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Acronyms

ADB	Asian Development Bank
ADB-CCF	Asian Development Bank Climate Change Fund
ADB-CTF	Asian Development Bank Clean Technology Fund
AEC	ASEAN Economic Community
AFTA	ASEAN Free Trade Agreement
AML	Anti-Money Laundering
AOR	Actual Operation Revenue
AP	Availability Payment
ASEAN	Association of Southeast Asian Nations
BAAC	Bank for Agriculture and Agricultural Cooperatives
BSPP	Burma Socialist Programme Party
BTO-MRG	Build-Transfer-Operation Minimum Revenue Guarantee
BVGL	Business Viability Guarantee Letter
CA	Concession Agreement
CBM	Central Bank of Myanmar
CDP	Comprehensive Development Plan
CF	Corporate Finance
CHDB	Construction and Housing Development Bank
CLMV	Cambodia, Lao PDR, Myanmar, and Vietnam
CMEC	China-Myanmar Economic Corridor
D/E ratio	Debt-to-Equity Ratio
DFI	Development Financial Institution
DICA	The Directorate of Investment and Company Administration
DSCR	Debt Service Coverage Ratio
ECAs	Export Credit Agencies
EDFI	Electricité de France International
EGAT	Electricity Generating Authority of Thailand
EGCO	Electricity Generating Public Company Ltd
EOR	Expected Operation Revenue
EPC	Engineering, Procurement, and Construction

EU	European Union
FATF	Financial Action Task Force
FDI	Foreign Direct Investment
FI	Financial Institution
FiT	Feed-In-Tariff
FND	Financiera Nacional de Desarrollo Agropecuario, Rural, Forestaly Pesquero
FY	Financial Year
GDP	Gross Domestic Product
GMM	Generalized Moment Method
GoI	Government of Indonesia
GoK	Government of Korea
GoL	Government of Laos
GoM	Government of Myanmar
GTAP	Global Trade Analysis Project
GVCs	Global Value Chains
HPEA	High Performing Economies of Asia
ICIO	Inter-country Input-Output Tables
IFRS	International Financial Reporting Standards
IIAE	Incheon International Airport Expressway
IIT	Inter-industry Trade
ILO	International Labour Organization
IMF	International Monetary Fund
ITA	Information Technology Agreement
IV	Instrumental Variable
KDB	Korea Development Bank
KRW	Korean Won
LLCR	Loan Life Cover Ratio
LP	Limited Partner
LPI	Logistics Performance Index
MADB	Myanma Agricultural Development Bank
MBS	Marginal Budget Shares

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MDI	Myanmar Development Institute
MICB	Myanmar Investment and Commercial Bank
MLA	Multilateral Agency
MLCS	Myanmar Living Condition Survey
ММК	Myanmar Kyat
МоС	Ministry of Construction
MOPF	Ministry of Planning and Finance
MPLCS	Myanmar Poverty and Living Condition Survey
MRG	Minimum Revenue Guarantee
MSDP	Myanmar Sustainable Development Plan
NGO	Non-Governmental Organization
NICs	Newly Industrializing Countries
NLD	National League for Democracy
NTPC2	Nam Theun 2 Power Company
0 & M	Operation and Maintenance
OBS	Off-Balance-Sheet Financing
ODA	Official Development Assistance
OECD	Organization for Economic Co-operation and Development
PAB	Private Activity Bond
PEFA	Public Expenditure and Financial Accountability
PF	Project Financing
PFM	Public Financial Management
PPA	Power Purchasing Agreement
PPI Act	The Promotion of Private Capital into Social Overhead
	Investment Act
PPP	Public Private Partnership
PRG	Political Risk Guarantee
PRI	Political Risk Insurance
RCA	Revealed Comparative Advantage
RoI	Return on Investment
RoR	Rate of Return

ROW	Right-of-Way
RRS	Revenue Risk Sharing
RSR	Risk-Sharing Revenue
RVCs	Regional Value Chains
SAB	State Agricultural Bank
SCS	Social Sustainability
SDI	Spatial Development Initiatives
SEE	State Economic Enterprises
SEZ	Special Economic Zone
SI	Strategic Investor
SME	Small and Medium Enterprises
SPV	Special Purpose Vehicle
SWF	Sovereign Wealth Fund
THB	Thailand Baht
TiVA	Trade in Value-Added dataset
TOP-PPA	Take-or-Pay Power Purchasing Agreement
TVET	Technical and Vocational Education Training
VS	Vertical Specialization
VTC	Voluntary Tax Compliance
WB	World Bank
WIOD	The World Input-Output Database
WTO	World Trade Organization
YEX Project	Yangon Expressway Project

INTRODUCTORY REMARKS

Welcome to the second issue of the Myanmar Economic Bulletin (MEB). A lot has happened since our first issue went to press, not least in terms of Myanmar's economy. MEB's purpose is not to get too overwhelmed by the transitory, however, but to explore the questions that rumble beneath. Nevertheless, we are also about being relevant and practical rather than being narrowly 'academic' or too abstract. As with our inaugural issue, we trust that this second iteration of MEB successfully achieves a balance between these imperatives.

Of course, since these remain early days of the MEB, we are still experimenting a little in terms of the journal's layout and structure. For this second issue for instance, we enjoyed a more than adequate supply of longer-form articles (and many of them are published in this volume), whilst the shorter-form technical briefs have been held-over for inclusion in our third edition, and in which we will take the opportunity to especially highlight the highly relevant and practical contributions of the Myanmar Development Institute and its (primarily) young Research Associates.

So, with these editorial comments out of the way, we welcome your reading and scrutiny of MEB Vol.2, No.1. You will note that a number of unifying themes are apparent in the papers – including the transformational possibilities of Myanmar's growing involvement in global supply chains and income flows (the papers of Aung Hein and Myat Su Tin); the expanding possibilities for, and the current limitations of, private and public finance (Om Ki, and Khin Maung Nyunt), and; the critical role of getting infrastructure 'right' (Wookeun Ken Yoon and Anders Moller). We end with our first-person interview, in this case a Myanmar scholar of truly global eminence, Emeritus Professor Ronald Findlay. One of the world's most influential economists, whose contributions across seven decades include just about all the topic areas noted above (and then some!), Ron is the very epitome of the engaged scholar in pursuit of a better world.

Finally, we received much feedback on the first issue of MEB. We are much appreciative of this, including, (indeed, maybe especially) the criticism. Please keep the correspondence flowing, and let us know what you think.

Sean Turnell Naypyitaw, April 2019

MYANMAR'S PROSPECT FOR DEEPENING GVC PARTICIPATION

Aung Hein¹

SUMMARY

Global value chains (GVCs) have become increasingly prevalent in the world, driven by the spatial fragmentation of manufacturing. This is more so in Asia than in any other region. Countries participate in GVCs by specializing in certain activities according to their factor endowments. Electronics, services, and primary industries have together played a disproportionate role in deepening Asian economies' GVC participation. Two ongoing trends in Asia are important: i) Asian economies are upgrading their industrial sophistication, and ii) the importance of the textile and apparel industry in China has declined. Thus, Myanmar potentially enjoys a twin advantage in deepening its GVC participation: i) it has location advantage in being in the region with the highest GVC participation, and ii) the industrial upgrading in Asian economies, plus the defocusing of the textile and apparel industry in China opens an opportunity for Myanmar to deepen its specialization in the downstream activities of certain industries. Myanmar does possess a favourable factor endowment; yet its barriers to trade are high. It needs to take advantage of its current demographic dividends and invest in human capital for medium-term industrial upgrading and long-term growth. Since the reforms in 2011, there has been FDI growth in the industrial sector. However, data limitations mean that we cannot pinpoint the sectors or activities that are benefiting. Thus, our policy recommendations include strengthening data systems, improving the business and trade environment, increased human capital investment, and implementing appropriate sets of industrial policies.

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1.1 INTRODUCTION

During the 1990s, first Japan, then the four Asian Tigers, and later other Southeast Asian economies and China all achieved substantial economic development through outward orientation, particularly in trade and manufactures. For Myanmar, natural resources and the products from the primary sector remain its main exports.

Now that Myanmar has opened, reengaged with the global economy, and sanctions have been lifted, the onus is on its leadership to change the course of Myanmar's economic development trajectory. The 12-point economic policy, shared by the National League for Democracy (NLD) government four months after coming to power in 2016, outlined economic priorities including private sector development, multi-sectoral investment, and human capital development and job creation (Kyaw & Hammond, 2016). Two years later, the NLD government affirmed its commitments to private sector-led development, human capital investment, and job creation in the Myanmar Sustainable Development Plan (MSDP) (Government of Myanmar, 2018). The MSDP is designed to provide a comprehensive framework to Myanmar's development. It aims to provide coordination and coherence to the existing and future development strategies, sectoral policies and investment plans.

As Myanmar envisions and plans its future, it is important to learn from the past and be cognizant of the present. Its policymakers and analysts must pay attention to the growth trends in the global economy and what has worked well for countries in similar circumstances.

This paper is one such attempt at this. It looks at the growth trends in global value chains with attention on Asia and China. It uncovers the GVC trends and patterns that have favoured the economies in the region. It attempts to determine whether Myanmar can deepen GVC participation and if so, which industries and tasks are the most promising.

We find rapid expansion in GVCs since 1990. Both the Newly Industrializing Countries (NICs) and the emerging economies in Asia have embraced and participated in GVCs more intensely than other regional economies. Manufacturing trade has contributed most to the GVC expansion globally; in Asia, electronics and service industries have contributed most to the Asian economies' integration with GVCs. Countries plug into GVCs, specializing in industries and activities in accordance with their factor endowment. Whereas advanced economies specialize in capital and skill-intensive industries and relatively upstream activities, others participate through downstream vertical specialization. The Asian economies have witnessed increased sophistication in industrial production

and trade, with foreign inputs increasingly being substituted by domestically produced intermediates.

The existing context provides a twin advantage to Myanmar: i) it exists in the region with the highest GVC participation, and ii) the more advanced economies of Asia are upgrading their production and trade, thereby freeing up industries and activities that CLMV countries can specialize in. At present, Myanmar trails other CLMV countries in export growth, export dynamism, manufacturing trade, and GVC participation. Its comparable and, in certain areas, superior factor endowment to other CLMV means that Myanmar has room to deepen its GVC participation, if it can improve human capital and substantially reduce barriers to trade. Since reforms began, the manufacturing sector has witnessed amongst the fastest growth in foreign direct investment. In this context, desirable policy recommendations concern Myanmar's data systems, the business and trade environment, human capital investment, and industrial policy.

The next section discusses some measurement issues involved in GVC trade. Drawing on the existing literature, section 1.3 then discusses existing GVC patterns and trends with a focus on Asia and China. Section 1.4 evaluates Myanmar's prospect for deepening GVC participation, and section 1.5 discusses foreign direct investment trends in Myanmar. Then, section 1.6 acknowledges the paper's limitations, and section 1.7 concludes with policy recommendations.

1.2 MEASURING TRADE AND NATIONAL COMPETITIVENESS IN THE AGE OF GVCS

Production fragmentation across countries and the emergence of global value chains make existing measures of trade and national competitiveness inadequate (Dai, 2013) (Koopman, Wang, & Wei, 2012) (Timmer, Erumban, Los, Stehrer, & de Vries, 2014) (Yamaguchi, 2018). Traditionally, the gross exports of *products* from a country are used to analyse its trade basket, its integration with the global economy, and its national comparative advantage.

In the age of production fragmentation, however, countries not only produce an entire product within its borders and export, but also specialize in specific production *tasks* and export *components* that go into final products. For exports, a country may use domestic or imported inputs. In fact, a country might specialize in assembling components that are all produced overseas. Thus, gross export figures do not give an accurate picture of a country's trade income, the level of integration with the global economy, or its comparative advantage. Production fragmentation means that value-added measures are more accurate indicators of

a country's depth and performance in global value chains, and its changing comparative advantage than gross exports (Dai, 2013).

The difficulty, however, is that until recently, trade statistics rarely distinguish between foreign and domestic value added, i.e., foreign and domestic content in a country's exports. Thus, the earlier research highlighting the prevalence of GVCs and the discrepancy between gross and value-added export measures depended on case-study methods and microdata (Pomfret & Sourdin, 2014). Yet, the representativeness of their findings is unclear. In addition, the secrecy with which firms guard their production data means that these studies depend upon assumptions, that may not be correct. Other studies focus on inter-industry trade (IIT) or utilize product labelling in trade databases to highlight the prevalence of production fragmentation.

More recently, however, researchers have increasingly used inter-country inputoutput tables (ICIO) to decompose gross exports into various measures of valueadded exports using the Global Trade Analysis Project (GTAP) data, the World Input-Output Database (WIOD), and the OECD-WTO's Trade in Value-Added (TiVA) dataset (Pomfret & Sourdin, 2014).

Studies have proposed several measures of vertical specialization. Hummels, Ishii, and Yi (HIY from now on) propose two measures of vertical specialization (Hummels, Ishii, & Yi, 2001). VS measures both directly and indirectly imported foreign content in a country's exports. A high VS share in gross exports indicates that a country depends upon foreign content to produce its exports. Such a country specializes in relatively downstream activities such as assembly that does not require technological sophistication. On the other hand, an increasing foreign content in a country's exports at the beginning can indicate its deepening level of GVC participation. Thus, the VS share in gross exports may follow an inverted U-curve, rising at the beginning of a country's integration with GVCs and falling over time as it upgrades its technological sophistication. Falling VS share over time can indicate that a country is increasingly substituting domestic for foreign components and switching its vertical specialization from relatively downstream activities such as assembly, to more capital- and skill-intensive upstream activities such as producing intermediates.

VS1, which measures the value of intermediate exports sent indirectly via third countries to final destinations, also indicates a country's vertical specialization. A country with a high share of VS1 in gross exports specializes in producing intermediates, which are imported by other countries for their own exports.

Daudin, Rifflart, and Schweisguth propose VS1*, which is a subset of VS1. It measures the value of a source country's exports imported by other countries as

inputs for producing final goods that are then imported back into the source country (Daudin, Rifflart, & Schweisguth, 2011). A country with a high VS1* share in gross exports has a high value of its own domestic content in the final imports. For instance, the U.S. imports assembled i-phones from China, which incorporate US' design and other components. Thus, a high VS1* share in gross exports also suggests a country's technological sophistication in production and trade. Johnson and Noguera proposes the VAX ratio, the ratio of value-added produced in a source country that is absorbed by a destination country to gross exports (Johnson & Noguera, 2012). All these measures indicate the level of fragmentation in production and trade as well as the patterns of vertical specialization among countries.

Koopman et al. propose a comprehensive accounting framework for decomposing gross exports into various measures of vertical specialization (Koopman, Wang, & Wei, 2012) (Appendix: Figure 1). The value-added exports (VT) from a country include i) domestic value-added in direct final goods export, ii) domestic value-added in intermediate exports absorbed by importers, and iii) domestic value-added in intermediates indirectly exported to third countries. Domestic content in intermediate exports that finally returns home (VS1*) includes i) domestic value-added in intermediates that return via final imports, ii) domestic value-added in intermediates that returns via intermediate imports, and iii) double-counted intermediate exports produced at home. Foreign content (VS) includes i) foreign value-added in final goods exported, ii) foreign value-added in intermediate exports, and iii) double-counted intermediate exports produced at home. The exports produced abroad. Domestic content in a country's export is a combination of VT and VS1*. The authors insist that double-counted items are important in assessing a country's depth and pattern in the GVC participation.

The OECD's TiVA indicators also decompose gross exports into i) domestic and ii) foreign content. It uses backward (the ratio of foreign content to gross exports) and forward (the ratio of indirect exports to third countries to gross exports) participation ratios to measure the level of GVC participation by countries (Yamaguchi, 2018).

Among potential usages of value-added exports, recalculating the gross Revealed Comparative Advantage (RCA) into the value-added RCA is an instrumental application in more accurately assessing a country's comparative advantage amidst the prevalence of vertical specialization (Dai, 2013) (Koopman, Wang, & Wei, 2012).

1.3 GVCS WITH FOCUS ON ASIA AND CHINA

The emergence of GVCs

The decline in transportation and communication costs in recent decades has enabled firms to increasingly take advantage of wage differentials among countries (Timmer, Erumban, Los, Stehrer, & de Vries, 2014). The multinational firms utilizing global value chains emerged in early 1990s mainly in North America, Europe, and Asia (Yamaguchi, 2018). In North America, the wage differential between U.S. and Mexico drove production fragmentation. In Europe, the wage differential between Western Europe on one hand, and Central and Eastern Europe on the other, led firms to relocate each production activity to the lowest-cost location. In East Asia, the driving force was the Japanese-led vertical specialization model in which Japan specialized in relatively upstream production activities and the ASEAN countries assembled components into final products.

Rapid GVC expansion

Since their emergence, GVCs have been expanding. Looking at the data for thirty years before 1990, prior to the intensification in production fragmentation, Hummels, Ishii and Yi looked at the imported input content (foreign value added) of exports, which they call VS, in the input-output tables of ten OECD and four emerging market economies (Hummels, Ishii, & Yi, 2001). The imported inputs in exports grew by almost 30% between 1970 and 1990. In these countries, the growth in VS exports accounted for the 30% of growth in the export-GDP ratio. The increasing usage of imported inputs for export indicates emerging vertical specialization in production and trade.

The evidence for pervasive production fragmentation in later periods is clear. From 1970 to 2009, the ratio of domestic value added to exports, the VAX ratio, declined by 10-15 percentage points for 42 countries (Johnson & Noguera, 2012). This indicates an increase in either the use of imported inputs for exports or the exports coming back to source country via final imports, both highlighting the extent of production fragmentation. The decline in the VAX ratio after 1990 is three times faster than before 1990, confirming that GVC participation intensified after 1990. The largest decline is in manufacturing and in the fast-growing economies experiencing structural transformation towards manufacturing, indicating manufacturing's key role in the expansion of GVCs.

Timmer et al. confirm the above findings on manufacturing (Timmer, Erumban, Los, Stehrer, & de Vries, 2014). Using data for 560 final products from 14 manufacturing industries in 40 countries for each year between 1995 and 2008,

they calculate the changes in foreign value-added shares of GVC outputs in manufacture (Figure 1.1). On average, the foreign value-added share rose from 28 to 34 percent. For value chains in electrical equipment, the increase in foreign value-added share was above average: from 33 to 40 percent. Although the foreign value-added shares in manufactured foodstuffs are low, they also increased. Although there is a dip in the foreign value-added shares in 2008-09 due to the 'Great Recession', they recovered by 2010. In addition, although earlier global value chains were regionally clustered around North America, Europe, and Asia, they have become truly global by 2000s. Yet, the authors caution that many factors determine production fragmentation and many value chains may still cluster regionally.

Figure 1.1: Changes in the foreign value-added shares of the GVC outputs in manufacture (1995-2008)



Notes: Each dot represents the share of foreign value added in output of a manufacture global value chain in 1995 and 2008. Shares are plotted for 560 global value chains, identified by 14 manufacturing industries of completion in 40 countries. Squares indicate global value chains of electrical equipment (ISIC rev. 3 industries 30-33) and diamonds indicate petroleum refining (ISIC 23). The dashed line is the 45-degree line.

Source: (Timmer, Erumban, Los, Stehrer, & de Vries, 2014)

In East Asia, trade facilitation measures played an important role in integrating economies with global and regional value chains. Trade costs fell in ASEAN, thanks to several ASEAN members undertaking unilateral tariff reductions, signing the WTO's Information Technology Agreement (ITA), installing single windows for border clearance; and later the completion of the ASEAN Free Trade Agreement (AFTA) and the initiation of the ASEAN Economic Community (AEC) (Pomfret & Sourdin, 2014). China's integration to Regional Value Chains (RVCs) as an assembly hub, its WTO ascension in 2001, and the 2004 ASEAN-PRC FTA were all important contributors to trade facilitation and GVCs/RVCs growth in East Asia. According to the OECD, the share of foreign value added in exports increased from 29% to 33% in ASEAN between 1995 and 2011 (OECD, 2016).

Asia leads in GVC participation with outsized contributions by certain industries

GVC participation is high globally and the intensity in participation is the highest in Asia. Koopman et al. uses the combined shares of foreign content (VS) and the intermediate exports sent indirectly to final destinations (VS1) in gross exports as a measure of intensity in GVC participation, which they call the share of vertical trading (Koopman, Wang, & Wei, 2012). Globally, the average share of vertical trading in gross exports is 43% in 2004 (Figure 1.2). The regional averages are the highest for the Newly Industrializing Countries (NICs) and emerging economies in Asia, 62% and 55% respectively. In comparison, the regional average share of vertical trading for other emerging economies is only 43%. For advanced economies, including the United States, Western Europe, and Japan, their regional average is the lowest at 39%, indicating the robustness of their domestic economies.

At the industry level, electronics and service industries have played the most important role in Asian economies' integration with GVCs. Between 1990 and 2013, the value-added exports of electric and electronic equipment from ASEAN increased from just around US \$25 billion to \$350 billion (Yamaguchi, 2018). The value-added exports of services also increased from just under US \$50 billion to almost \$350 billion. The increase in the value-added exports of primary industry followed at a distant third from less than US \$25 billion to more than \$100 billion. Similarly, in 2009, China's GVC participation is the highest in the electronics industry: 14% of total country exports. Chemicals and minerals, basic metals, and textiles and apparels followed at a distant at around 4%, 3%, and 2% respectively (OECD, 2013).



Figure 1.2: Shares of vertical trading in selected countries (2004), % of total gross exports

Source: (Koopman, Wang, & Wei, 2012)

The existing patterns of vertical specialization indicate the international division of labour by factor endowment

Countries participate in GVCs differently, specializing in certain tasks over others. Typically, the respective shares of foreign (VS) and domestic content (DC) in gross exports are used to gauge a country's patterns of GVC participation. The countries with higher VS shares engage in backward participation, i.e., they depend upon imported intermediates to export. On the other hand, the countries with higher domestic content in gross exports—higher DC shares—are forwardly engaged; they supply intermediates that are imported as inputs by other countries for export. As expected, advanced economies, on average, have the highest DC share at 84.8% in 2004 (Figure 1.3). In comparison, the average DC shares for Asian NICs and emerging Asia are respectively at 58.6% and 66%, behind the 75.9% for other emerging economies.

This picture, however, can be misleading. The large DC shares can indicate technological sophistication in production and trade. This is likely to be the case for advanced economies. However, they can also mean that a country is not deeply engaged in global value chains or engaged in ones that do not require technologically sophisticated inputs: a case more likely for developing economies. Indeed, the OECD finds high domestic content in exports from resource rich countries in Asia: Indonesia and Brunei Darussalam (OECD, 2016). On the other hand, foreign content in exports are high for countries that are engaging in

manufacture such as Malaysia, Thailand, Cambodia, and Vietnam, and high-skill exports of products and services such as Singapore and the Republic of Korea.



Figure 1.3: Foreign and domestic content shares in exports of countries (2004)

Source: (Koopman, Wang, & Wei, 2012)

Other studies also find that advanced economies specialize in intermediate production and trade, whereas others in relatively downstream activities. Dai uses the VS1/VS ratio, i.e., the ratio of the share of intermediate exports sent indirectly to final destinations over the share of foreign content in exports to detect the patterns of vertical specialization among countries (Dai, 2013). Out of her samples, U.S. and Japan have the highest VS1/Vs ratios for the period 1995-2009, indicating their technological sophistication and "upstream" specialization. The technological sophistication in China, Korea, Taiwan, and Mexico is lower, their VS1/VS ratios trailing the former countries' over the observed period.

Koopman et al. make similar observations in their study (Koopman, Wang, & Wei, 2012). Comparing the domestic content that was exported and then returns home either as intermediates or final imports (VS1* without the purely double counted items) to the share of foreign content in exports again without the purely double counted items, the authors show that advanced economies specialize in technologically sophisticated upstream activities, whereas other countries specialize in relatively downstream activities. Once more, the United States, Western Europe, and Japan lead with higher shares in domestic value added first exported that return home and lower shares in foreign content (Figure 1.4). East

Asian NICs and emerging Asian economies are more integrated into GVCs than other emerging economies, as demonstrated by the former's higher shares in foreign content and comparable shares in domestic content exports that return home.

The shares of foreign and domestic content differ by industry. As expected, the foreign content level is high in the electronics industry. In ASEAN, the share of foreign content is almost as high as 50% of the total value added exports from the industry, whereas in China, the backward participation rate contributes to around three quarters of its overall participation in this industry (OECD, 2013) (Yamaguchi, 2018). In both ASEAN and China, the foreign content share is high in the textiles and apparel industry. On the other hand, the domestic content share is high for service and primary industries in ASEAN and forward participation contributes to around half of China's overall participation in chemicals and minerals, and basic metals.

Figure 1.4: Patterns of GVC participation in countries (2004), % of total gross exports



Source: (Koopman, Wang, & Wei, 2012)

Thus, there is an international division of labour in GVC participation based on the factor endowment of countries. Whereas advanced economies with higher capital and skilled labour specialize in intermediate production and trade, other economies with relatively more abundant medium- and low-skilled labour focus on relatively downstream tasks such as assembly. Higher foreign content shares in Asian exports, along with their domestic content shares comparable to those observed in other emerging economies, suggest that the former are more intensely engaged in GVCs than the latter.

ASEAN countries along with China are upgrading their production and trade

Beyond the current patterns of GVC participation, it is important to pay attention to the trends over time. For the period 1995-2008, the emerging economies' share in the value of all GVCs in manufacturing has increased by 17.8 percentage points, while high-income countries' share declined by the same amount (Figure 1.5). Among high-income countries, Japan and the U.S. saw the largest decline in their shares, dropping by 9.7 and 4.1 percentage points respectively. In Asia, South Korea's share declined by 0.3 percentage points. Nearly the half of gains by emerging economies is by China, at 8.6 percentage points.





Source: (Timmer, Erumban, Los, Stehrer, & de Vries, 2014)

In Asia, GVC participation is deepening, and the pattern of participation is changing for some countries. At downstream, Malaysia, Thailand, Cambodia, and Vietnam all increased their backward participation rates between 1995 and 2011 (OECD, 2016). There is some evidence for industrial upgrading as their forward participation rates also increased modestly except for Cambodia, which instead saw a decline in forward participation. Except for natural resource exporting countries in the region, Japan, Singapore, and China saw a larger increase in their forward participation. In fact, for Singapore and China, there is a slight decline in their backward participation, indicating that these countries are upgrading their industrial production and trade.

Other studies report similar patterns of vertical specialization and changes over time in Asia. During 1995 and 2011, Japan has had the lowest share of foreign

value added in gross exports, indicating its upstream specialization as a supplier of parts and components (Yamaguchi, 2018). Its share of foreign value added, however, has increased over time. Among ASEAN countries, Thailand and Vietnam saw increases in the share of foreign value added in gross exports over time, as their GVC participation intensified. The domestic content share for China has increased since its 2001 WTO ascension, as its domestic input industry became more sophisticated and domestic sourcing of intermediates increased (Kee & Tang, 2017). Dai as well as Cui and Syed similarly concludes that the export sophistication in China is increasing, and it has moved away from assembly operations to the increased production of domestic intermediates (Dai, 2013) (Cui & Syed, 2007).

The foreign and domestic content shares are changing over time for many industries. In ASEAN, the foreign content shares have been decreasing for many industries for the period 1990-2013, indicating that these countries are upgrading their production sophistication and moving their vertical specialization upstream (Yamaguchi, 2018). The decline in the foreign content share is the most dramatic in electric and electronic industry, and similar but less dramatic declines are also observed in coke and petroleum products, automobiles, machinery and equipment, chemicals, and primary industry. On the other hand, the foreign content share has been increasing in textiles and clothing, and food and beverage industries as these traditionally domestic industries increasingly integrate with GVCs.

In fact, the sourcing of foreign content itself is changing in ASEAN and reveals industrial upgrading. The decreased usage of foreign content in ASEAN exports is primarily driven by the decreased usage of foreign content produced outside of ASEAN. Between 1990 and 2013, the usage of foreign content produced outside of ASEAN decreased modestly from 31.3% of gross exports to 29.9% (Figure 1.6). In the same period, the sourcing of foreign content produced within ASEAN increased by 4.3% percentage points from 3.3% to 7.6% of gross exports. Thus, along with the decreasing usage of foreign content for exports, ASEAN countries are increasingly using intermediates produced within ASEAN.

