_8 \text{ (usefulness of technology)} + \beta_9 \text{ (ease of use of technology)} + \beta_{10} \text{ (entrepreneurial capability)} + \beta_{11} \text{ (international measures)} + \beta_{12} \text{ (trade and investment)} + € \quad (2)$$

$$Y \text{ (employment creation)} = \beta_0 + \beta_1 \text{ (clarity)} + \beta_2 \text{ (disposition)} + \beta_3 \text{ (communication)} + \beta_4 \text{ (capability)} + \beta_5 \text{ (local market access)} + \beta_6 \text{ (international market access)} + \beta_7 \text{ (financing accessibility)} + \beta_8 \text{ (usefulness of technology)} + \beta_9 \text{ (ease of use of technology)} + \beta_{10} \text{ (entrepreneurial capability)} + \beta_{11} \text{ (international measures)} + \beta_{12} \text{ (trade and investment)} + € \quad (3)$$

Multiple regression analysis

Table 11 shows the multiple regression analysis which was used to find the most important factors that impacted the implementation of SME development in the rice sector of Myanmar. A positive sign for a regression coefficient indicates that the variable enhanced SME development, while a negative sign indicates that the variable hindered SME development. For the analysis, standardized coefficients or beta coefficients were used. The predictive ability of the model was assessed by comparing the R^2 of the different models in the regression analysis. Small P-values indicate statistical significance. Backward deletion regression was used. In backward deletion, the variables that correlate most strongly with the dependent variable are entered into the equation first, and once in the equation, they remain there.

Perceptions from experts and practitioners

The perceptions of experts and implementers were recorded in the results of the field interviews conducted during the preparation of this research. Qualitative interviews were conducted among the population of interest. The interviews emphasized the factors affecting the implementation of SME development in the rice sector of Myanmar and addressed the experiences of the individuals and not hypothetical situations. In other words, this study blended observations with reports provided by the subjects through in-depth interviews, personal experience and other documents (literature review).

Table 11. Unstandardized and standardized (in parentheses) multiple regression coefficients for SME development

Variable name	Model 1	Model 1	Model (final)	Model (final)
Dependent variable	Income generation	Employment creation	Income generation	Employment creation
Independent variables				
Clarity of policy goals and targets	-0.066 (-.083)	0.004 (0.004)	-0.068 (-0.085)*	..
Disposition of implementers	0.024 (.031)	0.000 (0.001)	..	..
Communication	0059 (.074)	-0.014 (-0.015)	..	..
Capability of implementers	0.111 (.140)**	0.125 (0.139)**	**0.163 (0.204)****	0.120 (0.133)***
Local market access	0.193 (0.242)****	0.111 (0.123)**	**0.190 (0.239)****	0.123 (0.137)***
International market access	0.029 (.043)	0.011 (0.012)	..	..
Financing accessibility	-0.060 (-0.075)	-0.138 (-0.153)***	-0.071 (-0.089)*	**-0.135 (-0.150)****
Usefulness of technology	-0.073 (-0.092)*	-0.011 (-0.012)	..	..
Ease of use of technology	0.014 (0.018)	0.071 (0.079)	..	0.076 (0.084)*
Entrepreneurial capability	0.093 (0.117)**	0.219 (0.243)****	0.095 (0.120)**	**0.227 (0.252)****
International measures	-0.024 (-0.030)	0.099 (0.110)**	..	0.092 (0.102)*
Trade and investment	0.022 (0.028)	0.049 (0.055)	..	..
Intercept	3.013****	2.590****	0.013****	2.590****
Adjusted R^2	0.131	0.192	0.133	0.202
F value (model fit)	6.008****	8.907****	3.223****	17.809****
N	400	400	400	400

Note: * p ≤ 0.1, ** p ≤ 0.05, *** p ≤ 0.01, **** p ≤ 0.001.

Policy implementation

"Rice policy is still inadequate" and the SME policy is "only in the book and there is no implementation." "The fundamental weaknesses are lack of cooperation, support and leading organization between the government sector and private sector." Myanmar needs more implementing training, preparation, finding common ground policy, among others. "It is very difficult to assess success because even if the theory is correct, part of the implementation is still very hard in Myanmar." "To recover the weak points, a significant assessment should be carried out on SMEs on its policy for implementation."

Market access

Weaknesses are a lack of "networking and legal framework" for access to international markets. "The SMEs in Myanmar are in the midst of international market competition and challenging market access." Some SME owners "do not know much about marketing." They also feel that "the information is sometimes late" when they receive it. They also perceive that "when the policy of the Government is good, marketing will be extended."

Financing accessibility

"Since the banking system is under development, financial loan services are also scarce. The bank does not provide loan services to SMEs due to lack of trust, collateral, guarantees and business plans. As a result, SMEs do not receive loans from any bank, including private banks." When they receive a loan, it is at high interest rates. Most SMEs are family businesses and the source of financing is the family, as the business is inherited from their parents. This represents 90 per cent of SMEs in Myanmar. "Due to lack of capital investment nationally, the business is not expandable."

Technology acceptance

"Due to Myanmar's years-long disengagement with international trade, SMEs do not receive technology and standardized machines." "Most businesses and government departments in Myanmar run on traditional techniques due to lack of research and development." Some SMEs think manual workers are more convenient and affordable for farmers than buying or hiring machines. However, technology is "a way to tackle manual worker scarceness." Although due to lack of wider technology acceptance, "the quality of rice is unqualified to export to the international market." Therefore, "the farmers need improvements in technology." The high cost of the Internet is also a "major problem for development in the business sector," but information and communications technology development is improved over the past three years.

Entrepreneurial capability

Many SMEs in Myanmar lack business plans when they start or are planning to start a business. In other words, they do not operate with confidence and proper business plans. Myanmar has a farming labourer, or manual worker, shortage and many need proper training by government agriculture staff and other experts.

Internationalization

SMEs "need more awareness of international policy to penetrate into international markets. They also need to cooperate with other countries, particularly Thailand and Viet Nam." "The more international rice companies [in the rice sector of Myanmar], the better for local farmers." Similarly, some SMEs feel that "the more Myanmar cooperates with international organizations, the more developed they are."

V. CONCLUSION AND RECOMMENDATIONS

Based on the results found in the rice sector, the majority of respondents are registered SMEs, meaning that they were formal business entities. This was discovered because 69 per cent of the respondents were able to provide the exact year in which they registered their businesses. Three components – the capability of implementers, local market access and entrepreneurial capability – were seen to positively influence SME development, and one component – financing accessibility – negatively influenced SME development.

Summary of findings

The findings of the study are hardly surprising and are likely to be specific to the time of the study and the situation in Myanmar during a time of various types of reforms after many years of isolation. The survey revealed that overall the respondents perceived the need for SME development in overcoming barriers and focusing on important factors that affect their successful implementation. The empirical findings are summarized as follows: the multiple regressions analysis using the backward deletion method showed that 4 out of 12 independent variables – capability of implementers, local market access, financing accessibility and entrepreneurial capability – had statistically highly significant effects on the implementation of SME development in terms of income generation and employment creation.

Capability of implementers and local market access had a positive relationship with income generation. The coefficients of 0.204 and 0.239 mean for a one unit increase in capability of implementers and local market access, we would expect a 0.204 unit and a 0.239 unit increase in income, respectively. These relations are also statistically significant at the 5 per cent level. In contrast, clarity of policy goals and targets, disposition of implementers, communication, international market access, financing accessibility, usefulness of technology, ease of use of technology, entrepreneurial capability, international measures, and trade and investment were seen to have little or no significant effects on income generation, which contradict some findings of earlier studies. The value of adjusted R-square (0.133) means that all of the variables together can explain about 13 per cent variation in the income generation aspect of SME development.

Financing accessibility had a negative relationship with employment creation while entrepreneurial capability had a positive relationship. The coefficient of -0.150 means for a one unit increase in financing accessibility, we would expect a 0.150 unit decrease in employment while the coefficient of 0.252 means for a one unit increase in entrepreneurial capability, we would expect a 0.252 unit increase in employment. On the other hand, clarity of policy goals and targets, disposition of implementers, communication, capability of implementers, local market access, international market access, usefulness of technology, ease of use of technology, international measures and trade and investment had little or no significant effects on employment creation, which contradicted some findings of earlier studies. The value of adjusted R-square (0.202) means that all the variables together can explain approximately 20 per cent of the variation in the employment creation aspect of SME development.

Discussion of factors affecting small and medium-sized enterprise development

This section of research looks at each of the six factors that affected the implementation of SME development based on the findings of the survey.

Regarding policy implementation, the output of the regression analysis was insignificant in relation to the implementation of SME development in terms of all subfactors, except for the capability of implementers, although the descriptive analysis showed that SMEs were positive about the policy environment. The expert interviews revealed the other side, namely that the Government "policy was still inadequate." In summary, although the policy implementation as a whole was not significant in relation to the implementation of SME development, it was an important factor in generating income and creating employment for SMEs.

In terms of market access, the output showed only local market access was significant in relation to the implementation of SME development for both income and employment. This was supported by the descriptive analysis, which showed that most of the SMEs were operating in the local market. The experts perceived that access to the international market was weak because of the lack of networking and the legal framework. Improvement in government policy and better accessibility to market information will boost market access. In summary, as most of the SMEs in the rice sector of Myanmar are operating their businesses in the local market, exposure to international market access is weak and the confidence level seems to be low.

Regarding financing accessibility, the output showed a significant relationship with the employment generation aspect of implementation of SME development. The descriptive analysis revealed few findings on the relationship between financing accessibility in terms of access to financial services, such as banks, and SME development due to the fact that most SMEs received their financing from family

members or friends. Many SMEs expressed the idea that access to financial services is a major obstacle for their business and this view was also supported by experts and practitioners and by the findings from other surveys. In summary, financing accessibility from financial services is an important factor for the implementation of SME development, especially for the employment generation aspect of SME development.

Regarding technology acceptance, the output showed an insignificant relationship with the implementation of SME development. The survey found that many SMEs perceive that technology can reduce costs and improve customer satisfaction. The expert interviews revealed that there was a strong relationship between technology acceptance and a scarcity of skilled and manual workers. In summary, even though technology acceptance can definitely improve SME development, there has been a dilemma for SMEs as they struggle to find a balance between technology and other factors.

For entrepreneurial capability, the output showed a significant relationship with the implementation of SME development, particularly for the employment generation. Many SMEs perceived that they are capable of starting a business but were limited by their production capacity. The experts also supported this by saying that most SMEs lacked business plans and did not operate with confidence. In summary, improvement of entrepreneurial capability could be a critical factor for the implementation of SME development, including in the rice sector, in light of various regional integration initiatives and programmes such as realizing AEC by 2015.

