

**Republic of the Union of Myanmar
Data Collection Survey on
Modernization of the
Financial System**

FINAL REPORT

October 2012

Japan International Cooperation Agency (JICA)

**Daiwa Institute of Research Ltd.
NTT Data Corporation
Fujitsu Limited**

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ABBREVIATION

ASEAN	Association of the South East Asian Nations
BankNW	Banking Network
BOJ	Bank of Japan
CBM	Central Bank of Myanmar
CLMV	Cambodia, Lao, Myanmar and Vietnam
CMDC	Capital Market Development Committee
CSO	Central Statistical Organization
EFT	Electric Funds Transfer System
FIFO	First In, First Out
FSA	Financial Service Agency
FTP	File Transfer Protocol
ICT	Information and communication technology
IMF	International Monetary Fund
LIFO	Last In, First Out
MADB	Myanmar Agricultural Development Bank
MCF	Myanmar Computer Federation
MEB	Myanma Economic Bank
MFTB	Myanmar Foreign Trade Bank
MICB	Myanmar Investment Commercial Bank
MIT	Myanmar Information Technology Pte Ltd
MOFR	Ministry of Finance and Revenue
MPT	Myanma Posts and Telecommunications
MPU	Myanmar Payment Union
MSEC	Myanmar Securities Exchange Centre Co., Ltd.
NRC	National Registration Card
OA	Office Automation
ODA	Official Development Assistance
PTD	The Post and Telecommunications Department
SPW	Security Printing Works
SWIFT MT	Society for Worldwide Interbank Financial Telecommunication Message Type
UPS	Uninterruptible Power Supply

1. Outline of the Study

1.1. Background and Objectives

On March 30, 2011, a new administration was formed in Myanmar. The President U Thein Sein announced reform target regarding politics, economy and society development in the general policy speech of the next day. In the field of economy, the government focuses the market oriented economic system and facilitates foreign investment, to make Myanmar economy grow rapidly. However, there are a number of challenges ahead, such as fiscal burden by state-owned companies, underdeveloped financial institutions, export/import system that can adversely impact international trades. Especially in the financial sector, the urgent need of modernization is also pointed out under the Article IV consultation of International Monetary Fund (IMF). Myanmar government has set a policy to develop and foster the capital market in the country by the time it is fully integrated into the ASEAN Economic Community in 2015.

Modernization of Myanmar's financial sector is one of the issues which Japan considers necessary to push ahead with its cooperation. In order for the financial sector to develop, it is similarly necessary to establish financial information and communication technology (ICT) systems which will be a basis of the modern financial market. Myanmar government has not yet worked on so far partly because the shortage of experience and human resources. Banks still do not have online connections between branches or ATM networks, and human resources with ICT skills are lacking, as there has been a brain drain, with skilled people leaving the country, and there are only a few thousand domestic specialists. Although ICT is used in some financial institutions, these systems have grown so outdated that data management and securities measures are not properly conducted and the transaction cost is high.

Japan considers that in order for Myanmar's financial system to be modernized, there is a need for integrated development aid that includes aspects such as training of human resources in addition to the infrastructure hardware. By establishing an infrastructure of the systems and by training people needed for ICT, commencing with financial ICT systems, the trend of modernization should then extend to other (non-financial) sectors.

Given these circumstances, this study was conducted 1) to understand outlines of Myanmar's present financial sector and financial ICT systems and to identify issues and needs through gathering and analyzing information from a broad-based perspective, then 2) investigate methods of adopting and setting up ICT systems to address the development issues identified, and finally, 3) propose a medium-term approach for developing Myanmar's financial ICT

systems. The consortium understands the objective of the study as being to formulate the content of the proposal as a development scenario (Draft) will be oriented as a common basis for the Myanmar side and the Japan International Cooperation Agency (JICA) to share their views on how cooperation should proceed.

Progress with the modernization of financial system will bring major advantages to Myanmar. Firstly, financial services provided to nations will be much improved thus nations will make use of financial institutions more frequently and actively. Once people start utilizing financial institutions, fund circulation in the market will be facilitated, leading to the economic development in Myanmar.

Secondly, the establishment of the financial and capital market will support and accelerate the growth and development of the local companies, which will find it much easier to expand their operations rapidly as raising funds becomes less problematic and more flexible as a result of their ability to make use of the financial and the capital market.

Furthermore, by making use of the local ICT technicians, opportunities beyond merely expanding the ICT industry can be hoped for in areas such as raising the level of Myanmar's ICT literacy through user education and training which should also result in Myanmar becoming a more investor-friendly country for foreign companies to enter because of a greater degree of ease in being able to hire their local workforces.

1.2. General Outline and Implementation

The study team collected and analyzed information such as an overview of the financial sector, current situation and issues of financial ICT system and cooperation from other donors in the financial sector. The study team also examined practical solutions to the issues by establishing or upgrading the ICT system in Myanmar.

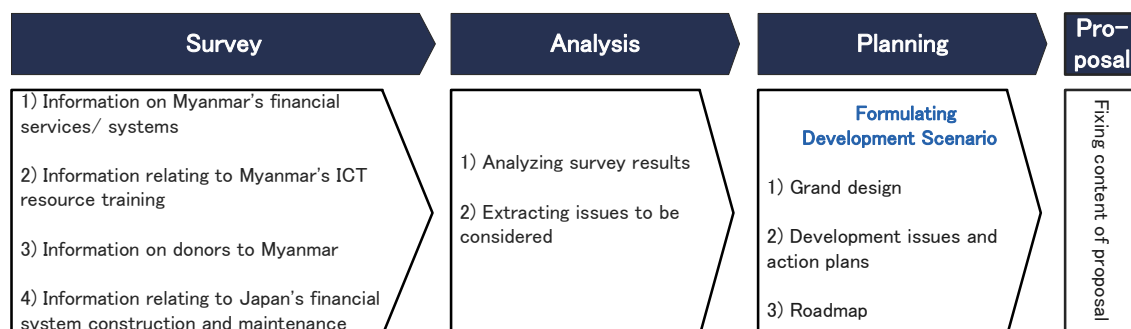
The survey was started in March 2012. In Japan, study team has collected and analyzed information about the Myanmar financial business operations, ICT system, ICT human resources and donor information, mainly through literatures, and determined overall situation. The study was followed by on-site interviews both in Myanmar and Japan, making maximum use of their local network and of the staff at the local facility. Interviews at government and financial institutions are conducted to analyze the current situation of the Myanmar's financial system, services and regulation, and to identify the impediments to the smooth modernization of the financial sector.

The study team visited government institutions as well as banks and ICT companies including Central Bank of Myanmar (Currency Department, Internal Audit and Bank Supervision Department, Accounts Department, Administration Department), Ministry of Finance and Revenue (MOFR), Myanmar Banking Association, state-owned banks (Myanma Economic Bank and Myanma Agricultural Development Bank), all commercial banks (such as Kambawza Bank, Myanma Apex Bank, First Private Bank, Yoma Bank, Asia Green Development Bank etc), ICT companies (ACE, MIT, Global Technology Co., Ltd). Persons that study team interviewed are summarized in Appendix1.

This report highlights major issues that found in the concerned sector, and proposes a blueprint for developing Myanmar's financial ICT system. The blueprint is to be shared between Myanmar and Japan to discuss their long-term collaboration.

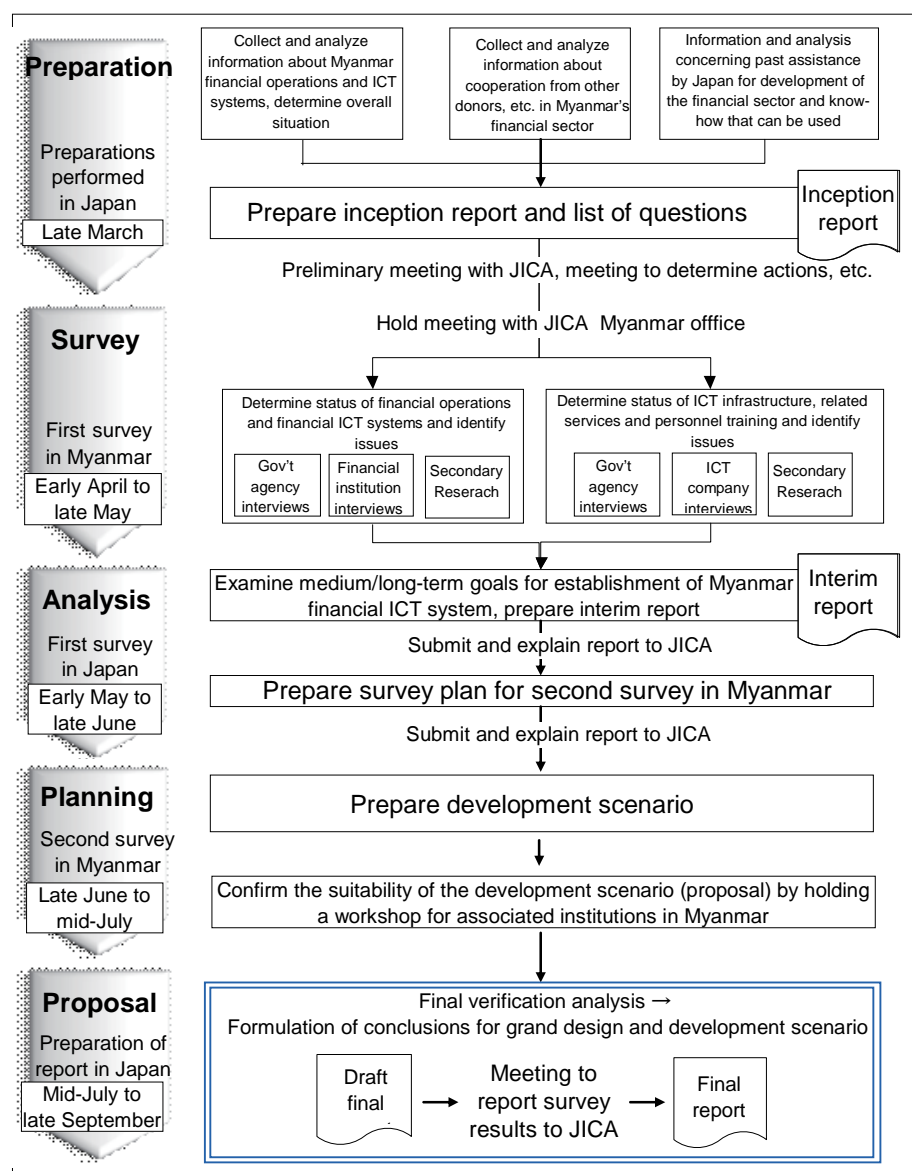
The main steps are shown in the Figure1-2-1, which can be divided into five major tasks: preparations, the survey, analysis, planning, and the proposal. The Figure1-2-2 is a flow chart for these tasks that includes the activities performed in each step.