The increased sophistication in production and trade in ASEAN is also reflected in the increased usage of ASEAN countries' domestic content by other countries for their exports. Between 1990 and 2013, the usage of domestic content from ASEAN countries in other countries' exports increased by 8.3% percentage points from 18.4% to 26.7% of gross exports (Figure 1.7). ASEAN countries have seen the increased usage of their domestic content by other countries—both within and outside of ASEAN.

Figure 1.6: Share of foreign value added in gross exports from ASEAN by source





Source: (Yamaguchi, 2018)

Likewise, the changing shares of industries in processing exports and imports highlight China's increased sophistication in production and trade at the aggregate level. Both export and import shares of textiles in processing trade have declined over time by 19.9 and 18.3 percentage points respectively from 1995 to 2005 (Figures 1.8 and 1.9). On the other hand, electrical machinery's share in processing exports and imports increased by 12.7 and 26.1 percentage points respectively. The export shares of non-electrical machinery also increased by 21 percentage points over the same period. Together, this highlights China's shift towards more technologically advanced industries.



Figure 1.8: Changing exprot shares of industries in China (1995-2005)

Figure 1.9: Changing improt shares of industries in China (1995-2005)



Source: (Cui & Syed, 2007)

China's technological upgrading is also evident at the task level, as it increasingly moves away from assembly to the production of intermediates. Although processing trade remains robust, the share of assembly operations declined between 1993 and 2006 as processing trade moved towards more profitable tasks (Cui & Syed, 2007). The domestic content in textile and machinery processing trade has been increasing since mid-1990s. The ratios of final exports to imported components have increased sharply for home electrical appliances and ordinary machinery, suggesting the increased production and substitution of domestic for foreign intermediates. In fact, the domestic production of intermediates has been increasing for many industries including semiconductors, steel, and chemical fibre.

1.4 MYANMAR'S PROSPECT FOR DEEPENING GVC PARTICIPATION

The rapid expansion of GVCs and the prominent role that they play for Asian economies means that if Myanmar is to pursue the East Asian model of export-led growth, deepening its GVC participation is a path to pursue. In addition, the existing patterns of vertical specialization among countries, along with industrial and trade upgrading by other Asian economies, opens an opportunity for Myanmar to specialize in certain industries and tasks, where it has comparative advantage and others' competitiveness is eroding.

We need to look at whether Myanmar has the potential to actualize this opportunity. The existing figures on the RCA, however, are of little help to us. On one hand, as discussed earlier, the gross RCA figures do not capture vertical competitive advantage. In fact, they would only have revealed Myanmar as having comparative advantage in primary exports, which currently dominate its trade basket (Appendix: Figure 1.14). The existing database with the value-added trade figures also does not cover Myanmar's trade.

Given the paucity of reliable data on Myanmar's trade, we need to look at alternative sources of information to determine if increased GVC participation is a realistic prospect. In particular, the "structural coherence" between industrial structure and factor endowment is important for a country's growth prospects (Che, 2012). The earlier discussion on the patterns of vertical specialization suggests such coherence in GVC participating countries. We thus look at Myanmar's prospects for increased GVC participation from the factor endowment perspective.

We compare Myanmar with other CLMV (Cambodia, Lao PDR, Myanmar, and Vietnam) countries as well as Bangladesh in trade, factor endowment, and trade costs—the CLMV+1 from now on. These countries are chosen for comparison because the earlier literature review suggests that leveraging their relatively low-cost labour; they occupy the lower rungs of vertical specialization in GVC trade: the potential entry points for deepening Myanmar's GVC participation. Thus, if Myanmar has a comparable level of factor endowment to these economies, and yet has a lower level of GVC participation, there exists room for deepening its GVC participation.

Again, given the paucity of data on the CLMV economies, the discussion in the succeeding sections is based upon a patchwork of data. Yet, to the extent possible, we have attempted to triangulate and bring out the overarching patterns that can inform our purpose.

The levels of industrial activities and trade in the CLMV+1

For the 15 years between 1998 and 2013, Myanmar's export growth has been one of the slowest and the least dynamic of the CLMV+1. Its exports grew only faster than Bangladesh's in the period (Khandelwal & Teachout, 2016). In fact, the growth from the existing country-product pairs contributed to 70% of overall export growth in Myanmar (Figure 1.10). In comparison, the net export growth to new destinations within existing products contributed to just over a quarter of the overall export growth in Vietnam. In Lao PDR, the growth in new products and the net export growth to new destinations each contributed nearly half and 23.3% to the overall export growth. For Cambodia, the contributions by the growth in new products and the net export growth to new destinations to the overall growth of exports are 20.1% and 12.5% respectively. Similarly, import growth in Myanmar is one of the slowest and the least dynamic in the CLMV+1. Thus, Myanmar has ample room for trade growth and diversification.

Figure 1.10: Contribution by incumbent, destination, and product margins to the overall export growth (1998-2013)



Note: The incumbent margin captures growth in existing country-product pairs. The destination margin captures growth in new destinations within existing products. The product margin captures growth in new products.

Source: (Khandelwal & Teachout, 2016)

Although the size of Myanmar's industrial sector is comparable to those of other CLMV+1, the primary sector dominates its exports. The size of Myanmar's industrial sector, 32% of GDP, is comparable to those of Vietnam (38.3%) and Laos (33.1%), the economies with the largest industrial sectors in the CLMV+1

(Khandelwal & Teachout, 2016). Yet, Myanmar's exports rely heavily on natural resources, with manufacturing exports only contributing marginally to overall exports. Of US \$15.7 billion exported in 2016, mineral products contributed 41%, far exceeding the 16% contributed by textiles at the HS 2 level (Appendix: Figure 1.14). Machine exports contributed only 4.4%, behind vegetable products (11%) and foodstuff (7.5%).

In comparison, Vietnam leads in manufacturing production in its exports among the CLMV+1. Its total export value of US \$208 billion dwarfed all other countries in 2016. Machine, textiles, and footwear and headwear each contributed 46%, 15%, and 9% to the overall export value. In both Bangladesh and Cambodia, textiles, footwear and headwear dominate the total exports.

At the micro-data level, taking Nike factory suppliers as an illustrative case, similar patterns of production and trade specialization among the CLMV+1 countries can be seen. In 2015, Vietnam hosted the most suppliers for Nike, totalling 68 factories employing over 300,000 workers (Khandelwal & Teachout, 2016). Cambodia and Bangladesh followed much further behind, operating 3 factories and employing just around 20,000 workers each. Both aggregate and micro data therefore suggests that Myanmar has some ground to cover in raising its manufacturing production and exports to the levels comparable to other CLMV+1.

In terms of GVC participation specifically, the TiVA indicators are available only for Cambodia and Vietnam, and suggest that the GVC participation in the two countries are just behind the levels observed in Malaysia and Thailand (OECD, 2016). Although the TiVA indicators are not available for Myanmar, it is likely the case that Myanmar's GVC participation trails these countries.

The available data in selected industries certainly indicate this to be the case. In textiles and clothing, foreign content makes up most of the value added in exports from Vietnam (Yamaguchi, 2018). The share of foreign content has been rising sharply since 1990, indicating the industry's increased GVC participation. In Cambodia, the share of foreign value added is low but increasing. In Myanmar, however, the share of foreign value added was negligible in 2013 and does not show any sign of sustained engagement with GVCs since 1990.²

The current picture thus is one in which Myanmar lags other CLMV+1 countries in aggregate export growth, export dynamism, and specifically manufacturing exports and GVC participation. Given the salience of GVCs, particularly in

² This picture, however, may be changing as a visit to the apparel shops in Yangon, the country's largest commercial city, that source knocked-down items from the local export factories can testify. They increasingly showcase the apparel from European brands. This again highlights the need for upgrading the existing data with reliable and up-to-date information.

manufacturing, deepening Myanmar's GVC participation presents an inroad into increased manufacturing activities, export growth and dynamism, and ultimately industrial upgrading.

Comparing factor endowment in the CLMV+1

In the 65 years between 1950 and 2015, population growth rates have been in decline for all CLMV+1 countries. Throughout the period, Myanmar's population growth rate has been the slowest, except for the years leading up to and during the Khmer Rouge's rule in Cambodia. This may be viewed as having a negative influence on Myanmar's labour market and its international competitiveness.

At the aggregate level, however, Myanmar along with Bangladesh and Vietnam are currently enjoying demographic dividends. Myanmar's 52 million population in 2015 is the third largest behind Bangladesh (161 million) and Vietnam (93 million) (The United Nations' Department of Economic and Social Affairs: World Population Prospects). The size of its working age population, i.e., 15-64 years old, hovers around two-thirds of the total population: the second largest in relative terms only behind Vietnam's (70%). In 2015, its total dependency ratio, i.e., the ratio of population aged 0-14 and 65+ over the working age population, is the second lowest after Vietnam. Its demographic profile is closest to Bangladesh's, with slowing population growth rates being evident in shrinking shares of age groups under 9. Although the continuing faster population growth is evident for Cambodia, it has large chunks of missing working-age population. Despite Cambodia's and Laos' faster population growth, their populations are unlikely to surpass the far larger Myanmar's population any time soon.

Similar trends are reflected in the labour markets of CLMV+1 countries. Myanmar's average annual labour force growth rate for the period 1991-2017 is the slowest among the CLMV+1, seemingly putting it at some competitive disadvantage vis-à-vis other countries. However, the estimated size of Myanmar's labour force, at 25.4 million in 2017, is the third largest behind Bangladesh (66.6 million) and Vietnam (57.5 million) (World Bank 2018).

Our estimates of capital-labour ratios for the CLMV+1 suggest that Myanmar may have a competitive advantage in labour intensive industries and tasks. There is no reliable figure for Myanmar's capital-labour ratio due to the lack of reliable data on its capital stock. However, Khandelwal and Teachout estimate Myanmar's capital stock to be 168% of GDP (Khandelwal & Teachout, 2016). In relative terms, this puts Myanmar behind Vietnam (272%), Bangladesh (216%), and Laos (189%), but ahead of Cambodia (137%). Deriving the capital stock estimates (PPP) from Khandelwal and Teachout and using the World Bank's labour force estimates, we estimate the capital-labour ratios for the CLMV+1 in 2013 (Figure 1.11). According to our estimates, Myanmar has the second lowest capital-labour ratio after Cambodia. This suggests that its factor endowment can favour competitiveness in labour-intensive industries and tasks over Bangladesh, Lao PDR and Vietnam. At least, barring idiosyncratic factors, Myanmar should not be at a competitive disadvantage in the areas of manufacturing production and trade that the other CLMV+1 are currently specializing.



Figure 1.11: Estimates of Capital-labour ratios (2013), in PPP

Note: The capital stock (PPP) estimates are derived from GDP (PPP) and the capital stock estimates (% of GDP) from Khandelwal and Teachout (2016). The labour force estimates are from the World Bank.

Source: Author's own estimates

Available statistics on labour productivity and costs suggest the competitiveness of Myanmar's labour force. Although ILO modelled estimates for 2013 places Myanmar's labour productivity (US \$2,522), as measured in output per worker in 2010 dollars, ahead of Bangladesh's (US\$ 2,335) and Cambodia's (US\$ 1,610) and just behind Vietnam's (US\$ 2,536), it is unclear how reliable these figures are (ILO). In the manufacturing sector, its labour productivity at US\$ 4,858, measured in median sales per worker in 2014 dollars, is ahead of Cambodia's (US\$ 2,648) but behind Bangladesh's (US\$ 5,900) and Lao's (US\$ 5,048) (Khandelwal & Teachout, 2016). Manufacturing labour in Vietnam is the most productive at US\$ 19,379. Although Myanmar's labour productivity trails most CLMV+1 countries, its minimum wage of around US\$ 90 in 2018 is far below Vietnam's, Cambodia's,
but higher than Bangladesh's. A 2013 survey by the Japan External Trade Organization also finds that wages across various occupations to be the lowest in Myanmar regionally (Tanaka, Spohr, & D'Amico, 2015). More up-to-date figures on monthly earnings, hourly labour costs per employee, and real wage growth, however, would be needed to give a more accurate picture.





Source: ILOSTAT

In terms of human capital, Myanmar's labour force ranks in the middle of CLMV+1, yet much investment is desirable. Myanmar sits in the middle of the CLMV+1 in terms of the share of workers with no formal education in the total employed population (Figure 1.12). In terms of the combined share of employed with basic and intermediate education—the level most suited for the downstream tasks in GVCs, it also sits in the middle ahead of Bangladesh and Cambodia, but behind Vietnam and Lao PDR. However, the large dropout rate between basic and intermediate education is alarming and poses a challenge to industrial upgrading (Tanaka, Spohr, & D'Amico, 2015). In addition, the current technical and vocational education and training (TVET) system is out of sync with business requirements and primarily geared towards those with formal educational qualifications.

Comparing trade costs in the CLMV+1

Along with competitive advantage, trade costs also matter for production fragmentation. Producers seek locations with not just cheap labour, but also adequate communications infrastructure, the supply of support services, and enforceable contracts (Pomfret & Sourdin, 2014). Comparative advantage provides rationale for fragmentation, whereas trade costs determine if fragmentation will be feasible. Trade and monitoring costs mean regional value chains are more prevalent than global value chains. Traditionally, the attention was on tariffs and non-tariff barriers to trade, when discussing trade costs. *Doing Business Indicators* and the gap between cost-insurance-freight (cif) and free-onboard (fob) measures of trade are now used. The latter, however, ignores behind-the-border trade costs.

Time costs influence the level of trade. According to Hummels, a day delay in transport due to custom clearance adds on average 0.8% to the value of a manufactured goods (Hummels, 2001). Djankov et al. estimate that a day delayed reduces trade flows by just over 1.0% (Djankov, Freund, & Pham, 2006). Freund and Rocha estimates that a day reduction in inland transport will increase exports by as much as 7% (Freund & Rocha, 2011). Several studies find that differences in trade costs are due to port infrastructure (Limao & Venebles, 2001) (Clark, Dollar, & Micco, 2004). Other studies find that communications infrastructure, institutional quality, and policies determine trade costs (Pomfret & Sourdin, 2014).

Except in Vietnam, the costs of doing business and trade in all CLMV+1 countries seems to be substantial. The World Bank's *Doing Business Indicators* and *Logistic Performance Index (LPI)* rank the rest of the CLMV+1 lowly. Myanmar and Bangladesh in particular are performing poorly. Among the CLMV+1, these two countries trade the bottom rank depending on the indicator. In addition, the quality of port infrastructure is the lowest in Myanmar, rivalled by Lao PDR.

1.5 FOREIGN DIRECT INVESTMENT TRENDS IN MYANMAR

Historically, the oil and gas and power sectors have received the most foreign direct investment into Myanmar. From 2003/04 to 2017/18, there were two years—2005/06 and 2010/11—when Myanmar received massive inflows of FDI (Figure 13). In 2005/06, the power sector received a major investment boost of US\$ 6 billion. In 2010/11, the FDI inflows into agriculture, oil and gas, and power sectors jumped by 404%, 280%, and 130% respectively. As of 2017/18, the oil and gas and power sectors rank first and second in the share of total FDI received:

US\$ 22.4 billion (29.5%) and US\$ 21 billion (27.6%) respectively (Figures 1.21 & 1.22).

Coinciding with the Myanmar reforms from 2011, FDI inflows in Myanmar became more diversified (Figure 1.13). Prior to the reforms, the average annual FDI growth was the highest in the natural resource and primary sectors: mining (25.9%), oil and gas (18.9%), agriculture (14.4%), and power (13.4%) (Figure1.14).³The average annual FDI growth for manufacturing sector in this period was a disappointing 0.9%. However, since the reforms, the fastest FDI growth has been in transport and telecommunication (89.2%), manufacturing (33.6%), real estate (32.6%), hotel & tourism (19.2%), agriculture (12.2%), and livestock (10.9%). As of 2017/18, the total FDI into the manufacturing sector stands third at US\$ 9.5 billion (12.5%), yet still less than half the size of total FDI into oil and gas sector. Between the pre- and post-reforms periods, the average annual FDI growth rates dropped for mining, power, and oil and gas sectors—25.4, 11.7, and 8.7 percentage points respectively.





Source: Directorate of Investment & Company Administration

Myanmar needs to sustain FDI growth into non-traditional sectors than it is currently experiencing. It must continue to attract FDI inflows into the nonnatural resource sectors with potential opportunities for GVC participation such

³ Despite agriculture's inclusion in this list, it did not witness sustained FDI inflows, unlike the other sectors. Its FDI inflows increased five-fold only in 2010/11.

as agriculture and manufacturing. Although the post-reform growth in FDI inflows into the manufacturing sector is an encouraging sign, the existing data does not specify which manufacturing activities are primarily seeing the FDI growth. If the Directorate of Investment & Company Administration (DICA), which currently collects the FDI statistics, can disaggregate the FDI figures into the HS 2-digit level, this will help illuminate the manufacturing activities that are attracting the increased FDI.





Note: The figures reported are the least-squares growth rates using a time series of FDI data for the period 2003/04-2017/18. The pre-reforms period runs from 2003/04 to 2010/11, and the post-reforms period is from 2011/12 to 2017/18.

Source: Directorate of Investment & Company Administration

1.6 LIMITATIONS

The major limitation of this paper is in the inadequacy of reliable data on Myanmar. The major patterns and trends of GVCs discussed are substantiated by multiple studies using different datasets and looking at different timeframes. Most studies referenced in this paper agree on these patterns and trends. The discussion of Myanmar's prospects for deepening the GVC participation, however, relies upon a patchwork of primary and secondary data. In many cases, particularly when discussing the comparative advantage of Myanmar by looking at its labour endowment and trade costs, the first best indicators are not available, and thus the study depends upon many proxy measures. Validating the key arguments in this paper using the most suited measures is an important next step in research. With this reservation, this paper has looked at the various aspects of labour endowment and trade costs to ensure that major patterns are not misinterpreted. In addition, although the existing FDI statistics highlights a promising sign for the manufacturing sector, it is important to analyse which manufacturing activities are experiencing the FDI growth.

1.7 CONCLUSION: POLICY RECOMMENDATIONS

This paper has highlighted those GVCs, particularly in manufacturing, that play an increasingly important role in international trade. The international division of labour in production fragmentation presents an opportunity for countries to plug in and specialize in GVC trade. Myanmar has a twin advantage: i) it exists in the region with the highest GVC participation rates and ii) other Asian economies are upgrading their industrial production and trade, freeing up industries and tasks that Myanmar and the other CLMV countries can specialize in.

We have also shown that Myanmar trails other CLMV countries and Bangladesh in export growth, export dynamism, manufacturing trade, and GVC participation. Yet, Myanmar's factor endowment in labour is comparable and, in certain cases, superior to the other CLMV countries and Bangladesh. Its barriers to trade, however, are prohibitive and pose significant obstacles to GVC participation. Myanmar must also increase human capital investment, if it is to avoid being locked-in in the lower rungs of GVC activities.

This paper thus concludes that Myanmar's location, the current trends and patterns in GVCs, and Myanmar's factor endowment are all conducive to deepening its GVC participation, if it can significantly improve the existing barriers to trade, bring down trade costs and invest in human capital. In taking advantage of the factors in its favour, Myanmar needs to be cognizant of the demographic window that it currently possesses.

Given this context, the following policies are recommended:

Data systems

1. To strengthen the existing trade-, FDI- and labour-related statistical systems by adopting international nomenclature and best practices such as the value-added trade accounting, the Harmonized System for FDI figures, and the measures of labour costs by industry and occupation

Business and trade environment

- 2. Reduce barriers to trade and trade costs related to contracts, infrastructure, and logistics
- 3. Maintain macroeconomic stability and control inflationary pressure on wages

Human resources

- 4. Continue the increased investment in education and reduce dropout rates between basic and intermediate education levels
- 5. Improve hardware and software investment in vocational training, particularly on the skills necessary for the downstream tasks in the electronics industry, and textiles and apparel
- 6. Design vocational training to target and cater to the needs of the currently and future employed without formal education
- 7. Implement a feedback system between education and labour markets for continuous industrial upgrading

Industrial policy

- 8. Target the downstream activities in the electronics industry and textiles and apparel, and attract foreign direct investment into these areas
- 9. Encourage domestic sourcing of intermediates for exports

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THE EFFECT OF FISCAL CONSOLIDATION ON ECONOMIC GROWTH IN MYANMAR ⁴

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SUMMARY

This research paper investigates the effect of government fiscal consolidation on the per-capita gross domestic product (GDP) growth rates of Myanmar for the period 1990-2016. It attempts to examine the gains under the government's fiscal consolidation to maintain the policy-required debt/GDP ratio based on the country's level of development, economic stabilisation, savings/GDP ratio, investment/GDP ratio, interest rate situation, and trade openness. The study finds negative effects of both increasing debt/GDP and fiscal-balance-to-GDP ratios on the per-capita-GDP growth rate. There exists a consensus on core elements determining debt/GDP ratios in transition economies, and the policies necessary for sustainable growth. However, the outcomes will depend on the effective implementation of these policies and proper sequencing. The policy implications of this study are that; first, reducing the debt/GDP ratio encourages the per-capita-GDP growth rate; second, increases in productive expenditure and gross fixed capital formation have a positive effect on per-capita-GDP growth rates; third, improving the tax/GDP ratio for allocative efficiency is encouraged, even though an optimal tax rate is hard to identify, and higher tax rates on productive resources may also impose a negative effect. Finally, lowering the fiscal deficit/GDP ratio contributes to debt sustainability, and enhances economic stability. Policy recommendations include setting up fiscal targets and formulating expenditure policies based on priorities and strategic plans, and developing measures towards operational efficiency and performance from both mediumterm to long-term-fiscal frameworks applying macroeconomic models and forecasting methods.

Keywords: Public debt, fiscal consolidation, fiscal balance, debt sustainability, economic growth, economic stability.

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2.1 INTRODUCTION

Amongst the factors affecting per-capita-GDP growth rates, a number of empirical studies on developing countries, as well as transition economies in the Euro area, have emerged applying traditional growth models incorporating fiscal variables. These studies show the effect of reallocation of government budgetary components on per-capita-GDP growth rates. In particular, most focus on the effect of fiscal reform variables such as tax revenue, productive expenditure, and government debt sustainability incorporating monetary policy variables: interest rates and inflation.

The Myanmar government is pursuing the modernization of the Public Financial Management (PFM) in line with the Government's Economic Policy priorities in the framework of a sequence of reforms supported by the World Bank. The first stage of this PFM project is for the period: 2014 to 2019, while the second stage has been signed for 2019 and beyond. The Public Expenditure and Financial Accountability (PEFA) is often used as an international tool for assessing PFM systems and performance. There exist seven pillars in PEFA framework viz: (i) budget reliability, (ii) transparency of public finances, (iii) management of assets and liabilities, (iv) policy-based fiscal strategy and budgeting, (v) predictability and control in budget execution, (vi) accounting, and reporting, and (vii) external scrutiny and audit.

This research attempts to examine empirically the effect of fiscal consolidation on economic growth in Myanmar based on available data. In addition, it attempts to contribute, in part, to PFM performance in the context of improvements in the fiscal space: in government revenue, including tax, public expenditure, public external debt/GDP threshold for debt sustainability, and their impact on percapital-GDP growth during the period under study. The remainder of the article is organised as follows. Section 2.2 discusses the relevant theoretical underpinnings such as the factor influencing per-capita-GDP of countries. Fiscal performance in Myanmar is analysed in Section 2.3 and our empirical model specification is discussed in Section 2.4. Section 2.5 performs testing for stationarity in timeseries and cointegration, while Section 2.6 reports the empirical analysis. Finally, Section 2.7 provides concluding remarks on the factors influencing per-capita-GDP of Myanmar, and policy implications and recommendations.

2.2 SOME OF THE EXISTING LITERATURE

The study of Carrière-Swallow et al. (2018) examines the short-term effects of fiscal consolidation on economic activity in fourteen countries in Latin America

and the Caribbean. Based on contemporaneous policy documents of these countries, they identify changes in fiscal policy motivated only by a desire to reduce the budget deficit regardless of the needs of economic perspectives. They find that fiscal consolidation has contractionary effects on GDP, which are close to those in OECD countries using the same dataset. They also find similar estimation results for the two groups of economies for the effect of fiscal consolidation on the external current account balance. António Afonso and J. G. Alegrec show in their 2008 study that the reallocation of government budgetary components can enhance long-term GDP growth in fifteen EU countries. They use three alternative dependent variables in a growth regression: economic growth, total factor productivity, and labour productivity with panel data techniques for the period 1971–2006. The results highlight a strong crowding-in effect associated to public investment, which enhances economic growth by boosting private investment.

Cristina and Rother (2010) investigates the average impact of government debt on per-capita GDP growth in twelve euro-area countries over a period of 40 years. They also find that channels in which government debt have an impact on the economic growth rate are (i) private saving, (ii) public investment, (iii) total factor productivity (TFP) and (iv) sovereign long-term nominal and real interest rates.

A study of Fischer and Easterly (1990) shows the long-run constraints on fiscal policy applying the debt dynamics model highlighting the effect of the government budget deficit on domestic saving and investment, and the current account. They find the different kinds of macroeconomic imbalances such as financing the deficit with printing money excessively leads to inflation; using foreign reserves excessively encourages a balance of payments crisis; depending largely on high foreign borrowing allows a debt crisis; and using higher domestic borrowing leads to high real interest rates and crowding out of private investment. Fischer and Sahay (2000) examines factor affecting macroeconomic performance of emerging countries based on initial conditions, the reform strategies, exogenous factors and macroeconomic and structural policies of these countries. These find that both stabilization policies and structural reforms, in particular, and privatization contributes to growth.

Adam and Bevan, in their 2005 study, show that for a given budget, an increase in productive government expenditure, which is financed through tax, will be growth-enhancing only if the level of domestic public debt is sufficiently low. On the theoretical front, Krugman (1988) explains the relationship between public debt and economic growth in the context of 'debt overhang' – the idea that government debt is used in part to finance productive public capital, and thus debt has positive effects up to a certain threshold, but negative effects beyond it. Saint-Paul (1992) and Aizenman et al. (2007) analyse the impact of fiscal policy

in an endogenous growth model, and find a negative relation between public debt and economic growth. Diamond (1965) examines the effect of taxes on consumption, savings, the capital stock and both public external and internal debt. It finds that internal debt can produce a reduction in the capital stock arising from the government debt.

In terms of a functional form of the model, a non-linear negative impact of external debt on growth is found only after reaching a certain debt-to-GDP ratio threshold. Pattillo et al. (2002), using a large panel dataset of ninety-three developing countries over 1969-1998, find that the impact of external debt on per-capita GDP growth is negative for a net present value of debt levels above 35-40% of GDP. Devarajan et al. (1996) shows a negative coefficient for public capital expenditure in a panel of forty-three developing countries for the period 1970– 1990, indicating a possible situation of overspending in public capital during this period. On the other hand, Bassanini and Scarpetta (2001), and Romero de Avila and Strauch (2008), using data very similar to ours, estimate a positive coefficient for EU and OECD countries. In addition, a study of Gupta et al. (2005) also reports a positive coefficient for public capital expenditure in their sample of 39 lowincome economies. Regarding the effect of government revenues, Bose et al. (2003) for developing countries, and Reed (2008) and Bassanini and Scarpetta (2001) for developed economies, illustrate the negative effect on growth in particular after reaching a certain tax/GDP threshold.

2.3 FISCAL PERFORMANCE IN MYANMAR

The fiscal space has been defined by Heller (2005) as the "availability of budgetary room that allows a government to provide resources for a desired purpose without any prejudice to the sustainability of a government's financial position." Thus it reflects the fiscal sustainability performed by the government to finance its operations, to service its debt obligations, and to ensure its solvency.

The performance of key fiscal indicators used in this study can be discussed briefly in this section. As reported in Table 2.1, the size of general government in terms of revenue and expenditure in Myanmar is historically small compared to other Asian countries with similar levels of income. The aggregate revenue as a percent of GDP is 18.8 percent, and in which the tax/GDP ratio came to 6.5 percent in the 2016/17 financial year (FY). The aggregate expenditure/GDP ratio was 21.23% and the government fiscal deficit constituted -2.5 percent of GDP in same year. Based on the Myanmar-Japan agreement, Myanmar undertook a debt restructuring plan to resolve its arrears through a bridge loan operation and the cancellation of principal payments and overdue charges in April 2012. In addition,

Myanmar also performed arrears clearance operations with multilateral institutions such as the World Bank and Asian Development Bank in the same period. As a result, Myanmar's public debt/GDP ratio decline from 77% of GDP in 2007/2008 to 47% in 2013/14.