Regarding internationalization, the output showed an insignificant relationship with the implementation of SME development. The survey found that most SMEs are indifferent in terms of international measures but agreed on the important aspects of trade and investment. Thus, the experts suggested that SMEs need to be more aware of international policy and to cooperate with other countries. In summary, the concept of internationalization in terms of international measures (both support measures and sanctions) and trade and investment was not widely considered as an important factor to the implementation of SME development although it is very relevant to Myanmar.

Conclusion

The study aimed to ascertain the role of influencing factors on the implementation of SME development in Myanmar. The study used the rice sector of Myanmar as the main target because of its importance to a fragile developing economy like Myanmar and because the majority of the population depends on it for employment. The predominance of the agricultural sector in most developing countries, including

Myanmar, is unquestioned. Whatever the yardstick – be it numbers employed, income generation, dependent population or export earnings – agriculture clearly occupies a position of prime importance and will continue to do so for a considerable time to come. In the developing countries like Myanmar, around 70 per cent of the total population is dependent on agriculture.

The findings revealed that in the implementation of SME development, the capability of implementers and local market access have a strong significant relationship with income generation and financing accessibility, while financing accessibility and entrepreneurial capability have exhibited a strong significant influence on employment generation.

As discussed, the overall picture of the implementation of SME development in the rice sector of Myanmar is "fuzzy" and requires additional research. The findings of this research suggest that SMEs, both registered and unregistered, may require special attention from both academic researchers and public policymakers in the future if the effective implementation of SME development in the rice sector of Myanmar is to be achieved.

Although there is not much difference among the various business types in the rice value chain, agro-processing and the marketing of processed food have the potential to emerge as new engines of inclusive growth. Agricultural productivity growth and consumption linkages generated by increased rural incomes would stimulate the rural economy further. Fostering SME development requires an inclusive financial system that offers access to financial products and services. Financial inclusion is one of the most important factors in the development of SMEs. A higher share of agricultural credit would enable farmers to expand their businesses, which would boost the sector and labour productivity.

One consideration in formulating development policies is how to balance the development of the different sectors. Balanced growth implies, in essence, certain relations between the growth rates of different sectors, which will minimize bottlenecks so that the different sectors may jointly promote the overall growth rate which the development policies call for. It is natural that, in the process of economic development, the rate of industrial growth as measured by production or employment should be significantly faster than that of agriculture. In fact there has been, in most countries, a marked structural change away from agriculture in favour of manufacturing and other sectors. In many countries, however, this shift has been the result of sluggish agricultural development, with the rate of increase of agricultural production in general, and of food in particular, falling short of the rate of population growth. Therefore, the implementation of SME development requires both long-term

and short-term strategies for structural transformation between agricultural and other sectors while keeping in mind rural-urban development gaps.

Recommendations and implications of future research

Inclusion of the internationalization factor in the implementation of SME development was an important concept that had not been emphasized in the extant literature. Internationalization is very difficult to measure, as it depends on various dimensions. This research is the first to focus on the importance of including internationalization in SME development studies. Some previous studies included international trade and investment, but did not emphasize the importance of international measures such as sanctions, especially for a country like Myanmar. Therefore, the outcome of this study provides a starting point for scholars to reinvestigate previous studies in different contexts with the inclusion of internationalization.

Based on the findings, it is proposed that the causal relationships posited in this research can be applied to the implementation of SME development in other sectors and value chains. This means that the findings are applicable to various types of business sectors such as manufacturing and services. Comparative studies on the experience of SME development in the rice sector of other countries can also be conducted. Thailand and Viet Nam have been mentioned by rice experts.

The research also suggested that implementers and practitioners, especially in relation to SME development, should concentrate not only on obvious challenges or obstacles faced by SMEs but also on best possible alternative solutions based on an assessment of the perceptions of businesses on the ground, and in particular keeping in mind capacity-building to improve skills and awareness of various trends beyond the scope their immediate environments.

As there are differences between demographic groups, it is suggested that policymakers, implementers and practitioners adjust according to the characteristics of an individual's background and to each business's profile. Different types of businesses in the rice sector or other sectors require future study as there is insufficient evidence in this research to be used to explain the impact of implementation of SME development on different types of businesses or to recommend different types of policy implementation approaches. This research recommended further comparative study between the rice business (with limited restrictions) and similar businesses such as the fully liberalized beans and pulses business in the agricultural sector.

In terms of practical aspects of implementation of SME development based on the influencing factors, the study recommends the adoption of SME development policies with comprehensive and clear guidelines; the promotion of improved coordination

among implementers, practitioners and SMEs; the creation of networking links and partnerships between local SMEs and international SMEs or multinational corporations, particularly for creating opportunity to join value chains; raising awareness regarding international agreements and standards; further strengthening of financing for SMEs through the establishment of credit facilities; support for upgrading of technology through technical cooperation and transfer; training and support measures for capacity-building for both skilled labourers and manual workers; the establishment of business development services such as a SME consultation centre; highlighting the importance of international measures to SME development, particularly international sanctions and restrictions; the promotion of trade and investment with a focus on SME development; and the promotion of effective integration of SMEs in global and regional value chains as an emerging and important policy objective.

In conclusion, through the above recommendations, the research expects to see Myanmar experience a smooth transition from a managed economy to an entrepreneurial economy in the near future.

REFERENCES

Abdelgawad, Sondos G., and others (2013). Strategic leadership and entrepreneurial capability for game change. *Journal of Leadership and Organizational Studies*, vol. 20, No. 4, pp. 394-407.

Abe, Masato, and Madhurjya Dutta (2014). A new policy framework for Myanmar's SME. ARTNet Working Paper, No. 142 (February). Bangkok: ESCAP.

Abe, Masato, and others (2012). *Policy Guidebook for SME Development in Asia and the Pacific*. United Nations publications, Sales No. E.12.II.F.2.

Asian Development Bank (2013). *Myanmar: Agriculture, Natural Resources, and Environmental Initial Sector Assessment, Strategy, and Road Map*. Manila. Available from www.gms-eoc.org/uploads/resources/349/attachment/ADB 2013 Myanmar Agriculture, Environment Assement.pdf.

_____ (2014). *Myanmar: Unlocking the Potential – Country Diagnostic Study*. Manila. Available from http://adb.org/sites/default/files/pub/2014/myanmar-unlocking-potential.pdf.

Chamberlain, Doubell, and others (2014). Myanmar: demand, supply, policy and regulation – synthesis note 2014. New York: United Nations Capital Development Fund.

Chhor, Heang, and others (2013). *Myanmar's Moment: Unique Opportunities, Major Challenges*. New York: McKinsey Global Institute. Available from www.mckinsey.com/insights/asia-pacific/myanmars_moment.

Economic Research Institute for ASEAN and East Asia (ERIA) (2014). *ASEAN SME Policy Index 2014: Towards Competitive and Innovative ASEAN SMEs*. Jakarta. Available from www.oecd.org/globalrelations/regionalapproaches/ASEAN SME Policy Index 14.pdf.

Global Entrepreneurship Monitor Thailand (GEM Thailand) (2012). *Global Entrepreneurship Monitor, Thailand Report 2012*. Bangkok: Bangkok University. Available from http://summeruniversitythailand.org/pdf/GEM Thailand 2012 Report.pdf.

Hang, Saing Chan (2009). Trade competitiveness of SMEs: importance of finance and policy options/government roles. ARTNeT GMS Notes, No. 1 (August). Bangkok: ESCAP.

Hlaing, Nang Saw Nandar (2014). The review and evaluation of industrial policy especially SMEs development of CLMV countries. ASEAN-Canada Research Partnership Working Paper Series, No. 6. Singapore: RSIS Centre for Non-Traditional Security (NTS) Studies.

Huang, Ing-wei (2003). Importance of SMEs development in Thailand. *Forum of International Development Studies*, No. 23, pp. 159-176.

IBON International (2014). *IBON Primer on the Private Sector in Development: Privatization of Development Cooperation?* Quezon City.

International Crisis Group (2012). Myanmar: the politics of economic reform. *Asia Report*, No. 231 (27 July).

International Trade Centre (2015). *The Republic of the Union of Myanmar National Export Strategy: Rice Sector Strategy 2015-2019*. Geneva.

Kayanula, D., and P. Quartey (2000). The policy environment for promoting small and medium-sized enterprises in Ghana and Malawi. Finance and Development Research Programme Working Paper Series, No. 15. Manchester: University of Manchester, Institute for Development Policy and Management.

Kubo, Koji (2014). Myanmar's non-resource export potential after the lifting of economic sanctions: a gravity model analysis. *Asia-Pacific Development Journal*, vol. 21, No. 1 (June).

Kudo, Toshihiro, and Satoru Kumagai (2013). Export-oriented growth strategy for Myanmar: joining production networks in East Asia. Policy Review Series on Myanmar Economy, No. 9 (January). Bangkok: IDE-JETRO.

Kyaw, Aung (2008). Financing small and medium enterprises in Myanmar. Discussion Paper, No. 148. Chiba, Japan: Institute of Developing Economies.

Kyaw, Khine, and Achara Deboonme (2015). FDI target set at $6 billion for fiscal 2015-2016. *The Nation*, 16 April.

Myanmar (2012). Framework for Economic and Social Reforms: Policy Priorities for 2012-15 towards the Long-Term Goals of the National Comprehensive Development Plan. Nay Pyi Taw: Myanmar Development Resource Institute – Centre for Economic and Social Development.

Myanmar, Ministry of Industry (2013). SME Working Committee. Available from www.smedevelopmentcenter.gov.mm/?q=en/sme_work_committee.

Myanmar, President Office (2014). SMEs key to economic boost and more jobs: Vice President U Nyan Tun, 31 August. Available from www.president-office.gov.mm/en/?q=briefing-room/news/2014/08/31/id-4095.

Myanmar Rice Federation (2015). About Myanmar rice federation. Available from http://myanmarricefederation.org/content/about-myanmar-rice-federation-mrf.

Myint, Than (2006). Country report – Myanmar. In *Enhancing the Competitiveness of SMEs: Subnational Innovation Systems and Technological Capacity-building Policies – Proceedings and Papers Presented at the Regional Consultative Meeting on Subnational Innovation Systems and Technology Capacity-Building Policies to Enhance Competitiveness of SMEs*. United Nations publication, Sales no. E.07.II.F.5.

Nwe, Khine Khine (2013). New perspectives on New Myanmar. Presentation given by the Joint Secretary General, Republic of the Union of Myanmar Federation of Chambers of Commerce and Industry.

Organization for Economic Cooperation and Development (OECD) (2013). *Multi-dimensional Review of Myanmar*, vol. 1, *Initial Assessment*. OECD Development Pathways Series. Paris.

_____ (2014a). Concept note: revision of the SME policy index methodology, for the small business act for Europe assessment in the EU pre-accession region and the Eastern partnership countries, 29 September 2014. Paris.