Figure 1-2-1. Main steps in conducting study



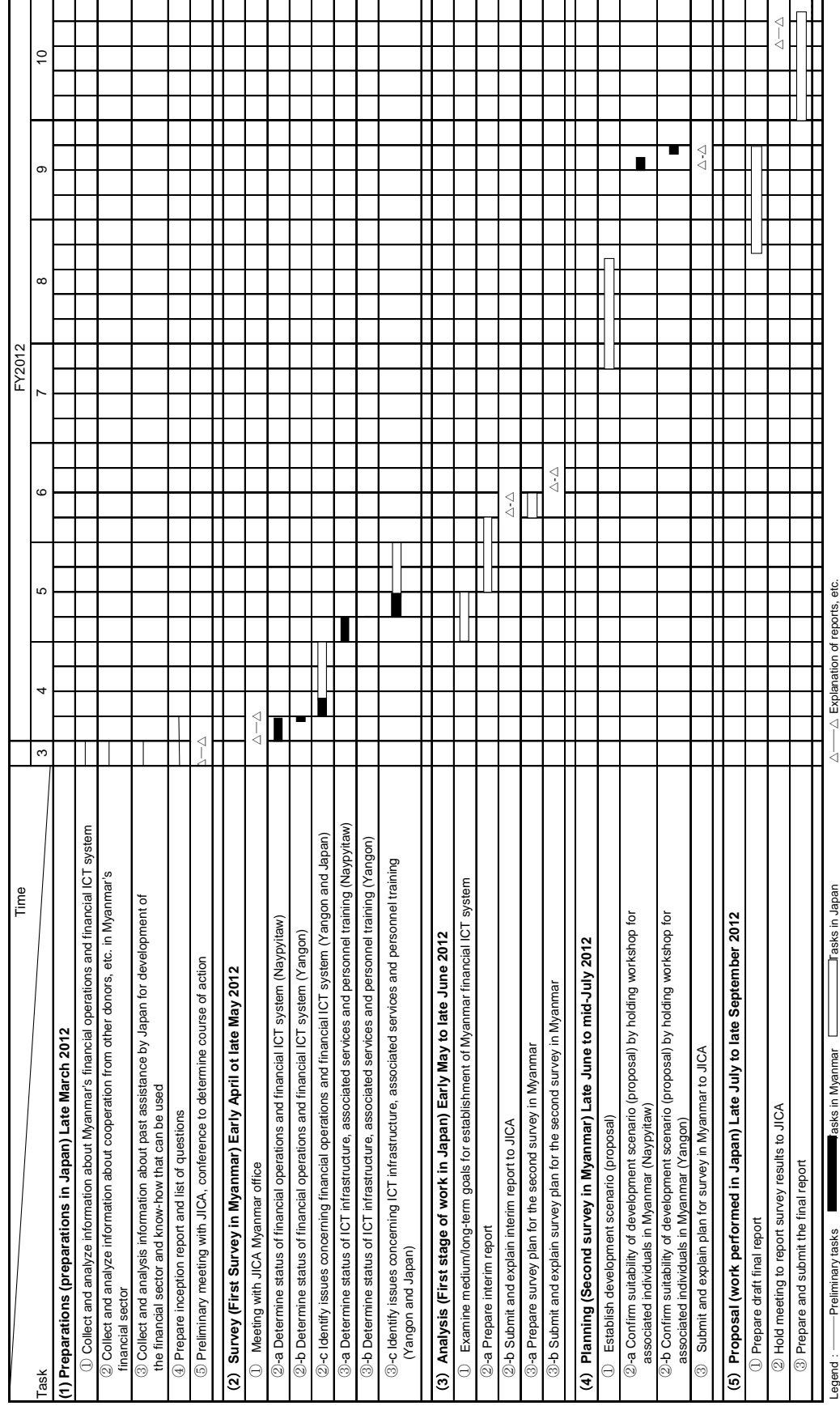
Source: Study team

Figure 1-2-2. Flow chart



Source: Study team

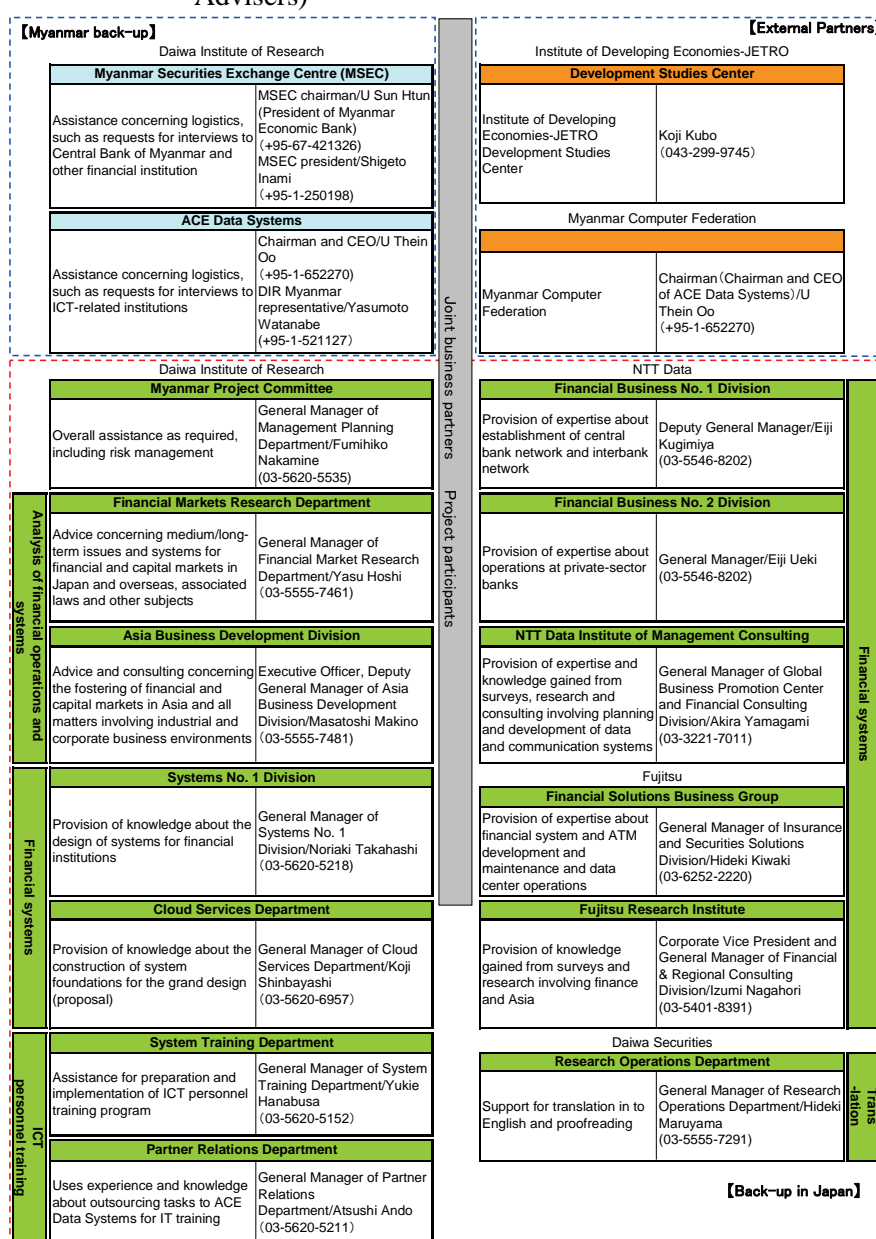
Figure 1-2-3. Plans for tasks



1.3. Composition and Assignment of the Study Team

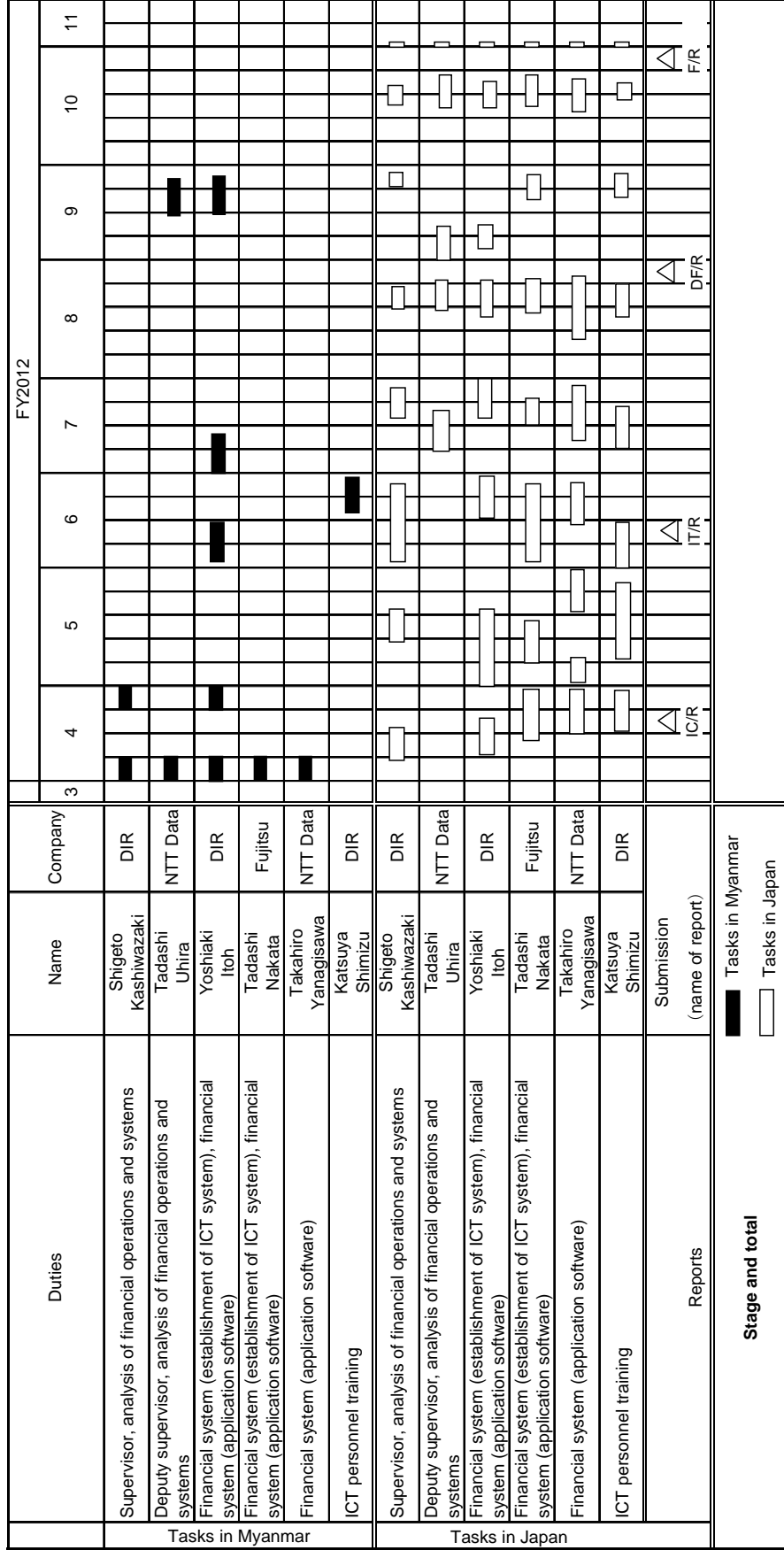
For this study, Daiwa Institute of Research Ltd. (DIR), NTT Data Corporation (NTT Data), and Fujitsu Limited (Fujitsu) formed a consortium for the study (Figure 1-3-1). The study team conducted local survey effectively, by making the best use of their knowledge and experience in their specialist area such as system of central bank, commercial banks, and securities, as well as their local network of relationships with the government.

Figure 1-3-1. Back-up framework for the Myanmar project (Japan/Myanmar / External Advisers)



Source: Study team

Figure 1-3-2. Personal plans



Source: Study team

2. Overview of Myanmar Financial Sector

2.1. Historical Background

1) Historical background

After independence from UK, state-owned banks and commercial banks had co-existed under the Union Bank of Burma, the central bank. Amongst commercial banks, especially British banks had been dominant in the Myanmar financial sector.

Major historic episode dates back in 1964 when all the private commercial banks (14 foreign and 10 domestic banks) had been nationalized by the newly established socialist government led by General Ne Win. During this political regime, numbers of reform had been taken place such as the implementation of the demonetization and the dual banking system that allowed the Union Bank of Burma to operate as an independent central bank.

Demonetization of currency, enforced three times (in 1963, 85 and 87), greatly ruined the reliability of financial system. Since old bank notes were not exchanged to new ones in 1987, nations gave vent to their dissatisfaction, leading to the riot in the next year.

In 1990, after the new government was formed, the financial sector developed rapidly as the relevant laws such as *the Central Bank of Myanmar (CBM) Law* enacted in 1990 and private commercial banks were permitted to operate in line with the government's initiative in economic reform. Approximately 20 commercial banks were formed between 1992 and 1996. During this period, economy as well as financial system in Myanmar had developed rapidly.

The Asian financial crisis of 1997 brought a period of macro-economic instability, and after the 2003 bank crisis led banks into a bank run, the financial authority has imposed restrictions to the banking sector. As a consequence the development momentum of the financial sector has slowed its pace. During that time the economy was in the doldrums due to US and European sanctions on the military government. However, under the new government established in March 2011, series of multiple new policies and relaxation and modification of existing policies in the financial sector has been seen along with other major economic reforms. After new private commercial banks given licenses for the first time in nearly two decades to enter the financial market in 2010, several significant policies have been implemented to enhance the banking sector. For instance, issuance of foreign currency exchange licenses and relaxation of collaterals for bank loans have allowed commercial banks to broaden their banking services.

Figure 2-1-1. Key historical events

Year	Key events in financial sector	Other historical events
1948	The Union Bank of Burma established	Independence from Britain with U Nu as prime minister
1962		General Ne Win inaugurated <u>Burmese Way to Socialism</u>
1963	All commercial banks <u>nationalized</u>	
1964	<u>Demonetization policy</u> (also in 1985 and 1987)	
1969	<u>Monobank system</u> implemented (Integration into the People's Bank of Union of Burma)	
1974		Named Socialist Republic of the Union of Burma
1976	<u>Two-tier banking system</u> introduced (central bank and commercial bank functions split)	
1988		8888 uprising: pro-democracy protests SLORC took power
1990	<u>Financial sector reform</u> via new relevant legal framework ◆CBM Law ◆Financial Institutions of Myanmar Law ◆Myanmar Agriculture and Rural Development Bank Law	General election held, result in victory of NLD
1992	<u>Financial sector develops</u> rapidly as the private commercial banks were given license to operate Savings Banks Law enacted	
1996	MSEC established	
1997	Asian Financial Crisis After this, financial sector <u>development slows down</u> with restrictions	
2003	<u>Bank run occurs</u> amongst several big commercial banks and restriction imposed	
2008	Myanmar Capital Market Development Committee organized	
2010	<u>New bank licences</u> issued to 4 banks	General election held, result in USPD victory
2011	Several financial reform under the new government: ◆ <u>Foreign currency exchange licences</u> issued to six commercial banks ◆ <u>Collateral</u> options for bank loans increased ◆ <u>Deregulation of depository</u> in banks from 10 to 16 times of capital ◆Six commercial banks allowed to operate ATMs. ◆Eleven commercial banks authorized to issue L/Cs for foreign trade.	U Tein Sein elected as president in the parliament
2012	◆Four commercial banks begin exchange services overseas. ◆ <u>Managed floating exchange rate</u> implemented	

Source: various media and information

2) Law and regulations

After 1988, financial system reform was also initiated by SLORC (State Law and Order Restoration Council) together with the economic reform. In 1990, in line with this reform, three major laws in financial sector were enacted, namely *the CBM Law*, *the Financial Institutions of Myanmar Law* and *the Myanmar Agriculture and Rural Development Bank Law*.