The World Bank's *Public Expenditure Review 2015* reported that "Debt Sustainability Analysis by the IMF and the World Bank concludes that Myanmar is at low risk of debt distress following the arrears clearance operations. All indicators of external debt solvency and liquidity remain below their indicative sustainability thresholds". Thus overall revenue mobilization has improved substantially in line with PFM reform of Myanmar. In particular, two major strategic efforts under PFM are first, it attempts to increase the tax-to-GDP ratio by both making tax administration more efficient and reducing the cost of tax-payer compliance; and second to promote investment and create job opportunities by using tax incentives. The domestic public debt/GDP and external debt/GDP ratios indicated 2.9 percent and 15.6 percent respectively in 2016/17 FY. Total public debt (i.e. external and domestic public debt) remains at 36.5 % of GDP in 2016/17 FY, and which is also within debt sustainability thresholds. On trade openness, total trade/GDP ratio increased from 34.7 percent in 2010 to 44.8 percent in 2016/17 FY and it encouraged GDP growth in the period of study.



Figure 2.1: Fiscal Space and Per-Capita-GDP Growth Rate

Table 2.1: Fiscal Performance Indicators in Myanmar

(Consolidated Account)

	2015/16	2016/17	2017/18
	Act.	Act.	Est.
		(percent of GDP)
Revenue	19.5	18.8	17.1
Taxes	6.1	6.5	6.7
On income, profits, and capital gains	2.3	2.4	2.0
On goods and services	3.0	3.4	4.0
On international trade & transactions	0.6	0.6	0.6
Other taxes	0.2	0.1	0.1
Social contributions	0.1	0.1	0.1
Grants	0.4	0.4	0.2
Other revenue	12.9	11.7	10.0
Interest income	0.1	0.1	0.1
Property income	1.5	1.4	1.3
Sales of goods and services	11.4	10.4	8.7
Expenditure	23.9	21.3	19.7
Expense	15.9	14.8	13.7
Compensation of employees	2.9	3.7	3.5
Purchases/use of goods & services	8.2	7.2	7.8
Interest	1.2	1.4	1.4
Subsidies and transfers	0.3	0.3	0.0
Social benefits	0.9	0.9	0.8
Other expense	2.4	1.3	0.2
Net acquisition of nonfinancial assets balances			
Gross operating balance	3.7	4.0	3.3
Net lending/borrowing	-4.3	-2.5	-2.7
Memorandum items:			
Primary balance	-3.1	-1.2	-1.3
Functional breakdown of public sector expenditure			
Economic affairs	11.7	10.1	7.6
Social services	5.1	4.4	3.6
Defense	4.3	3.7	3.4
Public debt	36.3	36.5	34.7
Domestic public debt	20.5	20.9	20.9
External public debt	15.9	15.6	13.8
Of which: Arrears			

Source: Preparation of the author based on Myanmar Staff Report for the 2018 Article IV Consultation; IMF Country Report No.19/100, April, 2019

2.4 EMPIRICAL MODEL OF DEBT SUSTAINABILITY AND GROWTH MODEL OF MYANMAR

This research investigates the effect of the government's fiscal consolidation effort on the per-capita GDP growth rate of Myanmar, incorporating country development condition, economic stabilization, and fiscal space: government tax, revenue and expenditure, institutions, trade openness and monetary variables. The modified version of the model is constructed in this study is based on the macroeconomic effects of fiscal consolidations employed by Fischer and Sahay (2000) and Checherita and Rother (2010). The model is estimated using three methods: regression with ordinary least squares method, instrumental variable (IV) regression, and IV generalized moment method (GMM) for the period 1990-2016. Comparing the results of the 3 models, the research identifies the possible factors determining growth performance in Myanmar. The study employs data from the World Bank Development Indicators series and various Statistical Yearbooks of the Central Statistical Organization, Myanmar. There exists a consensus on core elements of transition and the policies necessary for sustainable growth, however, considerable differences in implementation of these policies and the use of proper sequencing in implementation, for example, sequence of activities in PFM stage 1 and stage 2, is also crucial.

The specification of the model is provided as follows:

 $GROWTH_{t} = \beta_{0} + \beta_{1}ln (GDPPC)_{t} + \beta_{2}DEBT_{t} + \beta_{3}DEBT_{t}^{2} + \beta_{4}BUDSUR + \beta_{5}SAVR + \beta_{5}SA$

 $\beta_6 \text{GFCF}_t + \beta_7 \text{POPG} + \beta_8 \text{TRADER} + \text{other controls (IR, GOVE, TAXR) (1)}$

where:

GROWTH _t	= the growth rate of per-capita GDP
ln(GDPPC) _t	= natural logarithm of the initial level of per-capita GDP
DEBTR _t	= government external debt/GDP ratio
	(with GDP at 2010 constant price)
DEBTR ² _t	= debt-squared/GDP ratio
SAVR ₊	= government savings/GDP ratio

BUDSR	= fiscal balance/GDP ratio
L1BUDSR _t	= lag 1 of fiscal balance/GDP ratio
GFCF _t	= gross fixed capital formation/GDP ratio
L1GFCF	$= \log 1 \text{ of GFCF}_{t}$
IR _t	= real interest rate
L1IR _t	= lag 1 of IR_t
INF _t TAXR _t GOVE _t POPG _t TRADER _t L3TRADER _t e _t	 = annual inflation rate = total revenue/GDP ratio = government expenditure/GDP ratio = population growth rate = exponential smooth series of trade/GDP ratio = lag 3 of TRADER_t = the error term.

The term fiscal balance is defined as total government revenue minus total government expenditure while trade indicates the total value of exports and imports. The variables used in the estimation of the above growth model with fiscal consolidation include: saving/GDP ratio, gross fixed capital formation/GDP ratio, and population growth rate as proxies for country specific factors; inflation rate and fiscal balance for economic stability, interest rate for monetary policy instrument; tax/GDP ratio and government expenditure/GDP for government size, while trade/GDP ratio for the openness of the economy, and external competitiveness. The model is estimated by regressing per-capita-GDP growth rate on log per-capita-GDP, debt ratio, debt-squared/GDP ratio, fiscal balance, and saving/GDP ratio, while control variables reflect government expenditure, tax/GDP ratio and interest rate. Figure 2.2 depicts the association between per-capita-GDP growth rate and debt/GDP ratio and log per-capita-GDP.

Figure 2.2: Per Capita GDP Growth Rate, Debt/GDP Ratio and Log of Per-Capita-GDP



GGDP: Per Capita GDP Growth Rate; LGDPPC: log Per-Capita-GDP Growth Rate

In estimating the model shown by Equation 1, there are two parts. First, conducting a unit test for stationarity of the variables in the model, and testing cointegration in these variables. Finally, the model is estimated using three methods: multiple regression, IV regression and IV-GMM to identify the best possible results. The GMM lends itself well to instrumental-variables estimation as it can yield a heteroskedasticity-consistent result.

2.5 TESTING FOR STATIONARITY IN TIME-SERIES AND COINTEGRATION

This study applies the Phillips-Perron test to check whether individual variables have a unit root. The null hypothesis is that the variable contains a unit root, and the alternative is that the variable is generated by a stationary process. The Phillips and Perron's test statistics are widely viewed as Dickey–Fuller test statistics that have been made robust to serial correlation by using the Newey– West heteroscedasticity and autocorrelation-consistent covariance matrix estimator.

To test for cointegration among variables, the Johansen test is used as it indicates a multivariate generalization of the augmented Dickey-Fuller test. The Johansen test provides estimates of all cointegrating vectors. The existence of unit roots implies that standard asymptotic distributions do not apply in the same way as the Dickey-Fuller test.

	At Level		First Difference		
Variables	Constant Constant and Trend		Constant	Constant and Trend	
GROWTH	-3.750 ***	-4.38***	-2.629*	-2.238***	
ln(GDPPC)	-2,658	-3.743	-3.000*	-3.240	
DEBTR	-3.743***	-4.371***	-3.750 ***	-4.380***	
DEBTR2	-3.743***	-22.628***	-2.630	-3.240	
BUDSR	-3.743***	-4.371***	-3.750	-4.380**	
SAVR	-2.629	-3.238	-3.750**	-3.600**	
POPG	-2.629*	-3.238*	-2.630	-3.240	
INF	-1.600*	-3.240*	-3.750 ***	-4.380 ***	
IR	-2.629*	-3.238*	-3.000**	-3.2*	
GFCF	0.771	0.934	-3.121**	-3.946**	
TRADER	-3.240*	-2.630*	-3.750***	-4.38***	
GOVE	-2.630*	-3.240*	-2.629	-3.238	
TAXR	-2.629*	3.238*	-3.750***	-3.60**	
*, **, *** indicate the rejection of null hypothesis at 1%, 5% and 10% level of significance.					

Table 2.2: Phllips-Perron Unit Root Test Results

Source: Calculations of the author.

The Phillips-Perron unit root test results are provided in Table 2.2, while the Johansen Tests for Cointegration results are reported in Table 2.3. The study finds that variables: GGDP, DEBTR, DEVTR2, SAVR, IR, GOVE and TRADER turn out to be stationary at level, i.e. these variables are I (0). In contrast, variables POPG, GFCF and INF indicate stationary at first difference, i.e. I (1) variables. Since variables in the model are stationary at different levels, it is required to test

whether these variables are cointegrated applying Johasen cointegration test to check whether these variables are enable to use in the estimated model. As seen in Table 2.3, the maximum of five cointegration vectors are found in this study.

Maximum rank	parms	LL	eigenvalue	max statistic	5% critical value
0	11	-390.59925		331.59440	68.83
1	32	-224.80202	1.00000	128.43640	62.81
2	51	-160.58383	0.99413	96.14930	57.12
3	68	-112.50918	0.97863	70.49880	51.42
4	83	-77.25976	0.94039	49.40800	45.28
5	96	-52.55576	0.86142	32.25730	39.37

Table 2.3: The Johansen Cointegration Test Results Using MaximumEigenvalue

Source: calculations of the author.

The real external debt/GDP ratio and the fiscal balance prove to be highly statistically significant, and remain robust even after controlling for interest rates as a proxy for monetary policy effects. Government fiscal deficits are found to be negatively associated with per-capita-GDP growth rates. The research finds that the Debt/GDP ratio, fiscal balance/GDP ratio and log of per-capita-GDP and exponential smooth series of trade/GDP ratio have direct effect on per-capita-GDP growth rate, in contrast, the saving ratio, inflation rate, and real interest rates have negative effects on GDP growth rate. The government expenditure, tax revenue, and interest rate, are used as control variables in the IV and GMM models.

2.6 OTHER ROBUSTNESS CHECKS FOR VARIABLES

To examine the robustness of the estimates of model variables, the model is estimated using OIS regression, IV-2SLS and IV-GMM. The IV-2SLS regression method that allow controlling for other potentially relevant variables. IV-GMM estimator is generally more efficient and provides in general smaller standard errors allowing for arbitrary heteroscedasticity.

2.7 FINDINGS

The estimation results under OLS, IV-2SLS and IV-GMM are reported in columns 1, 2 and 3 respectively in Table 2.4. The estimated coefficients of individual variables indicate similar size and signs. In comparing 3 models, IV-GMM is selected as it provides minimum root mean square error (RMSE).

The real external debt/GDP ratio and the fiscal balance prove to be highly statistically significant, and remain robust even after controlling for interest rates as a proxy for monetary policy effects. Government fiscal deficits are found to be negatively associated with per-capita-GDP growth rates. The research finds that the government external Debt/GDP ratio, fiscal balance/GDP ratio and log of per-capita-GDP and exponential smooth series of trade/GDP ratio have direct effect on per-capita-GDP growth rate, in contrast, the saving ratio, inflation rate, and real interest rates have negative effects on GDP growth rate. The government expenditure, tax revenue, and interest rate, are used as control variables in the IV and GMM model.

The estimated coefficient of ln(GDPPC) in Table 2.4 shows 0.2685 in IV-GMM model indicating that a 1% increase in per-capita-GDP would increase per-capita-GDP growth rate by about 0.27% points. The estimated coefficient of debt/GDP is positive and debt²/GDP is negative, revealing that increases in the debt/GDP ratio contribute to an increase in per-capita-GDP in the first stage but, after a turning point i.e. after reaching relatively high government external debt/GDP level, it leads to a decline in per-capita-GDP growth rate. Thus if the debt/ratio increases by 1 unit, per-capita-GDP will increase by 0.4494 unit under IV-GMM at 1 percent significant level.

Table 2.4: The Model Results under Three Models

17 - 11	Model 1	Model 2	Model 3
variable	(OLS)	(IV-2SLS)	(IV-GMM)
	1.28128*	.123525	.26850
In(GDPPC)	(2.60)	(0.21)	(0.36)
DEDTD	.26131	.44949*	.52439
DEDIK	(1.45)	(2.45)	(1.68)
	00347	00492**	00638*
DEBIKZ	(-1.73)	(-3.24)	(-2.08)
	.74694	1.51370**	1.58813*
LIBOD2K	(1.44)	(2.66)	(2.56)
CAUD	20744**	15400*	19086***
SAVR	(-3.24)	(-2.02)	(-3.59)
ID	39943		
IK	-1.59		
COMP	.09245	.20662	.09258
GUVE	(0.84)	(1.25)	(0.57)
	59848		
TAXR	(-0.94)		
L3TRADER	.02705		.03147
-	(0.33)		(0.52)
N (number of observation)	24	26	24
R ²	.98152		
	.97043		
RMSE	1.68976	1.9620028	1.5724757

Dependent variable: GROWTH

t statistics in parentheses

p < 0.05, p < 0.01, p < 0.01, p < 0.001 significant levels.

Source: calculations of the author.

However, after reaching the high threshold of debt/GDP, the per-capita-GDP growth rate will decline by -0.008 unit at 5% significant level. The impact of interest rates on per-capita-GDP growth rate is found to be a negative, which comes from a change in investment and output. Since POPG, INF and GFCF are

control variables in the regression, the estimation will restrict itself to OLS estimation of the growth variable.

The fiscal deficit has a positive effect on growth at a 5% statistically significant level, indicating that 1 unit increases in a government budget surplus will increase the per-capita-GDP growth rate by 1.618 units. The negative coefficient attached to government savings will naturally reduce per-capita-GDP growth. Regarding tax/GDP, this study finds a negative impact of general taxation on growth like other studies. The overall effect of government spending is estimated to be positive in IV-GMM regression, as shown by the coefficient 0.9826 attached to GOVE/GDP variable with sample size of 24 years.

2.8 CONCLUSION AND POLICY RECOMMENDATIONS

This research examines the empirical relationship between 'economic structure and government fiscal policy variables' and economic growth in Myanmar. A strong and robust effect of fiscal consolidation on the per-capita GDP growth rate of Myanmar proves to be highly statistically significant. The government fiscal deficit/GDP ratio maintained at around 4 percent in 2017/18 FY in line with the PFM threshold. The current level of public debt is also not likely to be harmful since it is lower than the debt sustainability threshold. But at a certain level of higher public debt/GDP ratio can have a negative effect on per-capita-GDP growth rates.

The policy implications of this study are that; first, reducing the debt/GDP ratio encourages the per-capita-GDP growth rate; second, increases in productive expenditure and gross fixed capital formation have a positive effect on per-capita-GDP growth rate; third, improving tax/GDP ratio for allocative efficiency is encouraged to reach a certain level, even though an optimal tax rate is hard to identify, but higher tax rates on productive resources may also impose a negative effect. Finally, lowering the fiscal deficit/GDP ratio contributes to debt sustainability, and enhances economic stability.

The use of variables and area of analysis in this study can be improved in several ways. The impact of public debt (domestic and external debts) may be addressed in a more specific context. The expenditure can be disaggregated into public and private spending, and may be extended to include interaction between the two types of expenditure so that the crowding-out effects of public expenditure can be detected. Finally, the decomposition of public expenditure into current and capital components could also yield interesting results.

POLICY RECOMMENDATIONS

The policy recommendations of this study are provided as follows:

- (i) Target policies and strategies to maintain the debt/GDP ratio in the framework of debt sustainability that encourages long-run percapita-GDP growth rate of Myanmar.
- (ii) Explore use of new tax administration system and technology to improve tax efficiency and effort for obtaining tax/GDP ratio at a certain level of middle-income countries and for effective resource allocation.
- (iii) Reallocate the unproductive government expenditure to promote allocative efficiency of government and crowding effect in private investment.
- (iv) Encourage policy-based fiscal strategy and budgeting practice though setting up the fiscal targets and the level of expenditures, formulating expenditure policies based on priorities and strategic plan, and developing measures towards operational efficiency and performance from medium-term-fiscal framework to long-term-fiscal framework.
- (v) Enhance public-private partnership (PPP) mechanism in both economic and social infrastructure projects to enhance efficiency in spending and maintain the required threshold level of debt/GDP in the presence of debt sustainability.
- (vi) Develop effective measures to strengthen financial system to obtain the targeted revenue/GDP ratio, expenditure/GDP ratio and fiscal deficit/GDP ratio via fiscal consolidation to contribute to the debt sustainability and macroeconomic stability.
- (vii) Finally, encourage the use of macroeconomic modeling and macroeconomic analysis that would encourage fiscal efficiency, i.e., minimizing fiscal gaps in forward-looking expenditure and revenue forecasts and fiscal policy.

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AGRICULTURE FINANCE IN MYANMAR AND MYANM AGRICULTURE DEVELOPMENT BANK REFORM

Om Ki⁵

SUMMARY

Notwithstanding enormous increases in agricultural loans to smallholder farmers by successive governments of Myanmar over the past decade, the cost of cultivating crops still significantly exceeds the subsidised loans granted by the State, and to which less than half of farm households have access. Exacerbating this State financing gap, is the lack of access to timely, affordable and dependable credit from formal financial institutions broadly, including private banks and microfinance institutions. As a consequence, Myanmar's farmers are forced into borrowing (supplemental) loans from informal moneylenders at exorbitant rates of interest that range from 60 to 200 percent per annum, which (unsurprisingly) also chronically undermines the profitability, viability and sustainability of farm households.

This study presents a short contextual background and concise investigation into agricultural finance in Myanmar through a historical perspective, followed by a brief analysis of lessons learned from international experience in reforming agricultural banks in Asia and Latin America. The policy recommendations derived include restructuring, rehabilitating and reforming the Myanma Agricultural Development Bank (MADB), regulating it as a fully-fledged commercial/development bank under the 2016 Financial Institutions Law, transferring the supervision and regulation of the MADB to the Central Bank of Myanmar (CBM), and synchronising the MADB reform measures with the overall financial and agricultural sector reforms. The aim is to encourage the 'crowding in' of private sector intermediation and participation in facilitating, financing, and accelerating agricultural sector development in Myanmar.

Key words

Agriculture finance, Myanma Agricultural Development Bank, MADB reform

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3.1 CONTEXTUAL BACKGROUND

According to the 2014 Myanmar Population and Housing Census, the total population of Myanmar was 51.5 million⁶ with an annual population growth rate of 0.89 percent⁷. With 70 percent of the population (over 36 million) residing in rural regions and engaged primarily in agriculture-related livelihoods⁸, Myanmar is an agri-based economy, with the agricultural sector generating 29 percent of gross domestic product (GDP), employing 50 percent of total labour force and contributing to 30 percent of total exports by value in the fiscal year (FY) of 2015-2016.9 Successive governments of Myanmar have emphasised and prioritised agricultural sector development as one of the key engines of economic growth generation and the foundation for broad-based socio-economic development. The current National League for Democracy (NLD)-led government also envisions, in its 2018 Myanmar Agriculture Development Strategy and Investment Plan, that Myanmar will achieve "An inclusive, competitive, food and nutrition secure and sustainable agricultural system contributing to the socio-economic well-being of farmers and rural people and further development of the national economy"¹⁰. Fostering climate-smart agriculture, augmenting farm productivity and profitability, and ensuring an enabling economic ecosystem that facilitates sustainable agricultural development are thus among the top priorities of the government.

Nevertheless, agricultural growth in Myanmar lags drastically behind that of comparator countries at similar stages of their development¹¹. For instance, the yields of rice, the staple food of Myanmar people as well as the dominant and crucial cash crop of most agricultural households, are among the lowest in Asia, both in average and among the best farms.¹² Labour productivity in paddy production in the commercial parts of the Ayeyarwaddy Delta is only a fraction of the labour productivity achieved in other paddy production bowls of Asia. Low labour and land productivity results in low farm profitability in Myanmar, which is three times below the average generated in other countries.¹³ In addressing these challenges that undermine Myanmar's agricultural development, a

13 Ibid.p3.

⁶ Over 54 million as of January 31, 2019 http://www.dop.gov.mm/en (Accessed January 31, 2019)

⁷ Ministry of Immigration and Population (2015): The 2014 Myanmar Population and Housing Census: The Union Report.pp12-13.

⁸ Ibid. p17.

⁹ World Bank (2017): Increasing the Impact of Public Spending on Agricultural Growth: Myanmar Agricultural Public Expenditure Review.p1.

¹⁰ Ministry of Agriculture, Livestock and Irrigation (2018): Myanmar Agriculture Development Strategy and Investment Plan.p35.

¹¹ World Bank (2017): Increasing the Impact of Public Spending on Agricultural Growth: Myanmar Agricultural Public Expenditure Review.p3.

¹² Ibid.p3.

multifaceted and comprehensive approach is necessary, but the most critical challenge will be ensuring and enhancing reliable and affordable access to farmer-friendly finance.





Source: World Bank (2014)

3.2 AGRICULTURE FINANCE THROUGH A HISTORICAL PERSPECTIVE

Throughout the British colonial era (conclusively from 1886 to 1948) in Myanmar, the *Chettiars*, a money-lending caste from Tamil Nadu province of today's India, were the chief providers of agricultural credit to the cultivators¹⁴. The two key aspects of the predominance of agriculture finance by the *Chettiars* were the speed of their services: the time elapsing from the application for a loan to the credit paid over upon execution of necessary documents was often not longer than an hour; and the interest rate charged (ranging from 9 to 24 percent per annum depending on the type of collateral)¹⁵. During the parliamentary

¹⁴ Turnell (2009): Fiery Dragons: Banks, Moneylenders and Microfinance in Burma.p13.

¹⁵ Ibid.pp26-40.

democracy years after independence (1948-1962), the State Agricultural Bank (SAB) was established which provided agricultural finance with a 7 percent annual interest rate, but in the absence of adequate rural finance (the SAB did not have sufficient resources to cover all of Myanmar's rural credit needs), informal moneylenders provided around two-thirds of credit to the farmers, with a yearly interest rate of around 50 percent¹⁶.

Following this, during the regimes of the Revolutionary Council and the Burma Socialist Programme Party (1962-1988), all the domestic and foreign banks were nationalised to establish the monolithic People's Bank of the Union of Burma. Despite the rural finance provided by the government during these eras, three-quarters of credit provided to agriculturalists continued to be supplied by informal lenders, whose annual interest rates ranged from 27 to 314 percent per annum.¹⁷ By 1990 during the period of the State Peace and Development Council (SPDC) (1988-2010), the Myanma Agriculture and Rural Development Bank Law was promulgated with the objective of addressing the protracted deficiencies of rural credit, but the loans disbursed by this state-owned agriculture bank were chronically not sufficient to meet farming expenditures for crop production. Though the current government has raised the amount of seasonal crop loans available at an annual interest rate of 8 percent in three consecutive years of 2016, 2017 and 2018, studies suggest that these loans only cover approximately half of total production costs.¹⁸

¹⁶ Ibid.p201.

¹⁷ Ibid.p247.

¹⁸ Foerch et al. (2016): Myanmar's Financial Sector: A Challenging Environment for Banks.pp41-43.

Table 3.1: History and supervision of MADB over the past 66 years(1953-2018)

Year	Name	Supervising Ministry	Government led by	Legal Framework
1953	State Agricultural Bank	Ministry of Agriculture and Forestry	Anti-Fascist People's Freedom League	State Agricultural Bank Act (1953)
1967	Agricultural Finance Division, People's Bank of the Union of Burma	Ministry of Plan- ning and Finance	Revolutionary Council	People's Bank of the Union of Bur- ma Act (1967)
1976	Myanma Agricul- tural Bank	Ministry of Finance and Revenue	Burma Socialist Programme Party	The Bank Law (1975)
1990	Myanma Agricul- ture and Rural Development Bank	Ministry of Plan- ning and Finance	State Law and Order Restoration Council	Myanma Agricul- ture and Rural Development Bank Law (1990)
1997	Myanma Agricul- tural Development Bank	Ministry of Agriculture and Irrigation	State Law and Order Restoration Council	Law amending Myanma Agricul- ture and Rural Development Bank (1997)
2018	Myanma Agricul- tural Development Bank	Ministry of Plan- ning and Finance	National League for Democracy	The two laws enacted in 1990 & 1997

Source: Foerch et al. (2016), Government of Myanmar (1997 & 1990), MADB (2018), Turnell (2009)

3.3 CALLS FOR MADB REFORM

Established on June 1, 1953 under the name of State Agricultural Bank by the U Nu Administration, and with a view to supporting and advancing the development of agriculture, livestock and rural enterprises, the MADB has for much of its history played an important economic role by channelling state-subsidised capital to a large segment of low-income households involved in agricultural activities.¹⁹ Currently, through its extensive network of 229 branches operating

¹⁹ Turnell (2016): Banking and Finance in Myanmar: Present Realities, Future Possibilities.p57.

all over the country with approximately 2,800 personnel working under its three key departments (Loan Department, Internal Audit Department and Administrative Department), ²⁰the MADB is providing a limited range of financial services, mainly seasonal crop loans (96% of total loan portfolio) and term loans for farm machinery and others (4% of total loans) as illustrated in Figure 3.2. The MADB²¹ has around 1.9 million customers, mostly small-scale farmers, whilst it is estimated that over 3.5 million farmers are not yet served by the MADB. Each eligible farmer can borrow a loan for a maximum of 10 acres.

Table 3.2: Overview of seasonal crop loans (Maturity of less than 12 months)

Type of seasonal crop loan	Eligible crops	Disbursal period	Deadline for repayment
Pre-monsoon Loan	Paddy and long staple cotton	January - March	February 28 (Follow- ing year)
Monsoon Loan	Paddy, groundnut, sesame, beans, long staple cotton and corn	May - September	April 15 (Following year)
Winter Loan	Paddy, groundnut, sesame, beans, long staple cotton, corn and mustard	October - December	June 30 (Following year)

Source : MADB (2018), Myanma Alinn Daily (2018)

20 <u>https://www.mopf.gov.mm/my/content/myanma-agricultural-development-bank-news</u> (Accessed January 31, 2019)

²¹ World Bank (2014): Myanmar Agricultural Development Bank: Initial Assessment and Restructuring Options.pp15-17.



Figure 3.2: Composition of MADB's loan portfolio (FY 2011-2012)

Source: World Bank (2014)

Table 3.3: Summary of subsidised loan portfolio over the past decade
(2009-2018)

Fiscal year	Credit per acre of pad- dy (Kyat)	Credit per acre of other crops (Kyat)	Total credit disbursed (Kyat bil- lion)	Subsidised lending rate(% p.a.)	Commer- cial lending rate(% p.a.)	Govern- ment sub- sidy (Kyat billion)
2009-2010	10,000	6,000	93	17	17	-
2010-2011	20,000	10,000	191	17	17	-
2011-2012	40,000	10,000	353	17, 15 & 13	17	-
2012-2013	80,000	10,000	558	8.5	13	25.11
2013-2014	100,000	20,000	1159	8.5	13	52.16
2014-2015	100,000	20,000	1167	5	13	93.36
2015-2016	100,000	20,000	1091	5	13	87.28
2016-2017	150,000	20,000	1631	8	13	81.55
2017-2018	150,000	50,000	1707	8	13	85.35
2018 (6 months)	150,000	50,000	1416 (pro- jected)	8	13	70.80
2018-2019	150,000	100,000	-	8	13	-

Source: CBM (2012-2016), Foerch et al. (2016), MADB (2018), World Bank (2014) and Own Calculation

Despite its endeavours to achieve its objectives and accomplish its policy mandate, the MADB is currently confronting a myriad of major obstacles, including the following:²²

- Unsustainable financing mechanisms and sources, with infinitesimal savings mobilisation and accumulation (total deposits are just over one percent of total loan portfolio in 2018), and thus near-total dependence on government subsidies channelled through its state-owned sibling, the Myanma Economic Bank
- Lack of diversification of its loan portfolio, with substantial concentration in small-scale farmers and paddy production, and with the interest rate determined by its supervising ministry
- > Under-capitalisation, with paid-up capital of just 1 billion Kyat²³
- Poor corporate governance arrangements with no independent director on its board; no functioning committees on credit, audit, risk management and assets-liabilities management; accounts not prepared in compliance with International Accounting Standards (IAS) or International Financial Reporting Standards (IFRS), and no independent audit; no legal obligation to meet prudential standards imposed on other banks; and no supervision by the Central Bank of Myanmar
- Weak risk management strategy and architecture, with no credit analysis or other assessments of its borrowers by MADB staff, compounding the challenge of their constrained capabilities and competencies to monitor, measure, mitigate and manage credit and other important risks
- Rudimentary operational autonomy of senior management, hamstringing their professional performance and compromising their motivation
- Obsolete and inadequate information technology and operations infrastructure for data retention and analysis, with no core banking system for real-time data updating, processing and analysis, and with no website to facilitate rapid and timely dissemination of information on its services and products as well as for official announcements and notifications
- An extremely limited range of financial instruments to cater to the financing needs of farmers and other stakeholders engaged in agricultural value chains

²² Foerch et al. (2016), MADB (2018), Turnell (2016) and World Bank (2014).