_____ (2014b). *Multi-dimensional Review of Myanmar: Volume 2. In-depth Analysis and Recommendations*. Paris.

Oryza (2015a). Myanmar plans to export 2.5 million tons of rice in FY 2015-16; up 67% from 2014-15. Available from http://oryza.com/ 22313/myanmar-exports-17-million-tons-rice-2014-15-40-last-year.

_____ (2015b). Myanmar seeks strike trade between rice exports and prices. Available from http://oryza.com/22907/myanmar-seeks-strike-trade-between-rice-exports-and-prices.

Oum, Sothea (2013). SMEs: pivotal for Myanmar's economic growth. Presentation given at the Economic Research Institute for ASEAN and East Asia Capacity Building Seminar 2013 on the Regional Comprehensive Economic Partnership, SME, Competition Law, Consumer Protection, Intellectual Property Right - Overcoming Challenges Ahead: Myanmar ASEAN Chair 2014, AEC and Beyond 2015. Nay Pyi Taw, Myanmar, 28-30 November.

Petrick, M.J. (1968). The supreme court and authority acceptance. *Western Political Quarterly*, vol. 21 (March), pp. 5-19.

Pressman, Jeffrey L., and Aaron Wildavsky (1984). *Implementation*, 3rd ed. Berkeley: University of California Press.

Qin, Dexing (2014). ASEAN economic ministers meeting kicks off in Myanmar. Xinhua, 25 August. Available from www.ecns.cn/business/2014/08-25/131304.shtml.

Rogers, E.M. (1995). *Diffusion of Innovation,* 4th ed. New York: Free Press.

Theingi, Hla, and Myat Mon (2010). The potential contribution of return migrants in Burma's trade and investment liberalization strategy. Paper presented at 18th Biennial Conference of the Asian Studies Association of Australia. Adelaide, 5-8 July.

United Nations, Economic and Social Commission for Asia and the Pacific ((ESCAP) (2011). *Enabling Environment for the Successful Integration of Small and Medium-Sized Enterprises in Global Value Chains: Country Studies of Bangladesh, Nepal and Sri Lanka*. Studies in Trade and Investment Series, No. 70. Sales No. E.12.II.F.6.

_____ (2013). Technical assistance for the development of small and medium-sized enterprises in Myanmar, in business for development: increasing the capacity of small and medium-sized enterprises in Myanmar. Project document.

_____ (2014). Enabling participation of SMEs in international trade and production networks: trade facilitation, trade finance and communication technology. Trade and Investment Working Paper Series, No. 03/14. Bangkok.

United Nations, Economic and Social Commission for Asia and the Pacific (ESCAP), and Organization for Economic Cooperation and Development (OECD) (2014). *Myanmar Business Survey 2014: Survey Results*. Bangkok. Available from www.unescap.org/sites/default/files/MBS_Survey_Results.pdf.

U Thein Sein (2013). Address to the Small and Medium Enterprises Development Central Committee meeting at Presidential Palace (2013). *Nay Pyi Taw News* (Myanmar), 14 January.

World Bank (2014). Myanmar: overview, October. Available from www.worldbank.org/en/country/myanmar/overview. Accessed 2 July 2015.

_____ (2015a) *The Big Business of Small Enterprises: Evaluation of the World Bank Group Experience with Targeted Support to Small and Medium-Size Enterprises*, 2006-12. Washington, D.C. Available from http://ieg.worldbank.org/Data/reports/sme_eval1_0.pdf.

_____ (2015b). Doing Business: Measuring Business Regulations – economy ranking. Available from www.doingbusiness.org/rankings. Accessed 17 July 2015.

_____ (2015c). *Myanmar Investment Climate Assessment*. Washington, D.C. Available from www.worldbank.org.

_____ (2015d). Removing barriers to doing business key for Myanmar's growth, 24 March. Available from www.worldbank.org/en/country/myanmar/publication/investment-climate-assessment-in-myanmar.

_____ (2015e). WB update says 10 countries move up in income bracket, 1 July. Available from www.worldbank.org/en/news/press-release/2015/07/01/new-world-bank-update-shows-bangladesh-kenya-myanmar-and-tajikistan-as-middle-income-while-south-sudan-falls-back-to-low-income.

_____ (2015f). World Development Indicators Database -- Net official development assistance and official aid received current US$. Available from http://data.worldbank.org/indicator/DT.ODA.ALLD.CD.

Yamane, Taro (1967). *Statistics: An Introductory Analysis*, 2nd ed. New York: Harper and Row.

Yao, Wang (2014). Unleashing the full potential of SMEs: beyond financing. Working Paper, 27 June. Hong Kong: Asia Global Institute.

THE ROLE OF FISCAL SUSTAINABILITY IN ENHANCING SUSTAINABLE ECONOMIC GROWTH IN SOUTH ASIA: THE CASE OF BANGLADESH

*Tapan Kumar Sarker**

The present paper examines the role of fiscal sustainability in achieving sustainable economic growth in the context of South Asia. Excessive government debts have long-term implications and can cause serious intergenerational consequences. In this paper, the role of fiscal sustainability is discussed and the concept of a "just tax system" is analysed. Such a tax system can play an important role in achieving economic growth that is sustainable, rather than being focused on short-term gain. Using the case of Bangladesh, the paper highlights some of the key imminent challenges to transforming a tax system to be more equitable and fair. It finds that current taxation systems are based on short-term frameworks and can leave future generations with the ultimate burden of dealing with the limitations of those systems. Based on the case study, which supports those facts, policymakers in South Asian countries could integrate long-term measures to ensure fiscal sustainability in achieving sustainable economic development.

JEL classification: H21, F62.

Keywords: Fiscal sustainability, intergenerational equity, South Asian development.

> Treat the Earth well: it was not given to you by your parents; it was loaned to you by your children. We do not inherit the Earth from our ancestors, we borrow it from our children. It refers to a loan contract, the next generation being the lender and the current one the borrower. This is not the only existing proposal.
>
> (Gosseries, 2008, p.15)

* PhD (Australian National University), Department of International Business & Asian Studies, Griffith Asia Institute, Griffith University, QLD 4111, Australia (Tel: 61 7 3735 3835; fax: 61 7 373 5111; e-mail: tapan.sarker@griffith.edu.au). Dr. Sarker is a former World Bank Scholar and a former official with the National Board of Revenue in Bangladesh. The author would like to thank Ms. Nahida Faridy for her research assistance and the anonymous reviewers of the ***Journal*** for their constructive and helpful comments on earlier versions of this paper.

I. INTRODUCTION

This present paper examines the role of fiscal sustainability in achieving sustainable economic growth in the context of South Asia. This topic is particularly important in the light of the recent austerity measures taken in Greece and Italy, which resulted in serious social and political turmoil, including the resignation of both countries' presidents (Cabannes, 2011). There is also growing recognition that the current global patterns of consumption and investment are unsustainable, meaning that many countries must rebalance their economies towards repairing, maintaining and perhaps gaining fiscal sustainability (Sarker, 2013). This is particularly true for many developed economies, such as Japan and the Republic of Korea, which are experiencing the additional pressures of rapidly ageing populations and sluggish economic growth (Ernst and Young Global, 2011). According to analysts and scholars, reducing budget deficits by promoting fiscal discipline is one important action. For resource-rich economies, restoring fiscal sustainability entails using natural resource endowments to advance social, economic and environmental development outcomes by further broadening the tax base and aggressively enforcing existing taxes (Blanchard and Milesi-Ferretti, 2009; Ernst and Young Global, 2011; Sarker, 2011a; Scholl and others, 2010). This is important not only for current generations, but also for future generations, as the financial situation of one generation affects the next. It means that the debt reduction policies of current governments will have an impact on the level of intergenerational equity of the future generations, particularly as it relates to their living standards and the distribution of public resources (Australian, Department of Treasury, 2002). National debt can be viewed as an obligation passed from current generations to future generations. According to Auerbach (2008, p. 2):

> There are at least three important long-term objectives that appear to be associated with concerns about debt and deficits: intergenerational equity; economic performance; and fiscal sustainability. Unacceptably high levels of debt are seen as compromising all three objectives.

This paper aims to contribute to the existing literature by exploring the role of fiscal sustainability in achieving intergenerational equity. In particular, it investigates the role of a "just tax system" as a tool for achieving sustainable economic growth. For this paper, the term "just" is meant to address intergenerational equity rather than intragenerationanal equity. Hence, the scope of the paper is limited to address intergenerational equity only.

The remainder of the paper is organized as follows. Section II outlines the conceptual framework underpinning the theory of optimal taxation and discusses the importance of effective fiscal reforms and policy instruments for enhancing fiscal sustainability. Section III proposes the notion of a "just tax system" that is focused

on achieving economic growth and is sustainable in the long run, rather than being focused on short-term gains. Section IV provides an overview of some of the key fiscal policy challenges faced by the South Asian economies in the post-global financial crisis environment. Section V highlights some of the key imminent challenges for the tax system in the context of Bangladesh. The final section concludes the paper and provides suggestions for future research.

II. CONCEPTUAL REVIEW OF FISCAL SUSTAINABILITY

Fiscal sustainability is a term that is commonly used in relation to the affordability of government taxation and spending programmes and refer to whether the Government is able to maintain current policies without major adjustments in the future (Buckle and Cruickshank, 2013). Alternatively, it can be defined as the state wherein the government budget can be smoothly financed without generating significant increases in the public debt (or money supply) over time (Adams, Ferrarini and Park, 2010). Fiscal sustainability could be static (when the budget can be financed smoothly over time) or dynamic (when the budget does not lead to significant increases in public debt). Both static and dynamic fiscal stability are important, and threats to either or both can have implications for the macroeconomic and financial stability of a country.

The long-term implications of excessive levels of government debt and government spending have important intergenerational consequences; however, they generally receive little attention from policymakers, who generally focus on short-term political gains (Sarker, 2013). The current fiscal unsustainability means that future generations of taxpayers will face an unmanageable burden for something they do not benefit from due to the consumption of the current generation (Coombs and Dollery, 2002). Furthermore, fiscal unsustainability means that the enduring well-being and quality of life of future generations has been compromised by current generations (Sarker, 2013). This is particularly important in the context of the ageing population, as many governments are faced with the reality of being unable to provide an old-age pension for the growing numbers of retirees in their countries (Thompson, 2003). Hence, achieving fiscal sustainability is an important component to enhancing intergenerational equity to prevent future generations from bearing the burden of debt incurred by current generations. Coombs and Dollery (2002, p. 12) argue that:

> Governments can achieve fiscal sustainability simply by raising taxes … it is conceivable that a government can address its own financial affairs at the expense of its citizen's welfare. Accordingly, in order to ensure that fiscal sustainability is achieved without damage to the welfare of the economy, the concept of optimal taxation should be considered.