With the enactment of *the CBM Law* and *the Financial Institutions of Myanmar Law*, the history of finance in Myanmar changed dramatically. Under *the CBM Law*, CBM was granted to own the privilege to execute the monetary policy, while under *the Financial Institutions of Myanmar Law*, banking operation which had been exclusively carried out by state was permitted to commercial banks as well, resulting in the establishment of 20 banks from 1992 to 1997.

Recently, legal reform is taking place through revision of laws such as *the CBM Law* as well as introduction of *the Securities Exchange Law* that are currently under discussion amongst the relevant authorities to be enacted within one-year time frame.

Figure 2-1-2. Major laws in financial sector

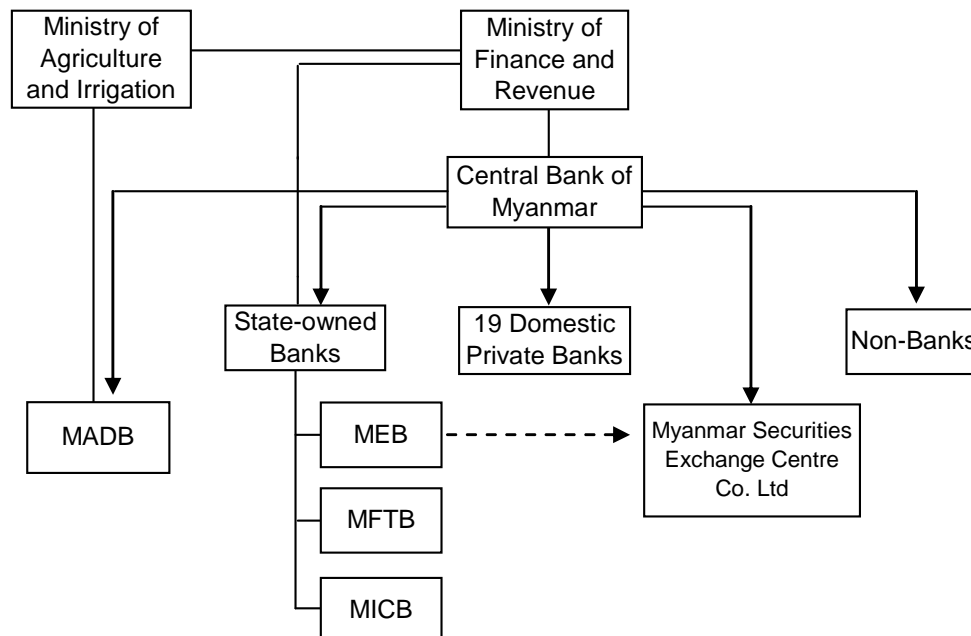
Name of law	enacted	Overview
Central Bank of Myanmar Law	1990	The Law empowers the Central Bank of Myanmar (CBM) <ul style="list-style-type: none">•to act as the sole issuer of domestic currency•to act as a banker to the Government•to act as an adviser to the Government in respect of economic matters•to inspect, supervise and regulate the financial institutions•to manage the international reserves of the State, etc
Financial Institutions of Myanmar Law	1990	<ul style="list-style-type: none">•Financial institutions, whether state-owned, jointly owned by state and private or private can obtain licence to operate, with the prior sanction from the CBM.•The permission to operate in the State as a financial institution with foreign capital, or as a branch of a foreign bank may be granted by the CBM.
Myanmar Agriculture and Rural Development Bank Law	1990	<ul style="list-style-type: none">•The Law grants the bank a broad mandate to effectively support the development of agricultural, livestock and rural socio-economic enterprises in the country by providing banking services.

2.2. Financial Sector Overview

1) Organization of financial sector

The financial sector in Myanmar is regulated under the supervision of the Ministry of Finance and Revenue (MOFR). CBM, which is currently under control of MOFR, is stipulated as the regulatory body of the banking sector under *the CBM Law* (Figure 2-1-2). Besides CBM, there are 23 banks in operation. Amongst them, 4 banks are state-owned namely, the Myanma Economic Bank (MEB), the Myanma Foreign Trade Bank (MFTB), and the Myanma Investment and Commercial Bank (MICB) as well as Myanma Agricultural Development Bank (MADB) which is established under the Ministry of Agriculture and Irrigation jurisdiction by nature. Other 19 banks are either joint venture banks between private and public institutions or purely private banks including the newly established 4 banks in 2010. In addition, CBM is also responsible in supervising non-banks including Myanmar Insurance Cooperation, Micro Finance Supervisory Enterprises, Myanmar Oriental Leasing and Myanmar Securities Exchange Centre Co., Ltd. (MSEC).

Figure 2-2-1. Key organizations of Myanmar financial sector



Source: Modified from “Myanmar’s Economy in Transition: Market Versus Control, Chapter3, IDE-JETRO No.546”

2) Bank balance and bond issuance

Even under tight control over the commercial banks since 2003 when the bank run event occurred, the total bank balance increased at a relatively faster pace of 44% CAGR (Compounded Annual Growth Rate) between 2007 and 2010 (Figure 2-2-2) from one trillion to over three trillion Kyats, respectively. Significant increase of bank balance can be seen in the private commercial banks than in the state-owned banks, which may partially reflect an increase in bank accounts at the newly established banks since 2010.

Figure 2-2-2. Bank balance

(Kyat bn)	FY2007	FY2008	FY2009	FY2010	2011	2007-'10 CAGR
People's savings (total)	1,267.8	1,734.8	2,458.2	3,753.1	5,467.9	43.6%
State-owned banks	700.4	958.2	1,315.8	1,698.2	1,957.9	34.6%
Private commercial banks	567.4	776.6	1,142.4	2,054.9	3,510.1	49.8%

Source: Central Statistical Organization (CSO)

Note: FY2007-2010: April-March, 2011: April-November

As for government bonds, Myanmar has two decade of experience in issuance. Currently there are three types, two-year government bonds (starting from 1st January 2010) with a coupon rate of 8.75%, those of three-year (starting from 1st December 1993) with a 9.0% coupon rate as well as those of five-year (starting from 1st January 1997) with a coupon rate of 9.5%. Myanmar's banks directly purchase government bonds from CBM, and others including retail investors buy at MSEC or eight branches of MEB.

For the past several years, outstanding amount of government bonds issued increased substantially from less than two hundred billion Kyats to more than 1.2 trillion Kyats (Figure 2-2-3). This is primarily due to Myanmar's worsening government budget deficit, in addition Myanmar government relies more on government bond issuance for its budget deficit financing. For FY March 2010 and FY March 2012, 40% or more of its government budget deficit was financed by government bonds, compared to 20% or less in the past.

Secondary market of government bonds, however, is not developed. Basically banks do not sell their government bonds until maturity. Retail investors sometimes sell their government bonds at MSEC or MEB, but trading activities are quite small.

Figure 2-2-3. Trends in government bond issuance

(Kyat bn)		FY 2007		FY 2008		FY 2009		FY 2010		FY 2011		FY 07-10 CAGR
			% Share		% Share		% Share		% Share		% Share	
Total Government Bond Issuance Outstanding (by Holder Category)		179.8	100.0%	297.4	100.0%	939.2	100.0%	1,272.3	100.0%	1,855.3	100.0%	92.0%
Two-year Bonds	Public sector	-	-	-	-	-	-	1.4	0.1%	51.4	2.8%	-
	Private sector	-	-	-	-	-	-	12.2	1.0%	290.7	15.7%	-
Three-year Bonds	Public sector	0.6	0.3%	0.6	0.2%	0.7	0.1%	0.5	0.0%	2.5	0.1%	-7.2%
	Private sector	121.1	67.3%	196.8	66.2%	755.9	80.5%	767.8	60.3%	746.4	40.2%	85.1%
Five-year Bonds	Public sector	5.3	2.9%	6.9	2.3%	11.8	1.3%	13.2	1.0%	15.1	0.8%	35.6%
	Private sector	52.8	29.4%	93.0	31.3%	170.8	18.2%	477.3	37.5%	749.2	40.4%	108.3%

Source: Myanmar Central Statistical Office

Note: FY2007-2010: April-March, 2011: April-December

3) Financial institutions: Central Bank of Myanmar (CBM)

The current organizational structure of CBM is shown in Figure 2-2-4. The CBM is headquartered in Naypyitaw, the capital of Myanmar, and has branch offices in Yangon and Mandalay.

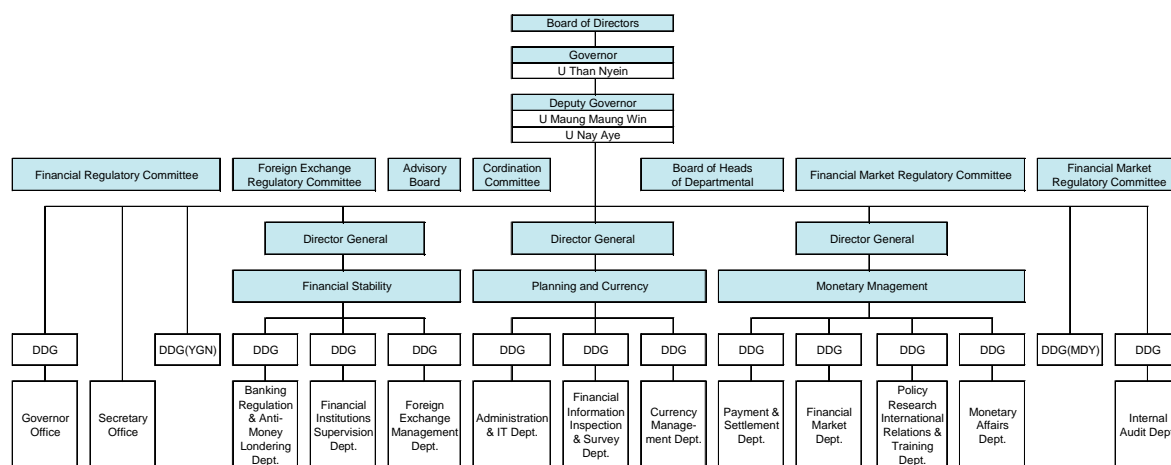
CBM is responsible to be the sole institute in issuing local currency, and serves as a bank of the government by controlling its accounts as well as a bank of other financial institutions. CBM also operates monetary policy to maintain macroeconomic stability by mainly using interest rate as measures.

Unlike the Bank of Japan (BOJ), CBM has the authority to implement necessary legal enforcement and to grant banking licenses. In Japan, it is not BOJ but the Financial Services Agency (FSA) that has this role and authority. This indicates that CBM has a very powerful influence on the financial sector in Myanmar.

Currently CBM belongs to MOFR, but it is expected to become independent after *the CBM Law* is revised. A new draft of *CBM law* is now under review at the Attorney General's Office, and will be submitted to the next parliament held in October. Therefore fiscal and monetary policies will be separated, which is in line with a global trend. While CBM's monetary policy should be aimed at achieving price stability, influence on monetary policy of MOFR, which is responsible for fiscal policy, is likely to lead toward inflation with a strong focus on increasing the money supply to cover the government expenditure.

As price stability should essentially be controlled over a medium- to long-term perspective, monetary policy should be conducted from a viewpoint completely independent from the fiscal policy that is projected and designed each fiscal year.

Figure 2-2-4. Organization chart of CBM



Note: As of end-Sep 2012. Organizational changes are taking place.

Source: Study team

4) Financial institutions: State-owned banks

Myanmar Economic Bank (MEB) is the largest commercial bank in Myanmar among both state-owned and commercial banks on value basis as well as on its branch number. MEB makes up around a half of total deposits in Myanmar banks and has 326 branches that cover all over the country. Approximately 70% of deposits are from individuals, which has similarity with Japan Post Bank. Number of accounts seems between 1 million and 2 million.

The bank has 2 major roles; a general commercial bank and the agent of CBM. By utilizing its nation-wide branch network, the bank supports treasury business and currency business of CBM that has only 3 branches in Yangon, Naypyitaw and Mandalay. In addition, during the bank run in 2003, MEB acted very crucial role supplying fund to other commercial banks.

The bank differentiates itself from other commercial banks by brand image of state-owned and deposit protected by government. Therefore many towns in rural area are requesting the bank to open branch.