²³ The equity base of the MADB might be gradually increasing, but its audited financial statements are inaccessible.

A legal requirement of an annual transfer of 75 percent of its profit to the government, aggravating its financial sustainability and viability

Given a broad array of the challenges presented above, the MADB is in urgent need of both financial and organisational restructuring, reinforced by strong political will and freedom from (undue) political interference. Before specific policy recommendations are proposed, lessons learned from reforming agricultural banks in different countries of Asia and Latin America will be briefly presented below so that these can be taken into careful consideration and contextualised when revamping and reforming the MADB.

3.4 LESSONS FROM GLOBAL EXPERIENCE

The majority of the challenges associated with state-owned agricultural bank transformation being encountered by Myanmar's policymakers have already been faced, and addressed, by their counterparts from different countries at different times. The Government of Myanmar is hence, as a latecomer, granted the opportunity of strategizing, systematising and speeding up the MADB reform process by contextualising and incorporating the relevant lessons learned from these countries. This section discusses a couple of successful case studies of agricultural bank reform from two countries from two continents: the Bank for Agriculture and Agricultural Cooperatives of Thailand, and the Financiera Rural of Mexico.

3.5 THAILAND: BANK FOR AGRICULTURE AND AGRICULTURAL COOPERATIVES (BAAC)²⁴

Established in 1966 by the Thai Government with the policy mandate of delivering credit to rural agricultural households, the BAAC underwent a series of transformations to move from a specialised agricultural lender only, to become a diversified rural development bank. In terms of its sources of funds, the BAAC previously relied heavily on the government budget, overseas borrowings and forced savings from commercial banks. Gradually, rural savings mobilisation was commenced and scaled up, and these are now the key source of BAAC funds (accounting for 87 percent of the total funding). In terms of lending operations, the BAAC's loan portfolio generally consists of retail credit to individual farmers

²⁴ Bank for Agriculture and Agricultural Cooperatives (2017): Annual Report 2016, World Bank (2014): Myanmar Agricultural Development Bank: Initial Assessment and Restructuring Options.

(80 percent), and wholesale credit to farmer institutions including agricultural cooperatives, farmer associations and others (20 percent). Additionally, the BAAC provides a broad spectrum of farmer-friendly financial services such as remittance, credit cards, ATM networks, some insurance services and so on. Above all, from 1997 onwards, the BAAC has been extending non-agricultural credit and thus diversifying its loan portfolio. In 1998, the BAAC came under the supervision of the Bank of Thailand, the country's central bank, and became fully subject to prudential regulations and standards.

Having gone through these key phases of reform over the past five decades, the BAAC has now achieved impressive accomplishments in terms of outreach, institutional viability and financial sustainability. With total employment of 22765, the BAAC has been providing a diversified range of financial services to over 7 million farm households (95 percent of total farm households) through its extensive network of 1275 branches. As at March 2016, the BAAC had total assets of 1.62 trillion baht (US\$ 48.9 billion), loans outstanding of 1.28 trillion baht (US\$ 38.6 billion), deposits of 1.41 trillion baht (US\$ 42.4 billion), net profit of 9.5 million baht (US\$ 0.29 million), a loan-to-deposit ratio of 91 percent and non-performing loans of 4 percent of the portfolio.

Among the principal elements that have ensured the success of the BAAC's transformation into an operationally autonomous and financially sustainable agricultural bank is the Thai government's respect for its considerable operational autonomy and freedom from political interferences; the radical shift to rural deposits mobilisation as the key source of funding; the strengthened corporate governance architecture and corporate culture emphasising cost-effectiveness, efficiency and productivity, and a strong human resources strategy focusing on promoting personnel productivity, the decentralisation and expansion of branch networks as the profit centres, and dramatic enhancements in loan portfolio quality.

3.6 MEXICO: FINANCIERA RURAL (FND)²⁵

By the end of 2002, the Government of Mexico wound up the National Bank of Rural Credit (*Banrural*), which was established in 1975 with the objective of financing the agricultural and rural sector. This was due to the Bank's insolvency resulting from increasing losses, substantial non-performing loans, clientele capture and unsuccessful endeavours at recapitalising and rehabilitation.

²⁵ Its official name "*Financiera Rural*" was changed to "*Financiera Nacional de Desarrollo Agropecuario, Rural, Forestal y Pesquero (FND)*" by the end of 2013.
Following this dissolution and liquidation, and with the technical and financial assistance of the World Bank, the government founded a new agricultural bank called *Financiera Rural (FND)* with a totally different set of characteristics in the field of agricultural and rural finance, including the legal requirement of the Bank's capital preservation by the board and management, a prohibition to accepting deposits and borrowings from other financial institutions; legal provisions that banned the government from recapitalising and bailing it out in case of failure; a policy mandate to focus on the rural sector and agricultural activities only; and full compliance with the banking rules and regulations set by the banking supervisor, the National Banking and Securities Commission. Today *Financiera Rural (FND)* has become a profitable retail and wholesale financial institution with an increasing capacity to serve the market and crowd in other private financial sector intermediaries. ²⁶

Of high importance and significance to the successful reform of *Financiera Rural* (FND) has also been a vast array of reform measures undertaken by the bank's senior management: Recruitment of seasoned banking professionals from the private sector; substantial investments in risk management and market intelligence; stringent limits on loan exposures in terms of customers, sectors and regions; the adoption of conservative collateral appraisal criteria and a maximum loan-to-collateral value ratio of 80 percent; a prohibition on lending to local governments and state-owned enterprises; compulsory utilization of insurance instruments for borrowers, and the creation of a wide variety of innovative financial products tailored to rural residents.

3.7 POLICY RECOMMENDATIONS AND CONCLUDING REMARKS

Based on the key challenges faced by the MADB, and the lessons learned from international experiences elaborated above, the following policy recommendations are suggested to be taken into account in transforming the MADB into a profitable and viable financial institution:

Introduce and operationalise market-based interest rates gradually for the most dominant lending products to cover overheads and operating expenses, to cushion and absorb potential agriculturally-inherent losses, and to incentivise and generate private financial sector intermediation, thereby eliminating the market distortions induced by subsidised loans

²⁶ The more updated annual reports of FND are not available.

- Diversify the loan portfolio by servicing a wider spectrum of stakeholders engaged in agricultural value chains and rural activities broadly
- Mobilise and expand independent sources of funding, and reduce statefunded subsidies step by step
- Raise the paid-up capital substantially to an amount at least equivalent to the minimum capital of licensed domestic banks, in order to finance its own modernisation and expansion
- License the MADB as a fully-fledged commercial/development bank under the 2016 Financial Institutions Law, and transfer supervision and regulation responsibilities to the Central Bank of Myanmar. In so doing, undertake strategic steps progressively to comply with prudential standards and requirements – on capital adequacy, liquidity, reserves, loan classification and provisioning, accounting rules and so on – as applicable to private counterparts
- Establish a robust corporate governance mechanism with independent directors and other members on the MADB's board who meet strict fitand-proper personnel criteria, professionalise the management team, appoint competent and committed banking professionals, while granting them sufficient operational autonomy and decision-making authority coupled with associated accountability and responsibility
- Prepare and produce MADB financial statements in compliance with the IAS and IFRS,²⁷ and execute an external audit by hiring an independent auditing firm
- Disclose and publish annual reports and audited financial statements in a timely and adequate manner, exercising the high standards of transparency and accountability
- Launch an official website of MADB with regular updates of nonconfidential information in order to nurture a culture of transparency and accountability
- Formulate and materialise a strong and independent internal control system
- Set up and institutionalise specific committees on credit, audit, risk management and assets-liabilities management, with each consisting of

²⁷ All the banks in Myanmar, including the MADB, are required to comply with IFRS starting from FY 2022-2023 pursuant to the notification released by the Myanmar Accountancy Council on July 4, 2018.

independent members, to develop written policies, strategies and standard operation procedures that are in line with international best practices, and to oversee their implementation

- Install and capitalise on modern information technology infrastructure to facilitate management information systems and advance operations, digitising all paper-based lending and other documentations vulnerable to unexpected losses and disasters
- Develop and implement a comprehensive human resources framework in order to attract, motivate, train and retain staff
- Enact a new comprehensive MADB Law that is in line with the 2016 Financial Institutions Law, revoking the two old laws promulgated in 1990 (Myanma Agriculture and Rural Development Bank Law) and 1997 (The Law amending Myanma Agriculture and Rural Development Bank Law)
- Set and march towards an ultimate reform goal (e.g. corporatisation and going public)
- Synchronise all the MADB reform measures with the overall banking and financial sector development reform agenda so as to avoid crowding out of private financial intermediaries in financing the agricultural sector, as well as with agricultural reform process as formulated in the "2018 Myanmar Agriculture Development Strategy and Investment Plan"

To conclude, what matters most in translating the MADB into an operationally sustainable and economically viable provider of financial services to different segments of agriculture, and the rural population in Myanmar broadly is the authentic and strong political will of the government that guarantees freedom from (undue) political interference into the MADB's operational autonomy. With this commitment in place, and in collaboration with international institutions equipped with relevant expertise and experience (such as the World Bank and International Fund for Agricultural Development), a carefully-orchestrated and strategically-sequenced reform agenda should be developed and implemented in order to transform the MADB into a successful and sustainable agricultural development bank.

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FINANCING THE YANGON EXPRESSWAY PROJECT: EXPLORING POTENTIAL FINANCING SCHEME AND POLICY INSTRUMENTS TO ENCOURAGE LOCAL PRIVATE BANKS' PARTICIPATION

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SUMMARY

To relieve chronic traffic congestion, the Myanmar government has decided to build a 47.5-kilometer elevated four-lane ring road, which is called the Yangon Expressway Project (YEX Project). This project will be a milestone in the Myanmar economy because it will be Myanmar's first large-scale infrastructure project using a project financing framework.

Since developing country infrastructure projects have distinctive features and constraints, this paper attempts to analyse infrastructure projects using three different developing country experiences (Indonesia (2014), Korea (1995) and Laos (2004)). To ensure comparability with the YEX Project, early-stage projects – implemented when relevant institutional/regulatory systems were not fully settled – were chosen. From these, the following five lessons were identified:

- Strong policy support was offered to *mitigate demand risk* or to *guarantee a stable revenue stream.* In all three the goal was the same: *enhancing bankability.*
- Except for Korean case, *foreign investors played a leading role* in the financing scheme.
- *Local investors' participation* was critical
- *Institutional/regulatory support* was required to address uncertainty
- *Government's active involvement* was a strong comfort to assure foreign investors

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And from these, five policies are suggested as follows:

- Fix regulatory flaws by legislation.
- Provide administrative/regulatory comforts.
- Relieve investors' demand risk and the government's fiscal burden/ uncertainty at the same time.
- Provide risk/credit guarantee.
- Take a carrot-and-stick approach to top-three local private banks.

4.1 INTRODUCTION

Traditionally, infrastructure investments have been financed mainly by public funding sources for two reasons: (i) sizable private investors able to participate in infrastructure projects were rare, and (ii) the nature of infrastructure as a public good has made it difficult for governments to invite private players to infrastructure projects. However, budgetary pressures and the inability of the public sector to deliver efficient investment spending have led to a reduction in public investments in infrastructure. For example, in 2018, the G20 estimates a US\$15 trillion investment gap in infrastructure through 2040.

To fill such gaps, governments around the world have developed various financing frameworks to utilize private investors' capability. From the early 1960s, developed countries began to adopt public-private partnership (PPP) models to leverage public spending on infrastructure and exploit the expertise of the private sector. Yet, in developing countries, private investors have been less active – *inter alia* in the transport sector. For example, according to the World Bank, there have been three times more PPPs in the power sector than in the transport sector in developing countries. Even when private investors do invest in transport projects, investment destinations are mainly ports and airports – not roads. On the other hand, private investment in roads hit a 10-year low in 2017, and continues to be concentrated in middle-income countries. Myanmar, a lower-middle income country, confronts similar problems – i.e., *passive participation of foreign/private investors in road PPP projects.*

Under these circumstances, this paper aims to support the Government of Myanmar (GoM) to *develop policy instruments to attract foreign/private investors to the Yangon Expressway Project.* To address this, this paper briefly discusses the concept of project finance (PF) – a popular deal structure in infrastructure

investment – and explores experiences of other developing countries which adopted PF schemes for infrastructure projects. It also seeks out potential financing schemes for the Yangon Expressway Project, and supportive policy options for the success of such financing plans.

The remainder of this paper proceeds as follows: Section 4.2 briefly explains two major financing schemes (project finance and corporate finance) used in infrastructure projects. Section 4.3 explores policy implications for successful PF by analysing infrastructure projects from three different countries. Based on the analysis in Section 4.3, potential financing schemes and the GoM's risk mitigation measures are presented in Section 4.4. In Section 4.5, conclusions and policy recommendations to attract private investors to infrastructure projects are briefly discussed.

4.2 FINANCING SCHEMES FOR INFRASTRUCTURE PROJECTS

Various financing schemes can be considered for infrastructure projects. First, projects can be financed by public, private or co-financed sources. Second, companies may choose to finance the project based on their own balance sheet (corporate finance) or cash flow of the project itself (project finance). Third, a company may consider multiple sources – e.g. debt, equity and mezzanine financing – and risk mitigation mechanisms – e.g. guarantee and risk insurance – to finance the project.

4.2.1 DEGREE OF GOVERNMENTAL INVOLVEMENT

First, government may choose to use public funds²⁹ to finance a project. However, due to budgetary constraints, governments around the world have chosen to invite private funds to infrastructure projects since at least the 16th century. Today, purely government-funded infrastructure projects have become less common. It can be found only in exceptional cases, such as small-scale projects and infrastructure with highly public features.

Second, government may consider a co-financing scheme, which is the most common form in today's infrastructure projects. The form of governmental involvement depends on the country's economic situation (e.g. developing or developed economy) and size or characteristics of the project (e.g. small- or largescale project, highly- or less-profitable project). Such governmental financial

²⁹ It includes broad sense of public fund, ranges from investment of central/local government to investment of public institutions and state-owned companies.

involvement can range from debt to equity investment, tax exemption/deduction and risk sharing.

Third, government can choose a pure private financing option. For example, mostly in developed economies, some private investors propose infrastructure projects to government (bottom-up) without relying heavily on public participation. Due to unstable demand and political/economic uncertainty, pure private financing is hard find in developing economies.

4.2.2 DEGREE OF SPONSOR COMPANY'S INVOLVEMENT

Sizable financing is needed for large-scale infrastructure projects. On the one hand, huge amounts of financing for a large-scale project can create a financial burden to the operation company (sponsor company), because it can soar up debt-to-equity (D/E) ratios of the operator and, even worse, failure of the project can result in bankruptcy. Hence, an operation company often prefers a financing scheme that can isolate the risks of such large-scale projects. On the other hand, in some cases, lenders also want to protect their investment in a certain project from risks originating from other projects of the borrower – i.e., they prefer to grant funds to a special purpose vehicle (SPV), which is legally autonomous from the operation company (borrower).

When the needs of the operation company and lenders coincide, they may choose an option in which debt and equity used to finance the project are paid back from the cash flow generated by the *project* (not the operation company overall). This scheme is called project finance (PF). Under a PF structure, the borrower is the SPV. Through the establishment of an SPV, a project can be largely insulated from the risks of the operation company (sponsor company). This is why PF is often called *off-balance-sheet* (*OBS*) *financing*³⁰. Due to such OBS characteristics of PF, lenders have *non- or limited-recourse*, making them ask the borrower to show objective, reliable and bankable estimations on future cash flow from the project. Moreover, in many cases, lenders are allowed to control the cash flows of an SPV by using an escrow account. Figure 4.1 presents a basic PF structure used in infrastructure projects.

³⁰ It does not mean that PF is OBS financing to the point which the project is *completely* self-sustaining without guarantees or undertakings by financially responsible parties. In fact, in many cases, borrowers are required to provide guarantee or collateral.



Figure 4.1: Illustrative contractual structure of a PF deal

Contrary to PF, an operation company itself is the borrower in a corporate finance (CF) scheme. Lenders provide money based on the credit and repayment ability of the *operation company* (not the project itself). Lenders enjoy *full-recourse* to the borrower (operation company) but cannot control the borrower as strict as they can do under PF scheme. Table 4.1 summarizes major differences of the two financing schemes.

Features	Project Finance (PF)	Corporate Finance (CF)
Borrower	SPV	Operator
Main variables underlying the granting of fund	Future cash flow from project	Operator's financial capability
Recourse	Non- or limited-recourse	Full-recourse
Collateral	Asset of SPV, Escrow accounts, Contracts between SPV and service providers, etc.	Operator's asset
Accounting treatment	Off-balance-sheet	On-balance-sheet
Lender's control	Strict	Less strict

Fig.4.2 compares PF and CF in the light of risk management. On the one hand, in some sense, debt lenders can reduce risks more effectively within a CF structure than a PF structure, because they can set up a range of collateral which belong to a borrower company. On the other hand, lenders would be exposed to higher

risks within a CF scheme than a PF scheme, because they are exposed to aggregated risks of *all* projects that a borrower company bears. For example, under a PF structure, default of project α (SPV α) does not affect lenders of project β (SPV β), as the lenders provide debt to SPV β – not to a shareholder company. However, under a CF structure, it would affect lenders, because they do not provide debt to SPV α or SPV β but to a shareholder company (borrower) which is exposed to risks of the two SPVs.





4.2.3 FINANCIAL INSTRUMENTS IN INFRASTRUCTURE FINANCE

There are various sources of financing for infrastructure projects. Such sources can be classified as debt, equity and mezzanine financing based on their asset category, and debt financing can be divided in turn into loans and bonds (See Table 4.2). Because each source has its own strengths and weaknesses, adoption of the most suitable instruments, according to the nature and/or phase of infrastructure projects, is crucial.

Asset category	Debt		Equity	Mezzanine
Type of instrument	ype of instrument Loans Bonds		Stocks	Hybrid sources
Characteristics	Indirect finance	Direct finance	Direct finance	Mostly direct finance
Major investor	Commercial bank, Multilat- eral Agency	Commercial bank, long-term fund	Sponsor com- pany, long-term fund	Equity inves- tors, state- owned develop- ment banks
Flexibility	High	Low	Low	Medium
Risk born by investor / Expected return	ected return		High	Medium
Proportion	50-70 percent		10-30 percent	10-20 percent
Example	Senior loan, se- curitized loan curitized bond		SPV's equity (common stocks)	Junior loan, preferred stock, convertible/ perpetual bond

Table 4.2: Financing sources for infrastructure projects

Debt financing

In general, debt is the largest source of infrastructure finance. Given its nature, debt enjoys the highest priority for repayment among the invested funds. Debt can be financed through multiple sources, and the two largest sources are loans and bonds: (i) Loan financing uses commercial lenders as *intermediaries.* For example, commercial banks participate in infrastructure projects as long-term debt providers. Compared to bond financing, loan financing is flexible, since it is relatively easier to renegotiate terms when facing new and/or unforeseen conditions; (ii) Bond financing allows borrower to *directly access* debt providers, rather than using intermediaries – i.e., borrower can finance debt through selling bonds in the bond market.

On the one hand, bond financing has comparative advantages over loan financing. For example, the *interest cost* of bond financing is generally lower than that of loan financing, because intermediaries are not involved in the financing process. Moreover, relatively *long-term* financing is possible with bond financing. On the other hand, bond financing has comparative disadvantages in terms of *flexibility*. For example, as bond financing is drawn all at once (i.e., upfront), the borrower bears the excessive 'cost of carry' from the date of receipt to the date it is invested. Also, given the dispersed and large number of bond holders, it is practically impossible to restructure existing debt in bond financing.

Debt providers – both bond and loan financiers – are more risk-averse than other investors, so they prefer to participate in the mature stage of infrastructure projects – e.g. the operation phase.

Equity financing

Equity is provided to an SPV for, theoretically, an unlimited period. Equity providers may invest in cash or non-cash forms. In PF cases, both strategic investors (SIs) – e.g. sponsor companies that provide expertise and indispensable services to the project – and financial investors (FIs) – e.g. long-term investors such as pension funds and insurance companies – serve as equity providers.

Equity is the form of financing with the *highest risks*, and debt providers have the priority to claim a project's assets, rights and/or repayment over equity providers. Such priority holds even when the project goes into bankruptcy. For this reason, debt providers insist on a low D/E ratio to provide a sufficient financial cushion to repay their debt services. Equity providers also seek to minimize its risks, which can be achieved with less debt. However, unlike debt providers, they, in some sense, prefer a high D/E ratio³¹ to enjoy more leverage effect.

Given its nature as risk capital, the role of equity financing is critical in infrastructure projects. For example, a sufficient amount of equity investment is interpreted as a sign of confidence for the feasibility of a project, making debt financing easier. Moreover, equity financing plays a crucial role to initiate a project, because debt providers tend not to participate in the early phase of infrastructure projects. In this early phase, equity investment serves as a major source of capital.

Mezzanine financing

Mezzanine is a hybrid of debt and equity. Although the nature of mezzanine capital is different in each specific case, it is placed somewhere between traditional senior debt (e.g. secured debt) and equity in terms of risks and returns. In other words, mezzanine capital is subordinate to senior debt and tax-deductible; but in return for bearing such higher risks, it is compensated in various forms, such as high interest rates and equity kicker.

³¹ It does not mean that "higher debt-to-equity ratio is, happier equity providers are". Since a high level of debt makes a project vulnerable to unexpected shocks, equity providers seek to reach optimal level of leverage. However, there is a division between equity and debt providers as to what the optimal level is.

Mezzanine financing can be strategically utilized to achieve an optimal financing structure – i.e., minimizing the cost of financing while maintaining the bankability of projects. For instance, in many infrastructure projects, equity investors' mezzanine investment is deemed to fulfil equity requirements to a certain extent. Since such a strategy makes it possible to improve the rate of return (RoR) on equity investment and reduce an SPV's tax payment, equity investors are incentivized to offer not pure equity, but a mix of equity and mezzanine capital.

Risk mitigation mechanisms

An infrastructure project has two distinctive features: It typically takes a long time for repayment (20-40 years) and is highly capital-intensive. Accordingly, investors are inevitably exposed to various kinds of risk. Such risks tend to be amplified in developing countries which should rely on cross-border financing due to insufficient size and/or expertise of local capital to finance infrastructure projects. For example, with a cross-border financing, foreign investors encounter additional risk sources – e.g. volatile foreign exchange rate.

To mitigate risks, investors use various risk-hedging mechanisms. For instance, they may claim *credit guarantees* from multilateral agencies (MLAs), export credit agencies (ECAs) or host governments, or the presence of MLAs as co-financiers in an A/B loan structure³². In many cases, the host government is also asked to support infrastructure projects by mitigating uncertainty over regulation and revenue (demand). Moreover, investors may require *political risk insurance (PRI)* which covers the default by a sovereign or corporate entity due to political risks, such as currency inconvertibility, expropriation, civil disturbance and breach of contract. MLAs are major providers of such insurance programs, and Fig.4.3 shows basic transaction flows as to the guarantee/insurance provided by an MLA.

³² It is a type of syndication led by an MLA, especially the World Bank Group. Within an A/B loan structure, MLA retains a portion of the loan for its own account (A loan) and sells the remaining portion to other financiers (B loan).

Figure 4.3: Basic transaction flows in a guarantee/insurance program by an MLA



4.3 INFRASTRUCTURE PROJECTS USING PF SCHEMES

Before introducing a potential PF structure for the Yangon Expressway Project in Section 4.4, it would be helpful to draw lessons from successful PF cases in foreign countries. Three cases from three different countries – Indonesia, Korea and Laos – are chosen for this purpose³³. This section aims to explain actual financing schemes of the three projects and analyse the three governments' policy support to invite foreign and/or local private investors.

4.3.1 INDONESIA: SARULLA GEOTHERMAL POWER PLANT PROJECT (2014)

Overview

The Sarulla Geothermal Power Plant Project (Sarulla GPP Project) is the world's largest single-contract geothermal power project to date. This project is strongly backed by the Indonesian government's long-term national energy policy 2014 which aims to increase energy security by reducing Indonesia's high reliance on oil imports to produce electricity. To meet this goal, the government set a goal to

³³ To draw lessons that can be applicable to Myanmar context, it is necessary to choose countries with similar economic, regulatory and political condition to Myanmar. When the PF negotiations in analysis were launched, economic condition – in terms of GDP per capita – for all the three countries were quite different from Myanmar (Myanmar: US\$1,275 (2016), Indonesia: US\$3,492 (2014), Korea: US\$12,332 (1995), Laos: US\$418 (2004)). Nevertheless, it is expected to provide insight to Myanmar for two reasons: (i) All the three PF cases were early-stage cases in each country when relevant regulatory system was not fully settled. (ii) At that time, political risks of all the three countries deemed high or moderate-to-high, so governments needed to provide incentives to attract local private and foreign investors. Such political condition is similar to Myanmar's current situation.

increase the share of renewable energy in the energy mix from 5 percent to 23 percent by 2025. Particularly, the Government of Indonesia (GoI) expects geothermal to play a pivotal role by contributing 6.1 percent of the whole energy mix.

Despite such importance and interest of the GoI, there were multiple barriers – *inter alia* complicated regulatory frameworks and an unfavourable electricity tariff structure. Such barriers have made a geothermal project less attractive to investors, and, for this reason, the Sarulla GPP Project had been halted for about 13 years since the launch of appraisal process in 1993. Realizing these obstacles, the GoI began to expedite regulatory reform in two ways.

Policy support

First, the GoI *amended two regulatory barriers* that had restricted investment in the geothermal sector. These two regulatory reforms have made the geothermal sector attractive to private developers and investors.

- (i) *Reclassification:* In the past, the exploitation of geothermal resources was categorized as mining activity. Under this category, the development of geothermal resources cannot be carried out in forest conservation areas where many potential geothermal sites are located. In 2014, the Geothermal Act reclassified geothermal activities, so that developers could access forest conservation areas.
- (ii) *Reducing concessionaire risk:* Under the old regulatory framework, geothermal concessions were assigned only to Pertamina Geothermal Energy (PGE), a state-owned oil and natural gas corporation. Under this framework, private developers had no choice but to sign a joint operation contract with PGE to run a business, making geothermal projects less bankable. The Geothermal Act of 2003 abolished such restriction, so private developers became able to obtain concessions *independently.*

Second, the GoI *introduced the following two financial incentives* to attract private investors:

(i) *FiT Program:* In 2009, Indonesia introduced a *feed-in-tariff (FiT)* to boost investment in the renewable energy sector, and has improved the FiT program since its introduction. For example, through 2012 amendments, the GoI enhanced price predictability. Before the 2012 amendments, tariffs were set after winning a bid by negotiation between a developer and Perusahaan Listrik Negara (PLN) – the state-owned electricity off-taker. Such processes made geothermal projects less predictable,

restricting active private investment. This issue was addressed in the 2012 amendment by incorporating a tariff proposal into tender documents, making geothermal projects more predictable from an early stage. Also, the GoI has increased the tariff ceiling by around 265 percent (from US\$0.097/kWh in 2009 to US\$0.258/kWh in 2014), which enhances the bankability of geothermal projects.

(ii) *Credit enhancement:* In addition to the FiT program, the GoI introduced a guarantee program to attract foreign and local private investors. Under Indonesia's regime, the main electricity off-taker should be PLN, which is obligated to subsidize consumers' electricity costs by charging lower fees. This obligation has put PLN into chronic financial deficit, provoking potential financiers' concern over the bankruptcy of PLN. The GoI introduced a guarantee program, called *Business Viability Guarantee Letter (BVGL)*, which supports the creditworthiness of PLN and improves bankability of geothermal projects.