The theory of optimal taxation is governed by the Principles of Taxation, which were developed by Adam Smith in 1776 (Smith, 1776). These Principles state that a good tax should be proportional or equitable, certain, simple, transparent, and efficient. When considering the question of intergenerational taxation, the equity principle would at first glance seem to be the most applicable. Equity in taxation is usually assessed by asking who bears the burden of the tax, defined as the change in the distribution of private real income produced by any given tax (Kotlikoff and Summers, 1987; Sarker, 2006). A tax burden that falls most heavily on the poor is said to be "regressive", while a tax burden that falls most heavily on the rich is said to be "progressive". Progressive taxation may often be considered the most socially desirable outcome, as redistributive taxation can subsidize people with low incomes and provide a minimum level of consumption for all (Mirrlees, 2011). Public economics theory argues that an efficient form of taxation is one in which most taxes are collected by direct taxes (those on incomes, profits and capital gains). It also argues that commodity taxes, especially non-uniform commodity taxes, are distortionary, as they affect the incentives to produce a given basket of goods. Furthermore, as everyone, the poor as well as the rich, pays the same rate of tax, commodity taxes are also regressive (Jha, 2010). A remedy for this problem would be to introduce a value-added tax (VAT). This type of tax has been an important part of tax reform in many counties. One key advantage of VAT is that as the tax base excludes inputs, there is no cascading effect. The role of VAT as a means to enhance fiscal sustainability is discussed in section V in this paper using the case of Bangladesh.

There is also a well-acknowledged trade-off between equity and efficiency. Policymakers must negotiate this because a steeply progressive tax system can remove incentives to work (Pressman, 2002). As a result, policymakers often assess whether a taxpayer ought to be bearing that particular tax burden based on two principles: the benefit principle and the ability to pay principle. The benefit principle states that people should pay tax according to the benefits they receive from government spending of that tax revenue. This would seem to imply that the present generation, who is receiving the benefits of the mining boom, should pay taxes according to those benefits received (Auerbach, 1983). By contrast, the ability to pay principle states that those who are more capable of bearing the burden of taxation should pay more taxes than those with less ability to pay. Hence, effective fiscal reform and policy instruments can enhance, maintain or repair fiscal sustainability, thus playing a role in helping a country achieve sustainable economic development.

However, equity considerations under the Principles of Taxation are focused on determining the short-term redistributive impact of a proposed change in taxation. A number of different types of equity could also be considered, such as intertemporal equity (impact on long-term decisions); intergenerational equity (future generations);

and spatial equity (urban-rural divide) (Australia, 2010). As policymakers are increasingly being required to grapple with designing a tax policy to meet long-term challenges, such as intergenerational debt concerns or the ageing population, there is beginning to be a shift away from the traditional concept of equity in taxation to a much broader notion of "justice" in taxation that takes long-term intergenerational considerations into account (Sarker, 2013).

III. A "JUST TAX SYSTEM"

While assessments of equity in taxation review short-term considerations, the notion of a "just tax system" adopts a longer-term, intergenerational perspective. According to Thompson (2003), three different conceptions of societal justice are commonly used. These are the mutual advantage theory, the entitlement theory and justice as fairness. The mutual advantage notion of justice is essentially a cost-benefit analysis, and is satisfied when each person derives the maximum possible gains from voluntary cooperation. The entitlement theory notion of justice focuses on rewards and punishments, and is satisfied when all members of society get what they deserve. The notion of justice as fairness is the most relevant to a tax system; it focuses on the intergenerational distribution of wealth, or intergenerational equity (Sarker, 2013). Justice as fairness holds that all individuals should be able to enjoy a fair share of resources regardless of their history, opportunities, or origin (Thompson, 2003). Under the principle of justice as fairness, current and future generations should have the same access to resources, wealth and consumption opportunities, and intergenerational rebalancing may be required where this does not currently occur (Ablett, 1996).

To move beyond a merely theoretical notion of intergenerational rebalancing, it is necessary to be able to quantify the extent of generational imbalance to determine the adjustment required to rebalance the generations. Generational accounting is one tool that used to determine the amount of intergenerational rebalancing necessary to achieve "justice" in enhancing intergenerational equity. It is based on the premise that future generations should not pay a higher share of their lifetime incomes to the government than current generations do (Auerbach, Gokhale and Kotlikoff, 1994). Generational accounting states the government's intertemporal budget constraint as the present value of remaining net tax payments of existing generations plus the present value of net tax payments of future generations, which is equal to the present value of all future government consumption less government net wealth. Generational balance is then assessed by comparing the per capita fiscal burdens of current and future generations (Sarker, 2013). If the net fiscal burden of the future generation is significantly higher than the current generation, the assumed policy scenario is unsustainable (Ablett, 1996; Auerbach, Gokhale and Kotlikoff, 1994; Coombs and

Dollery, 2002). The generational accounting framework described above posits that an increase in the consumption of current generations without an increase in the tax currently paid will result in an increased fiscal burden to be borne by future generations (Auerbach, Gokhale and Kotlikoff, 1994; Deutsche Bundesbank, 2001). Generational accounting can thus be used as a tool to design policies aimed at achieving intergenerational equity.

The sovereign wealth fund of Norway is a leading result of a policy designed to achieve intergenerational equity. According to the United Nations Human Development Index, Norway has the highest living standards in the world (UNDP, 2013). The country owes its prosperity to exporting its rich oil and gas deposits. Usually, resource-rich countries typically spend their resource wealth, which means current generations often experience higher standards of living than future generations (Corden and Neary, 1982). By contrast, Norway has adopted a different approach. The sovereign wealth fund was established to retain and invest surpluses from taxing the country's oil and gas sales at a high rate (Sunley, Baunsgaard and Simard, 2003). It aims to maintain the living standards and pension payments of future generations when its natural resource deposits are depleted. The fund, which is the second largest sovereign wealth fund in the world, is an excellent example of how policymakers can secure intergenerational equity by taxing current generations to provide for future generations (Kunzel and others, 2011; Reiche, 2010; Norwegian Ministry of Finance, 2007), while also facilitating the transition from one form of capital to another.

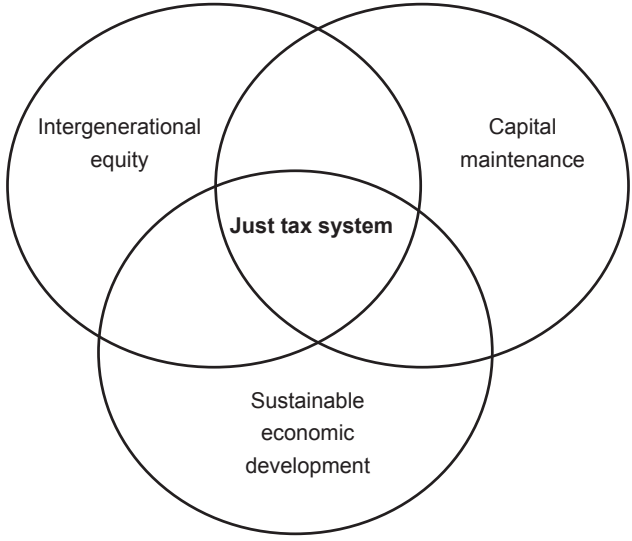
The Five Capital Model is another example used to provide a framework for examining trade-offs between the different but interconnected forms of capital, which are: natural capital; human capital; social capital; manufactured capital; and financial capital (Brereton and Pattenden, 2007; Porritt, 2003; Sigma Project, 2003). The Five Capital Model framework implies that those forms of capital should be repaired, maintained and enhanced rather than depleted or degraded (Mikesell, 1989). As taxation policy can affect business incentives, it can be used to facilitate intergenerational redistribution by assisting the transition from one form of capital to another. Rather than depleting one form of capital altogether (Mikesell, 1989), the focus should be on achieving optimal outcomes across all forms of capital (Southalan, 2011). The model implies that the income generated from natural resource extraction, such as depletion of natural capital, should not be entirely used for consumption. Instead, the revenue from natural resources should be retained and used to develop another form of capital, such as human capital, financial capital, manufactured capital or social capital. The sovereign wealth fund of Norway is an example of this; a portion of the country's revenues from oil and gas extraction (the depletion of natural capital) are retained and used for pension payments for a future ageing population (enhancing human capital). This also applies to resource rich developing countries, which often

face the prospect of a natural resource curse by not being able to accumulate mineral wealth for investment (Kazi and Sarker, 2012). Collier (2010, p. 78) argues that:

> In resource rich low income countries ... the key fiscal issue to be addressed is the replacement of depleting natural assets with other assets, real and financial ... the revenues need to be earmarked for investment.

Figure 1 graphically shows how the components of a just tax system can be derived from the above discussion. A just tax system can help achieve fiscal sustainability and intergenerational equity by maintaining and developing capital, rather than depleting it. Simultaneously, it focuses on achieving economic growth that is sustainable, rather than being focused on short-term gains.

Figure 1. A "just" tax system



Source: Sarker (2013).

The leftmost circle refers to the relationship between intergenerational equity and fiscal sustainability. As national debt can be inherited by future generations, fiscal sustainability is necessary to reduce excessive national debt and achieve intergenerational balance. The circle on the right describes how the Five Capital Model advocates for capital maintenance rather than depletion. Fiscal sustainability in the long term often requires investing in the five forms of capital and ensuring that such capital is maintained for future generations. This capital investment may be in a number of different forms, including education and human capital development or establishing

a sovereign wealth fund. The final circle, sustainable economic development, refers to economic growth that is sustainable, taking into account social and environmental welfare. Fiscal sustainability and intergenerational equity are necessary to achieve government spending and economic growth that is sustainable. Capital maintenance also contributes to achieving economic growth that is sustainable, as extensive capital depletion will eventually hinder economic growth. As shown in figure 1, these long-term policy objectives are interrelated, and that the nexus of the three of them can be used to describe a "just" tax system that simultaneously achieves all three objectives.

IV. STRENGTHENING FISCAL SUSTAINABILITY IN THE SOUTH ASIAN SUBREGION

Policymakers around the world are trying to find ways towards achieving fiscal sustainability through effective fiscal policy reforms. Examples of such policies include municipal amalgamation to strengthen the financial viability of local government in Canada (Slack and Bird, 2013) or phasing out corporate tax breaks in China (Shuhong, Zhenzi and van der Hoek, 2008). Strengthening fiscal sustainability has both short- and long-term implications for the countries in the South Asian subregion. In the short term, high government debt can increase the cost of borrowing. This may, in turn, restrict some of the potentially productive private sector economic activity. A higher level of government debt also means that the government faces higher interest costs each year, at the expense of other government spending. In the long term, high debt burdens may cause problems for future generations in the form of higher tax rates than would otherwise be the case, as debt eventually needs to be repaid (New Zealand Treasury, 2013). While the issue is most pressing in debt-stricken developed countries and regions, such as the United States of America, Japan and Europe, developing countries in the South Asian region are also trying to make drastic policy changes to address long-term social and economic challenges by redesigning their taxation systems.