Myanmar government's expenditures are paid by MEB. In Japan, such payments are performed by BOJ, but since CBM does not have a nation-wide network in Myanmar, MEB is responsible for this particular operation on behalf of CBM.

Myanmar Agricultural Development Bank (MADB) is established in 1957 as State Agricultural Bank. In 2007 the name was changed to Myanmar Agricultural Development Bank. Its branch network of 205 is the second largest in Myanmar, following MEB. Myanmar has

around 340 cities, and thus its branch network covers most of rural areas except for those near the border of Thailand. The number of accounts is nearly 1.7 million, which is almost equivalent to that of MEB. The bank's asset consists of deposits from farmers (2%), funding from MEB (90%), and share capital (5 billion Kyats).

Agriculture, where around 70% of Myanmar's labor workers are involved in, plays a major roles in its economy. The bank provides short-term seasonal loans and term loans. Seasonal loans utilize expected harvest, the data provided by Land Record Department of Myanmar government as collateral and group of farmers as guarantor. Term loans utilize real estate as collateral.

The deposit interest rate for farmers is 8% whereas the loan interest rate for farmers is 8.5%. Therefore the bank's profit from this spread is not big. However since the loan interest rate from Myanma Economic Bank is 4%, most of the profit comes from this gap. The loan interest rate of 8.5% for farmers is much lower than the loan interest rate of 13% for other commercial bank. This special rate is not offered to all farmers. Only the farmer whose farm land is less than 10 acre can open a loan account in the bank.

Myanma Foreign Trade Bank (MFTB) is one of the banks for foreign banking business in Myanmar. MFTB operates under *the Financial Institutions of Myanmar Law*, to implement the international banking and financial services, to provide the external trade and non-trade foreign exchange operations for market oriented economy.

In MFTB, it is allowed to open two types of foreign currency accounts; namely current deposit account and interest bearing six months fixed deposit account.

Myanma Investment and Commercial Bank (MICB) started its business in 1989 as a subsidiary of MEB, and became independent in 1990 under *the financial Institutions of Myanmar Law*. MICB handles international banking services mainly on private sector.

5) Financial institutions: Commercial banks

Private banks were rationalized from 20 banks to 15 banks by the business restriction after 2003. And currently there are 19 private banks including 4 banks newly established after 2010 (Figure 2-2-5). The main role of private banks is financial intermediation, cash possessions, settlement, and collecting money from the depositors.

Private banks can be divided into two types of category again: semi-governmental banks and purely private banks (hereinafter simply described as private banks). The semi-governmental

banks are established and invested jointly by the government and private organizations. Semi-governmental banks tend to focus on clearly chosen business targets, which could be corporations related industry parks, Ministry of Commerce, Ministry of Livestock and Fisheries, and various associations. Private banks are established and invested by private organization, and most of the private banks are a part of financial conglomerates. In many cases, the private banks' branches are located in large cities and conduct business for individuals as well as corporations, with massive funding ability.

Each bank's preparation has rapidly advanced: for instance, they invite the specialist from overseas, dispatch its staff to the foreign banks etc. since the international business restriction was mitigated in 2012. However, it is concerned about a remarkable difference about each system introduction because of funding ability and ICT strategy.

It is important that all private banks advance the modernization of the financial system simultaneously for the economic development in Myanmar.

6) Financial institutions: MSEC

MSEC, established in 1996 jointly between state-owned MEB and Daiwa Institute of Research, is one and only non-bank institution with foreign capital operating today. Since its establishment, MSEC has been providing securities exchange services. 2 local stocks, namely Forest Products Joint Venture Co. Ltd. (hereafter FPJV) and Myanmar Citizens Bank, are traded at MSEC's counter. However trading activities are illiquid. MSEC is also assigned by the CBM as one of the two selling agents of government bonds, while the other agent being the MEB.

Under the guidance of MOFR and CBM, MSEC has been supporting financial authorities together with the members of Capital Market Development Committee (CMDC) in achieving further capital market development in Myanmar. Daily activities of MSEC includes frequently given financial advices to the relevant authorities and information dissemination to the public. Besides, one of the initial commitments by MSEC in the late 1990s was to help drafting of *the Securities and Exchange Law*. The law is expected to be approved by the cabinet and enacted in the near future, as mentioned earlier.

Figure 2-2-5. Bank list

Name	No. of Branches	Founded	Description
1. Central Bank			
Central Bank of Myanmar	3	1952	Central bank.
2. State-owned banks			
Myanma Economic Bank	326	1976	Largest in total assets as well as number of branches.
Myanma Foreign Trade Bank	1	1976	Provides international banking services.
Myanma Investment and Commercial Bank	2	1990	Provides services also to foreign companies operating in Myanmar.
Myanma Agricultural Development Bank	205	1987	Under supervision of Ministry of Agriculture and Irrigation, not CBM.
3. Private banks			
Kanbawza Bank	60	Jun-94	Largest private bank.
Myanma Apex Bank	15	Jul-10	An affiliate of Eden Group.
First Private Bank	N.A.	May-92	Public company.
Yoma Bank	51	Jul-93	An affiliate of FMI group.
Asia Green Development Bank	18	Jul-10	An affiliate of Htoo group.
Myanmar Citizens Bank	7	May-92	Public company traded at MSEC. Ministry of Commerce is a large shareholder.
Tun Foundation Bank	N.A.	Jun-94	Established by Mr. Tun
Co-operative Bank	10	Aug-92	Public company. Ministry of Cooperatives is a large shareholder.
Myawaddy Bank	19	Jan-93	Myanmar Economic Holdings is a large shareholder.
Myanmar Oriental Bank	19	Jul-93	Chinese origin.
Myanma Livestock and Fisheries Development Bank	56	Feb-96	Public company. Ministry of Livestock and Fisheries is a large shareholder.
Ayeyarwady Bank	26	Jul-10	An affiliate of Max Myanmar Group.
Sibin Tharyaryay Bank	2	Jun-96	Ministry of Border Affairs is a large shareholder.
United Amara Bank	10	Jul-10	An affiliate of IGE Group.
Innwa Bank	32	May-97	Myanmar Economic Corporation is a large shareholder.
Yangon City Bank	2	Mar-93	An affiliate of Yangon City.
Myanma Industrial Development Bank	15	Jan-93	Public company.
Asia Yangon Bank	2	Mar-94	Has a branch in Naypyitaw.
Yadanarbon Bank	1	Aug-92	An affiliate of Mandalay City.

Source: Study team

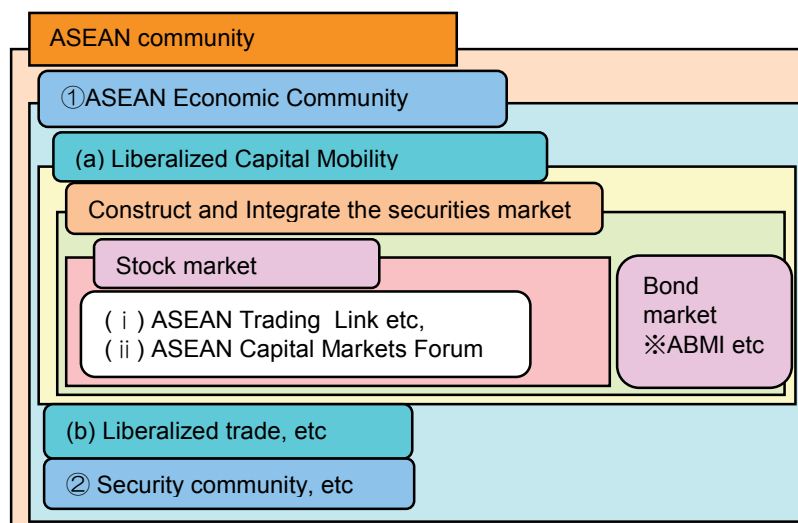
2.3. Capital Market

The Myanmar government was aware of the fact that its neighboring ASEAN countries took advantage of capital market to raise large amounts of funds from domestic and foreign investors to support their rapidly growing economies. Thus the government commenced consideration of introducing capital market into Myanmar from mid-1990's. Since no securities exchange had ever existed in the country before, MSEC was set up in 1996 as the first decent securities exchange market and an organization designed to be positioned as a forerunner for the future exchange. However, the 1997 Asian financial crisis triggered sharp declines in the currencies of most of the countries in the region, which resulted in enthusiasm for the Myanmar government's plans for the development of securities markets waning and the project being slowing down thereafter.

There is not yet an independent regulatory body for the capital market in Myanmar, such as the Financial Supervisory Agency (FSA) or the Securities Exchange Commission (SEC) as seen in other countries. However, *the Securities and Exchange Law*, which is expected to be enacted in the near future, is said to stipulate such regulatory organization and currently establishment of SEC is under preparation by relevant government agencies. Once it is established, together with the CBM supervising the banking sector, there will be a more distinct monitoring and regulating structure for the capital market which should be able to bring about an efficient and productive financial sector as a whole.

Given the economic and financial reform policies in place by the new government, the international community has acknowledged its willingness and efforts that will lead to an economic development incorporating some of the ongoing initiatives amongst neighboring countries and to a broader regional term (Figure 2-3-1). For instance, ASEAN has been working more closely in recent years to form a regional economic cooperation namely the ASEAN Economic Community (AEC). In line with the regional economic integration which is scheduled to begin after 2015, numbers of tasks and goals from legal structure to actual effective policies are set including promotion of free trade and liberalization of capital mobility. As for the financial sector, integration of the securities market via ASEAN Trading Link as well as enhancing disclosure standards for cross-border trade amongst member countries at the ASEAN Capital Markets Forum (ACMF) are examples of such regional cooperation.

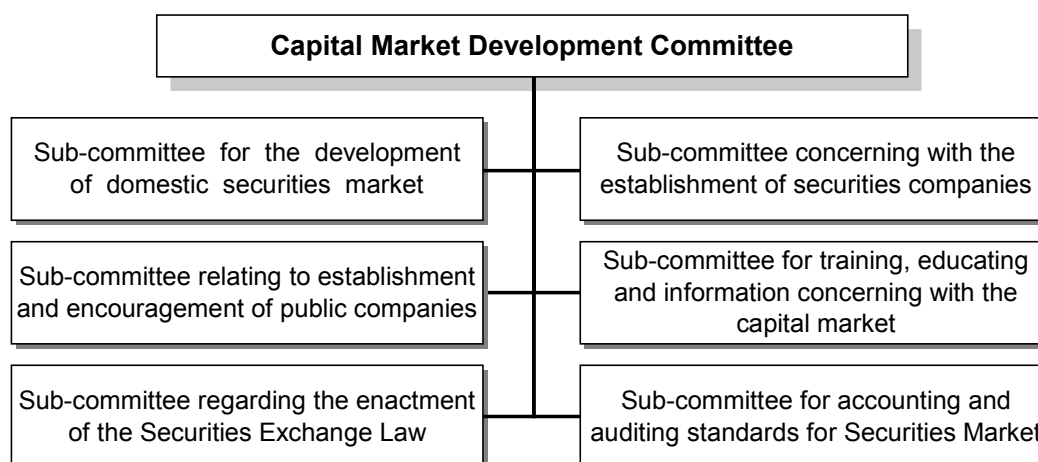
Figure 2-3-1. Capital market development in ASEAN community



Source: Study team

Along with such regional cooperation and initiatives, Myanmar has been also adjusting its policies in financial sector development gradually in the recent years. On July 2008, The Capital Market Development Committee (CMDC) was formed led by the Minister for the Ministry of Finance and Revenue with the approval of the Prime Minister's Office. The committee was assigned to prescribe *the Securities and Exchange Law* and to set up SEC and other infrastructure needed for developing capital markets. To carry out these objectives, the committee is split into 6 subcommittees (Figure 2-3-2).

Figure 2-3-2. Capital market development committee



Source: CBM

The committee was assigned to submit the necessary facts and information to carry out the development of capital market as well as to be in line with the ASEAN Capital Market Vision. CMDC submitted a development roadmap with precise schedule of itemized tasks and policies to be implemented in three phases from 2008-2015 (Figure 2-3-3). This roadmap covers various policy items in capital market development as a whole to be implemented including stipulating necessary legal framework, establishing regulatory authorities, relevant securities market institutions and infrastructure.