Financing scheme

The Gol's comprehensive support in the form of regulatory reform and financial incentives attracted wide participation. Particularly, the developer and the investors could have confidence over the project's revenue stream backstopped by the GoI – e.g. *30-year FiT* and *20-year BVGL*.

Around US\$1.6 billion was financed though equity, debt and mezzanine financing (See Figure 4.4). First, a consortium of four sponsor companies participated in the Sarulla GPP Project as an equity provider³⁴. The consortium held more than 90 percent of total shares. Second, the project attracted about US\$1.2 billion of debt financing. Two development financial institutions (FIs) and multiple commercial banks provided a senior loan worth around US\$1.1 billion (JBIC: US\$492 million, ADB: US\$250 million, commercial banks syndicate: US\$328 million). Besides debt financing, JBIC served to protect the commercial loan by providing a political risk guarantee (PRG), which facilitated commercial banks' participation. Third, ADB-CTF and ADB-CCF – funds administered by ADB – contributed US\$80 million and US\$20 million, respectively, in the form of a mezzanine loan. Thanks to low interest rates offered by the two funds, it could reduce interest cost and improve bankability of the project.

³⁴ The amount of investment is classified, but it is known about US\$0.2 billion to US\$0.4 billion.



Figure 4.4: PF structure of the Sarulla GPP Project

4.3.2 KOREA: INCHEON INTERNATIONAL AIRPORT EXPRESSWAY PROJECT (1995)

Overview

The Incheon International Airport Expressway (IIAE) is the sole direct link between Seoul and Incheon International Airport, the largest international airport in Korea. In the 1990s, the Government of Korea (GoK) decided to build a new airport in Incheon as it became apparent that its old international airport could not cope with increasing air traffic. Incheon International Airport was planned to be built in 2001³⁵, and relevant transport infrastructure, which connect the airport and Seoul, was needed accordingly. To meet such needs, the GoK planned to build an expressway between the two destinations. It was originally started as a public financing project. However, fiscal constraints made the Korean government consider other options, such as PF.

Despite serious interest of the GoK in a PF structure, private investors proved lukewarm. Such passive responses originated from a lack of experience and expertise of local FIs. Although a comprehensive act on PF (The Promotion of Private Capital into Social Overhead Investment Act (PPI Act)) was enacted in 1994, there had been no PF cases yet. Therefore, it was necessary to *invite a qualified FI* who could lead the whole project. In addition to having a lead arranger, the GoK needed to consider providing *strong financial incentives* to lure private investors.

³⁵ Construction was initially scheduled to be completed in 1997 but delayed due to the aftermath of 1997 Asian financial crisis.

Policy support

First, the GoK utilized expertise of the *biggest state-owned bank* (Korea Development Bank (KDB)). In the 1990s, KDB was trying to find new investment opportunities, and already had strong expertise in corporate financing. Considering similarities between corporate financing and project financing, KDB was the sole local candidate who could assume a role of a lead arranger. The GoK assigned KDB to this role, and KDB established a new organization to focus exclusively on this project³⁶.

Second, the GoK backstopped its first PF project to reduce *uncertainty over demand.*

- BTO-MRG Program³⁷: The GoK introduced a strong guarantee program, (i) called Build-Transfer-Operation Minimum Revenue Guarantee Program (BTO-MRG Program). Figure 4.5 shows mechanism of the BTO-MRG scheme. Within the BTO-MRG Program, 1) the concessionaire (private developer) builds infrastructure using its own expertise (B); 2) Once construction is completed, the concessionaire transfers the ownership to the government (T); Then, 3) the government grants the operational right to the concessionaire for a certain period (0). Under this scheme, the more predictable the expected operational revenue is, the easier the project attracts investment. This is because return on investment is determined by the size of operational revenue. To improve predictability of the revenue stream, the government decided to guarantee a minimum level of revenue (MRG) - i.e., the GoK granted the concessionaire 30-years concession period with a guarantee of 90 percent³⁸ of expected operational revenue for 20 years. Such strong guarantee played a key role to reduce the financial risk of the IIAE Project and to stimulate widespread private investment.
- (ii) Active role of the government: The GoK did not remain as a passive player, but actively participated in the IIAE Project. First, the government contributed a significant amount of money by providing a *construction subsidy worth KRW358.4 billion* (or 17.1 percent of whole financing). More importantly, before launching the project, the GoK had *completed*

³⁶ KDB successfully carried out its role, and, since then, has carried out 532 PF cases (about US\$80 billion). Now, KDB has an independent PF centre, and becomes the second largest lead arranger in global infrastructure PF market (US\$30.04 billion, 2014).

³⁷ Various developing countries, including Chile, Peru, Turkey and South Africa, adopted MRG scheme to attract foreign and private investors.

³⁸ Criticism raised that the government bore most of the project risks, and the GoK renegotiated MRG from 90 percent to 80 percent.

major administrative procedures, including *land acquisition and traffic/ environmental impact assessments*, which often take a long time and put infrastructure projects at risk. Such active participation of the GoK changed private investors hitherto pessimistic view on the IIAE Project.



Figure 4.5: BTO-MRG Program in the IIAE Project

Financing scheme

KDB's leadership and the GoK's strong commitment considerably reduced uncertainty over future revenue streams of the IIAE Project. It attracted the widespread interest of the local capital market, and the project was financed *fully by local FIs* with *local currency, KRW.* Such local funding *eliminates foreign exchange risk,* reducing overall financing cost.

Beyond the government's construction subsidy, KRW1,740 billion (approximately US\$2.25 billion³⁹) was financed through equity and debt financing (See Figure 4.6). First, a consortium of 11 construction companies participated in the project both as an EPC contractor and an equity provider. The consortium contributed KRW440 billion in equity investment. Second, 18 local FIs⁴⁰ led by KDB formed a syndicate and injected a KRW1,300 billion senior loan to the project. These lenders claimed multiple financial instruments to hedge risks. For example, they required equity providers to provide a junior loan to the SPV in case of

³⁹ KRW to USD exchange rate was about KRW771.25/US\$ in 1995. As of 2018, it is about KRW1,070/US\$.

⁴⁰ Relatively large number of FIs participated in the IIAE Project. This is because, despite KDB's leadership and strong financial incentives, local FIs were not confident on their first PF.



Figure 4.6: PF structure of the IIAE Project

shortages. Also, they asked the SPV to sign an insurance contract with a designated insurer, and to use an escrow account for all cash transactions. Such measures enhanced creditworthiness of the SPV and mitigated various risk profiles of the IIAE Project.

4.3.3 LAOS: NAM THEUN 2 HYDROPOWER PROJECT (2004)

Overview

The Nam Theun 2 Hydropower Project (NT2 Project) aimed to build a dam in Laos and supply electricity mainly to Thailand. It was originally identified in the 1970s by the Mekong River Commission – an inter-governmental organization among four countries (Cambodia, Laos, Thailand and Vietnam) to jointly manage water resource of the Mekong River. A feasibility study was undertaken in the 1990s, but the project was stopped due to the 1997 Asian financial crisis. From 2001, Laos and Thailand resumed their talk on the project and construction began in 2005. Since the completion of construction in 2009, it has been in normal operation.

It was a milestone in the Lao economy, as the size of financing (US\$1.58 billion) was equivalent to more than 67 percent of the country's GDP (US\$2.36 billion in 2004). Considering the size of the Lao economy, this gigantic project inevitably relied on foreign capital⁴¹. However, it was challenging to attract foreign investors

⁴¹ In 2004, when financing terms were agreed, Lao GDP was US\$2.36 billion and gross domestic savings was around US\$0.36 billion. As of 2016, Myanmar's GDP and gross domestic savings are estimated around US\$67.43 billion and US\$10.9 billion, respectively. Compared to the Lao economy in 2004, today's Myanmar economy has abundant local capital sources, but passive attitude and lack of experience of local FIs are similar in both countries.

for a couple of reasons. For example, both countries – Laos and Thailand – were politically unstable from an investors' point of view. In addition, the underdeveloped regulatory framework of Laos was another source of concern. For example, laws and regulations that addressed the same issue were contradictory, increasing uncertainty of the NT2 project. To mitigate such risks, the government of Laos (GoL) decided to ask for financial and technical support from the World Bank (WB). The GoL and WB addressed several critical issues to meet the compelling needs of foreign private banks.

Policy support

First, the *interdependent contractual structure* was developed to reduce risk of breach of contract. Lao political risks were allocated to the GoL under the concession agreement (CA) consistent with precedents applied in emerging countries; and Thai political risks were addressed under the power purchasing agreement (PPA) between SPV (Nam Theun 2 Power Company (NTPC2)) and Thai off-taker (Electricity Generating Authority of Thailand (EGAT)). Lao and Thai players showed a strong commitment by contributing a significant amount of investment. For example, from the Lao side, the GoL contributed about 25 percent (US\$112.5 million) of whole equity investment (US\$450 million); and, from Thai side, the involvement of seven major Thai commercial banks and Thai-Exim added a further level of assurance to foreign private investors. Such intense involvement made the two countries vulnerable to the failure of the NT2 Project. That is, it was not in the interests of both parties to do anything to prejudice the project that was a supplier of cheap electricity for Thailand, an important source of tax revenue for the GoL, and a significant investment destination for both parties at the same time. This structure was viewed as a strong Lao-Thai commitment to the success of the project.

Second, *MLAs* and *ECAs* played a decisive role to assure foreign private investors. Their presence itself was viewed as a key risk mitigation factor. This is because such a strong ongoing relationship between Laos and MLAs and ECAs was essential for continued economic development which, in turn, reduced the possibility of breach of contract. In addition to participation in equity and debt financing, they backstopped the NT2 Project by providing a guarantee to foreign private investors (See Table 4.3). Such a guarantee protected the entire US\$ debt (US\$326 million)⁴², giving additional comfort to foreign lenders.

⁴² Thai banks' debt financing (denominated in Thailand Baht) was not guaranteed.

Table 4.3: Guarantees provided by MLAs and ECAs in the NT2 Project (US\$ mil.)

Institution				MLAs				ECAs	Tatal
Institution	IDA	MIGA	ADB	sum	Coface	EKN	GIEK	sum	Total
Amount	42	42	42	126	140	30	30	200	326

Third, the GoL offered strong and innovative comforts to relieve investors' concerns:

- (i) *Regulatory support:* To address regulatory uncertainty, the Lao government granted *exceptionally strong legal authority to the CA.* To be specific, investors identified ambiguous and/or conflicting aspects of existing laws and regulations in the CA, and this CA was approved by the Lao National Assembly (the supreme legislative body in Laos). Through this process, the CA was authorized to supersede existing laws and regulations, effectively relieving regulatory uncertainty.
- (ii) Financially preferential treatment: To support NTPC2 (SPV) to meet the debt repayment schedule, the GoL provided a tax cut program. Within the 15-years-of repayment period (from 2006 to 2021), corporate tax (30 percent) is exempted or significantly reduced. Table 4.4 shows that tax rate will gradually increase from zero percent to 30 percent in 2028. According to the CA, the increase in the corporate tax rate from 5.0 percent to 15.0 percent is not implemented unless the repayment is finished. Such a scheme is equivalent to subordinate the government's revenue to the obligation of debt repayment. Besides the tax cut, the GoL agreed to *fix a concession rate at 5.2 percent* to help NTPC2 fulfil its contractual obligation to debt providers. Figure 4.7 summarizes the financial incentives adopted by the GoL.

Year	2004	2010	2014	2021	2024	2027	2029	2039
Major events	Project starts	Repayment starts Concession starts			Repayment	ends		Concession ends
Corporate tax rate		-2014: <u>0%</u>		2015-2021: <u>5%</u>	2022-20)27: <u>15%</u>		2028-: <u>30%</u>
Concession rate	-202			24: <u>5.2%</u>		2025-2029:	15.0% 	2030-: <u>30.0%</u>

Figure 4.7: Schedule of financial incentives

Financing scheme

With the strong support of the GoL and MLAs, about US\$1,580 million, including US\$1,278.5 million private investment (more than 80 percent of total financing), was financed for the NT2 Project.

First, equity investors contributed US\$450 million. The GoL invested US\$112.5 million (25 percent) through a state-owned company, Lao Holding State Enterprise (LHSE); and the remaining US\$337.5 million (75 percent) was provided by private investors. Among the private equity holders, a construction contractor – Electricité de France International (*EDFI*) – and Thailand power producing company owned by power purchaser – Electricity Generating Public Company Ltd. (EGCO) – accounted for large shares (35 percent and 25 percent, respectively).



Figure 4.8: PF structure of the NT2 Project

Second, along with US\$190 million debt financing by MLAs and ECAs, nine foreign banks provided a US\$326 million senior loan guaranteed by PRI. Seven Thai private banks provided senior loans worth US\$615 million. This senior loan was denominated in Thai Baht (THB) – the main off-taker's currency. It contributed to lower financing costs by *reducing risk from potential currency mismatch*. Within the debt service from the Thai banks, US\$115 million was provided as a contingency loan to assure nine foreign debt providers.

To ensure the stability of the project, NTPC2 signed a *long-term 'take-or-pay power purchase agreement (TOP-PPA)'* with Thai state-owned off-taker (EGAT). It was the key stabilizer of the project, because it enabled NTPC2 to obligate with

EGAT to purchase 5,636 GWh per year (or 95 percent of generation capacity) at agreed tariffs on a take-or-pay basis for 25 years. These financial instruments improved predictability of the revenue stream, contributing to a cut in financing cost further. Fig.4.8 briefly illustrates the whole financing scheme and the GoL's policy supports.

4.3.4 POLICY IMPLICATIONS

In all three cases here, each government played a crucial role in attracting foreign and/or private investors to the infrastructure projects. By using various policy tools, they added stability and predictability to the projects. For example, governments implemented regulatory reform to reduce legal/institutional uncertainty; adopted diverse financial incentives to bolster bankability of the projects; exploited capabilities and reputation of MLAs and ECAs to relieve potential investors' anxiety; and built well-balanced and interdependent contractual structures to make breach of contract an unreasonable and expensive option. Table 4.4 summarizes policy interventions adopted by the governments of Indonesia, Korea and Laos.

Since infrastructure projects in developing countries are deemed risky, such *active role of government* as a risk mitigator and a dealmaker is critical. Given the similarities in political/economic/regulatory conditions between Myanmar and the three countries, the three cases can serve as the baseline for designing financing schemes and supportive policy instruments for the Yangon Expressway Project. However, as exemplified in the three cases, it is important to explore the most suitable and effective policies according to the distinctive features of the project and country-specific context of Myanmar. The goal – attracting foreign and/or private investors by reducing uncertainty and enhancing bankability – is the same, but the paths to this goal should be customized.

Project	Policy	Policy impact		
Sarulla GPP, In- donesia	Reclassify geothermal industry	Enhance bankability by allowing access to forest conservation areas where profitable sites are located		
	Reform regulations on concession contract	Reduce uncertainty related to a concession contract by abolishing monopolistic status of PGE as a concessionaire		
	Introduce FiT Program	Enhance bankability and predictability by guaranteeing a certain amount of revenue set by FiT Program		
	Provide credit enhancement	Increase stability by supporting creditworthiness of state-owned off-taker (PLN)		
	Utilize state-owned bank's expertise	Assign a role of lead-arranger to a state-owned bank (KDB) and exploit its leadership		
IIAE, Korea	Introduce BTO-MRG Program	Enhance bankability and predictability by guaranteeing 90 percent of expected operational revenue for 20 years		
	Provide administrative convenience	Reduce uncertainty by completing major administrative procedures (e.g. land acquisition, traffic impact assessment)		
	Build interdependent contractual structure	Reduce uncertainty by incentivizing contracting parties to carry out contractual obligations		
NT2, Laos	Provide strong guarantee	Reduce uncertainty by providing 100% guarantee to foreign private debt financiers		
	Relieve regulatory concerns	Reduce uncertainty by providing the CA strong legal authority to supersede ambiguous parts of existing regulations		
	Introduce financial programs to support the SPV's fulfillment of debtor's obligation	Improve the SPV's cash stream by providing preferential treatment on corporate tax rate and concession rate		

Table 4.4: Policy tools implemented in the Sarulla GPP Project, the IIAEProject and the NT2 Project

4.4 POTENTIAL FINANCING SCHEME FOR THE YANGON EXPRESSWAY PROJECT

In this section, a potential financing scheme for the Yangon Expressway Project (YEX Project) and policy tools required to support such a financing plan will be explored. Before introducing a financing scheme, it will analyse the YEX Project to figure out important features that should be reflected in the financing scheme. Based on this analysis, potential PF models and necessary supportive policies will be explained.

4.4.1 YANGON EXPRESSWAY PROJECT

Overview

Yangon – the former capital of Myanmar – still serves as an economic hub and the most important commercial centre, contributing about a quarter of national GDP (US\$60 billion). Such economic capability has been luring people; around 15 percent of Myanmar population lives in Yangon Metropolitan region (7.6 million, 2014) with a projection of over 14 million by 2040. Despite this strong population growth, roads infrastructure has not been sufficiently expanded. Moreover, the Myanmar government has relaxed regulations on auto imports in recent years, leading to a 53 percent increase in the total number of registered vehicles in Yangon between 2011 and 2014. Combined with an insufficient road network, it has exacerbated traffic congestion – e.g. average speeds at peak times have plummeted from 38km/h in 2007 to 10-12km/h in mid-2015.

As a part solution to this problem, the central and local government and the World Bank Group proposed to build a 47.5-kilometer elevated four-lane ring road (YEX Project). The government of Myanmar (GoM) prepared a three-phase plan (See Table 4.5) and invited expressions of interest in May 2018 as the first step. The GoM expects to carry out this project through a public-private partnership (PPP) model.

Phase	Section	Destination	Length	App. Cost
1	East Wing	Strand Road in downtown to Mingalardon Industrial zone	25.0km	US\$400 mil.
2	West Wing	Yangon urban area to Yan- gon-Mandalay expressway	16.5km	US\$370 mil.
3	East-West Link	Connection route between East and West Wing	6.0km	US\$300 mil.
Total			47.5km	US\$1,070 mil.

Table 4.5: The Yangon Expressway Project

Potential risk profile of the YEX Project

Since the GoM plans to perform the project through a PPP model, it is necessary to examine a risk profile of the YEX Project from private investors' point of view. Risks would arise from two directions. (i) *Inherent characteristics of the YEX Project* can be a source of risks. The project can be categorized into a roads sector, which bears multiple risk factors – *inter alia* demand risk. Besides demand risk, other risk factors (e.g. regulatory risk) should be taken into account to develop a bankable financing scheme. (ii) *Country-specific risk factors* also need to be considered.

Source of risk	Category	Sub-category	Description	Risk bearer	Risk mitiga- tion
	EDC	Administra- tive/ regulato- ry risk	Delayed acquisi- tion of the right- of-way or other administrative process; and legal hiatus	Grantor	Complete the procedure in advance, war- rant CA's legal authority
	Ert	Construction risk	Cost increase or schedule delay caused by incor- rect estimation or unforeseen events	Cost increase or schedule delayConcession- aireaused by incor- rect estimation or unforeseen events	
Project risk (Roads sector)	Financial	Interest rate risk	Increase in interest rate and interest cost due to unforeseen macroeconomic events	Concession- aire	Hedging, fixed-rate contract, swap
		Forex risk	Increase in financial cost due to unforeseen/ unhedged chang- es in foreign exchange rate	Concession- aire	Hedging, local currency funding
		Tax risk	Increase in tax rate that adverse- ly affects return on investment (RoI)	Jointly	Confirm a binding tax schedule in advance

Table 4.6: Potential risk profiles of the YEX Project

Source of risk	Category	Sub-category	Description	Risk bearer	Risk mitiga- tion
Project risk (Roads sector)	Opera-	Demand risk	Difficulties of demand fore- casting; and lower-than-fore- casted demand that adversely affects RoI	Jointly	Guarantee a certain level of revenue
	tional	0&M risk	Non-compliance with the speci- fied level of O&M mainly due to unforeseen high cost	Concession- aire	Contract with qualified firm, penalty deduction
	Inflation risk		Higher-than-pro- jected level of inflation rate that adversely affects RoI	Grantor	Allow toll rate adjustment
Country risk (Developing country)	<i>Force majeure</i> risk		Occurrence of unexpected and non-controlla- ble events (e.g. natural disaster, civil war)	Jointly	Use guaran- tee/ insurance program (MLAs or ECAs)
	Opportunity cost risk		Lower-risk-and- higher-return in- vestment options may exist	Concession- aire	Lower risk profile of infrastructure investment

Private investors typically show weak interest in developing countries' infrastructure projects. To foreign private investors, such projects are deemed highly risky; and to local private investors, they might be less attractive than other investment options. Given high benchmark interest rates and lack of experience in infrastructure investment, local private investors are less likely to invest in infrastructure projects. Table 4.6 summarizes such potential risk profiles of the YEX Project⁴³.

⁴³ The ten potential risk factors were identified based on desk research and review on roads infrastructure cases in foreign countries. Thus, this report should not be regarded as a final product, but as a starting point of further research. In order to figure out more realistic and reliable risk factors, robust due diligence is required.

Among the 10 potential risk factors listed in Table 4.6, the Myanmar government needs to focus more on five risk factors in the shaded rows – i.e., Administrative risk, Tax risk, Demand risk, Inflation risk and *Force majeure* risk. As in most roads infrastructure cases in other countries, private investors – especially foreign private investors – would expect the GoM's active role in mitigating these five risks. Thus, success or failure to invite qualified foreign private investors depends on the GoM's willingness and ability to control such risks.

Participation of competent foreign private investors, in turn, would be crucial to encourage local private investors' participation. This is because the presence of experienced foreign investors itself can be a sign of feasibility of the project, a prerequisite to lure Myanmar private investors. Therefore, the GoM should develop a comprehensive financing scheme to attract not only foreign private investors but also local private investors, as local private investors would be less likely to invest in the YEX Project without leading foreign private investors. In the remaining part of this section, we will propose a potential financing scheme which encompasses both foreign and local players (Section 4.2) and policy measures to mitigate relevant risks (Section 4.3).

4.4.2 POTENTIAL FINANCING SCHEME

Within a PPP model, private players are usually responsible for building a financing scheme as they have expertise in it. However, the GoM should have an idea on essential parts of the financing plan to lead a lengthy negotiation process. The financing scheme in Fig.4.9 can serve as a seminal plan for further discussion.



Figure 4.9: Potential financing scheme for the YEX Project using PF structure

In the potential financial scheme in Fig.4.9, US\$400 million is financed *mainly through foreign and local private sources.* The GoM's direct financial exposure to the project is limited to the equity investment of two state-owned banks (the Myanmar Investment and Commercial Bank (MICB) and the Construction and Housing Development Bank (CHDB)). In order to invite foreign and local investors, however, *the GoM should bear risks further in other forms* – e.g. a guarantee on loans and/or revenues of the project and completion of administrative procedure in advance. Table 4.7 summarizes the detailed financing scheme and the role of each investor.

Mode		Investor	US\$ million	Currency	Description
	Common stock	EPC consor-	80-145 (80-90%)	Local: MMK	- Consortium of local/ foreign construction company
				US\$	- Consortium signs a con- tingent loan agreement
Equity	Common stock	MICB, CHDB	10-30 (10-20%)	ММК	 The GoM participates in the project as an equity holder through MICB and/ or CHDB They sign a contingent loan agreement
	Pre- ferred stock	SPV (local FIs)	10-15 (5-10%)	ММК	 The GoM sets up an SPV; and local private FIs (top- three banks) participate in this SPV as LP The GoM grants incen- tives and safeguards to SPV (e.g. opt-out option)
Equity su	b-total		100-160 (25-40%)		
Debt	Senior loan or junior loan; or mixture of them	Tranche 1 (DFIs)	50-60 (15-20%)	US\$	- DFIs provide (i) senior loan with lower interest rate than other Tranches, or (ii) junior loan

Table 4.7: Detailed financing scheme and the role of each investor

Mode		Investor	US\$ million	Currency	Description
	Senior infra- struc- ture bond	Tranche 2 (SWFs, MLAs)	0-10 (0-5%)	US\$	 Only if it is predicted to be sold, issue limited amount of infrastructure bond When refinance the project after the three-phase-construction is done, try to increase the portion of bond financing
Debt	Senior Ioan	Tranche 3 (Foreign pri- vate FIs)	120-150 (45-50%)	US\$	 Foreign private syndication provides senior loan (highest priority) The GoM provides guarantee on this loan through MLAs and/or ECAs
	Senior loan	Tranche 4 (Local private FIs)	60-80 (20-25%)	ММК	 Local private syndication provides senior loan (highest priority) The GoM provides debt guarantee on this loan directly
Debt sub-total			240-300 (60-75%)		
Total			400 (100%)		

Equity financing

The potential financing scheme assumes three kinds of equity investors – i.e., a consortium of EPC companies, the GoM (through state-owned banks) and SPV composed of local FIs.

(i) EPC consortium: As in typical infrastructure projects, the EPC consortium needs to serve as a leading equity investor. Generally, infrastructure projects bear high risks during the construction period, so FIs tend not to invest in equity from early phase⁴⁴. Moreover, since the YEX Project is the first large-scale PF project in Myanmar, it would be difficult to invite

⁴⁴ Unlike in the early phase, many FIs participate in infrastructure projects as equity investors in operation phase.

equity investors not only from FIs but also from construction companies. Thus, the GoM needs to consider providing EPC consortium incentives, such as administrative assistance, to reduce uncertainty of the project. Also, as a large share of resources is procured locally in roads projects, local construction companies in the consortium need to be required to invest in Myanmar Kyat (MMK).

- (ii) The GoM via state-owned banks: Since this is Myanmar's first billion-dollar infrastructure project, the Myanmar government inevitably needs to bear high risks to assure private investors. Such voluntary exposure is widely used in developing countries to demonstrate confidence of government and attract private investors. For example, countries in Section 4.3 showed strong commitment by providing construction subsidies worth KRW358.4 billion (or 17 percent of whole financing) (Korea) and investing 25 percent of equity worth US\$112.5 million (Laos). In the YEX Project, MICB and CHDB can be utilized as financial channels for the GoM given their missions⁴⁵. In addition to equity investment, the GoM, together with the EPC consortium, needs to consider providing *contingent capital* for further comfort.
- (iii) Top-three local private banks: local private FIs especially, top-three private banks (KBZ, AYA, and CB) – need to be encouraged to participate in the project from an early phase. There are two reasons for this: (i) Local private FIs' presence as a shareholder would send a positive sign of the project's bankability to foreign investors. (ii) To enhance local private FIs' capability in PF, they should gain experience by actively managing PF projects as shareholders.

Despite such necessities, local private FIs would be less likely to buy in this scheme due to the fear of risk-taking. To ease local private FIs' anxiety, the GoM can propose to provide *equity investment through an SPV*⁴⁶ (See Fig.4.10). To be specific, the GoM – along with the support of the International Finance Corporation (IFC) – sets up an SPV (PEF) and the top-three banks invest in this PEF as *limited partners (LPs)*. The three banks can be insulated from investment risk but can enjoy both fixed returns on investment (RoI) and upside potential, because they participate in the project as LPs of PEF. To relieve risks further, the GoM can consider providing additional comfort, such as an *opt-out option*, which allows

⁴⁵ For instance, at a board meeting in 2017, the CHDB announced plans to provide unsecured loans to the winning bidders of government projects of up to 50 percent of the project costs.

⁴⁶ Under the current regulatory system, it is unclear whether local private banks can invest in this potential financing scheme using PEF.

exit when construction is completed⁴⁷. Given their needs to change asset portfolio (See Box 4.1), such profitable RoI potential backstopped by the GoM might persuade the three banks to join the project.

Figure 4.10: Illustrative structure: local private banks' equity investment in the YEX project via SPV



⁴⁷ If local private FIs choose to exit, various kinds of refinancing options can be considered. For example, state-owned equity holders (MICB and CHDB) or a new state-owned development bank, which is under discussion, can take over their equity. Or shareholders of SPV (YEX Company) would decide capital reduction and increase in debt.

Box 4.1. Local private banks' asset composition and profitability

According to research by Roland Berger, a German consulting firm, local private banks' assets has grown from MMK8 trillion in Mar 2013 to MMK20 trillion in Mar 2016. Among their assets, loans account for the biggest share (See Fig.4.11), marking around 61 percent (MMK12 trillion).



Figure 4.11: Size of local private bank's assets and their composition

However, due to restrictive interest rate band and relatively high inflation rates, loan business has not yielded sufficient profit. To be specific, currently, the Central Bank of Myanmar (CBM) sets a cap and a floor on lending rates at +3 percentage point and -2 percentage point of the CBM reference rate, respectively. Combined with inflation rates, such a restrictive interest rate band has made local private banks experience small profits or even losses in real terms.