Gross domestic product (GDP) in South Asia has slowed recently. It only grew an estimated 4.7 per cent in market price terms in 2013, as compared with 5.0 per cent in the previous year (World Bank, 2014b). Fiscal deficits in the region are relatively high, and government debt ratios are also high in some countries (Bhutan, India, and Pakistan), which reflects weak revenue mobilization, a factor behind fiscal imbalances in the South Asian countries as shown in table 1. As a potential drag on economic growth, fiscal consolidation measures in the subregion is crucial and should be considered as a necessary step towards restoring fiscal sustainability (World Bank, 2015). However, successful fiscal consolidation requires long-term fiscal reforms to

improve the existing low tax to GDP ratios. This is particularly important to ensure fiscal sustainability and increase the resources required in meeting the Millennium Development Goals and poverty reducing expenditures. Another threat to South Asian countries is the impact of climate change. According to a recent report by the Asian Development Bank (2014), climate change is likely to slash up to nine per cent off the South Asian economy every year by the end of the century. The human and financial toll could be even higher if the damage from floods, droughts, and other extreme weather events is included. The report also suggests that if the world continues on its current path, South Asia will need to spend at least $73 billion, or an average of 0.86 per cent of its GDP, every year between now and 2100 to adapt to climate change. Such impacts would pose added pressure to enhance and rebuild fiscal sustainability in the South Asian economies.

Table 1. South Asia forecast summary

	2010	2011	2012	2013	2014	2015
GDP at market prices	9.7	7.3	5.0	4.7	5.3	5.9
Fiscal balance/GDP (%)	-7.8	-7.5	-7.2	-6.9	-6.7	-6.6
Current account balance/ GDP (%)	-2.7	-3.1	-4.1	-2.2	-2.0	-2.2

Source: World Bank (2014b).

Developing countries, in general, face benign cyclical environments to build fiscal buffers and to restore fiscal sustainability. This, however, is not the case in South Asia as the countries in this subregion have been confronted with a sudden decline in international capital flows in the recent years. For instance, while real GDP growth in India has increased steadily, other countries in the subregion, such as Bangladesh and Pakistan, may not see similar growth, partly due to low political stability, and poor governance, which pose a serious threat to their economic growth (World Bank, 2014b). Furthermore, countries in the South Asian region often provide generous energy subsidies that distort activity and are seen as impediments to private sector activity. Notably, however, the recent dramatic fall in oil prices could provide an opportunity to rebuild fiscal space while removing the economic distortions associated with subsidies in the subregion.

In general, countries in the South Asia region have shown varied levels of economic growth since the fiscal year 2009/10 as shown in table 2. However, these countries need to rebuild fiscal policy space, as many of them used their buffers as a consequence of the great financial crisis. This means that the successfully consolidating the budget in the near term and achieving sustainability will rely on

revenue mobilization mainly through effective tax policy reforms. Some of the key policy implications that could strengthen fiscal sustainability in selected South Asian economies, namely Bangladesh, India, Pakistan, Sri Lanka, and Nepal, are discussed below.

Table 2. South Asia: selected economic indicators (as % of GDP)

	Country	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15 (projected)
GDP growth	Bangladesh	5.7	6.1	6.7	6.2	6.0	5.5
	India*	8.6	9.3	6.2	5.0	4.6	5.4
	Pakistan	2.6	3.7	4.4	3.6	3.3	3.1
	Nepal	-	3.4	4.8	3.9	4.8	5.0
	Sri Lanka	3.5	8.0	8.2	6.4	6.3	6.8
Revenue and grants	Bangladesh			11.9	12.9	12.9	13.2
	India*	9.2	9.0	8.7	9.1	9.1	9.3
	Pakistan	14.3	12.6	13.1	13.2	13.0	12.8
	Nepal	-	17.7	18.7	19.3	21.1	21.3
	Sri Lanka	15.0	14.9	14.5	13.2	13.4	13.9
Revenue	Bangladesh			11.7	12.4	12.4	12.6
	India*	9.2	9.0	8.7	9.1	9.1	9.3
	Pakistan	14.0	12.4	12.8	13.0	13.9	14.1
	Nepal	-	14.4	16.0	17.7	18.4	18.3
	Sri Lanka	14.5	14.6	14.3	13.0	13.2	13.7
Tax revenue	Bangladesh	8.6	9.0	10.0	10.4	10.4	10.5
	India*	7.1	7.4	7.1	7.4	7.3	7.5
	Pakistan	10.1	9.5	10.3	9.7	9.8	9.8
	Nepal	-	12.6	13.5	15.3	16.3	16.7
	Sri Lanka	12.8	12.9	12.4	11.1	11.7	12.1
Expenditure	Bangladesh			16.0	16.3	16.9	16.9
	India*	16.1	15.4	14.8	14.2	14.3	14.9
	Pakistan	20.2	19.5	21.5	21.7	20.8	20.8
	Nepal	-	18.7	19.3	17.9	20.8	21.1
	Sri Lanka	24.9	22.8	21.4	19.7	19.3	19.3

Table 2. *(continued)*

	Country	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15 (projected)
Overall fiscal balance	Bangladesh			-4.1	-4.0	-4.5	-4.3
	India*	-7.0	-6.4	-6.0	-5.1	-5.3	-5.6
	Pakistan	-5.9	-6.9	-8.4	-8.5	-7.8	-8.0
	Nepal**	-	-2.6	-2.7	-2.0	-2.2	-1.5
	Sri Lanka	-9.9	-8.0	-6.9	-6.4	-5.8	-5.4
Total public debt	Bangladesh			65.4	67.2	57.6	55.9
	India*	72.5	67.4	67.0	67.6	67.3	67.3
	Pakistan	61.5	59.5	63.8	66.6	69.2	71.9
	Nepal	-	34.5	36.3	31.5	30.2	30.5
	Sri Lanka	86.1	81.9	78.4	80.2	79.9	78.0

Sources: IMF Country Reports (2013-2014) and authors own compilation.
Note: *India (Central Government's data), **Nepal (excluding grants).

The economy of Bangladesh has maintained a level of performance consistent with previous years; although rising inflation, high underemployment, and budget and trade deficits continue to be concerns. Economic performance has continued to be strong in the fiscal years 2011 and 2012, with GDP growth °of 6.1 per cent and 6.7 per cent, respectively. Concerns about the possible effects of global climate change have led to robust public discourse, insightful research projects and policy interventions in recent years. The government and the civil society are engaged not only in raising awareness but also in devising policies to mitigate projected effects (BTI, 2014). According to IMF (2013a), strengthened revenue administration and reforms in VAT and income tax legislation have helped boost tax collection in the country.

Among the South Asian countries, the financial system of India is well capitalized and supervised, but, according to IMF (2014a), the country still needs to undergo fiscal consolidation and there is scope to improve the quality of fiscal adjustment. In addition, containing persistently high inflation and a firm commitment to reducing the debt generating fiscal deficits are critical for achieving higher long-term growth.

The tax to GDP ratio for 2012/13 was 9.7 per cent, which is significantly less than the 11.4 per cent ratio in 2002/03 (IMF, 2013b). This means that fiscal consolidation will have to rely heavily on tax policy changes to broadening the tax base. The implementation of a full value-added tax remains the first-best option to raise tax revenue (Hassan and Sarker, 2012), but if this remains politically unfeasible, other

permanent tax policy measures could be considered, such as wholesale reductions in exemptions and concessions, and by fully incorporating services into the tax net.

In Sri Lanka, tax revenues have been declining as a per cent of GDP for years, and are now considered low by international standards (IMF, 2013c). In 2011, the first round of reforms involving rationalizing taxes, rate reductions and some base broadening were implemented. Notwithstanding, the tax revenue-to-GDP ratio was estimated to have fallen to level that slightly exceeds 11 per cent in 2012, lower than most other countries in the subregion. Similar to other South Asian economies, a critical issue in Sri Lanka is the need to strengthen the revenue system to support consolidation while making space for capital investment and key social spending in order to sustain robust and inclusive growth. The second generation of tax reform focused on base broadening and improving administration. Notably, addressing losses at state-owned energy companies requires a comprehensive approach.

In Nepal, revenue growth has remained strong, owing to high import growth and ongoing administrative reforms in the inland revenue and customs departments (IMF, 2014b). According to IMF (2014b), the country's fiscal policy needs to support growth through higher public investment. Key areas with a large impact on potential growth are power generation and distribution, and transport. Investments in those areas would also likely crowd in private sector investment, as they would provide the essential infrastructure for agriculture and industry. Spending on health and education has increased significantly in recent years, including through donor support.

V. A CASE STUDY OF BANGLADESH

Bangladesh is a developing country located in South Asia, with an estimated 32 per cent of the population living below the poverty line (World Bank, 2014a). Growth in Bangladesh averaged 6.3 per cent during the period 2010-2013, but slowed to an estimated 5.4 per cent during the fiscal year ending in June 2014. Social unrest and low political stability, among other things, have impeded efforts in recent years to improve fiscal sustainability. The fiscal cost of food and fuel subsidies in Bangladesh is also heavy, and its energy subsidy alone amounts to between 6 to 10 per cent of revenues (IMF, 2013a). The country faces low tax/GDP ratios and inelastic expenditure/GDP ratios, which often lead to structurally entrenched fiscal deficits. According to IMF (2013a), the relatively low tax/GDP ratio of Bangladeshis is primarily due to inherent weakness in the taxation system. Table 3 provides an illustration of the tax revenue as a percentage of GDP in Bangladesh.

Table 3: Evolution in tax revenue in Bangladesh (in % of GDP)

	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15 (projected)
Total revenue	10.9	11.7	12.4	13.2	13.6	14.2
Tax revenue	9.0	10.0	10.4	10.9	11.3	12.2
NBR tax collection	8.6	9.6	10.0	10.5	10.9	11.8
VAT and supplementary duties	4.9	5.4	5.5	5.5	5.6	6.4
Customs and excise duties	1.4	1.4	1.4	1.5	1.4	1.5
Taxes on income and profit	2.3	2.8	3.1	3.5	3.7	3.9

Sources: Bangladesh, National Board of Revenue (NBR) (2014); and authors/own compilation.

As shown in the above table, Bangladesh has been experiencing low tax/GDP ratios, which has only slightly improved in recent years. The poor performance in revenue mobilization reflects weakness embedded in the tax policy and in revenue administration, which indicates that limited effort has gone into revenue collection. This low tax effort is largely explained by the significant amount of tax revenue foregone due to preferential tax treatment given to specific taxpayer groups or to investment expenditures or their returns through targeted tax deductions, credits, tax exclusions or exemptions (IMF, 2011b). An assessment by the Bangladesh National Board of Revenue in 2007 estimated that foregone revenue could be as much as 2.5 per cent of GDP (Bangladesh, National Board of Revenue, 2007).