Figure 2-3-3. Capital market development roadmap (2008)

Phase 1 2008-09	Diversify treasury bonds issued by Central Bank of Myanmar
	Increase numbers of public companies and issuance of corporate bonds
	Constitute a committee of development for capital markets
	Promote and disseminate knowledge of securities through workshops, seminars, business talks and media
	Capacity building of local employees in financial sector
	Attend international conferences and seminars in ASEAN and the other countries
Phase 2 2010-12	Enforce the Securities and Exchange Law
	Issue municipal bonds
	Convert state-owned companies to a joint-stock corporations
	Educate institutional investors
	Establish an industry association for the securities market
Phase 3 2013-15	Establish a stock exchange
	Diversify methods of securities transaction

Source: Capital Market Development Committee

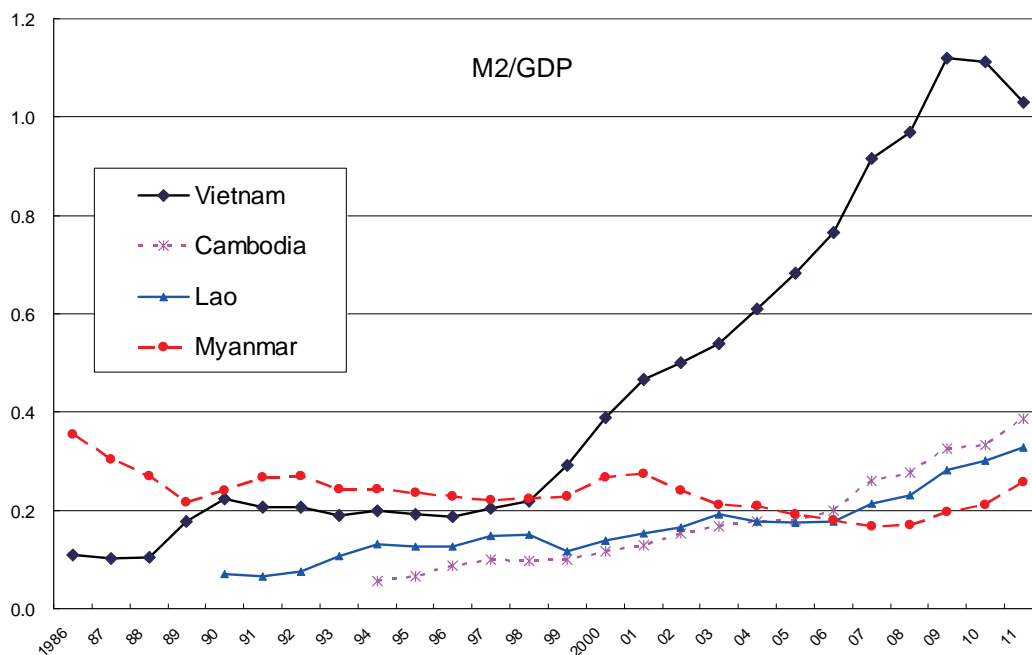
According to the CBM and members of the CMDC, most of the targeted tasks are accomplished that were scheduled in the first phase between 2008 and 2009. Yet, from the field survey conducted, their observation is that a few of the tasks such as increasing numbers of public companies and issuance of corporate bonds and capacity building of local employees in financial sector still remain to be enforced. While establishment of stock exchange and enactment of relevant laws are currently entering into actual implementation stage, remaining additional tasks that are scheduled during the second and third phase still seem to be under preparation.

2.4. Current Situation and Issues of Financial Sector

1) Current situation

Due to historical and political reasons as well as misaligned policies implemented by the financial authority from time to time, the financial sector in Myanmar has not seen much development as it had expected, compared to other regional economies. For example, unlike Vietnam which has just been accredited by the international financial institutions to become a member of middle-income countries in 2011 after a decade of long economic growth and financial sector development, the financial depth of Myanmar merely changes over the recent twenty years.

Figure 2-4-1. Financial depth comparison amongst CLMV



Source: IMF, ADB, compiled by study team

Figure 2-4-1 shows a comparison of financial deepening ratio in 4 countries, Cambodia, Lao PDR, Vietnam and Myanmar (CLMV). In general, this ratio of money stock M2 to the GDP is one of a classic measurement or an indicator of a country's financial depth. It is quite evident that Vietnam has more money circulation than its country's economy with its ratio surpassing 1.0 since 2009 hence financially deeper than Myanmar whose ratio is still at the level less than 0.3 even behind neighboring Lao PDR and Cambodia both catching up its pace in the recent

years due to economic growth.

Even looking at the share of cash amongst the total money stock M2, one could observe that Myanmar has higher liquidity of cash in circulation than other CLMV countries in 2011 (Figure 2-4-2). This implies that unlike other developing economies in ASEAN, cash is yet a primary means for any kind of economic transaction and settlement in Myanmar. It is quite natural to assess that the reason behind this situation is the shortage of modernized financial ICT infrastructure and limited accessibility of financial institutions.

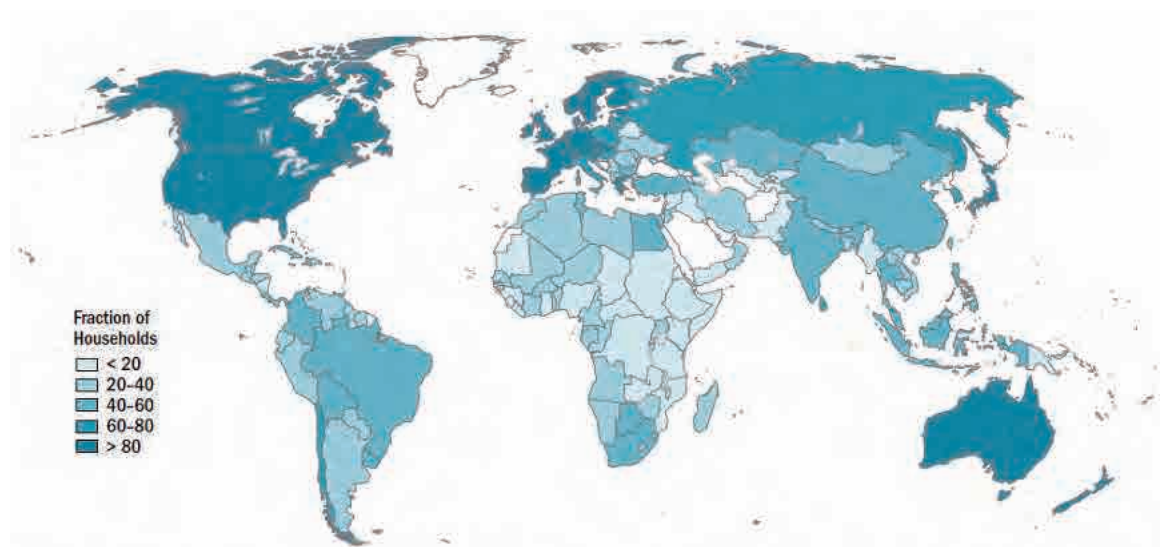
Figure 2-4-2. Share of cash amongst M2, CLMV comparison (2011)

	Vietnam	Cambodia	Lao PDR	Myanmar
Cash	11.9	15.2	18.3	43.2
Local Currency Deposit	70.9	3.0	35.8	56.8
Foreign Currency Deposit	17.2	81.8	46.0	
Total (M2)	100.0	100.0	100.0	100.0

Source: IMF

The macro-economic situation mentioned above are also addressed in the World Bank's report (2008) where Myanmar has yet plenty of rooms left to improve the households' accessibility to financial institution (Figure 2-4-3). While most financial institutions in Myanmar today are commercial banks, coverage of the banking services are yet only limited to major cities. Therefore, the remaining population especially in the suburban and rural areas may not have sufficient access to banks. One and only financial institution with relatively higher coverage is the state-owned MEB with more than three hundred branches nation wide.

Figure 2-4-3. Fraction of households with an account in financial institution



Sources: Beck, Demirgüç-Kunt, and Martínez Peria (2007b); Christen, Jayadeva, and Rosenberg (2004); Peachey and Roe (2006); and Honohan (2006). See also box 1.4.

Source: World Bank (2008)

It is not easy at all to grasp the situation surrounding the circulation of foreign currencies including US Dollar bills in Myanmar due to shortage of statistical data. However, it is estimated that there are foreign currency reserves of around 4.6 billion dollars in accumulation in 2010 according to IMF report. Therefore it is likely that substantial amount of dollar is in circulation. Prior to the changes in the foreign currency policy in April 2012, Myanmar citizens were not allowed to own any foreign currencies. Taking certain amount of cash carried in by hand from neighboring countries as well as other types of unofficial domestic inflows into account, the volume of foreign currencies, particularly US dollars in circulation, as a proportion of the local currency money stock is estimated to be a double-digit percentage.

2) Current issues

There are numbers of key issues that need consideration in order for the financial market to develop. Study team categorized into four major issues (Figure 2-4-4) for convenience in the remaining discussions to follow in this report.

First issue is the law and regulation. While the present government highly values the efforts to develop financial market in various aspects, the overall financial sector development master plan is not yet official and effective at the moment. However, it is currently being developed

with the assistance of the World Bank. Under the master plan, a *Foreign Exchange Management Law* will be enacted, which will allow local banks to set up joint-venture banks with foreign banks with branches in Myanmar.

There exists capital market development roadmap. However, it is somewhat unrealistic because it is an old plan created years ago and not updated since then. In addition, there exists no legalized regulation for the market as well as any kind of enforcement for securities transaction as of today.

Second issue is the supervisory function. Since CBM is currently a subsidiary organization of MOFR, CBM faces structural limitation in the level of independence particularly for its decision relevant to monetary policies. Although *the CBM Law* is currently being modified, it is still unclear whether the capability of supervisory function is improved, or smooth transfer of business is secured. Information sharing and communication between CBM and other banks are neither timely nor efficient given the current communication lines and infrastructure that support such reporting activities.

Thirdly, there is an issue of accounting and auditing. Current Myanmar Accounting Standards comply with the IFRS (International Financial Reporting Standards), which is a set of accounting standards developed by an independent, not-for-profit organization called the International Accounting Standards Boards (IASB). However, due to the shortage of relevant law amongst other reasons, Myanmar Accounting Standards are applied only for limited number of local companies, such as public companies as well as banks.

Limitation of modernized ICT infrastructure is the forth issue. Present absence of modernized clearing and settlement system results in most of the payments through cash transactions primarily in Myanmar. Hence, the actual settlement relies on manual processes which are time consuming and highly probable human errors.

Shortage of staffs with ICT skills as well as the shortage of decent ICT education in Myanmar are also other key issues to be addressed.

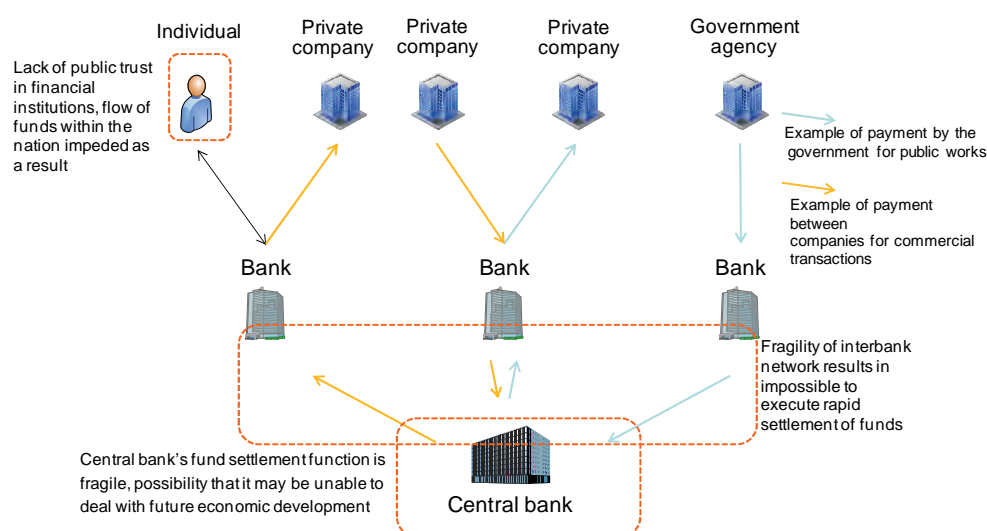
Furthermore, it is also important to note that the settlement of funds is an inevitable adjunct to economic activities. In Myanmar, however, the ICT required for accomplishing the actual settlement is not yet in place. This factor could be one of the impediments to the smooth transaction of business operations (Figure 2-4-6).

The Central Bank's funds settlement function may become even more vulnerable with the transaction volumes on the increase in tandem with future economic development. However, rapid settlement of funds may also unreliable if the network linking the financial institutions remain instable. If so, this weakness faced by the Central Bank which is located at the core of the financial system together with similar issues amongst all financial institutions linked through the interbank settlement system will hence brings risk to the financial sector and relevant stakeholders in Myanmar.