Under these circumstances, local private banks have been driven to find new investment opportunities, and equity investment in infrastructure projects can be one such alternative.

Debt financing

The potential financing scheme assumes that debt can be financed through four tranches – senior loans by bilateral/multilateral development financial institutions (DFIs), senior bonds by SWFs, and senior syndicated loans by foreign FIs and local FIs.

(i) *DFIs' senior/junior loan:* Particularly in developing countries' infrastructure projects, DFIs' debt service plays a critical role in the whole financing scheme. This is because their presence *per se* is often interpreted as a sign of bankability, leading to participation of private investors. For example, in the NT2 Project (See Section 4.3), the Indonesian government leveraged MLAs' investment. To be specific, MLAs' significant amount of investment (US\$174)
million senior loan or about 15 percent of whole debt financing) attracted active participation from the private sector – private investors provided a US\$941 million senior loan, which is about 5.5 times bigger than MLAs' loan. In addition to this leverage effect, DFIs' debt service has multiple advantages in the light of debt terms and formation of syndicate (e.g. MLA's A/B loan structure and bilateral DFIs' leadership). Therefore, the Myanmar government should *secure a minimum level of investment from DFIs* as a prerequisite of the whole financing scheme and *examine the most effective use of DFIs' investment* from strategic point of view⁴⁸.

(ii) *Infrastructure bond:* For long-term financing, bonds are one of the ideal financing instruments in terms of financing cost and stability. The use of bonds allows governments and project developers to tap into broader financing sources, including long-term institutional financiers (e.g. sovereign wealth funds (SWFs) and pension funds). For these reasons, bonds, along with loans, are one of the two popular debt financing tools in developed countries' infrastructure projects. However, *entry barriers* exist in the bond market. That is, due to inherently high risks of infrastructure projects, bond issuers (project developer or host governments) should have a stable and reliable credit history. For this reason, project bonds have been utilized mostly in developed countries.

The GoM could tap into investors' intent on project bonds for the YEX Project both in foreign and local markets. First, in major foreign markets (London and New York), it would be less likely to succeed in bond financing given Myanmar's sovereign credit history. Moreover, global financial markets are not favourable to developing countries – i.e., since the beginning of tapering by the United States in 2014, risk appetite of institutional investors has been gradually reducing. Under these circumstances, it would be difficult to hold foreign investors' attraction to the YEX Project bonds. Second, a local corporate bond market does not yet exist. Thus, it is not legally possible for a project developer (YEX company, SPV) to issue bonds. If the GoM gives special permission to the YEX Project, such legal issues might be resolved. However, considering that even the GoM issues only relatively short-term bonds (3-year and 5-year treasury), it would be difficult to find sufficient demand for long-term project bonds issued by the SPV. Alternatively, the GoM could consider *directly issuing special bonds* that provide exceptional benefits to investors (See Box 4.2). This is more feasible option than corporate bonds, but it also needs legal and institutional foundations to issue and circulate these bonds.

⁴⁸ For instance, if private participation is predicted to be low, the GoM might choose to invite the largest amount of DFIs' investment in any mode. On the other hand, if private investors require DFIs' backstop, the GoM might ask DFIs' mezzanine investment.

Taking these circumstances into account, instead of bond financing, it could be a viable option to *increase the portion of loan financing*. For example, the GoM can consider (un)officially asking bilateral DFIs' investment during high-level meeting with major investment partners – e.g. China, Japan and Korea. Or, if local private FIs are proved to have sufficient will and financial capability, the GoM can encourage their long-term loan financing.

Box 4.2. Private Activity Bond (PAB) of the United States

Some governments issue special bonds to attract private investors to qualified infrastructure projects. For example, in the United States, municipalities are allowed to issue this kind of bonds, called Private Activity Bonds (PABs).

PABs are debt instruments issued by state or local governments in which bond proceeds are used to finance a qualified project where there is significant private involvement. Such qualified projects are stipulated in Title 26 of the United States Code (26 U.S.C.). This bond usually serves as a catalyst to attract private investments, because interest dividends on PABs are exempted from federal tax thus reducing overall financing cost. Fig.4.12 shows that municipalities have issued about US\$109 billion PABs per annum during the 2006-2015 period.



Figure 4.12: PAB issuance by year

Despite its advantages, it has critical disadvantages: The greater volume of taxexempt PABs often leads to higher cost of financing traditional government activities. This is because when the supply of tax-exempt PABs increase, governments should raise interest rates to lure investors into investing in government bonds other than PABs. For this reason, the Myanmar government should be cautious of using this instrument. Considering the high treasury rate (higher than 9 percent per annum), PABs could create considerable fiscal burden to the GoM.

(iii) *Foreign private FIs' syndicated loans:* Due to the lack of a mature local financial market, developing countries depend heavily on external funding. One

of the external funding sources is foreign private capital, which often occupies a large portion of debt financing. For example, in the Sarulla GPP Project, foreign private syndication provided 40 percent (worth US\$328 million) of the entire debt; and in the NT2 Project – even when Thai syndication is categorized into local financing⁴⁹ – foreign private syndication accounted for about 28.8 percent (worth US\$326 million) of the entire debt (See Section 4.3).

Considering that the role of local private FIs is expected to be limited in the YEX Project, foreign private syndication needs to serve as a *main debt provider*. The potential financing scheme assumes a US\$120-150 million senior loan, accounting for around 45-50 percent of the entire debt service, from them. What the GoM needs to keep in mind is its financing cost. Since foreign private capital usually requires strong guarantees in developing countries' projects⁵⁰, the GoM needs to provide extensive comforts (e.g. PRG), which boost financing costs. However, despite such cost disadvantages, foreign private syndication is inevitable not only to fund the YEX Project but also to draw foreign investors' attention to the Myanmar infrastructure market in general. Hence, the GoM needs to decide the optimal level of foreign private syndication's participation⁵¹ that can strike the balance between the two policy purposes.

(iv) *Local private FIs' syndicated loan:* Last, but the most important avenue of debt financing is local private syndication. In the YEX Project, local private FIs' participation is important for three reasons. First, given the characteristics of roads projects, local procurement accounts for large portion of construction costs. Therefore, to avoid *currency mismatch*, it needs to secure sufficient amount of MMK debt⁵². Second, the financing cost of local private syndication is relatively cheaper than that of foreign private syndication. Since local players are good at managing local risks, they usually require lower risk premiums which results in *lower financing costs*. Third, in order to implement upcoming infrastructure projects smoothly, local FIs need to assume a constructive role. However, Myanmar FIs – even the top-three banks – are not ready to perform such roles mainly due to lack of experience. Thus, they should participate actively in the YEX Project to *deepen understanding* on infrastructure projects and PF schemes.

⁴⁹ As noted, the NT2 Project is a cross-border project of Laos and Thailand. The dam is located in Laos, but major off-taker (about 95 percent of generation capacity) of electricity from this dam is Thailand. Thus, US\$615 million debt from Thai private syndicate would be classified into a local source. If it is classified into a foreign source, share of foreign private debt soars to 83.2 percent.

⁵⁰ In the Sarulla GPP Project, JBIC provided full guarantee; In the NT2 Project, the WBG and three ECAs jointly provided full guarantee (See Section 3).

⁵¹ If the portion of foreign private syndication decreases, alternative funding source would be DFIs. Since the sizes of local banking sector and capital market are limited, it is less likely to expect additional local financing.

⁵² For example, in the NT2 Project, about 56 percent of debt was financed from local private FIs denominated in Thai Baht. It contributed the project to hedge currency risks during construction phase.

The potential financing scheme assumes that local FIs⁵³ contribute 20-25 percent (worth US\$60-80 million or MKK81-108 billion) of total debt financing. Although more than 10 commercial banks operate in Myanmar, non-top-three banks are not capable of participating in infrastructure projects given their asset size and organizational ability. Ultimately, promising local candidates that can form a syndication are narrowed down to top-three banks (KBZ, AYA and CB). However, considering the limited asset size of the top-three banks (estimated about MMK12-13 trillion in March 2016), MKK81-108 billion loan to a single project could cause serious financial distress. The GoM needs to consider backstopping their investment and providing attractive incentives to lure their participation.

Necessity of risk mitigation

It is evident that most financiers are less likely to join the YEX Project unless sufficient level of risk mitigation is provided by the Myanmar government and/or external guarantors. Such expectations are common to all infrastructure projects, so, even in developed countries, risk mitigation is regarded as an essential part of PF.

For success of the YEX Project, the Myanmar government needs to provide strong risk mitigation for two reasons. First, since Myanmar has no sovereign credit record, the project would obviously be classified into the highly risky category without risk mitigators. Second, in order for success of upcoming infrastructure projects, the GoM should gain a positive first impression from investors. This is because the demonstrated success of the YEX Project will be an important contributor to future infrastructure projects. Considering these two points, the GoM's policy supports should be regarded as an *indispensable* part of a financing scheme. In the next part, required policy supports to mitigate risks and to incentivize investors are discussed.

4.4.3 RISK MITIGATION: POLICY SUPPORT

In Section 4.1, five risk factors – Administrative risk, Tax risk, Demand risk, Inflation risk and *Force majeure* risk – that need to be mitigated by the GoM were identified (See Table 6); Section 4.2 assessed that additional incentives are required to lure local private FIs. In this section, four policy tools are explored to address risks and to incentivize investors (See Table 8): (i) Administrative/

⁵³ FIs encompass a broad range of business operations, including banks, insurance companies, brokerage firms, and trust companies. However, in this paper, when this term is used to explain Myanmar financial market, it indicates only 'banks'. FIs other than banks are excluded, since they do not have capabilities to participate in infrastructure projects.

regulatory support would address uncertainty which arises from legal/ institutional ambiguity; (ii) Cost (revenue) support could reduce various risks that materially affect RoI; (iii) Guarantee programs would provide reliable comforts against unforeseen events; and (iv) Multiple incentives/comforts might help change risk profile of the YEX Project and attract more local private FIs.

Policy tools	Description	Risks addressed	Beneficiaries	
Administrative/ regulatory support	 Complete major administrative process in advance (e.g. ROW acquisition) Establish an <i>ad hoc</i> organization dedicat- ed on infrastructure projects 	Administrative/ Regu- latory risk	Concessionaire, investors	
	- Enact and amend rele- vant laws			
Cost (revenue) support	- Guarantee fixed rev- enue stream condi- tional on quality of the service	Demand risk, Forex risk, Inflation risk, Tax risk	Debt investors	
Guarantee on in- vestment	 Provide PRG to foreign private debt providers through MLAs/ECAs 	<i>Force majeure</i> risk	Debt investors	
- Provide financial incentives to local pri- vate FIs (e.g. opt-out option)Incentive/comfort to local private FIs- Provide regulatory comfort to local banks (e.g. Basel III and bank- ing supervision)		Regulatory risk, Oppor- tunity cost risk	Local private FIs	

Table 4.8: Policy tools to mitigate risks and incentivize investors

Administrative/regulatory support

In a roads project, administrative issues tend to be a principal source of uncertainty. For example, typically, a roads project spans a huge area, so it faces massive land acquisition issues. Also, since new roads cause increases in traffic, they inevitably need to go through traffic/environmental impact assessments. Such administrative requirements may cause delays and cost overruns, leading to high financing cost.

It usually creates a problem in developed countries, because their legal process on administrative issues tend to be much stricter than developing countries' ones. However, despite the relatively generous stance of developing countries, it is still one of the major sources of uncertainty for two reasons. First, in some developing countries, it is *unclear* which regulatory agency is in charge of which regulation. Second, there is a *risk of reversal of official permission*. In other words, due to a lack of intra/inter-ministry communication and/or weak institutional contexts, unforeseen extra administrative requirements are likely to pop up and sometimes even government's authoritative permission can be overturned.

Such uncertainty exists in the YEX Project as well, and it would drive up financing costs. However, such uncertainty can be effectively addressed with low-cost administrative/ institutional solutions:

- (i) Complete major administrative processes in advance: Since the public sector has comparative advantages in dealing with administrative issues, the GoM needs to satisfy administrative process/requirements before signing a concession agreement (CA)⁵⁴. Such process/requirements would include ROW acquisition and various kinds of assessment, including traffic/environmental impact assessment. To minimize the uncertainty, the GoM needs to collect exhaustive lists of administrative process/requirement from all relevant government agencies⁵⁵ and provide *irreversible administrative assurance* to investors. Considering legal ambiguity and practical difficulties in satisfying administrative requirements, *inter alia* land acquisition, the GoM needs to seriously consider *completing the relevant processes before signing a CA and/or a financing document.*
- (ii) Establish the authoritative ad hoc organization: Currently, an official negotiating representative from the Myanmar government for the YEX Project is the Ministry of Construction (MoC). However, investors would not have confidence in pledges of the MoC, since many other ministries e.g. Ministry of Planning and Finance and Ministry of Transport and Communications are involved in this project. Such a lack of confidence often leads to higher risk premiums and higher financing costs. To reduce such risk the GoM can consider establishing a pan-governmental ad hoc committee under the Office of the President, which should perform as an 'exclusive external representative and guarantor' for the YEX project. Later, the GoM can develop this committee into permanent organization by assigning it infrastructure projects in general.

⁵⁴ For example, in roads projects, most governments often take responsibility for ROW acquisition and bear the relevant cost.

⁵⁵ It encompasses both the Central and the Yangon Regional government agencies.

In addition to administrative uncertainty, regulatory uncertainty⁵⁶ can drive up financing costs. The Lao government was faced with a similar situation, and it addressed this problem by granting parliament's approval to the CA (See Section 4.3)⁵⁷. It is one of the strongest forms of comfort to investors, but is likely to trigger a political backlash. The least controversial option to deal with this problem is to *legislate relevant laws before signing a CA*. Given the progress of the YEX Project⁵⁸, the GoM still has time for legislation. Thus, it would be a better option to identify potential legal hiatus and flaws and fix them through legislation.

Cost (revenue) support

In PPP roads projects, what is at the heart of risk profile is cost (revenue) risk – which originates from uncertainty in multiple factors, including demand, foreign exchange rate (forex), inflation rate and tax schemes. Government attempts to minimize its exposure to such uncertainty by transferring them to the private sector; in return, the private sector (concessionaire), requires from a government risk mitigation measures, such as guarantees on minimum traffic volumes or minimum revenues. To reconcile these two conflicting interests, a government should develop a policy that can minimize government's risk while providing sufficient support to attract investors.

As a policy support, three conceptual options can be explored: (i) Minimum Revenue Guarantee (MRG): guarantee minimum revenue based on demand forecast, (ii) Revenue Risk Sharing (RRS): guarantee minimum revenue comparable to the benchmark (e.g. treasury rate), and (iii) Availability Payment (AP): guarantee fixed revenue conditional on quality of service – not on demand. Table 4.9 summarizes important features of these three alternatives. Considering the risk profile of the YEX Project and pros & cons of the three policies, AP can be the most realistic and appropriate option for three reasons:

(i) The GoM needs not only to provide strong backstop but also to reduce fiscal uncertainty: On the one hand, a sufficient guarantee is the essential prerequisite to finance the YEX Project. On the other hand, the GoM should avoid excessive fiscal uncertainty. To harmonize these two purposes, the GoM needs to provide an attractive remuneration package while capping its downside risks.

⁵⁶ If the YEX Project follows a financing structure roughly explained in this paper, legal questions would arise from several points, such as a BOT structure, independent state of SPV and preferential treatment on debt services to infrastructure projects by local banks.

⁵⁷ Such supra-constitutional measure was possible because the NT2 Project was vital to improve dire economic condition of Laos.

⁵⁸ The GoM invited expression of interest in May 2018. Considering a usual negotiation process, it would take additional two to three years to sign a CA and a financing document.

Policy option		MRG	RRS	АР
Trigger of support		- When actual operation revenue (AOR) is less than expected operation revenue (EOR)	- When actual opera- tion revenue (AOR) is less than the agreed percentage of risk-sharing revenue (RSR)	- When conces- sionaire provides services, which satisfy agreed level of quality
Amount of support		(EOR) – (AOR)	(RSR) – (AOR)	Pre-fixed amount
Tall	Setter	Private	Private	Public
1011	Collector	Private	Private	Public or private
Fiscal impact	Amount of burden	- Depends on accu- racy of revenue (demand) forecast	- Depends on the pre-fixed risk-shar- ing ratio	- Depends on the level of pre-fixed payment
	Uncertainty	High	Moderate-to-low	Low
Attractiveness to investors		High	Low	Moderate
Pros & Cons	Pros	 Provide the stron- gest backstop of the three options If the demand forecast is not overestimated, it creates no or small fiscal burden to a govt 	 Address moral hazard by making concessionaire share demand risk Fix the largest amount of govt's support 	 Fiscal burden is pre-fixed since govt and investors set payment in advance Govt can retain toll-setting right
	Cons	 Concessionaire tends to overes- timate demand, causing huge fiscal burden to a govt Govt has limited options agst. con- cessionaire's toll increases 	- Without reliable govt's credit- worthiness, it is difficult to attract investors. Thus, it would not be a plausible option to developing countries	 Concessionaire is not incentivized to maximize traffic volume (revenue) Demand risk falls exclusively on govt

Table 4.9: Three policy options to address cost (revenue) risk

First, strong support can be offered through the *MRG* scheme. It would be a safe investment for the concessionaire, because most demand risk is born by the GoM. If the demand forecast is accurate, demand risk would not materialize and no fiscal burden would be created. However, in general, it is challenging to have reliable long-term forecasts in developing countries due to a lack of reliable traffic data. Such deviations could worsen within an MRG scheme, because MRG incentivizes the concessionaire to *overestimate* demand. Table 4.10 shows that demand is

overestimated by around 188.0 percent in five roads projects in Korea, causing a US\$101.8 million fiscal burden in 2010. Given such downside risk, the GoM should be cautious to adopt this option.

Road*		IIAE	IC Bridge	MH Tunnel	WJS Tunnel	MWS tunnel	Total
	Forecast	93,094	35,425	55,006	35,722	52,127	271,374
Demand (Unit/	Actual	53,490	25,549	34,705	10,276	20,292	144,312
day)	Overesti- mation 1	174.0%	138.7%	158.5%	347.6%	256.9%	188.0%
Fiscal supp million)	ort (US\$	82.7	3.4	4.9	4.8 6.0 101.8		101.8
* IIAE: Incheon International Airport Expressway		IC Bridge: Incheon Bridge		MH Tunnel: Munhak Tunnel			
WJS Tunnel: Wonjuksan Tunnel			MWS Tunnel: Manwolsan Tunnel				

Table 4.10: Demand forecast and fiscal support in five selective roads in
Korea (2010)

Second, the *RRS structure* would offer two benefits to the GoM. 1) The GoM can share demand risk with the concessionaire. For example, Fig.4.13 assumes that the GoM agrees to provide revenue support only when the actual operation revenue (AOR) is higher than 40 percent of the risk-sharing revenue (RSR)⁵⁹. In year 1 and 3, the GoM is not obliged to support the concessionaire; only in year 2, it is obliged to provide US\$30 to guarantee the pre-fixed RSR (US\$70). 2) Since the GoM takes demand risk only when the AOR is higher than the agreed threshold (US\$28), it can fix the largest fiscal burden. Conversely, such advantages to the GoM suggests disadvantages to the concessionaire – i.e., insufficient backstop. For this reason, it would not be a negotiable option.





⁵⁹ Government and concessionaire can set RSR through negotiation – e.g. treasury + α , debenture + α or LIBOR + α .

Third, the *AP structure* would be a compromising option between the concessionaire and the GoM. In some senses, it is similar to MRG because demand risk is largely transferred to the GoM⁶⁰. But, compared to the MRG, fiscal uncertainty is lower under the AP scheme because the government and the concessionaire would set maximum payment in advance. Therefore, the AP scheme *caps downside risk* and *guarantees budget certainty* for the GoM; and it guarantees a *stable revenue stream* for the concessionaire. One serious potential problem of the AP scheme is materialization of demand risk. Once the risk is realized, risk should be taken by users of Yangon Expressway or general taxpayers⁶¹. However, if the traffic of Yangon Expressway is expected to be sufficient, the GoM would keep any upside beyond the availability payment as well.

(ii) *The GoM needs to retain rate-setting authority:* Spearheaded by the YEX Project, a series of roads projects will be implemented in and around Yangon. If the GoM retains rate-setting rights using AP scheme, it can charge optimum rate from a holistic view. This is because an AP concession enables the government to apply a *universal tolling policy*. Under this tolling framework, loss from some projects could leverage profits from other projects.

Let's assume that Yangon has three toll roads (α , β and γ). If the rate-setting right is reserved for each concessionaire, it would charge a separate rate that can maximize its own revenue. Even though optimum traffic can be achieved at the lower rate, concessionaires would not care about this because their goals are to maximize revenue from their own roads. On the other hand, if the GoM holds ratesetting right, it can charge a *universal rate* that achieves optimum traffic in all the three roads. For example, the GoM would set a lower rate than a separate concessionaire, although this rate creates loss in road β . Such scheme is possible because the GoM, as a single concessionaire, can divert profits from road α and γ to compensate for loss from road β .

Given the scale of the entire roads projects in Yangon region, the GoM needs to retain rate-setting rights. Box 4.3 presents an illustrative case in the United States⁶².

⁶⁰ If a concessionaire meets certain availability standard – measured by quality of infrastructure – it can receive agreed amount of payment regardless of demand.

⁶¹ If the GoM decides to increase toll, demand risk would be born by users; or if it decides to raise tax (e.g. fuel tax), the risk would be spread through the general public.

⁶² Due to social needs on preserving rate-setting right for the government, AP concession is frequently used in transportation projects. For example, in 2014, 89 percent of AP concessions – eight out of nine cases – were transportation projects in the United States.

Box 4.3. AP concession on Goethals Bridge

In 2013, the Port Authority of New York and New Jersey (PANYNJ) signed a financial deal on an AP concession to rebuild Goethals Bridge. Within an AP scheme, PANYNJ could maintain the universal toll policy that applied on its other five river crossings. This universal policy enables PANYNJ to better manage mobility across the regions and to cross-subsidize among its six bridges.

(iii) *The GoM needs to enhance stability of a deal structure:* An unstable structure would raise financing costs and require strong backstop from the GoM, causing fiscal burdens and uncertainty. The GoM, therefore, needs to adopt an option that can stabilize a deal structure.

The AP scheme would be useful to address this need for two reasons. First, one of the biggest advantages of the AP structure is that it allowed the concessionaire to *avoid demand and revenue risk*, thereby permitting a *lower rate of return*. This would translate into lower availability payments, which relieves the fiscal burden of the Myanmar government. Second, under the AP scheme, *cash flows are more stable* than with the other schemes (MMG or RRS). Also, the AP scheme transfers demand risk from the concessionaire to the GoM. Thus, the cost of capital can be lowered and debt service requirements – e.g. debt service coverage ratio (DSCR) and loan life cover ratio (LLCR) – can be eased as well. It would enhance flexibility of the concessionaire (SPV) and mitigate its insolvency risks.

Given these three advantages, the AP scheme can be the most viable revenue supporting policy to reduce demand risk and ease the GoM's fiscal burden and uncertainty. However, this option is merely a *prototype*. This prototype should be customized to reflect distinctive features of the YEX Project. For this, thorough due diligence and a round of negotiations among relevant interested parties are required.

Guarantee on investment

A guarantee delivers benefits not only to foreign investors but also to the Myanmar government. On the one hand, a guarantee is a *comfort for investors*. It is the essential instrument to assure foreign creditors, which contributes about half of debt financing in the potential financing scheme. For example, in NT2 Project, the Lao government provided full guarantee (worth US\$326 million) through MLAs and ECAs to invite foreign debtors. Given the risk profile and uncertainty of the YEX Project, it would be difficult to attract foreign investors without offering reliable guarantees.

On the other hand, a guarantee is a useful instrument for the GoM as well. Because it could mitigate certain kinds of risks, borrowing terms can be improved, leading to *less fiscal burden and uncertainty* to the GoM. For instance, Table 4.11 shows that borrowers enjoyed such benefits – longer maturity and lower interest rate – with the WBG's guarantee products.

Guarantee product	Partial Risk Guarantees				Partial Credit Guarantees			
Case	Case 1 (Vietnam)	Case 2 (Bangladesh)		Case 3 (Thailand)		Case 4 (The Philippines)	
	Before	After	Before	After	Before	After	Before	After
Debt matu- rity (yrs)	5	16 (+11yrs)	1	14 (+13yrs)	0	10 (+10yrs)	7	15 (+8yrs)
Interest rate (%)	5	2 (-3%p)	3	2 (-1%p)	8.5	2.9 (-5.6%p)	3	2.5 (-0.5%p)

Table 4.11: Benefits of the WBG's guarantee products

A guarantee helps to cut financing cost, and, in turn, relieves insolvency risk and enhances stability of a deal. Hence, the GoM should consider leveraging guarantee programs. For this, the GoM needs to investigate guarantee products from various MLAs and ECAs to develop an optimal combination.

Incentive/comfort to local private FIs

In addition to the three policy supports explored so far, the Myanmar government needs to consider additional incentives or comforts to encourage local private FIs' participation. Their participation is important for two reasons. First, it is a *sine qua non* to minimize forex risk and lower overall financing cost. Second, and more importantly, local private FIs should perform a pivotal role in future infrastructure projects, but, currently, none of them are qualified to do so. To gain experience and increase exposure to infrastructure projects, local private FIs should partake in the YEX Project.

However, considering their lukewarm but stable business model and lack of experience in infrastructure projects, local private FIs would not be necessitated to participate in the YEX Project. Thus, to induce their participation, the GoM needs to consider *changing their risk-return profiles* by providing multiple incentives. Table 4.12 presents five potential policy options that can be used for this purpose.

Policy option		Description	Expected impact	
Project-specific	Provide opt-out option on equity investment	 Provide flexibility to equity investors: 1) stay in if investment is ex- pected to be profitable; or 2) opt-out in other ways around 	- Mitigate risks from long-term exposure to the YEX Project	
	Provide preferen- tial treatment on future infrastruc- ture investment	- Give investors in the YEX Project priority in future infrastructure deals	- Attract FIs interested in portfolio diversi- fication	
General	Address regulato- ry uncertainty	- Share the CBM's eval- uation on credit risk of each infrastructure project as a guideline	- Reduce supervisory risk	
	Relieve interest rate band require- ment	- Lift or relieve interest rate band requirement for debt investment in infrastructure projects	- Hold investors' attraction to infra- structure projects by improving revenue	
	Adopt preferential tax program	- Exempt or reduce tax on return earned from infrastructure invest- ment	potential	

Table 4.12: Potential policy options to attract local private FIs

Although only the top-three local private banks are presumed to be eligible for the infrastructure project financing, the Myanmar government should be careful not to officially restrict the policy targets to the top-three banks. Such discrimination would discourage potential participation from non-top-three banks. However, the GoM needs to put in discriminative efforts incognito to retain the top-three banks' participation to the YEX Project. The GoM can consider having a *closed meeting* between high-level officials from the Central Bank and top-three banks' CEOs. Through the meeting, the GoM can deliver to the CEOs its firm commitments on success of the YEX Project; it also underlines that infrastructure projects would be new and lucrative investment opportunities, replacing their old-fashioned personal-loan-centred portfolio.

As a contingency plan, the GoM needs to have policy instruments up its sleeves. For example, the GoM could consider providing powerful inducement, such as voluntary tax compliance (VTC) program. As explained in Box 4.4, since this policy would create mixed impact and trigger a possible political backlash, it should be a last resort. In addition to such carrots, the GoM also needs to prepare for legal but irresistible sticks to draw the top-three banks' participation.

Box 4.4. Voluntary tax compliance (VTC) program

(AML) watchdog under the Organization for Economic Co-operation and Development (OECD), gives concise definition of voluntary tax compliance (VTC) program: "VTC program refers to any program that is designed to facilitate legalization of the taxpayer's situation vis-à-vis funds or other assets that were previously unreported or incorrectly reported".

Countries usually adopt this policy to increase tax revenue by legalizing black assets. Besides such policy purposes, VTC programs can be used to encourage investment in the targeted area. For example, the Myanmar government might offer tax amnesty to attract local private banks' investment in the YEX Project. According to the study by the Global Financial Integrity, in Myanmar, the underground economy occupied circa 53.2 percent of the official economy during the 1995-2013 period (See Fig.4.14). Given such size, a considerable amount of underwater liquidity from multiple sources – including local private banks – might be incentivized to invest in the project.