Revenue collections of Bangladesh as a percentage of tax revenue are shown by tax category in table 4. It shows that VAT stands as the largest source of revenue collection in Bangladesh; however, the share is limited and has ranged between 32 per cent and 39 per cent since fiscal year 2000/01. In addition, the data presented in the following table also show a gradual growth in income tax collection and a decline in international trade tax, such as customs duty and supplementary duty.

The table also indicates the country's heavy reliance on indirect tax, more specifically on VAT. The argument that personal income tax, generally considered to be the most effective means of taxing the rich, is relatively unimportant in most developing countries (Bird and Gendron, 2005), holds convincingly true for Bangladesh. The predominance of indirect taxes in revenue yield over direct taxes is evident as direct taxes accounted for only 35 per cent of the tax revenue in 2013/14 while indirect taxes accounted for about 65 per cent. The number of people within the personal income tax net equally indicates the malnourished tax culture of the country. For instance, only 1.17 per cent of the Bangladesh population is registered for personal income tax and of those, less than 1 per cent actually pays any income tax. VAT is one of the largest taxes in the country. It accounts for a substantial share of its tax

revenue even though only 13 per cent of the businesses are registered under VAT (Bangladesh, National Board of Revenue, 2014).

Table 4. Contribution of the different taxes as percentage of total tax revenue

Years	Income tax	VAT	Customs duty	SD	Excise duty	Other taxes	Total (%)
2000/01	18.70	33.90	26.94	18.12	1.47	0.87	100
2001/02	19.80	33.33	25.60	18.57	1.40	1.30	100
2002/03	20.21	33.61	24.47	18.48	1.30	1.93	100
2003/04	19.51	31.70	26.98	20.07	0.62	1.12	100
2004/05	19.18	34.77	26.22	18.36	0.49	1.37	100
2005/06	20.23	35.48	23.90	18.55	0.47	1.37	100
2006/07	23.86	36.50	22.08	16.26	0.49	0.81	100
2007/08	23.47	37.00	20.23	17.33	0.46	1.51	100
2008/09	25.54	37.95	18.02	17.20	0.55	0.74	100
2009/10	27.59	38.84	15.13	17.22	0.56	0.66	100
2010/11	28.89	37.78	14.44	17.08	0.61	0.52	100
2011/12	29.92	37.54	14.12	17.72	0.70	0.53	100
2012/13	31.44	36.13	12.92	17.78	0.88	0.85	100
2013/14	35.49	36.75	10.75	15.32	0.96	0.73	100

Sources: Bangladesh, Ministry of Finance (2014); and authors' own compilation.
Note: SD = Supplementary duty.

The United Nations ranked Bangladesh in the low human development category in 2012, but it also highlighted the country for having made substantial progress since their last evaluation in 2011 (UNDP, 2013). Given the extremity of the development problems experienced by Bangladesh, policies that work in the country are likely to provide guidance to other developing economies experiencing less extreme conditions. According to the Asian Development Bank (2004) and others (IMF, 2011a; Kim, 2005), effective fiscal policies directed at achieving sustainable economic development are crucial for poverty alleviation in developing countries, such as Bangladesh. However, such tax policy reform should be country specific, as taxes that work in one country may not be effective in another country context (Mirrlees, 2011; Tanzi and Zee, 2001).

Bangladesh is also highly vulnerable to the impacts of climate change, owing to its location and large proportion of low-lying land subject to inundation as sea levels rise (Sarker and Azam, 2014). The country's vulnerability to climate change poses a serious impediment to long-term economic development (Agrawala and

others, 2003). To mitigate this vulnerability, significant internal and external funding is required (Sarker and Azam, 2014). The Bangladesh Climate Change Resilience Fund, which was established in 2010, is enabling the Government to channel more than $188 million in grant funds to millions of Bangladeshis to build their resilience to the effects of climate change.

Apart from the climate change issue, Bangladesh also faces the mounting task of increasing funding for education and human capital development, which can help long-term economic development. The country's new education policy has addressed this issue and has notably received much attention in recent years as a key mean of improving its GDP growth and redressing inequality. It is estimated that between 42 and 51 per cent of the population is currently illiterate, and that 38 per cent of the population has received no formal education (Bangladesh Bureau of Statistics, 2010; Bangladesh, Ministry of Education, 2010). The recent National Education Policy 2010 of Bangladesh acknowledges the importance of expanding the provision of quality education in this country, which according to education policy experts would require more than 30 trillion Bangladesh taka (TK) (approximately US$37.5 billion) (Haque, 2011). However, State-provided or subsidized education raises the question of funding, with developing countries, in particular, facing severe funding limitations (International Institute for Education Planning, 2007; World Bank, 2014a). Developing countries seeking to alleviate poverty by expanding the education sector are facing acute financing problems, and hence, must look to new sources of revenue, mainly through internal resource mobilization, which require effective fiscal policy reform (Lewin and Caillods, 2001; Wang, Zheng and Zhao, 2012).

However, finding a new tax base to fund and implement such an important policy is a daunting task for any developing country. Bangladesh is no exception, as the country has massive funding costs for its ambitious education plan. One possible option suggested was to expand the tax base on land and property, which has received renewed attention in recent years. Importantly, this would provide a degree of transparency as the property tax would be imposed on a relatively immobile base (making it difficult to evade), and would be based on land and property valuations (FAO, 2002). Education and tax experts of Bangladesh have suggested that a property tax could address the problem of education funding and raise substantial revenue, if managed properly (Haque, 2011; Sarker, 2011a). This taxation method has been used in other countries, including the United States of America, to fund local schools (Kenyon, 2007). One way this type of taxation could be implemented would be to allocate such revenue collected separately for the purpose of funding local schools. This may have a significant redistributive impact by increasing the taxation on the wealthier members of society, and contributing funds to raising the education level of many others. This is crucial in a developing nation to alleviate poverty and stimulate economic growth (Haque, 2011; Sarker, 2011b).

Increasing a country's level of education has significant short-term and long-term benefits at both the individual and social levels. Education is a well-recognized driving factor behind increased social mobility, reduced inequality, increased living standards and poverty alleviation. According to a number of international bodies (International Finance Corporation, 2001; OECD, 2010; World Bank, 2014a), it also increases the productivity of the labour force and its health and economic growth. In addition, it drives economic competitiveness and promotes democracy, peace, stability and environmental preservation. Education is thus not only crucial to achieving short-term economic growth, but also to attaining long-term intergenerational equity objectives, such as higher living standards and lower poverty rates. A property tax in Bangladesh may assist in achieving these goals by easing inequality, as well as investing in education, thus providing a double dividend for such a poor nation.

A second tax in Bangladesh that may assist in achieving intergenerational equity is VAT (Faridy and Sarker, 2011; Sarker, 2013). Widely considered to be one of the more efficient taxes, VAT, if introduced in place of more narrowly based indirect taxes, can lead to significant efficiency gains (Ebrill and others, 2002; KPMG, 2011). Across the Asia-Pacific region, there has been a de facto broadening of the VAT tax base through targeted compliance programmes (Ernst and Young Global, 2013). Bangladesh introduced VAT in 1991, but many exemptions have hindered its revenue-raising potential (Faridy and Sarker, 2011), thus, there is a strong argument for broadening the base of VAT in Bangladesh. Effective mobilization of internal revenue is crucial for the ongoing economic development of Bangladesh, as government-provided welfare can assist in achieving poverty alleviation. Mobilization of internal revenue sources can also help to ensure the long-term fiscal sustainability of Bangladesh, as it can help reduce the country's dependence on foreign funding sources, and therefore reduce government deficits (Faridy and Sarker, 2011). Similar arguments have been made in the United Kingdom of Great Britain and Northern Ireland in the context of the economic recovery from the global financial crisis, where it was proposed that the VAT rate be increased to 20 per cent to assist the government's fiscal consolidation and debt reduction (Fuest, 2009). Obtaining enough foreign loans to finance its $395 billion deficit has been a problem for Bangladesh in the past (Bangladesh, 2010). Essentially, broadening the VAT base would help Bangladesh achieve fiscal sustainability, which helps intergenerational rebalancing.

VI. CONCLUSIONS

This paper has highlighted a range of factors that policymakers should consider in designing a just tax system. The long-term social, economic and environmental sustainable development challenges faced by a country must be integrated into its tax reform agenda, along with the long-term distributional implications of its current tax system. Easing the intergenerational imbalance needs to be addressed by maintaining the various forms of capital rather than their depletion. Implementing taxes on unsustainable "bads" will incentivize a focus on more sustainable development and allow for funds to be reallocated towards increasing long-term economic productivity. Finally, consideration needs to be given to long-term issues, such as ageing populations and climate change, in present-day policy development along with efficient, simple and transparent fiscal policy development.

REFERENCES

Ablett, J. (1996). Generational accounting and intergenerational balance. *Agenda*, vol. 3, No. 4, pp. 407-418.

Adams, C., B. Ferrarini, and D. Park (2010). Fiscal sustainability in developing Asia. Economics Working Paper Series, No. 205. Manila: ADB.

Agrawala, S., and others (2003). Development and climate change in Bangladesh: focus on coastal flooding and the Sundarbans. COM/ENV/EPOC/DCD/DAC(2003)3/FINAL. Paris: OECD.

Asian Development Bank (2004). *Economic Growth and Poverty Reduction in Bangladesh*. Manila.

_____ (2014). Climate change threatens South Asian economy, bank warns, 20 August. Available from http://ens-newswire.com/2014/08/20/climate-change-threatens-south-asian-economy-bank-warns/.

Auerbach, Alan J. (1983). *The Taxation of Capital Income*. Cambridge, MA: Harvard University Press.

_____ (2008). Long-term objectives for government debt. Paper presented at a conference on Fiscal Policy and Labour Market Reforms organized by the Swedish Fiscal Policy Council (Finanspolitiska RÂdet). Stockholm, 29 January.

Auerbach, Alan J., J. Gokhale, and Laurence J. Kotlikoff (1994). Generational accounting: a meaningful way to evaluate fiscal policy. *The Journal of Economic Perspectives*, pp. 73-94.

Australian, Department of Treasury (2002). Budget 2002-2003. Canberra.

_____ (2010). What does equitable distribution mean? Australia's future tax system: architechture of Australia's tax and transfer system. Canberra.

Bangladesh Bureau of Statistics (2010). *Report on the Bangladesh Literacy Survey*. Dhaka: Ministry of Planning.

Bangladesh desperate for foreign loans to meet budget deficit (2010). *Xinhua*, 18 April. Available from http://english.peopledaily.com.cn/90001/90778/90858/90863/6954688.html.