Figure 2-4-4. Major issues regarding Myanmar financial sector

1) Law and regulation
No official financial development masterplan hence the future plan is unclear
Capital market development is undergoing but with limitation including lack of relevant laws such as the Securities and Exchange Law
2) Supervisory function
The central bank has limitation on the level of independence from the Ministry of Finance and Revenue
Information sharing and communication between Central Bank of Myanmar and other banks may not be timely and efficient
3) Accounting and auditing
The national accounting standards are designed based on international accounting standards
The actual practice and adoption of standards, however, is very limited to few companies
4) IT modernization
Insufficient modernized clearing and settlement structure reflects method of payment primarily through cash transactions
The actual settlement relies on manual processes which are time consuming and subject to human errors

Figure 2-4-5. Image of settlement network linkage amongst stakeholders

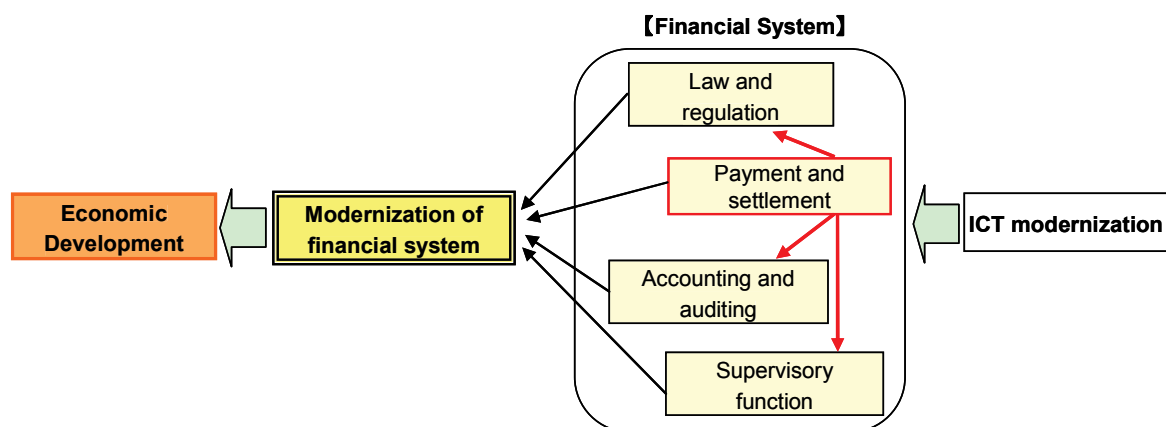


Source: Study team

It is an indispensable prerequisite in achieving economic development on track that the financial system infrastructure is established and strengthened. Starting with the law and regulation, along with accounting, auditing, supervisory, compliance and settlement functions are all equally important.

When it comes to the financial sector improvement in the context of this study, the use of ICT to modernize the settlement function can be identified as one of the pre-eminent issues. Computerizing the settlement function will produce a ripple effect across the infrastructure in other areas such as the accounting, auditing and supervisory institutions through increasing the volume and the processing speed of the transaction. It is conceivable that enforcement of these key components of financial sector will effectively facilitate the modernization of the financial system as a whole (Figure 2-4-5).

Figure 2-4-6. Image of how financial sector modernization could bring about economic development



Source: Study team

2.5. Cooperation by Other Entities

Until recently, Myanmar received limited ODA for its financial sector. Annual foreign aid to the financial sector in Myanmar per country or entity has been less than USD 1 million (Figure 2-5-1). Japan provided ODA mainly in areas of "the financial sector policy and operations", and Korea has also provided ODA for "education in the banking and financial service". In general, there has been no proactive attempt to provide Myanmar with aid including the financial sector.

ODA to the financial sector is on the rise since 2011. Technical assistance for developing Myanmar's bond market under Asian Bond Markets Initiative started in June 2011 to prepare a

roadmap. Phase 2 for ABMI Myanmar is expected to be discussed at the next ASEAN+3 Finance Minister Meeting, in 2013. IMF started supports for Myanmar's currency system since its visit in October 2011. With IMF's technical assistance, Myanmar unified its exchange rates with effect from 2 April 2012. IMF dispatched its staff to Myanmar for Article 4 consultation. IMF also dispatched experts to station at CBM to strengthen its central bank's roles and activities (Figure 2-5-2).

In May 2012, Daiwa Institute of Research and Tokyo Stock Exchange Group signed Memorandum of Understanding (MOU) with CBM for the purpose of developing a capital markets. In August 2012, Policy Research Institute, a research arm of Ministry of Finance, Japan, signed a memorandum of understanding with CBM for providing technical assistance in legal framework for capital market.

CBM also signed a memorandum of understanding with Bank of Thailand for technical collaboration in its capacity building.

Figure 2-5-1. ODA for the Myanmar financial sector by country/entity

	2005	2006	2007	2008	2009	Total
Japan	0.0853	0.1003	0.0773	0.0256	0.0455	0.334
Korea	0	0.0042	0.0403	0	0.0177	0.0622
Norway	0.3105	0.4572	0.5356	0.725	0.1004	2.1287
Italy	0	0	0	0.0577	0	0.0577
Sweden	0	0.0014	0.004	0.0076	0.0363	0.0493
Germany	0.0457	0	0	0	0	0.0457
EU entities	0	0	0	0	0.1379	0.1379
UNDP	0	0	0	4.623	1.1249	5.7479

Note: units in million dollars

Source: QWIDS (Query Wizard for International Development Statistics), OECD, compiled by study team.

Figure 2-5-2. Recent cooperation by overseas countries and institutions

Date	Major Event
June 2010	TA for Myanmar's bond market development begins, funded by Japan-ASEAN Financial Assistance (JAFTA) Fund
Oct 2011	IMF starts support for Myanmar's financial system
Jan 2012	Singapore and Myanmar sign Memorandum of Understanding (MOU) on the Singapore-Myanmar technical cooperation programme
May 2012	Daiwa Institute of Research and Tokyo Stock Exchange sign Memorandum of Understanding (MOU) with CBM for the pupose of developing a capital market
May 2012	IMF publishes Staff Report for the 2011 Article IV Consultation
Jul 2012	CBM signs a memorandum of understanding (MOU) with Thailand's central bank on technical cooperation
Aug 2012	Policy Research Institute in Japan signs Memorandum of Understanding (MOU) with CBM
Aug 2012	ADB, World Bank open Myanmar office World Bank is preparing \$85 million in grants to support reforms
Aug 2012	Asian Development Bank (ADB) publishes Myanmar country report

Source: Compiled by study team

Figure 2-5-3. Foreign investment of permitted enterprises (by sector)

No.	Particulars	Permitted Enterprises		
		No.	Approved Amount (US \$ in Million)	%
1	Power	5	19,067	46.40
2	Oil and Gas	113	14,182	34.51
3	Mining	66	2,814	6.85
4	Manufacturing	179	1,830	4.45
5	Hotel and Tourism	45	1,065	2.59
6	Real Estate	19	1,056	2.57
7	Livestock & Fisheries	25	324	0.79
8	Transport & Communication	16	314	0.76
9	Industrial Estate	3	193	0.47
10	Agriculture	9	183	0.44
11	Construction	2	38	0.09
12	Other Services	6	24	0.06
	Total	488	41,091	100.00

As of 31/8/2012

Source: Directorate of Investment and Company Administration (DICA)

Figure 2-5-4. Foreign investment of existing enterprises (by country)

No.	Particulars	Existing Enterprises		
		No.	Approved Amount (US \$ in Million)	%
1	China	14	14,064	45.28
2	Hong Kong	23	6,278	20.21
3	Republic of Korea	42	2,892	9.31
4	Thailand	25	2,460	7.92
5	U.K	22	2,247	7.23
6	Singapore	40	1,515	4.88
7	France	1	500	1.61
8	Malaysia	16	434	1.40
9	India	7	269	0.87
10	Japan	14	114	0.37
11	Russia Federation	2	94	0.30
12	Panama	2	55	0.18
13	Viet Nam	4	50	0.16
14	Mauritius	2	31	0.10
15	Indonesia	3	22	0.07
16	Republic of Liberia	2	15	0.05
17	Philippine	1	7	0.02
18	Australia	1	6	0.02
19	The Netherlands	2	4	0.01
20	Germany	1	3	0.01
21	Canada	2	1	0.00
22	Austria	1	1	0.00
	Total	227	31,061	100.00

As of 31/8/2012

Source: DICA

3. Current Situation of Financial Institutions

3.1. Central Bank

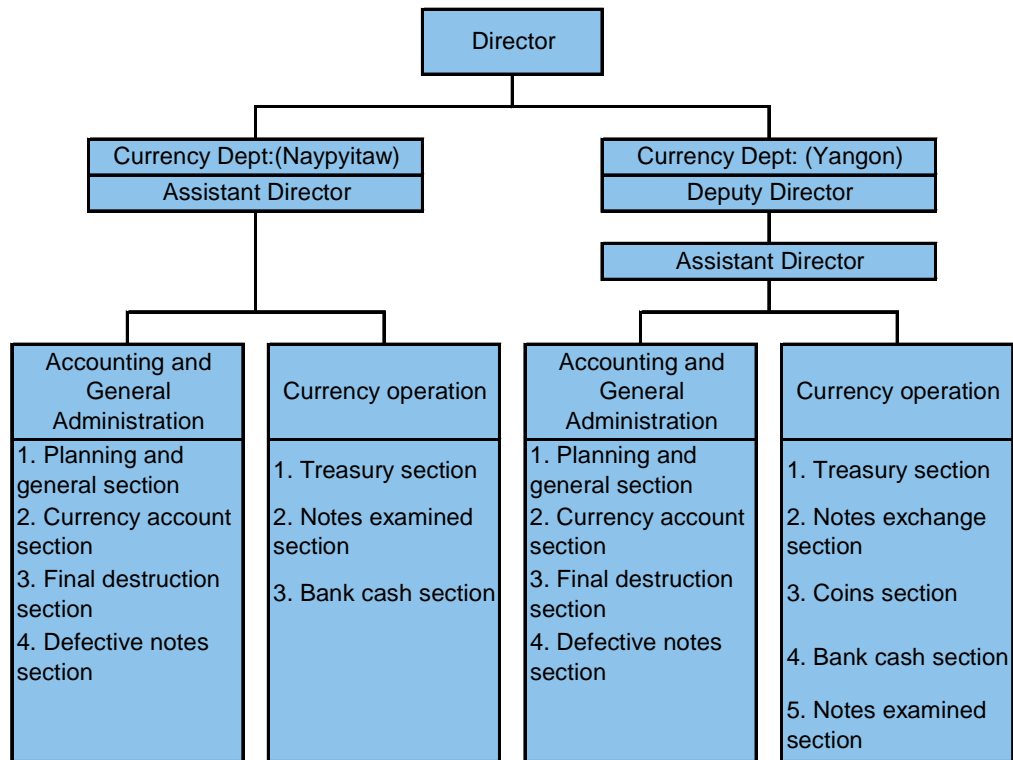
Even prior to the formal approval of the revised *CBM law*, which stipulates independence of CBM from MOFR, survey results indicate that CBM is preparing to play an active role as an independent central bank, for example, through the establishment of a “Monetary Policy Department”. This change can imply that the current administration of Myanmar respects the significance of monetary policy and expects CBM to enact monetary policy independently. At the same time, CBM is designed to execute actions to ensure a smooth and steady monetary policy. Therefore, modernization of CBM can be identified as the top-priority task which could support CBM’s essential role and contribute further to modernize overall financial sector.

Besides, given the planned economic integration within the ASEAN countries from 2015, the financial system modernization in Myanmar is regarded as urgent task in order to stabilize not only Myanmar's economy but also the regional and global economies. Recalling back the lessons learned from the Asian financial crisis in 1997, as cross-border economic activities increases, a failure in monetary policy or a collapse of the financial system in one country is increasingly likely to lead to a chain-reaction in other countries. Under the assumption that Myanmar will conduct economic activities not only at home but also abroad as a member of the international community, stabilization of the financial system in Myanmar should have a significant effect.

1) Management of currency

The currency unit in Myanmar is the Kyat. The Currency Department is responsible for issuing and controlling bank notes. In addition, unlike Japan, CBM also executes the role of issuing coins. Coins are generally uncirculated in the market, but according to the interview, CBM is sometimes required coins from commercial banks. Physical production of notes and coins is conducted by Security Printing Works (S. P. W.), a governmental organization.

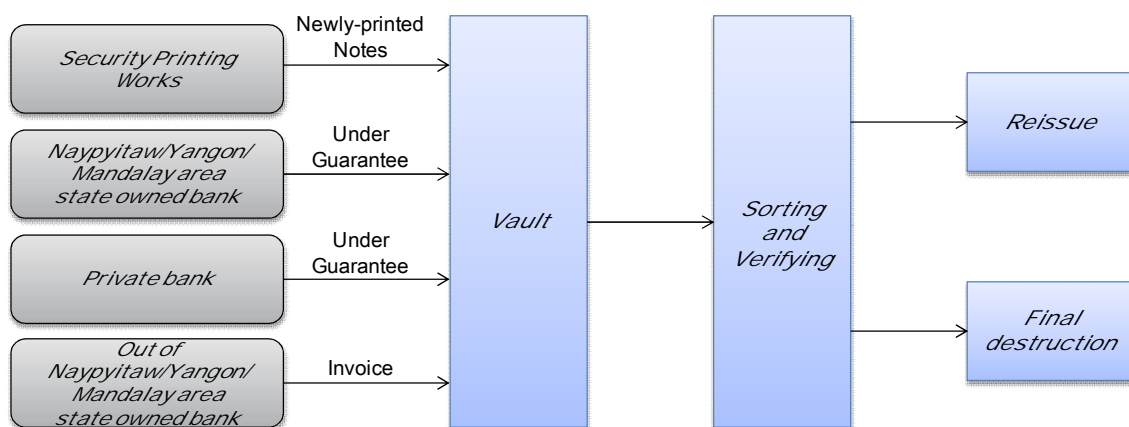
Figure 3-1-1. Organizational structure of the Currency Department



Source: Study team (based on CBM website)

The department receives newly-printed notes from S.P.W. and in-use notes from commercial banks. The department sorts (First In, First Out: FIFO and Last in, First Out: LIFO, etc.) and counts them. After that, the department checks the notes for reuse or disposal based on given rules.