Figure 4.14: Myanmar's underground economy by year

However, the GoM should be cautious about its side effects. First, it could undermine the 'culture of paying appropriate tax'. If the VTC program is not accompanied with measures to improve tax compliance, it would make people and businesses expect another tax amnesty in the future. Second, it would provoke concern of FATF/OECD. Myanmar had been under financial sanction of the United Nations partly because of its incompetent AML system. Although the sanction was lifted in 2016, VTC program would likely to draw attention of FATF/OECD, because such program is deemed vulnerable to AML risks.

4.5 CONCLUSION AND RECOMMENDATIONS

This paper explained various financing instruments that have been used in infrastructure projects. Initially such financing tools were adopted only in developed countries, but they have become popular among developing countries since the1990s. Through the analysis of infrastructure projects in Indonesia, Korea and Laos, the following three policy implications were found:

• Due to the shortage of local capital and local FIs' inexperience, *foreign investors' pivotal role is inevitable.*

- Despite lack of capability, *local private FIs' participation is required* to mitigate a certain kind of risk and bolster bankability of a project (e.g. forex risk).
- To attract both local and foreign private investors, government should provide *strong guarantee packages*.

Based on these lessons, a potential financing scheme for the 1st phase of the YEX Project was explored. The potential plan adopted a PF scheme proposing to raise US\$400 million – US\$240-300 million (60-75 percent) from foreign investors and remaining US\$ 100-160 million (25-40 percent) from local investors. This paper highlighted that the Myanmar government should offer *strong policy support* to mitigate inherent risks of the YEX Project. Such risk mitigators may have to range from administrative/regulatory support to cost (revenue) support and the provision of guarantee programs. Besides these supports, additional carrots and sticks would be required to make local private FIs, especially the top-three banks, invest in the YEX Project.

While implementing the potential financing scheme and negotiating with interested parties, the Myanmar government should pay careful attention to the following four guidelines and caveats:

- An *ad hoc committee* with broad representation from the relevant executive and legislative branches should be established as soon as possible. This special-purpose committee should be authorized as an exclusive representative of the Myanmar government. It would help not only to reduce administrative uncertainty but also enhance internal capability and negotiating power of the government.
- The top-three local private banks should be handled *subtly but firmly*. The top-three local banks should invest in the YEX Project not only for the success of the project, but also for their competitiveness. Thus, the Myanmar government may have to draw their participation by any means. To demonstrate serious attention of the government, *high-level officials of the CBM* should lead negotiations and design an effective strategy.
- The potential financing scheme should be *publicly elaborated by senior political figures* in due time. Since a substantial number of the general public will be involved with the YEX Project and subsequent infrastructure projects it is important to gain public understanding beforehand.
- Legal hiatus needs to be addressed by *legislation,* not by Presidential decree. Presidential decree is a quick fix but would not be sufficient to

overcome foreign private investors' pessimism and to substantially reduce funding cost.

This paper also noted that it would be *premature to utilize bond financing* for the YEX Project. But, the necessity of bond financing as an alternative debt funding source is generally acknowledged. Particularly, as the global regulations (e.g. Basel framework) on the banking sector have become stricter, the importance of bond financing has gradually increased. Despite such needs, most developing countries have not utilized bond financing in infrastructure projects due to volatile economic/political situations. To foster infrastructure bond financing, the development of local capital markets should be given top priority. The main areas of focus would include building up institutional infrastructure and stimulating the capital market to increase its demand for long-term assets. To develop effective and detailed policies, further research may have to be conducted.

Finally, the Myanmar government should note that there is *no 'free lunch'* in infrastructure PPPs. Since the concessionaire pays the upfront costs, it could lose sight of this reality. But, even within a perfect risk sharing structure, the cost of an infrastructure project must eventually be paid either by the taxpayer or the user. To avoid such risks, it is important not to support non-essential and/or unproven projects by establishing *objective and fair appraisal processes* independent from politics and rent-seeking bureaucrats. If their electoral concerns or personal interests are involved in infrastructure PPPs, it would inflict severe long-term financial damage to the Myanmar government and the taxpayer.

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USING INCLUSIVE INFRASTRUCTURE TO PROMOTE PRO-POOR GROWTH IN SPATIAL DEVELOPMENT INITIATIVES

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SUMMARY

Spatial development initiatives (SDIs) are large-scale infrastructure projects that include transportation arteries, industrial zones, Special Economic Zones, economic corridors, or even entire new cities. Myanmar already has numerous SDIs, principally national highways and industrial zones, with several megaprojects in the pipeline. However, SDIs should not only consist of economic infrastructure, but also inclusive infrastructures (which refers to both social and entrepreneurial infrastructure) to realize their full potential and promote propoor growth. Planning for inclusive infrastructure is becoming ever-more pressing as Myanmar moves ahead with negotiations for the potentially massive China-Myanmar Economic Corridor. Although costly, inclusive infrastructure can be financed using innovative financing approaches that, for example, lock private investors and third-party lenders into building relevant infrastructures against future value gains from land sale and building tariffs.

5.1 INTRODUCTION

Myanmar spends heavily on infrastructure in a bid to transform the economy. Roughly a quarter of the Union government's expenditure goes to electricity, transport and communication (although the vast majority is allocated to electricity) while state/region governments allocated nearly half their budget on building & maintaining roads in Fiscal Year 2016-17 (World Bank 2017; MOPF Citizens Budget 2017, Valley et al. 2018: 17). Government infrastructure spending is set to increase, however, as it has pledged to roughly double electricity production within the next three years and pave about 1300 miles of the national & rural road network (Global New Light of Myanmar, April 2018). Meanwhile, spatial development initiatives (SDIs) such as the China-Myanmar Economic Corridor (CMEC) and New Yangon City promise to deliver a whole slew of large-

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scale infrastructure developments which includes highways, railways, sea ports, oil pipelines and industrial zones. These spatial initiatives, when systematically designed and implemented, harbour tremendous potential to spur economic growth and radically transform the physical space of Myanmar. The next few years are therefore a watershed moment for building inclusive, prosperous and liveable spaces in Myanmar that can benefit all its citizens, which requires prudent spatial planning.

5.2 ECONOMIC, SOCIAL AND ENTREPRENEURIAL INFRASTRUCTURE

There are many different definitions of 'infrastructure,' which generally includes transport infrastructure (roads, bridges, railways, airports, sea ports, water ways, etc.), energy infrastructure (power stations, dams, oil & gas pipelines, transmission lines) and communication infrastructure (telecommunication networks, phone lines, fibre optic cables), and so on (see Prud'homme 2004). All of these are commonly nestled under the term *economic infrastructure*. There are also many kinds of *social infrastructure* as well (i.e. healthcare, education, affordable housing, public parks, community centres, water and sanitation). Small commercial spaces such as market squares and food courts that promote micro-enterprises can also be considered social infrastructure, while institutions that promote SME growth (business incubators, one-stop business registration centres, financial institutions and research facilities) can be termed "entrepreneurial infrastructure."

As pointed out by Hein (2018) in the previous edition of the *Myanmar Economic Bulletin*, infrastructure has a myriad of benefits on both productivity and also overall human flourishing. While transportation infrastructure leads to a rise in real incomes through facilitating trade efficiency, energy and communication infrastructure increases manufacturing output but also human development (Hein 2018: 98). Many studies have shown a significant and positive effect of public investment in economic infrastructure on both growth and productivity (e.g. Munnell and Cook 1990, Nourzad 2000, Shioji 2001, Teruel and Kuroda 2005, Fedderke and Bogetić 2006). This relationship holds true for both developing and industrialized countries (Nourzad 2000). Similarly, social infrastructure makes a direct impact on social development but is also an important supply-side input that improves the quality and mobility of labour (Gnade et al. 2017). The direct social benefits of building more hospitals and schools are self-evident, but this generates a spillover by ensuring that the labour

force is healthier and better trained.⁶⁴ Social infrastructure should also include opportunities for micro-enterprises, such as market squares and food courts, to help create a built environment that is commercially dynamic and vibrant.



Figure 5.1: The Solid Waste Management Chain

Diagram of the solid waste management chain as an example of basic sanitary infrastructure. Without proper investment in sanitation, solid waste (garbage) and liquid waste (sewage) will accumulate in urban spaces which pose a huge public health hazard. Source: Author.

Taken together, social and entrepreneurial infrastructure can be referred to as *inclusive infrastructure*. Pursuing inclusive infrastructure development leads to further spillovers from large-scale infrastructure investments by creating economic opportunities for lower socio-economic groups, and therefore promotes pro-poor growth (CDIA 2016).

In contrast, failure to plan for inclusive infrastructure is likely to create further exclusion of marginalized socio-economic groups (Rajé 2018). It has traditionally been assumed that infrastructure spending creates development for everyone through a trickle-down effect. However, recent research has shown that especially transport investment (i.e. roads, railways) tends to benefit the 'non-poor' while side-lining or downright harming the poorest classes, and that "investments must [therefore] be consciously designed to avoid further impoverishing poor people" (Starkey and Hine 2014: 4). If pro-actively planning the current and future needs of poorer socioeconomic groups, potential displacement can be mitigated.

⁶⁴ In a similar vein, public transportation infrastructure is also a vital investment target as cheaper, quicker commutes make the population happier, healthier, and more productive. It can therefore be considered as either social or economic infrastructure.

Although some studies indicate that public infrastructure investment in developing countries is more beneficial than private investments (Ram 1996), the immense infrastructure investment gap in Myanmar necessitates the deployment of private financing as well as overseas development assistance, or Official Development Aid (ODA) (Hein 2018). For economic infrastructure projects that are profitable, private-sector led investments can be done in collaboration with the government under various models of public-private partnerships (PPPs). Traditionally, social infrastructure – which is not immediately profitable but has a demonstrative social development impact – has been the prerogative of governments or ODA. However, as will be explored further below, there is enormous unrealized potential of economic mega-projects which can be unlocked by making private investors spend more on social and inclusive infrastructure against future gains.

5.3 LARGE-SCALE INFRASTRUCTURE PROJECTS

Spatial development initiatives such as industrial parks, special economic zones (SEZs), and economic corridors, are often built as greenfield⁶⁵ projects without pre-existing social infrastructure. Greenfield projects can have both advantages and disadvantages. Take for example Thilawa SEZ, a joint-venture initiative between the governments of Myanmar and Japan (together with private-sector backers) about 25km South-West of Yangon. The new SEZ is part of the wider Yangon region and an important part of its economy, having already issued approvals for over 80 manufacturing-based projects. Its semi-remote location was necessary to facilitate exports via a new sea port. The opportunity cost, however, is that the inaccessibility and lack of housing opportunities in the surrounding area makes it harder to hire and retain qualified blue- and white-collar workers for the SEZ (source: Author interviews). The lack of accompanying social infrastructure creates an economic deterrent for the agglomeration of people and complementary industries which would otherwise naturally spring up around existing infrastructures.

Similarly, large transport infrastructure backbones are often built as discreet entities without a long-term view. This is problematic because it is likely to be harder or costlier to retroactively build complementary infrastructures for greenfield projects. Long roads that wind through barren land, such as the Yangon-Mandalay Highway, are a wasted opportunity to generate *agglomeration economics*, which are the benefits accrued from firms and people being located

⁶⁵ In context of infrastructure and spatial development, greenfield refers to projects on unused land whereas brownfield refers to projects which need to demolish, re-purpose or upgrade existing structures.

near one another.66





According to Saito and Matsuura (2016), agglomeration economies boost firms' profits directly by boosting productivity and indirectly by improving product quality. In turn, higher quality products increase the value-added exports of a given's country which promotes economic development. Source: https://voxeu.org/article/agglomeration-economies-productivity-and-quality-upgrading

The solution is to build inclusive infrastructure, which complements SDIs and infrastructure projects. This encourages the development of economic clustering around new infrastructures, which increases growth and creates positive spillovers by providing access to more people. Moreover, inclusive infrastructure creates liveable urban spaces, which refers to built environments that are good to live, work, and play in. Designing economic projects with liveability in mind is undoubtedly more efficient than attempting to retroactively make Myanmar's built spaces more habitable (or building entirely new urban spaces in the decades to come), and it will also ease the pressure of rural-urban migration on existing urban centres such as Yangon and Mandalay. Complementing economic infrastructure with inclusive infrastructure is therefore a matter of long-term sustainable development.

In the short run, jobs creation can be promoted through building spaces for micro-enterprise. This includes, for example, market squares, food courts, and small commercial buildings, developed in conjunction with social infrastructure. Communal spaces such as parks and community centres are other low-cost projects which will help increase liveability, social capital and micro-enterprise. In the long run, productivity can be further boosted by establishing entrepreneurial infrastructure that promotes SME growth, such as business incubators, one-stop

⁶⁶ These benefits are primarily due to ease of transportation. When firms and individuals are located closer to one another, it is easier to exchange goods, services, and ideas (Glaeser 2010). This reduces the cost of doing business, increases labour productivity, and saves time for people which gives them higher quality of life.

business registration centres, financial institutions and research facilities (e.g. Tan, Tan and Young 2000). In this way, economic, social, and entrepreneurial infrastructure complement one another to generate self-sustaining urban clusters that are both productive and attractive to live in.



Figure 5.3: Clustering of Economic Activities

Clustering of economic activities along a national highway and an industrial park. By developing social infrastructure around transportation node (B), urban growth (green) will provide a favourable living environment for workers in the industrial park (A). In turn, this will encourage the development of complementary industries (red), such as logistics and packaging companies. The presence of a liveable urban space with easy access to jobs will promote steady urbanization (pale green) in the long run and the growth of service industries. Prepared by: Author.

One of the largest upcoming SDIs in Myanmar is the China-Myanmar Economic Corridor, which has the potential to shape the physical and built landscape of the country. CMEC is the framework for a roughly 1,700km-long economic corridor connecting Kunming in China's Yunnan province with Mandalay (central Myanmar), Yangon (South-East), and Kyaukphyu SEZ (South-West), and is part of China's Belt and Road (BRI) initiative.⁶⁷ In addition to linking Kunming to Yangon and Kyaukphyu via a high-speed railway and a new national highway, CMEC will include Kyaukphyu SEZ, industrial parks and other infrastructure projects that

⁶⁷ Source:https://www.irrawaddy.com/news/burma/govt-signs-mou-beijing-build-china-myanmareconomic-corridor.html

are still being negotiated. Inclusive infrastructures should be included already in the planning stages to ensure that the corridor meets Myanmar's long-term development goals.



Figure 5.4: Existing industrial parks in and around Yangon

Myanmar currently has 63 industrial zones in operation, with about three dozen more planned.⁶⁸ Of these, 33 of them are located in the Yangon region. As Myanmar expands her industrial infrastructure, it is important to plan for long-term usage, including the need for inclusive infrastructure, to maximize the social and economic benefit of these projects.

Source: FMR (2019). Prepared by: Tun Tun Khine.

⁶⁸ Source:<u>https://www.mmtimes.com/news/industrial-zones-hampered-poor-infrastructure-demand-remains.html</u>

5.4 INTERNATIONAL EXAMPLES

Hawassa Industrial Park (HIP) stands as a common example of how failure to strategically plan infrastructure growth may derail national industrialisation. The US\$ 250 million flagship project, seen as a strategic "point of infection" for Ethiopia, was opened in July 2016 and is slated to create up to 60,000 jobs and \$US 1 billion in export revenues (Mihretu and Llobet 2017). One key economic bottleneck is Ethiopia's poor logistics system, including (and especially) the lack of a railway line connecting the 741-acre large industrial park to the nearest port in Djibouti. Moreover, the complete lack of investing in affordable housing for factory workers has resulted in overcrowding in existing facilities and the rapid rise of informal housing at Hawassa's periphery. This leads to poor and unhealthy living conditions for workers, and has helped create an unusually high labour turnover rate in HIP (Beavor 2018; Blattman and Dercon 2017). As pointed out by a World Bank report (Mihretu and Llobet 2017: 41), nearby Hawassa is a typical Ethiopian city in that it lacks adequate urban infrastructure & services for its residents; without significant investment in (inclusive) infrastructure, the growth potential arising from the new manufacturing jobs' multiplier effect will not be realized.

In contrast, an integrated approach can be seen in the case of Iskandar Malaysia, a 220,000 hectare economic corridor bordering Singapore, launched in 2006. The project will use economic and 'soft' infrastructure to integrate the area's main city (Johor Bahru), Tanjung Pelepas container port, an industrial hub and several smaller towns plus the development of the surrounding agricultural land (roughly 60% of the planned area). To this end, the Comprehensive Development Plan (CDP) anticipates that by 2025, a total of RM335 billion (US\$ 82 billion) public and private funding will be invested while population growth will hit 3 million, up from 1.3 million (Rizzo and Glasson 2011). Significantly, the CDP strongly emphasises using inclusive infrastructure such as mixed-income housing and mass-transit systems to make sure the built environment is liveable and offers equal economic opportunity for all. Other initiatives include a TVET skill development & employment scheme for locals launched in 2016. Although it is an on-going project, it has already hit RM 157 billion in pledged investments and a population topping 2 million, indicating that it is on track to generating more widespread economic growth.⁶⁹

⁶⁹ Sources:https://web.archive.org/web/20150107034838/http://www.establishmentpost.com/timebring-plan-b-iskandar; http://iskandarmalaysia.com.my/sustainable-inclusive-iskandar-malaysia-betterquality-life/

5.5 FINANCING INCLUSIVE INFRASTRUCTURE

Financing inclusive infrastructure is challenging. This is because it is difficult to internalize (capture) the financial gains from social and entrepreneurial infrastructure, the targeted socio-economic groups have little spending power to pay user fees, and Myanmar's government has a tight fiscal space for financing public service projects. It is therefore necessary to leverage investment either through private sector contribution, low-cost public debt instruments, and/or official development assistance (ODA).

Private sector actors are already involved with SDIs in various ways. One common example is as industrial park developers, where they finance, build and operate industrial zones – independently or in collaboration with local governments – and then receive a return on their investment from third-party investors who make use of the park. This is harder to do for associated inclusive infrastructures, which are often public goods or services priced too low to be profitable. Take for example (i) sub-urban roads, (ii) low-cost housing units, (iii) peri-urban electrification, (iv) water and sanitation systems, and (v) a bus network connecting industrial parks and new urban sprawl. One approach is to legally require investors (i.e. industrial zone operators or individual companies) to also build social infrastructure. However, this may discourage investment, particularly in a place like Myanmar which faces many economic bottlenecks and has a very low "ease of doing business" score (ranked 171 out of 190 countries in 2019, the lowest in the ASEAN region).

Instead, public investments can be leveraged to build inclusive infrastructures by capturing land value gains. As pointed out by the World Bank (Peterson 2008: ix), "land values are highly sensitive to infrastructure investment and urban economic growth." In other words, basic economic and social infrastructure investments that are planned in advance, such as roads and utilities, as well as the natural urban sprawl that is triggered by inclusive infrastructure investments will greatly increase the value of land surrounding SDIs. Assuming much of the surrounding land is publicly owned (or acquired through land expropriation), this provides an opportunity for financing social and entrepreneurial infrastructure spending.

Public land has already been used as equity investment for SDIs in Myanmar, as for example in Kyaukphyu and New Yangon City. However, this model has till now been based on giving government part-ownership of predominantly *economic* infrastructure projects. It is difficult to use this public-private partnership (PPP) model to finance inclusive infrastructure because, as already mentioned, the economic gains are difficult to capture, which makes private investors unlikely to take on the additional risk. Public developers should therefore look towards new and innovative forms of land-based financing to fund inclusive infrastructure.

One potential model is for the developing authority (whether it is a public entity or PPP) to take out loans against future gains. These future gains need not only be tied up in planned land sales, which was the approach used by Ørestad Development Corporation of Copenhagen, Denmark in the 2000s (Clark et al. 2014: 31-32), but can also be against future tariffs. The tariff approach was successfully trialled in the UK city of Milton Keynes in the late 2000s, which forward-funded "community" (social) infrastructure from a third-party, public lender against expected building tariffs. The Milton Keynes Building Tariff consists of a fixed fee per dwelling or per hectare of commercial land, of which 75% is charged to developers upon completion. This reduced the developers' need for borrowing while "allowing greater certainty for both parties" (Ibid.: 29; Milton Keynes Council 2007). Developers were also allowed to pay for the development tariffs in-kind by building relevant infrastructures. In combination with planned land sales, this unique approach helped Milton Keynes expand its housing stock by 18% between 2001 and 2011 (Centre for Cities 2014: 11), and it continues to be ranked as one of the UK's most liveable and fastest growing cities.

Lastly, ODA is another potential source of inclusive infrastructure funding. Many NGOs and overseas development partners are interested in sponsoring socialand entrepreneurial infrastructure projects; however, to take advantage of this, local policy makers will need to include them at the planning stage. If bilateral or multilateral development partners are unable or uninterested in directly funding inclusive infrastructure spending, they can instead provide seed capital to insure commercial loans from financial institutions.

5.6 POLICY RECOMMENDATIONS AND CONCLUSION

Using inclusive infrastructure to complement large-scale SDIs will ensure that Myanmar's built environment is liveable and more socially and economically useful for the population as a whole. Inclusive infrastructure includes both social and entrepreneurial infrastructure, which helps create further growth opportunity – especially for lower-socioeconomic groups – thus ensuring more sustainable development. The key challenge for policy-makers is to be pro-active by including these in the planning stage of spatial development and large-scale infrastructure projects.

Major infrastructure arteries such as CMEC should include plans for social infrastructure to help catalyse the growth of secondary cities. This can be financed by private capital or public loans against future land value gains. For new

industrial zones and urban development projects like New Yangon, adequate housing and social service provisions need to be built for migrant workers. It is in the interest of investors to build these facilities to insure worker welfare and productivity, although the building costs would need to be subsidized. Affordable housing and social service provisions may also be co-financed by the government as public-private partnerships, perhaps with financial or technical support from international development partners.

Entrepreneurial infrastructure is equally important. In line with Myanmar's Sustainable Development Plan (MSDP 2018-2030), particularly strategy 3.2 which emphasises support for SMEs to promote job creation in industry and service, the government should spearhead micro- and SME investments that complement larger infrastructure projects. Although the government of Myanmar is resource constrained, it is relatively inexpensive to construct small markets, transit hubs, food courts or even business incubators and one-stop business registration centres in new secondary cities. It is well documented (from for example micro-finance projects and partially built social housing initiatives around the world) that if given a moderate amount of material assistance, the labouring poor are capable of innovating and expanding the productive capacity of their built environment.

Finally, public consultations will help coordinate inclusive infrastructure spending and develop a sense of ownership amongst stakeholders. This can guide inclusive investment spending to where they are most impactful while giving the government's development plans more credibility. An integrated approach to spatial development with plans for long-term, inclusive use will undoubtedly require bold new thinking by both Union and local governments, but is necessary to promote pro-poor growth in Myanmar.

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Empirical Analysis of How Remittances Impact on Household Expenditures in Myanmar

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SUMMARY

Domestic and international migration is widespread in Myanmar. The issue has two main economic impacts, one regarding labour allocation and another regarding the flows of money from migrants to their homes. This paper focuses on the latter by using the nationally representative household-level dataset of the Myanmar Living Conditions Survey (2014/15). The study reveals how migrant families alter their expenditure decisions on consumption, durable goods, and housing expenditure shares. Of note, is that the study finds that remittancereceiving households spend proportionately less on consumption, and more on housing. These results provide relevant information for the design of policies that take into account the implications that remittances have over household decisions.

Keywords: Migration, Remittance, Household expenditure share, Consumption, Myanmar

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6.1 INTRODUCTION

As a developing country with diverse geography and regional disparities in income and economic development, voluntary domestic migration to urban centres is a natural process in Myanmar that provides people with better opportunities for jobs, education and ultimately the hope to get out of poverty. In addition to local migration, voluntary international migration is also common in Myanmar as the emerging economies of ASEAN play a role in providing jobs, especially for unskilled cheap labour. A comparison analysis of birth township and current township included in Myanmar Census data (2014) indicates the existence of migration that suggests, on average, that 35 percent of township populations move to other townships at some point. The issue of migrant workers is a concern for policy-makers, however, as a potential driver for domestic economic development through good migration and remittance governance.

The idea that the remittances of migrant workers could be a potential exit out of poverty is now an established finding in the research field. Such remittances bring a positive effect on the growth rates of GDP per capita, and equally have a positive effect on literacy and investment in poor developing countries (Catrinescu etal., 2009; Ziesemer, 2012). Other significant positive effects are likewise identified. Chowdhury (2011), for example, finds that remittance inflows have a remarkable effect on the financial development in Bangladesh. Meanwhile, the empirical analysis of Bayangos & Jansen (2011) extends the existing literature, showing that the labour market effects of emigration and remittances have a positive significant effect on the competitiveness of the Philippine economy.

In addition to macro level analysis, Bang, Mitra and Wunnava (2016), Bouoiyour, Miftah, & Mouhoub (2016) and Howell (2017) use household level data to show the impact of migrants' remittances on income equality. The empirical results of Bang, Mitra, & Wunnava (2016) indicate that remittances of migrant workers increase household expenditure, both food and non-food, at all levels of expenditure distribution, and the impact is unambiguously greatest for poorer households in Kenya.

Moreover, Adams and Checuecha (2010) highlights two key marginal spending behaviours of households in Guatemala by using a nationally-representative households data set, and controlling for selection and endogeneity. They first find that households receiving international remittances from the United States spend less at the margin on a key basic consumption good: food. Their second key finding is that households receiving either internal or international remittances spend more at the margin on important investment goods: such as education and housing.

Taking the existing literature on remittances and migrant workers into consideration, there is room for analysis on the contribution of remittances on social welfare improvement for Myanmar households. This paper is the very first attempt to analyse the contribution of remittances sent by migrant workers on their household expenditures in Myanmar by applying a multiple linear regression method, as well as state and region fixed effects.

This present paper applies the expenditure share form used in the literature of Adams & Checuecha (2010) to analyse expenditure patterns of migrant households by using three outcome variables: basic consumption share, durable goods expenditure share, and housing expenditure share. The paper focuses on a sample of households that have at least one migrant worker.

6.2 DATA AND METHODOLOGY

This paper uses a household level survey data set of the Myanmar Poverty and Living Conditions Survey (MPLCS) conducted by the Myanmar Central Statistical Organization (CSO) and the World Bank in 2014/2015. The data set includes 3,648 urban and rural households, and is designed to be statistically representative at the national level. Since this survey was not designed as a migration or remittance survey, it has limited information on these topics. However, this paper uses the available remittance information of migrant households to find out the contribution of the total remittances received on their household expenditures

Table 6.1 presents the summary data of 3,648 households included in the MPLCS data, comparing the household characteristics of remittance receiving and non-remittance receiving households. The composition of migrant and non-migrant households in the sample of MPLCS data is summarized in Figure 6.1.a. Among 3,648 households in total, 42.98 percent (1,568 households) have one or more migrants; 53.7 percent of migrant households do not receive remittances and 46.3 percent of migrant households receive remittances from one or more migrant workers as shown in Figure 6.1.b. In other words, less than half of migrant workers send money back to their home. Most of them (54 percent of total migrant workers in the sample) may use their earnings for their survival, as they fail to send any remittances at all to their home.

Figure 6.1: a) Migrant and non-migrant households in Myanmar and b) Remittance receiving and non-remittance receiving migrant households in Myanmar (MPLCS, 2014/15)



This study's main focus is the group of households having at least one migrant worker which is 43 percent of the total households in the dataset.

With reference to the summary statistics in Table 6.1, the head of household characteristics are not much different between remittance receiving households and non-remittance receiving households. All households in Myanmar, including both remittance receiving and non-remittance receiving households, have four household members on average. The head of household characteristics such as gender and education are also nearly the same in both groups of households. On average, the remittance receiving households have greater total annual
expenditure than the non-remittance receiving ones. However, the description of summary statistics reveals that remittance receiving households spend less on average on the annual nominal consumption of food and basic survival non-food items, compared with non-receiving households.