Bangladesh, Ministry of Education (2010). National education policy 2010. Available from http://planipolis.iiep.unesco.org/upload/Bangladesh/Bangladesh_National_Education_Policy_2010.pdf.

Bangladesh, Ministry of Finance (2014). *Economic Review 2014*. Dhaka.

Bangladesh, National Board of Revenue (2007). *Annual Report of the National Board of Revenue, 2005-2006*. Dhaka.

_____ (2014). *Annual Report of the National Board of Revenue*, 2011-2012. Dhaka.

Bird, R.M., and P. Gendron (2005). *VAT Revisited: A New Look at the Value Added Tax in Developing and Transitional Countries*. United States Agency for International Development.

Blanchard, O.J., and G.M. Milesi-Ferretti (2009). *Global Imbalances: In Midstream?* Washington, D.C.: IMF.

Brereton, D., and C. Pattenden (2007). Measuring what matters: monitoring the contribution of a new mining project to community sustainability. Paper presented at the 3rd International Conference on Sustainable Development Indicators in the Minerals Industry. Milos Island, Greece.

BTI (2014). *Bangladesh Country Report*. Gütersloh: Bertelsmann Stiftung.

Buckle, R., and A. Cruickshank (2013). The requirements for long-run fiscal sustainability. Working Paper, 13/20 (July). New Zealand Treasury.

Cabannes, A. (2011). The European monetary crisis explained. Available from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1911816.

Collier, P. (2010). Principles of resource taxation for low-income countries. In *The Taxation of Petroleum and Minerals: Principles, Problems and Practice*, Philip Daniel, Michael Keen and Charles McPherson, eds. Oxon, UK: Routledge.

Coombs, G., and B. Dollery (2002). An analysis of the debate of intergenerational equity and fiscal sustaniability in Australia. *Australian Journal of Social Issues (Australian Council of Social Service)*, vol. 37, No. 4, p. 363.

Corden, W.M., and J.P. Neary (1982). Booming sector and de-industrialisation in a small open economy. *The Economic Journal*, vol. 92, No. 368, pp. 825-848.

Deutsche Bundesbank (2001). The long-term sustainability of public finance – an analysis based on generational accounting. *Monthly Report of the Deutsche Bundesbank*, vol. 53, No. 12, pp. 29-43.

Ebrill, L., and others (2002). The allure of the value-added tax. *Finance and Development* (English ed.), vol. 39, No. 2, pp. 44-47.

Ernst and Young Global (2011). Asia-Pacific tax policy outlook. *Global Tax Policy*. Available from http://emergingmarkets.ey.com/2011-asia-pacific-tax-policy-outlook/.

_____ (2013). Asia-Pacific tax policy outlook. *Global Tax Policy*. Available from www.ey.com/GL/en/Services/Tax/Asia-Pacific-tax-policy-outlook.

Faridy, N., and T. Sarker (2011). Progressivity of value added tax (VAT) in developing countries: empirical evidence from Bangladesh. *Asia Pacific Tax Bulletin*, vol. 17, No. 3, pp. 185-191.

Food and Agriculture Organisation (2002). Rural property tax systems in Central and Eastern Europe. Available from www.fao.org/DOCREP/005/Y4313E/y4313e05.htm.

Fuest, C. (2009). The UK should increase VAT. *The Tax Journal*, pp. 24-25.

Gosseries, A. (2008). Theories of intergenerational justice: a synopsis. *Surv. Perspect. Integr. Environ. Soc*., vol. 1, pp. 39-49.

Haque, M. (2011). Property tax be imposed to finance education policy implementation. *Holiday*, 1 April.

Hassan, B., and T. Sarker (2012). Reformed general sales tax in Pakistan. *International VAT Monitor*, vol. 23, No. 6, pp. 417-421.

International Finance Corporation (2001). Education sector strategy. Available from www.ifc.org/ifcext/che.nsf/Content/StrategyE.

International Institute for Educational Planning (2007). Higher education and development. *Newsletter*, vol. 25, No. 1.

International Monetary Fund (IMF) (2011a). *World Economic Outlook Report: Tensions from the Two-speed Recovery*. Washington, D.C. Available from www.imf.org/external/pubs/ft/weo/2011/01/.

_____ (2011b). Revenue Mobilization in Developing Countries. Washington, D.C.

_____ (2013a). Bangladesh: country report, No. 13/357 (December). Washington, D.C.

_____ (2013b). Pakistan: country report, No. 13/287 (September). Washington, D.C.

_____ (2013c). Sri Lanka: country report, No. 13/120 (December). Washington, D.C.

_____ (2014a). India: country report, No. 14/57 (February). Washington, D.C.

_____ (2014b). Nepal: country report, No. 14/214 (July). Washington, D.C.

Jha, R. (2010). Fiscal policies and challenges in South Asia. ASARC Working Paper, 2010/01. Canberra: Australian National University.

Kazi, W.B., and T. Sarker (2012). Fiscal sustainability and the natural resource curse in resource rich African countries: a case study of Uganda. *Bulletin for International Taxation*, vol. 66, No. 8, pp. 1-12.

Kenyon, D.A. (2007). *The Property Tax-School Funding Dilemma*. Cambridge: Lincoln Institute of Land Policy.

Kim, Seung-Rae. (2005). Optimal fiscal policies for sustainable development: greening the tax and budget system. Paper presented at the UNESCAP-KAPFEKIPF Symposium: First Regional Policy Dialogue.

Kotlikoff, L.J., and L.H. Summers (1987). Tax incidence. Working Paper, No. 8829. Cambridege, MA: National Bureau of Economic Research.

KPMG (2011). Economic analysis of the impacts of using GST to reform taxes. CPA Australia.

Kunzel, P., and others (2011). Investment objectives of sovereign wealth funds-a shifting paradigm. Working Paper, No. WP/11/19. Washington, D.C.: IMF.

Lewin, K., and F. Caillods (2001). *Financing Secondary Education in Developing Countries: Strategies for Sustainable Growth*. Paris: UNESCO, International Institute for Educational Planning.

Mikesell, R.F. (1989). Depletable resources, discounting and intergenerational equity. *Resources Policy*, vol. 15, No. 4, pp. 292-296.

Mirrlees, J. (2011). Professor Sir James Mirrlees on poverty and redistribution. Available from http://beta.adb.org/features/professor-sir-james-mirrlees-poverty-and-redistribution.

New Zealand Treasury (2013). Affording our future: statement on New Zealand's long term fiscal position. Available from www.treasury.govt.nz. Accessed 17 October 2014.

Norwegian Ministry of Finance (2007). Background note: Norway's position in relation to the international debate on Sovereign Wealth Funds. Available from www.regjeringen.no/globalassets/upload/fin/statens-pensjonsfond/swf-memo-oct07-off.pdf.

Organisation for Economic Co-operation and Development (OECD) (2010). What are the economic benefits of education? Available from www.oecd-ilibrary.org/education/education-at-a-glance-2010/what-are-the-economic-benefits-of-education_eag-2010-11-en.

Porritt, J. (2003). *The World in Context: Beyond the Business Case for Sustainable Development*. Available from www.cisl.cam.ac.uk/publications/the-world-in-context.

Pressman, S. (2002). Income guarantees and the equity-efficiency tradeoff. Discussion Paper, No. 21. U.S. Basic Income Guarantee Network. Available from www.usbig.net/papers/021-Pressman.doc.

Reiche, D. (2010). Sovereign wealth funds as a new instrument of climate protection policy? A case study of Norway as a pioneer of ethical guidelines for investment policy. *Energy*, vol. 35, No. 9, pp. 3569-3577.

Sarker, T. (2006). Who bears the burden of taxes in developing dountries? A case of income taxation in Bangladesh. *Pakistan Economic and Social Review*, vol. 44, No. 2, pp. 181-207.

_____ (2011a). Effective tax policy reform through strategic stakeholder communication: lessons from Australia. *Bulletin for International Taxation, Journal IBFD*, vol. 65, No. 10, pp. 582-590.

_____ (2011b). Time for a property tax: how it may work. *The Financial Express*, 11 March.

_____ (2013). Taxing for the future: an intergenerational perspective. In *The Asian Century, Sustainable Growth and Climate Change*, Moazzem Hossain, Tapan Sarker and Malcolm McIntosh, eds. Cheltenham, UK: Edward Elgar Publishing.

Sarker, T., and M. Azam (2014). Mainstreaming climate change adaptation through technology transfer in developing countries: a climate hotspot case from coastal Bangladesh. In *Responding to Climate Change: Lessons from an Australian Hotspot*, P. Burton, ed. Clayton, Victoria, Australia: CSIRO Publishing.

Scholl, G., and others (2010). Policies to promote sustainable consumption: innovative approaches in Europe. Paper presented at the Natural Resources Forum.

Shuhong, K., L. Zhenzi, and M. Peter van der Hoek (2008). The dual corporate income tax in China: the impact of unification. *Public Finance & Management*, vol. 8, No. 4, pp. 656-677.

Sigma Project (2003). The Sigma guidelines - toolkit: SIGMA guide to the global reporting initiative sustainability reporting tool. London. Available from projectsigma.co.uk/Toolkit/SIGMAGlobalReporting.pdf.

Slack, E., and R. Bird (2013). Does municipal amalgamation strengthen the financial viability of local government? A Canadian example. *Public Finance & Management*, vol. 13, No. 2, pp. 99-123.

Smith, A. (1776). The Wealth of Nations (Modern Library Classics). Oxford: Oxford University Press.

Southalan, J. (2011). What are the implications of human rights for minerals taxation? Resources Policy, vol. 36, No. 3, pp. 214-226.

Sunley, E.M., T. Baunsgaard, and D. Simard (2003). Revenue from the oil and gas sector: issues and country experience. *Fiscal Policy Formulation and Implementation in Oil-Producing Countries*, pp. 153-183.

Tanzi, V., and H. Zee (2001). Tax policy for developing countries. *Economic Issues*, vol. 27. Washington, D.C.: IMF.

Thompson, J. (2003). Intergenerational equity: issues of principle in the allocation of social resources between this generation and the next. Australia: Department of the Parliamentary Library.

United Nations Development Programme (UNDP) (2013). *Human Development Report 2013 Summary The Rise of the South: Human Progress in a Diverse World*. New York. Available from http://hdr.undp.org/en/content/human-development-report-2013-summary.

Wang, W., X. Zheng, and Z. Zhao (2012). Fiscal reform and public education spending: a quasi-natural experiment of fiscal decentralization in China. *Publius: The Journal of Federalism*, vol. 42, No. 2, pp. 334-356.

World Bank (2014a). Bangladesh at a glance. Available from http://devdata.worldbank.org/AAG/bgd_aag.pdf.