Figure 3-1-2. Distribution of bank notes



Source: Study team (based on CBM Data)

In the actual assessment operations at CBM, each person is required to check 125 packs of 100 notes. Just for such assessment operations, 74 persons are allocated in Naypyitaw head office, 120 in Yangon, and 90 in Mandalay Branch.

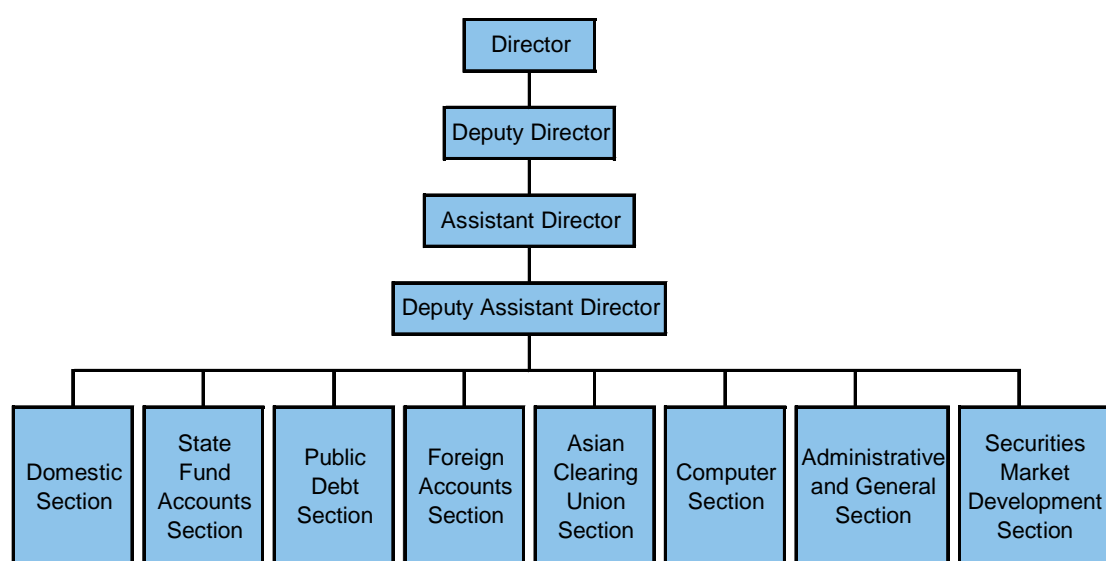
In Myanmar, cash settlement is still a primary payment practice, cash needs are relatively higher than other non-cash payment methods. The largest bank note newly introduced in June 2012 is 10,000 Kyat (approximately USD12). When a large amount is settled between companies, etc., a bunch of bank notes are required for payment. People have to deliver physically and manage them. Therefore, it is assumed that the average life of bank notes is shorter due to their frequent use in payment. The inefficiency and the operational risks are likely to increase assuming that the assessment operations continue to be carried out by hand. In fact, in the interview with CBM/MOFR, some of the interviewees confessed that they aim to reduce the amount of cash in circulation via promotion of electronic settlement.

2) Management of fund

(1) Account structure of CBM

The Account Department controls and manages the current accounts at CBM, including the fund settlement.

Figure 3-1-3. Organizational structure of the Account Department



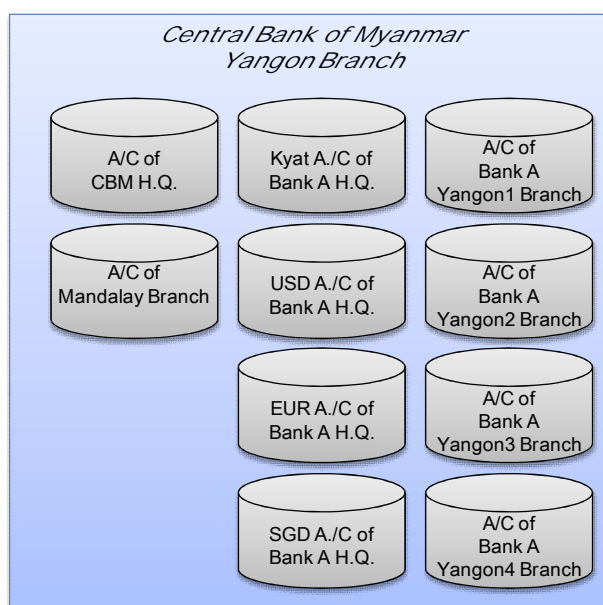
Source: Study team (based on CBM website)

The structure of the current accounts of participating financial institutions held by CBM is significantly different from the situations of central banks in other countries. Not only each commercial bank's head office but also each branch of the bank holds a current account at CBM. Even between head office/branches in the same bank, fund transfer is executed via current accounts with CBM. In particular, Myanma Economic Bank (MEB) with a large number of branch offices holds nearly 100 accounts by the CBM Yangon Branch.

In addition, the CBM head office and each CBM branch office hold accounts by each other as similar to correspondent accounts. Fund transfer between head office and branches is implemented through these accounts.

Regarding foreign currency, the financial institutions that are allowed to handle foreign exchange and operate foreign currency exchange (17 banks) may hold foreign currency accounts (USD, EUR and SGD).

Figure 3-1-4. Example of current account (A/C) system (CBM Yangon Branch)



Source: Study team

General ledger is managed electrically, but it is far from ideal. Since automatic recording system is not available, daily final account balance is simply input on hands. In parallel with this inefficient management, account balances are also recorded on paper as well.

(2) Electronic Funds Transfer System (EFT)

Electronic Funds Transfer System (EFT) is in place for the payment of accounts between the CBM and the financial institutions. EFT is an application operated on the Banking Network¹. The telegram format is compliant with the SWIFT MT Format (MT103 or MT202, etc.), connecting CBM and each commercial bank's head office for fund transfer between current accounts at CBM. As of May 2012, the system is in a test phase where 5 to 6 banks participate. CBM has notified all banks to participate in the system in future.

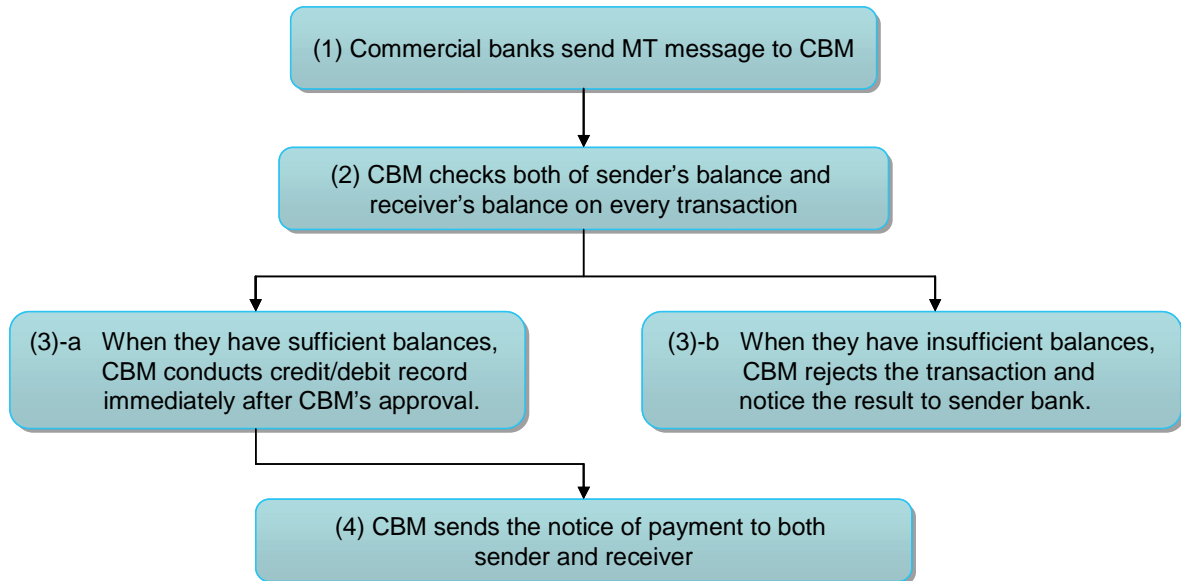
EFT is designated to three types of fund payments: fund transfer, treasury bond and bill, and deposit/withdrawal. Available fund transfers are confined to those current accounts held by head office and branch offices within the same bank and those between current accounts held by two different banks with the same branch of CBM (Naypyitaw, Yangon or Mandalay) due to the operational practice. In other words, it is impossible to implement fund transfers through current accounts held by two different banks with different branches of CBM, for example, to transfer money from the current account of Bank A held with the CBM Yangon Branch to the current account of Bank B held with the CBM Naypyitaw head office. EFT is available for eligible foreign currencies other than Kyat.

Daily transfer operations finish at 15:00. During the operation hours, transaction is done by each gross basis. And the final account balance on each day is carried forward to the next day.

With regard to the specific fund transfer workflow, the procedure stated below is automatically executed in each transaction. However, EFT is just a telegram message transmission and reception system, and the actual approval and deposit/withdrawal records are not automated.

¹ The Banking Network is the circuits connecting the CBM Naypyitaw headquarter and the Yangon Branch office with E1 circuits whilst the other commercial banks are connected to CBM by ADSL circuits

Figure 3-1-5. EFT workflow



Source: Study team

Figure 3-1-6. EFT screen image (Sample)

The screenshot shows a 'Cash Withdraw Information' form. The 'Sender' field is populated with 'MWDBLHO' and 'MYAWADDY BANK LTD', and the 'Receiver' field with 'CBMMRYGN' and 'Central Bank of Myanmar'. The 'Date' is set to '08/09/2011'. The 'Transaction Type Code' is 'Withdraw'. The 'Ordering Institution' is 'MWDBLHO' and 'MYAWADDY BANK LTD'. The 'Account Identification' is '10615350'. The 'Amount' is '700.00' MMK, with a note 'Seven Hundred Kyat(s) Only'. The 'Computer No.' is 'BANKING_003' and the 'Sender Reference' is 'BKAC/TRF/2011080925'. The 'Instruction Code' and 'Related Reference' fields are empty. At the bottom, there are buttons for 'New', 'Save', 'Generate Message', and 'Close'.

Source: Study team

If a transaction is in the stage (1) and (2), it is revocable. However, once a transaction is implemented with a debit/credit record, it is no longer revocable and the relevant sending bank is required to refund the paid money from the receiving bank through individual negotiation.

In EFT managed via systemized operations, the ledger for EFT is also systematized. However, it is not coordinated with the general ledger. In addition, as there is no coordination between EFT and the general ledger, no efficient and obvious effects have been achieved via fulfillment of coordination, an advantage of systemization. Furthermore, in order to verify the

actual account balance, it is not enough to rely on only the EFT ledger due to the absence of coordination. Therefore, under the current situation, it is necessary to confirm the account balance manually. It is far from a complete automation.

While EFT is in test phase, the number of banks participating in EFT remains small. In addition, the total number of transactions per day is not large (approximately 10 transactions per day) and the volume of total transactions per day is as small as 10 billion Kyats. Given that fund transfer through current accounts with CBM is not actively utilized, it is estimated that funds do not circulate smoothly in Myanmar.

(3) Fund settlement before introduction of EFT

Under the current situation, where EFT has not been introduced fully, checks drawn on CBM are commonly used. It is also possible for commercial banks to submit a request for fund transfer at CBM counters.

(4) Clearing house

Each commercial bank brings checks to the clearing house set up in each branch of CBM (Naypyitaw, Yangon and Mandalay), and check clearance is executed through reimbursement and the netting of the current accounts held by each commercial bank with the CBM branch. The calculation result through netting is settled through the current account of CBM. However, as Myanmar does not have national-scale clearing houses like Japan, it usually takes more time to deliver a check for settlement in a rural area or remote place. In addition, as there is no unified standard for checks in Myanmar, each commercial bank issues a different-formatted checkbook. This situation is likely to become an obstacle preventing the automation in the future.

There are clearing members participating in each clearing house. They represent each commercial bank. However, only the MEB has several branches participating in each clearing house. This may be because MEB has the largest number of branch offices nation wide and coordination within MEB is not sufficient.

The average settlement at clearing houses per day totals 3,000 transactions in number and 70 billion Kyats in volume.

There is no penalty system comparable to the Japanese system in the case when a company dishonors a check. According to the interviews with CBM, there have been very few cases where companies in Myanmar dishonored checks in the past because those who are eligible to issue checks are confined to companies with exceptionally good credit standing.