All Households				Remittance Receiving Households			Non-remittance Households	
Variables	Mean	Std. Dev.		Mean	Std. Dev.		Mean	Std. Dev.
No. of HH member	4.56	2.15		4.23	2.17		4.53	2.19
Age of head	50.96	14.42		56.84	13.95		53.94	11.89
Annual Nominal Consumption (Food & Non-food)	2,658,271	2,051,824		2,576,622	1,903,230		2,701,234	1,792,046
Annual Nominal Durable Goods Expenditure	577,753	7,686,592		402,014	4,650,344		346,625	2,000,217
Annual Nominal Housing Expenditure	607,579	906,125		640,966	906,578		496,989	654,457
Annual Nominal Total Expenditure	3,843,604	8,790,741		3,619,601	5,572,105		3,544,848	3,613,663
	Percent	Cum.		Percent	Cum.		Percent	Cum.
Gender of Head								
Male	77.85	77.85		65.84	65.84		74.94	74.94
Female	22.15	100		34.16	100		25.06	100
Education of Head								
No Education	1.4	1.4		0.83	0.83		1.66	1.66
Primary	40.05	41.45		38.43	39.26		40.86	42.52
Secondary	29.06	70.5		27.96	67.22		27.43	69.95
Tertiary	29.5	100		32.78	100		30.05	100
			1			1		
Urban	63.49	63.49	1	62.12	62.12	1	69.95	69.95
Rural	36.51	100		37.88	100		30.05	100
N	3648			726			842	

Table 6.1: Summary Statistics of all households, remittance receiving households and non-remittance receiving households

Following the study of Adams & Checuecha (2010), this paper measures the effect of receiving remittances on the expenditure of Myanmar households by analyzing the expenditure share patterns of migrant households using the following proper functional form as econometric model:

$$\frac{c_i}{Exp} = \alpha_i + \frac{\beta_i}{Exp} + \gamma_i (1 + \log Exp)$$
(1)

where is the share of consumption expenditure on three outcome goods in total expenditure . Adding up assumption that , the Equation (1) is equal to the following Engel function:

$$C_i = \beta_i + \alpha_i Exp + \gamma_i Exp (1 + \log Exp)$$
(2)

The main purpose of this paper is to examine the impact of remittances on household expenditure behaviour. The primary variable of interest is which is the total amount of remittances received by a household within a year. In addition, various socioeconomic and regional factors other than expenditure must be taken into account in measuring the effect of receiving remittances on household expenditure behaviours. Thus, as part of observed control variables are a number of characteristics of households and their head: (1) number of household members in the household; (2) age of the household head; (3) age squared; (4) gender of the household head; (5) the categorical variable of household head's education (6) a dummy variable indicating whether the household is in an urban or rural area, is included in the model as well. Including such household characteristics in the model is very important as it introduces considerably more nuance and relevance into the results. Let denote the household characteristic variables and let be constant. The complete model is:

$$C_{i} = \beta_{i} + \alpha_{i} Exp + \gamma_{i} Exp \left(1 + \log Exp\right) + \theta_{i} Total remittance + \sigma_{i} Total remittance (Exp) + \sum_{j} \left[\left(\delta_{ij}\right)Z_{j} + \varepsilon_{ij}(Exp)(Z_{j})\right] + \mu$$
(3)

Written this in expenditure share form, it is equivalent to:

$$\frac{C_i}{Exp} = \alpha_i + \frac{\beta_i}{Exp} + \gamma_i \left(1 + \log Exp\right) + \theta_i \frac{\text{Total remittance}}{Exp} + \sigma_i \text{ Total remittance} + \sum_j \left[\left(\delta_{ij}\right) \frac{Z_j}{Exp} + \varepsilon_{ij}(Z_j)\right] + \mu$$
(4)

The outcome variable refers to the household 's annual nominal consumption (food and non-food), annual nominal durable goods expenditure, and annual nominal housing expenditure.

The first outcome variable, annual nominal aggregate consumption, includes all the food consumed by the household in a year, regardless of its source, and all the non-food items used by the household in a year to achieve a basic minimum standard of living. The food consumption includes twelve categories: (i) rice and cereals; (ii) pulses, beans, nuts and seeds; (iii) roots and tubers; (iv) meat, dairy and eggs; (v) fish and other seafood; (vi) vegetables; (vii) fruits; (viii) oils and fats; (ix) spices and condiments; (x) other food products; (xi) alcoholic beverages; and (xii) food consumed away from home. Food consumption is calculated by multiplying market prices or the unit value of food by total quantities consumed. The World Bank uses a price imputation method for missing local market prices following the recommendation of Deaton and Zaidi (2002), and this method is used here too. Furthermore, the outliers are corrected on an item-by-item basis of food categories.

Non-food items are goods and services, including expenditure on energy, fuel, education, health, transportation, telecommunication and clothing. As non-food items are largely heterogeneous, data is collected on the total value of non-food purchases. Following the inclusion criteria developed by the World Bank, (i) weddings and funerals; (ii) expenditures on gold, jewellery, gems and precious stones; (iii) house repairs and expense including property tax; (iv) transfers to other households, are excluded from this non-food expenditure.

The second variable, nominal durable expenditure, is all the durable goods purchased by the household in a year including household appliances, televisions, radios, motor bikes, cars, etc. As most households are unlikely to make such purchases within the survey period, the purchase expenditure of those durable goods cannot directly be added to the consumption data. Therefore, the World Bank here applies the appropriate measure of consumption for such durable goods following the "user cost" estimating approach presented in Deaton and Zaidi (2002).

The final variable, annual nominal housing expenditure, is imputed by using a hedonic pricing model for the non-reporting majority of households and completed rental cost for reporting households. The idea of using those variables as dependent variables is to capture if households spend more of their expenditure share on necessities whenever they receive remittances, or if they invest more of their expenditure share on investment goods, such as durable and housing expenses.

In estimating the model, the three types of household expenditures are used as independent variables, rather than income data. Since the purpose of this research is to analyse the impact of receiving remittances on the spending behaviour of households, expenditure data is more appropriate than income data. Moreover, expenditures are often easier to measure and collect than income because a large part of the population is self-employed, and most are reluctant to provide income as it can be a sensitive issue in a developing country like Myanmar.

After applying the model in Equation (3), the interpretation of result is derived from the following marginal share equation:

$$MBS_{i} = \frac{d\frac{C_{i}}{Exp}}{d Total remittance} = \theta_{i} \frac{1}{Exp} + \sigma_{i}$$
(5)

6.3 RESULTS

Table 6.2 presents the regression results of the applied model using states and region fixed effects. The main finding is that receiving remittances allows households to spend a bigger share on investment goods, durable items and housing, while they spend a lesser share on consumption expenditure. The results show that households receiving 1 Kyats of remittances in a year spend a lesser share (0.77 percent) on consumption expenditure, which is significant at the 10 percent level. However, households obtaining 1 Kyats of remittances in a year, increase (0.09 percent) durable good expenditure, although it is insignificant. In addition, such households spend about 0.68 percentage more on housing expenditure if they receive 1 Kyats of remittance from the migrant workers. This is result is also significant at the 10 percent level. Thus, it is shown that remittances sent by migrant workers mainly contribute towards household investment goods - durable goods and housing. Investing in such goods, rather than spending on consumption of food and basic non-food items, is sound household financing for future economic security through proper physical investment.

	(1)	(2)	(3)
	Consumption Share	Durable Goods Expen- diture Share	Housing Expenditure Share
Total expenditure	-192964.10**	80613.9	112350.3*
	(58680.2)	(44270.6)	(45265.0)
Log total expenditure	-0.157***	0.147***	0.00980
	(0.0202)	(0.0236)	(0.0151)
Total remittance	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
Remittance/Total expenditure	-27964.0**	3324.1	24639.9**
	(9978.6)	(4518.1)	(8692.8)
Constant	3.277***	-2.155***	-0.121
	(0.310)	(0.357)	(0.229)
Adjusted R-squared	0.374	0.332	0.344
State & region fixed effects	Yes	Yes	Yes
Control variables	Yes	Yes	Yes
Ν	1568	1568	1568

Table 6.2: Multiple linear regression results using state and region fixed effect

Robust standard errors in parentheses

* p<0.05, ** p<0.01, *** p<0.001

6.4 CONCLUSION

This paper uses a nationally representative household survey data of Myanmar to examine the benefits of remittances received from migrant workers on household expenditure. The contribution of remittances to expenditure is captured by using three dependent variables: consumption share, durable goods expenditure share, and housing expenditure share. After controlling for household characteristics, this paper finds that the share of spending on investment goods by a household increases with the amount of remittances they receive.

The findings of this paper support the idea that remittance receiving households in Myanmar spend more proportionally on investment than on basic consumption.

Thus, remittances of migrant workers actually have a positive impact on the economic development of Myanmar, by increasing the level of investment in physical capital such as housing. However, there is room to consider if those remittance receiving households already have a specific standard of living, and so are less likely to spend their receiving remittances on investment goods rather than daily consumption expenditure anyway. Future research should include empirical analyses on the characteristics of migrant workers and households to capture their decisions on migration. The migrant workers leave their place of origin since there is a lack of opportunities in their region, or there are better options to choose from in migration regions. These potential research questions can be tested when an updated data set of the Myanmar Living Condition Survey (MLCS), already collected the World Bank in 2016/17, becomes available.

Policy makers should develop formal remittance transfer methods by enhancing banking services, as only 25 percent of migrants in this data set use formal transfer systems such as those offered by local and international banks. In addition, a systematic economic mechanism should be developed to enlarge the local economy, for example, by establishing a housing instalment purchase system. At the household level, the higher investment in durable goods and housing among remittance receiving households in Myanmar can represent an ideal type of investment for migrant households, and a useful means for stimulating growth in small and medium enterprises that service them.

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FIRST PERSON AN INTERVIEW WITH EMERITUS PROFESSOR RONALD FINDLAY

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As noted in our first issue, a feature that will regularly appear in the Myanmar Economic Bulletin is an interview with a key Myanmar economic thinker and/or practitioner. Bridging biography, the application of economic theory to policy-making, and the complexity of economics 'as it is done', these features are especially aimed at young scholars who might reasonably ask: Just what is it that economists do?

For this second issue of MEB we showcase the life and work of Professor Ronald Findlay who, along with the great Sayagyi, U Hla Myint, ranks as the most internationally eminent of Myanmar's economists. The latter is no small matter since, hopefully as will become apparent as this series of MEB portraits unfolds, Myanmar's economists have punched greatly above their weight in terms of their contributions to economic thought. In Ron's case these contributions are primarily in especially-innovative aspects of trade and development, although to limit his scholarship to any particular classification risks underplaying someone who, for many decades, has been one of the world's most original thinkers.

Ron was born in Yangon, is a graduate (and was a teacher) at what is now the Yangon University of Economics, but has held appointments at a great many of the world's foremost institutions of higher learning. The recipient of numerous accolades and awards, Ron is currently the Ragner Nurske Professor Emeritus of Economics at Columbia University in New York.

The interview below took place across a number of days and dates, in Yangon and New York. The interviewer is Sean Turnell.

Q: Your career began at what is now the Yangon University of Economics (then the Economics Department of the University of Yangon). Can you tell us something of what Economics was like there in the 1950s? Who had the biggest influence upon you there?

Unquestionably the most important influence on me in my early economic career, at the University of Yangon and more broadly, was U Tun Thin. He was head of the Economics Department when I first visited the University. This was while I was still a school student, in order to see what was on offer, to see what I might do.

Amongst all the speakers on that day from all the faculties, he really stood out. His confident manner, self-assurance, even his well-cut suit really impressed me! I know this sounds trivial now, but he was sharp and cool, and so I thought was economics!

But of course, U Tun Thin was far more than a great speaker in a sharp suit. Astonishingly bright and intellectually impressive, he had gone to Harvard as a Government Scholar in 1948 (after having studied at the University of Yangon during the colonial era, in the early 1940s), and ultimately completed a brilliant PhD there that, in 1952, won the David Wells Prize for the best Harvard PhD of that year. His supervisor was the famous Russian-American economist Wassily Leontief, who won the Nobel Prize in Economics in 1973 for his work on input-output analysis, and for the way that different sectors of the economy interacted with each other. Later Tun Thin would go on to head the IMF's Asia Department.

Other colleagues were also an influence on me (as one's peers usually are), but I especially remember Ezra Solomon. He came out of the small Jewish community in Yangon, did his undergraduate degree at the University of Yangon and then went on (as a State Scholar) to do a PhD at the University of Chicago. He would eventually become Professor of Economics at Stanford University in California (now the very centre of the internet economy), and to serve on the Council of Economic Advisors under President Nixon.

U Thet Tun was another memorable contemporary. He was trained in economics and statistics in Japan, and would go on to head Myanmar's statistical agency – where for decades he would fight to keep things real. Meanwhile, the always impressive Aye Hlaing (who would head the Economics Department in Yangon for many years) returned to the University while I was there. He was a wonderful colleague. There was lots of discrimination against women in those days unfortunately, but some of the best economics students of my era were women. April Khine especially stood out. Like many of the young women she did lots of teaching, while it was usually only the men who got State Scholarships to undertake study abroad.

Of course, looming over all was the great Hla Myint, who set the whole tone for the study of economics at the University of Yangon, but who (because of politics, and Hla Myint's very high standards of scholarship which sometimes grated with politicians) was mostly away in my time at the University, and in Oxford and the London School of Economics. Hla Myint was one of history's truly great economists and the only one, in my estimation, who was never wrong on the issues that matter⁷¹.

⁷¹ For more on Hla Myint, see Turnell, Sean (2014). 'Sayagyi and sage: Hla Myint, Myanmar's "classical" economist', *Sojourn*, Vol.29, No.3, pp.691-720.

Because of the example set by Hla Myint, and the practical structure he put in place (even the core of the economics library consisted of books he brought back from England), the Economics Department at the University of Yangon was truly one of the best in the world. It did not have the resources of some (we often had to share books, and equipment, even pens and paper were in short supply) but the intellectual quality of the programs, the calibre of the staff, the level of debate and scholarly interactions were truly first rate. My mind was opened at the University of Yangon, and its legacy has kept me in good stead in the many decades since. It truly was a remarkable place.

Finally, in talking about the foundations of economics at the University of Yangon it would be remiss not to acknowledge the great contribution – in some ways the most important of all – of Harro Bernadelli⁷². A figure unfortunately too often overlooked, Bernadelli had joined the University of Yangon in 1935. A refugee from Nazi Germany, he had also been a student of Frederich Hayek, who would later be Hla Myint's PhD supervisor too (this was no accident – Bernadelli having established the connection, and with the then home of Hayek, the London School of Economics). Bernadelli was forced out of Myanmar during the war, and later settled in New Zealand, where he made particularly influential contributions to demography and population studies. But he left Yangon economics in a good place. He left us a message in a bottle.

Q: You started teaching at the University of Yangon, straight after graduation?

I was appointed as a tutor in my fourth year, age 19. There is nothing like having to teach something to really inspire one to learn – so this experience was very important for me. Again, this was all for the better by the fact that the program was so good. My teaching was very broad, so I drew upon many of the great thinkers of economics up to that time, and used the works of Ricardo (a real favourite of mine – and he remains so), Keynes, Hansen, Stigler, R.S. Sayers (on banking), Benham. At that time there was not much written on Myanmar itself, though we did use Andrus' (1947) 'Burmese Economic Life'⁷³.

I have noted already Hla Myint's building of the Economics Department (in turn upon foundations laid by Bernadelli), but clearly Hla Myint's own written work was used in teaching too. It was interesting – by then most other economists had moved on from the great classical economists, and devoted themselves to questions of resource allocation, price systems, monetary issues and so on – but it was Hla Myint who revived classical thought and re-applied it to the big

⁷² For more on Bernadelli, see Dongahue, Mark (2007), 'Harro Bernardelli', in *A Biographical Dictionary of Australian and New Zealand Economists*, edited by J.E. King. Cheltenham: Edward Elgar.

⁷³ Andrus, J. Russell (1947), Burmese Economic Life, Stanford, California, Stanford University Press.

questions of growth and development. Everyone else seemed to have forgotten that that was what Smith and the other founders were all about. It took a brilliant boy from the paddy fields to remind the profession of their original purpose.

Q: You also worked for the fledgling democratic government of U Nu?

I did. While a tutor at the University I was increasingly asked by government ministers to advise them on an array of topics (often arising out of questions put to them in the parliament), and to generally provide them with updates on global economic conditions and thinking – the latter based around summaries I wrote for them from the pages of *The Financial Times, The Economist,* and other international publications that at that time were hard to get in Myanmar.

Over time, however, my fairly simple policy role expanded, and I found myself being asked to write memos for Ministers, and even Cabinet submissions. My role was mostly unacknowledged publicly, but it did earn me much goodwill from key policy makers. Likewise, I received from all of this a good education in practical politics!

Q: In 1957 you went to the Massachusetts Institute of Technology (MIT) – can you tell us something of your arrival there, how you were perceived?

Well the first thing to say about my arrival there was that it was freezing cold, and I was not at all prepared for it. I was a poor boy from the tropics and the bitter cold of that part of the USA was an initial, bracing shock to all the senses. However, I soon recovered from this, and got used to what was a very different climate than I had ever experienced before.

On more important scholarly matters, my arrival at MIT was a very positive one. So well prepared had I been from my education in Yangon that Charles Kindleberger, the famous scholar of financial crises and other things (including being one of the primary architects of the Marshall Plan), pushed me to do the coursework quickly, and take the exams that would allow me to then start on my PhD dissertation early. That said, I enjoyed the classes, and had some truly great teachers who are now household names within the economics profession: Kindleberger I have already mentioned, but others included Nobel laureates Paul Samuelson and Bob Solow, Evsey Domar (one half of the famous Harrod-Domar growth model) and George Schulz (who later became US Treasury Secretary *and* Secretary of State). MIT was, and is, a great school – but I have always maintained that a good teacher is always more important than a good school.

My time at MIT was funded by a Ford Foundation scholarship, which I could have used to go to the University of Chicago, or Michigan. At the time economics at MIT

was a minor part of what it did (especially when compared to its great influence on economics today). The Ford Foundation brought me to the US on a plane – naturally the first time I had travelled on such a marvellous thing.

I finished my PhD within three years. My supervisor was initially Kindleberger, and then Bob Solow, while my examiners were Solow, Samuelson and Domar.

During my MIT years I wrote three papers, which essentially established my reputation and set the course of my career in many ways⁷⁴. Concerning technical progress and countries' terms of trade, growth and distribution, they were reviewed well and I came to the attention of people such as Harry Johnson and Nicholas Kaldor (famed Hungarian/British economist at Cambridge University), as well as some younger peers such as Max Corden and Jagdish Bhagwati. [*Editors Note: Ron is being modest here – these papers made an enormous splash, and his esteem within the economics profession was pretty much set from this point. These papers were real intellectual breakthroughs – Sean].*

Q: Before continuing on with your professional career, and your return to Myanmar after MIT, can we go back further in time – to your family background, and your experiences during the Second World War?

I was born in 1935, and grew up in a house on what was then Dalhousie Street (now Maha Bandoola Road) in Yangon. As you can see from my name, I came from a mixed background that included, several generations before me, and Englishman with the surname of Findlay. My father managed the Bombay Hotel and Restaurant, which was owned by an Iranian man – yet another illustration of how cosmopolitan Yangon was. My uncle, Leo Wellington, was a prominent lawyer, and a pillar of the Anglo-Burmese community. He was by far the wealthiest member of the family, and had a tennis court that my sister and I used to play on. He was a friend of some of the leading politicians of the day (including Sir Paw Tun, who was Prime Minister at the outset of World War Two). Like so many others, my uncle Leo did not survive the Second World War, and the Japanese occupation.

One of my earliest memories was listening on the radio to reports of the German air-raids of London, and one could sense from the adults the looming war in Yangon too. I vividly remember the first air raid on Yangon, which took place on December 23, 1941. Many people didn't realise the danger though, and raced outside to look at the planes. Scores were killed, but they were the first of what

^{74 &#}x27;Factor Intensities, Technological Progress and the Terms of Trade', Oxford Economic Papers, February 1959, Vol.11, no.1, pp.111-121; 'International Specialization and the Concept of Balanced Growth', Quarterly Journal of Economics, 1959, vol,73, no.2, pp.339-346; 'Economic Growth and Distributive Shares', Review of Economic Studies, June 1960, Vol.27, no.3, pp.167-178.

would be hundreds of thousands of Burmese (civilians mostly) that would die in the war.

Being part-Anglo, it was apparent to my family that with the Japanese invasion would come special ill-treatment for us, and so we became part of what would become a vast exodus out of Yangon, destined for India. This caravan of suffering, the 'road of death' people came to call it, would become a tragic legend of the war. By this time there was no transport, and so on foot we would undertake this trek of hundreds of kilometres. Thousands died along the way. Some from strafing planes. Many more from hunger and disease. Worldly possessions thrown aside, while by the wayside lay the dead and the dying. Life ebbing away. The British air force tried food drops, but not all of it reached us. By the end of two months everyone was gaunt, haggard, and emaciated, and we all looked like later images of victims of the Holocaust.

Interestingly, the people who coped best, perhaps not unexpectedly, were those who in normal life were very poor. They had more skills for basic survival. I was seven years old, and at that age you often cope better than when you are older and know more about what is going on. I remember especially the lack of anywhere to sleep and the thought each morning, terrible when I think on it now, that you didn't know whether you would still be alive that evening.

I recall with great clarity the day of deliverance. The day that we crossed into safety, and through the British lines into India. Running ahead of the pack that day I came across a clearing in the trees to behold a shirtless Australian soldier (I knew he was Australian by his slouch hat), leaning against a stump. Unfazed at my sudden appearance he just drawled, 'You're safe now sonny'. I have had a soft spot for Australia ever since.

Q: Following your return from MIT you taught at Yangon University, but also worked for the Government again?

Yes, upon completion of my PhD I returned to Yangon. With pleasure I might add, since my fiancé Jane was there. She had graduated in Law, and was working for the Burma Chamber of Commerce. We married a year after I got back.

I also returned to the University of Yangon, now as a Senior Lecturer. At that time the so-called 'caretaker' government of General Ne Win was in place, but soon democracy would return under the venerable U Nu.

The next two years were enormously productive for me. I continued to teach, of course, and enjoyed some of the best teaching years of my career. Many of my students were wonderful young scholars. A very high proportion of them were women, and one of the great joys of my life was to see so many of them again years later, when Myanmar began to open up once more.

Likewise, my research was also progressing well, and my work was increasingly making an impact internationally. One notable example of this was a paper I wrote in 1963 regarding what became known as the 'capital controversies' in economics, and which was published in *Economica*. This drew the attention of one of the main protagonists of these debates, the very formidable Joan Robinson (a near contemporary of John Maynard Keynes, and the most prominent female economist of the 20th Century), who even diverted her travels to Delhi in order to come to Yangon to 'have it out' with this young Findlay guy. And she did⁷⁵.

Meanwhile, I continued to advise the government here and there, albeit at a higher level than before. Now this task was a lonelier one however. The political climate was growing darker. Hla Myint had briefly returned, but was once more in exile, while Tun Thin too had left for the IMF.

Q: Can you tell us something of the great 'fork in the road' taken by Myanmar economically in the early 1960s, and the launch of the 'Burma Way to Socialism'?

In March 1962 General Ne Win launched his coup, and before too long what became known as the *Burmese Way to Socialism* was gradually imposed. On the economic side, this began with a challenge to us economists at Yangon University (myself, Rector Aye Hlaing, Dr Khin Maung Kyi, and assisted by U Thet Tun and U Kaung Tin of the Central Statistical and Economics Department) to come up with a new economic plan for the nation. Simultaneously U Ba Nyein (another pre-war economics honours student, but who was noted for his strong Marxist convictions and communist sympathies) was asked to draw up an alternative.

The Yangon economists plan, which was coordinated by Yebaw (Comrade) Chan Aye (an economics honours student at Yangon University in the late 1940s, but who had become a leading financial journalist), was firmly based on the sort of ideas Hla Myint had long championed, and would soon be used by the 'Asian tiger' economies to great effect. That is, it was a plan with a strong focus on export-led growth, production and price freedoms for farmers, and for Myanmar broadly to exploit its comparative advantage in international trade. The idea was that the country be open to international trade and investment, and have an economy in which both the public and private sectors would play an active and complementary role.

⁷⁵ This 'discussion' between Ron and Joan Robinson also advanced through the pages of *Economica* in 1963 (vol.30), in the wake of Ron's original piece. In sequence, this to-and-fro consisted of: *The Robinsonian Model of Accumulation* (Ron), *A Reply: Findlay's Model of Accumulation* (Joan Robinson), *Reply to Joan Robinson* (Ron).

U Ba Nyein's plan, on the other hand, was more or less Stalinist economics at its most extreme. Indeed, so extreme was its degree of centralisation and state control, that the Ambassadors of the Soviet Union, Hungary and a number of other communist countries urged caution (ironically, the time of Ne Win's dramatic shift left coincided with moves towards some limited market-reforms in the Eastern Bloc itself – most famously the so-called 'Lieberman reforms', named after the economist who led the charge on this front).

All to no avail alas. When Chan Aye came back from the meeting at which this choice was made he told us that Ne Win had declared that our plan was 'something the CIA would come up with', and would hand the country to the colonial oppressors. In the end Ne Win handed much of day to day economic management to Brigadier Tin Pe, and thus the great slide began.

Q: This shift would have severe implications for you personally too?

Yes, I am afraid it would be the beginning of the end of my professional life in Myanmar too. At first we economists sought to focus on technical things, and to use our work to try and steer the country away from the worst instincts of what some of the leaders were trying to do. After a while it became hopeless, however, and whatever we did in the realm of 'shadow prices' and the like could do little to stop more and more disastrous policies being put in place.

Of course, the fact that the leadership did not regard me as being 'fully Burmese' also became an issue, and I found myself being gradually frozen out. Then came Myanmar's first demonetisation episode, and the lives of people dedicated to economic reform became more and more impossible.

Q: And at this moment came an unexpected offer?

Yes, in the middle of all of this came, totally out of the blue, a letter from Harry Johnson (the aforementioned legendary Canadian economist at the University of Chicago, who was a dominant figure within the profession through the 1950s and to his untimely death in 1977) – checking to see how I was, and offering to find me a place if I wanted or needed to leave Myanmar. Naturally, and apart from anything else, this was a huge boost to my confidence at a time of great stress and strain. Johnson was probably the most influential economist in the world at this time, so to get his attention in this way gave me a boost and, as it turned out, changed my life.

So, after hearing about my situation, Harry got going and before too long letters of offer came in. But it was the offer from Columbia University in New York that was the most attractive. I accepted it, and started the preparations for leaving my

homeland. These took quite a while. Ne Win's government went very slow in providing the necessary documents and permissions, and in the end they did not issue me with a passport, but simply a certificate of identity that at least allowed me to leave. This I did finally in February 1969. I arrived in New York, once more into a blizzard, and I never left.

Q: What have been your most important contributions do you think?

Certainly the one that has been most cited is my paper on technology transfer and foreign direct investment⁷⁶, but amongst my favourites are those that combine history with economic theory⁷⁷. Many of the themes in my writings on these fronts came together in my 2007 book (written in collaboration with Kevin O'Rourke), *Power and Plenty⁷⁸*. Of most relevance to Myanmar these last fifty years or so perhaps was my work on the theory of the state, and the political economy of authoritarianism⁷⁹. Of course, now I hope the most relevant will be those works to do with economic transformation, and economic growth.

Q: Finally, what are your thoughts on Myanmar's prospects?

I remain optimistic for Myanmar in the long run, even though in the short to medium term the road will necessarily be a steep one. The country has been through much turmoil and strife for so long, but its people are resilient, innovative against the odds, and astonishingly brave. The young women and men of Myanmar are especially impressive, and with open hearts and minds I believe they can achieve much. My own life has contained so many elements, but it has been a journey above all that illustrates the possibilities that arise from international exchange. True for economies, true for people too.

⁷⁶ Findlay, Ronald (1978), 'Some Aspects of Technology Transfer and Foreign Direct Investment', *American Economic Review*, vol.68 (no.2), May, pp, 275-279.

⁷⁷ Ron's output of scholarly writings can only be described as vast. For an appreciation of its scale, however, see the listing at IDEAS: https://ideas.repec.org/e/pfi15.html. For a recent example of Ron's combination of history and economics, see Findlay, Ronald (2013), 'Coastal-Inland Interactions in Burmese History: A Long-Term Perspective', *Asian-Pacific Economic Literature*, Vol.27, no.1, pp.1-26.

⁷⁸ Findlay, Ronald and Kevin O'Rourke (2007), *Power and Plenty: Trade, War and the World Economy in the Second Millennium*, Princeton: Princeton University Press.

⁷⁹ Such as, Findlay, Ronald and John D. Wilson (1987), 'The Political Economy of Leviathan', in Razin, Assaf and Efrain Sadka (eds), *Economic Policy in Theory and Practice*, pp.280-306, Palgrave Macmillan, London; Findlay, Ronald and Stanislaw Wellisz (2003), *The Theory of the State*, Columbia University, Department of Economics, Discussion Paper Series, D203,25.