_____ (2014b). *Global Economic Prospects: Shifting Priorities, Building for the Future*. Washington, D.C.

_____ (2015). *Global Economic Prospects: Having Fiscal Space and Using it*. Washington, D.C.

PURCHASE ORDER FORM

(Please type or print)

NAME: _____

POSITION: _____

ORGANIZATION: _____

ADDRESS: _____

_____

_____

_____

COUNTRY: _____ POSTCODE: _____

TELEPHONE: _____ FACSIMILE: _____ E-MAIL: _____

United Nations publications may be obtained from bookstores and distributors throughout the world. Please consult your bookstore or write to any of the following:

Customers in: America, Asia and the Pacific

E-mail: order@un.org
Web: un.org/publications
Tel: +1 703 661 1571
Fax: +1 703 996 1010

Mail Orders to:
United Nations Publications
PO Box 960
Herndon, Virginia 20172
United States of America

Customers in: Europe, Africa and the Middle East

United Nations Publication
c/o Eurospan Group
E-mail: info@eurospangroup.com
Web: un.org/publications
Tel: +44 (0) 1767 604972
Fax: +44 (0) 1767 601640

Mail Orders to:
United Nations Publications
Pegasus Drive, Stratton Business Park
Bigglewade, Bedfordshire SG18 8TQ
United Kingdom

For further information on publications in this series, please address your enquiries to:

Chief
Conference and Documentation Service Section
Office of the Executive Secretary
Economic and Social Commission for Asia and the Pacific (ESCAP)
United Nations Building, Rajadamnern Nok Avenue
Bangkok 10200, Thailand

Tel: 66 2 288-1110
Fax: 66 2 288-1000
E-mail: escap-cdss@un.org

READERSHIP SURVEY

The Macroeconomic Policy and Development Division of ESCAP is undertaking an evaluation of the *Asia-Pacific Development Journal,* with a view to improving the usefulness of future publications to our readers. We would appreciate it if you could complete this questionnaire and return it, at your earliest convenience, to:

Director
Macroeconomic Policy and Development Division
ESCAP, United Nations Building
Rajadamnern Nok Avenue
Bangkok 10200, THAILAND
E-mail: escap-mpdd@un.org

QUESTIONNAIRE

	Excellent	*Very good*	*Average*	*Poor*
1. Please indicate your assessment of the *quality* of the publication in terms of:				
• presentation/format	4	3	2	1
• readability	4	3	2	1
• timeliness of information	4	3	2	1
• coverage of subject matter	4	3	2	1
• analytical rigour	4	3	2	1
• overall quality	4	3	2	1
2. How *useful* is the publication to your work?				
• provision of information	4	3	2	1
• clarification of issues	4	3	2	1
• its findings	4	3	2	1
• policy suggestions	4	3	2	1
• overall usefulness	4	3	2	1

3. Please give examples of how this publication has contributed to your work:

.....

.....

.....

.....

.....

4. Suggestions for improvement of similar publications:

.....

.....

.....

.....

5. Your background information, please:

Name: .....

Title/position: .....

Institution: .....

Office address: .....

.....

Please use additional sheets of paper, if required, to answer the questions.
Thank you for your kind cooperation in completing this questionnaire.

ASIA-PACIFIC DEVELOPMENT JOURNAL
INSTRUCTIONS TO CONTRIBUTORS

Published by the Macroeconomic Policy and Development Division of the United Nations Economic and Social Commission for Asia and the Pacific, the *Asia-Pacific Development Journal* provides a platform for the exchange of ideas and experiences on development issues and concerns facing the region, and aims to stimulate policy debate and assist in the formulation of policy. Policy-oriented articles and original pieces of work, focusing on development issues and challenges relevant to the Asian and Pacific region, are welcomed in the *Journal*, which is published twice a year.

1. MANUSCRIPTS

Authors are requested to provide copies of their manuscripts in English. Contributors should indicate in their covering letter to the Editorial Board that the material has not been previously published or submitted for publication elsewhere. The manuscripts should be typed, double-spaced, on one side of white A4 paper and the length should not exceed 30 pages. Manuscripts are accepted subject to editorial revision.

Since all manuscripts will be refereed by professionals in the field, the name(s) of the author(s), institutional affiliation(s) and other identifying information should be placed on the title page only, in order to preserve anonymity. The title page should contain the following: (a) title; (b) name(s) of the author(s); (c) institutional affiliation(s); (d) complete mailing address, telephone number, facsimile number and e-mail address of the author, or of the primary author in the case of joint authors; and (e) JEL classification and key words relevant to the article. The second page should contain the title, the name(s) of the author(s) and an abstract of approximately 150 words. Acknowledgement (if any) should appear after the abstract.

It is preferred that manuscripts be submitted by e-mail to the address below (if hard copies are submitted, kindly provide two copies of the manuscript to the address below). The preferred word-processing software is Microsoft Word. Once a manuscript is accepted for publication, the author(s) may be asked to submit electronic files of their manuscript, figures, tables and charts, as appropriate.

2. FOOTNOTES AND QUOTATIONS

Footnotes, if any, should be numbered consecutively with superscript arabic numerals. They should be typed single-spaced and placed at the bottom of each page. Footnotes should not be used solely for citing references. Quotations should be double-spaced. A copy of the page(s) of the original source of the quotation, as well as a copy of the cover page of that source, should be provided.

3. TABLES AND FIGURES

All tables and figures should be numbered consecutively with arabic numerals. Each table should be typed double-spaced. Tables and figures should be planned to fit the proportions of the printed page. Full information on the source(s) should appear below the table/figure, followed by notes, if any, in lower-case letters.

4. REFERENCES

Authors should ensure that there is a complete reference for every citation in the text. References in the text should follow the author-date format, followed, if necessary, by page numbers, for example, Becker (1964, pp. 13-24). List only those references that are actually cited in the text or footnotes. References, listed alphabetically, should be typed double-spaced on a separate page in the following style:

Africa achieving healthy and steady growth rate (2007). *World Bank News*, 14 November. Available from http://go.worldbank.org/6AJB33NOF0.

Desai, Padma, ed. (1883). *Marxism, Central Planning, and the Soviet Economy.* Cambridge, MA: MIT Press.

Husseini, Rana (2007). Women leaders attempt to bridge East–West cultural divide. *Jordan Times*, 9 May.

Krueger, Alan B., and Lawrence H. Summers (1987). Reflections on the inter-industry wage structure. In *Unemployment and the Structure of Labour Markets*, Kevin Lang and Jonathan S. Leonard, eds. London: Basis Blackwell.

Moran, Theodore H., and Gerald T. West, eds. (2005). *International Political Risk Management*, vol. 3, *Looking to the Future*. Washington, D.C.: World Bank.

Sadorsky, P. (1994). The behaviour of U.S. tariff rates: comment. *American Economic Review*, vol. 84, No. 4, September, pp. 1097-1103.

Salagaev, Alexander (2002). Juvenile delinquency. Paper presented at the Expert Group Meeting on Global Priorities for Youth. Helsinki, October.

Stiglitz, Joseph, and others (2006). *Stability with Growth: Macroeconomics, Liberalization and Development*. Initiative for Policy Dialogue Series. Oxford: Oxford University Press.

Straub, Stephane (2008). Infrastructure and growth in developing countries: recent advances and research challenges. Policy Research Working Paper, No. 4460. Washington, D.C.: World Bank.

United Kingdom, Department for Education and Skills (2007). *Care Matters: Time for Change*. London: The Stationery Office. Available from www.official-documents.gov.uk.

For further details on referencing, please refer to the editorial guidelines at: www.unescap.org/sites/default/files/apdj_editorial_guidelines.pdf. The Editorial Board of the *Asia-Pacific Development Journal* would like to emphasize that papers need to be thoroughly edited in terms of the English language, and authors are kindly requested to submit manuscripts that strictly conform to the attached editorial guidelines.

Manuscripts should be sent to:

Chief Editor, *Asia-Pacific Development Journal*
Macroeconomic Policy and Development Division
Economic and Social Commission for Asia and the Pacific
United Nations Building
Rajadamnern Nok Avenue
Bangkok 10200
Thailand
Tel: 66 2 288-1902
Fax: 66 2 288-1000; 66 2 288-3007
E-mail: escap-mpdd@un.org

United Nations publications may be obtained from bookstores and distributors throughout the world.
Please consult your bookstore or write to any of the following:

Customers in: America, Asia and the Pacific

E-mail: order@un.org
Web: un.org/publications
Tel: +1 703 661 1571
Fax: +1 703 996 1010

Mail Orders to:
United Nations Publications
PO Box 960
Herndon, Virginia 20172
United States of America

Customers in: Europe, Africa and the Middle East

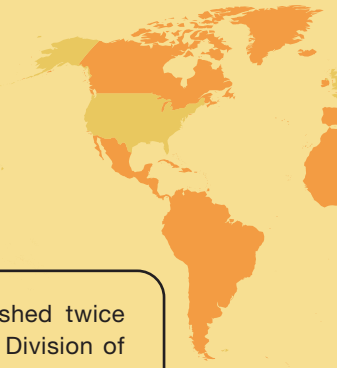
United Nations Publication
c/o Eurospan Group
E-mail: info@eurospangroup.com
Web: un.org/publications
Tel: +44 (0) 1767 604972
Fax: +44 (0) 1767 601640

Mail Orders to:
United Nations Publications
Pegasus Drive, Stratton Business Park
Bigglewade, Bedfordshire SG18 8TQ
United Kingdom

United Nations
Economic and Social Commission for
Asia and the Pacific
Macroeconomic Policy and Development Division
United Nations Building, Rajadamnern Nok Avenue
Bangkok 10200, Thailand
Fax: 66 2 288-3007
E-mail: escap-mpdd@un.org
escap-publicationsoffice@un.org
Website: www.unescap.org

United Nations publication
Sales No. E.15.II.F.16

ISBN: 978-91-1-120702-6
e-ISBN: 978-92-1-057633-8
ISSN: 1020-1246
ST/ESCAP/2725



The *Asia-Pacific Development Journal* (APDJ) is published twice a year by the Macroeconomic Policy and Development Division of the United Nations Economic and Social Commission for Asia and the Pacific.

The primary objective of the APDJ is to provide a platform for the exchange of knowledge, experience, ideas, information and data on all aspects of economic and social development issues and concerns facing the region and to stimulate policy debate and assist in the formulation of policy.

The development experience in the Asian and Pacific region has stood out as an extraordinary example of what can be achieved when policymakers, experts, scholars and people at large harness their creativity, knowledge and foresight. The APDJ has been a proud partner in this process, providing a scholarly means for bringing together research work by eminent social scientists and development practitioners from the region and beyond for use by a variety of stakeholders. Over the years, the Journal has emerged as a key United Nations publication in telling the Asian and Pacific development story in a concise, coherent and impartial manner to stimulate policy debate and assist in the formulation of policy in the region.

ISBN 978-92-1-120702-6

9 789211 207026

15-00818