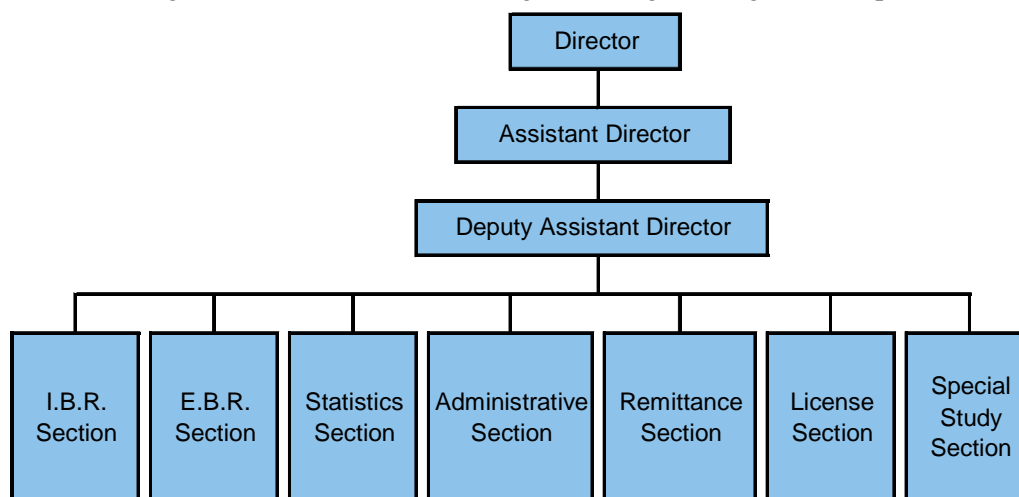
In case of default, the corresponding bank shall contact the drawer for the verification of the result and notify CBM to refrain from settlement, if necessary.

In addition, with regard to clearing operations, CBM does not charge fees to clearing members.

(5) Foreign currency management

The Foreign Exchange Management Department is responsible for foreign exchange control. In addition, the Monetary Policy Department is also involved in the supervision of the exchange rate.

Figure 3-1-7. Organizational structure of Foreign Exchange Management Department



Source: Study team (based on CBM website)

Note: I.B.R.= Import Bill Receivable, E.B.R.= Export Bill Receivable

Prior to April 2012, there were multiple rates consisting of the official parity rate and the market conversion rate in Myanmar. However, Myanmar adopted a managed floating currency system which came into effect from April 2012. After the introduction of the managed floating

currency system, foreign exchange rates are determined on the basis of market demand. Commercial banks with the authority to deal foreign currencies quote bid and ask prices for foreign currencies to CBM on a daily basis for the purpose of determining the reference foreign exchange rates. This is only applied to the U.S. dollar exchange rate.

Under the present rule, bid/offer prices are notified from 8:30 to 9:00 every day by facsimile, the bid opening is conducted via a bidding system introduced by the IMF, and the result is informed to each commercial bank by facsimile. Final settlement is carried out through the Kyat account/foreign currency account of each commercial bank against the Kyat account/foreign currency account of CBM at 16:00. When a commercial bank does not have a sufficient account balance, the bank will not be allowed to participate in the bidding.

In addition, when a bid is widely different from the rate of the previous day, CBM may refuse the quote at its discretion. CBM aims to keep the reference rate within a certain range of fluctuation by taking such action to each commercial bank.

CBM holds correspondence accounts abroad and uses SWIFT Network for instructions for bank transfer to the account.

CBM is also involved in the export process. An exporter must apply to the Myanmar Foreign Trade Bank (MFTB) and customs authorities for approval to export products. CBM verifies that information in these applications is the same.

Managed floating currency system has just started in Myanmar. Staffs of the foreign exchange management department said that they need more knowledge to manage currency system. They do not have general information of foreign exchange intervention to make market more stable. Japan, who has a lot of experience with intervention, can transfer the operational knowledge of it with ICT system.

3) Credit/collateral management

CBM lends money to commercial banks against collateral of treasury bonds for the purpose of providing liquidity. The actual amount of loan is determined by the commercial bank applying for the loan. The lending period is fixed at 90 days with a lending rate of 10% per annum. However, very few commercial banks borrow money for 90 days, and loans are usually repaid before 90 days.

As there is no secondary market for treasury bonds in Myanmar, the face value of treasury bonds is assessed as the collateral value of the loan. If a treasury bond secondary market

develops in Myanmar in the future, it should be required to assess a proper collateral value and manage accompanying additional collateral.

Both credit management and collateral management are executed with the use of a hand-written record book.

4) Treasury bond management

In Myanmar, there are three types of treasury bonds with 2, 3 and 5 year maturities and treasury bills with 3 month maturity. Myanmar treasury bonds are not scrippless and are issued in paper form. Although, financial institutions hold 95% of outstanding treasury bonds, which are managed as registered bonds for which CBM acts as a registrant. However, the management record is handwritten.

Figure 3-1-8. Myanmar treasury bonds

2 year treasury bond

(Face value: 10,000 Kyat)



5 year treasury bond

(Face value: 10,000 Kyat)



Source: CBM website

When Myanmar treasury bonds are issued, MEB and the Myanmar Securities Exchange Centre (MSEC) participate in the bidding of the treasury bonds. The two participants are also involved in the treasury bond market as direct participants having direct accounts with CBM. The other holders of Myanmar treasury bonds are treated as indirect participants.

Since a secondary market has not developed, most of the treasury bonds are bought to be

redeemed as buy and hold investment.

Interest is paid from the account held by the Budget bureau of MOFR to each corporate and individual holder's account. Redemption proceeds are drawn from the government account and paid to each corporate and individual holder's account.

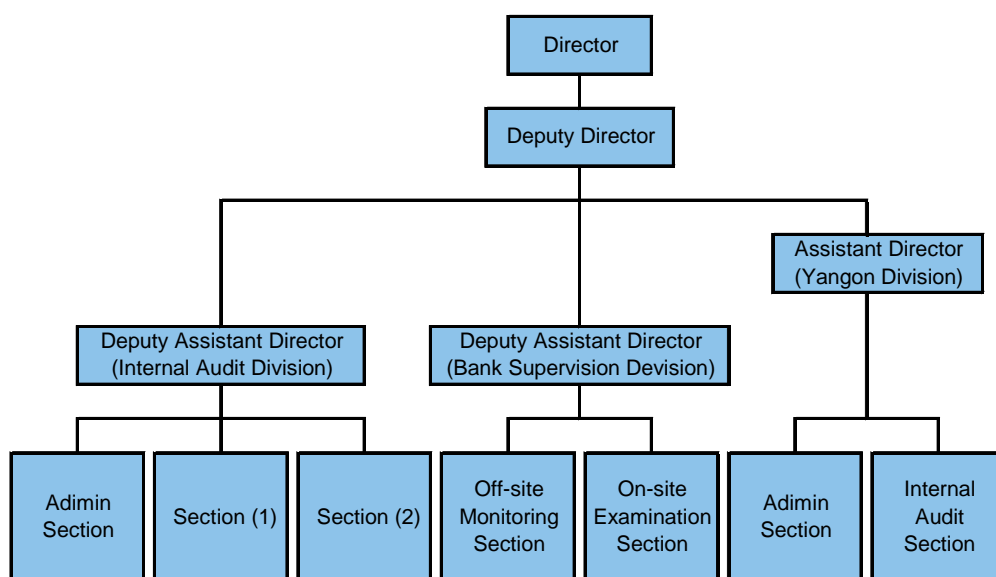
As described above, there are currently just four types of interest-bearing treasury bonds. However, it seems that a wider variety of treasury bonds, such as discounted treasury bonds, will be studied in CBM in order to meet market demand in the future.

5) Information collection and analysis

(1) Online financial report

This is an application working on the Banking Network which is utilized by the Internal Audit and Bank Supervision Department. In particular, it is used for off-site monitoring operations. Commercial banks report summary of daily operation data in Excel or other formats to CBM. When CBM receive the report, staffs of CBM re-enter the information to their local computers. It is currently in test phase.

Figure 3-1-9. Organizational structure of the Internal Audit and Bank Supervision Department



Source: CBM website

Looking at the actual documents submitted by commercial banks to CBM, there is no unified documenting format. In addition to Excel files, Word and PDF files are also used. In particular, some PDF files are submitted as image documents, which cannot be directly embedded into the system.

(2) On-site monitoring

In CBM, there are seven teams in charge of on-site monitoring. On average, each team is responsible for 3 commercial banks.

CBM stays on average for three weeks per year for one time of an audit at commercial banks.

6) Monetary policy

As the secondary market for treasury bonds is inadequate, the Monetary Policy Department, a newly established organization, has no effective measures for financial adjustment due to its inability to conduct treasury bond operations.

An adjustment of the bank reserve ratio can be also considered as other monetary control means, but it is fixed at 10%.

Some staffs at CBM pointed out that they are hard to collect information required for decision-making in monetary policy through sufficient analysis. They are urgently required to achieve a structure to collect information of target benchmarks as rationale for decision-making in monetary policy, while a market operation or adjustment of bank reserve ratio would be important as monetary means.

Staffs have no experience of monetary policy operation. So they are exploring how to build new operations for monetary policy. Some staffs also pointed that they need to learn the advanced techniques of Bank of Japan (BOJ). It is considered that it is important to develop human resource as well as ICT system in the future.

7) Others

(1) Chest box management

The Currency Department of CBM is also responsible for overseeing money management handled by MEB. According to the explanation by CBM, MEB plays the role of the agent of CBM and it holds money that should originally be handled by CBM.

A vault called the “Chest Box” is in place at a police station located near each MEB branch office (excluding branches in Naypyitaw, Yangon and Mandalay regions). CBM and police work together for the delivery to a police station. Each MEB branch office withdraws cash from the Chest Box before the commencement of daily operations and deposits cash in the Chest Box after the close of daily operations. In daily operations, each MEB branch office manages the aggregate amount of money (called “Box Balance”) composed of money owned by MEB (called “Hand Balance”) and money at the Chest Box (called “Chest Balance”). Each branch is obliged to notify the balance at opening, the amount of cash withdrawn from the Chest Box, the amount of cash deposited in the Chest Box, and the balance at closing to CBM on a daily basis. However, it takes a week or so for some MEB branch offices located in remote places to notify these data to CBM due to the lack of communication infrastructure, according to a CBM staff.

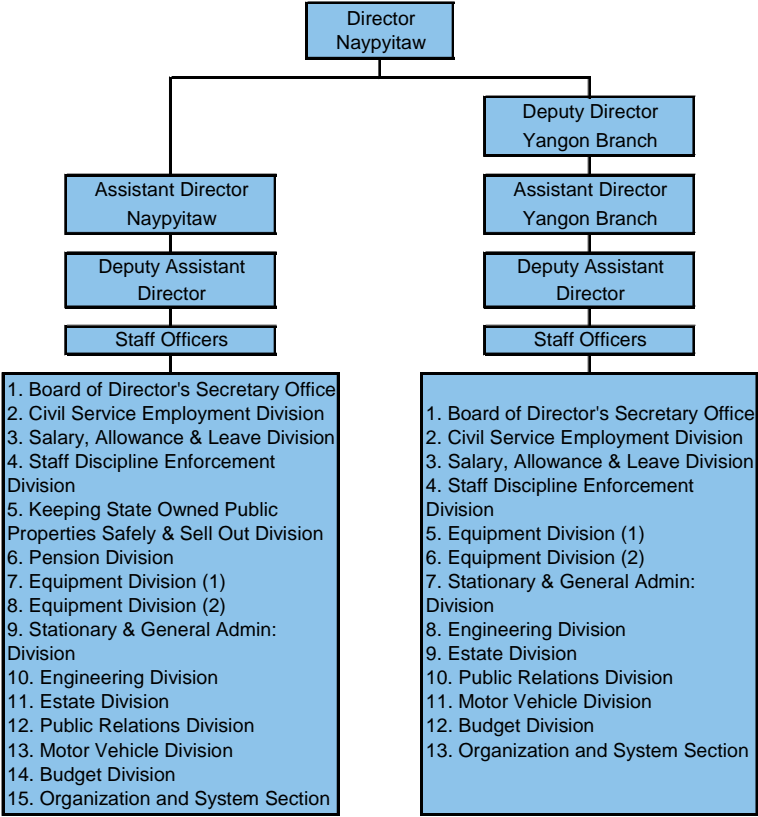
(2) Bank mail and file transfer protocol

An application called “Bank Mail and File Transfer Protocol” is implemented on the Banking Network, which is used as an application for email and file transfer in all the bureaus of CBM. This application, for instance, is used for making files which is reported from commercial banks to share among the staffs.

(3) Reporting formats

Due to a lack of unified format, reporting formats and daily operations vary widely among commercial banks. Therefore CBM staff should re-write to their local record. The aspect of modernization, a lack of unification makes inefficiency. These problems should be addressed through regulations that should be formulated by CBM, a supervisory authority governing financial institutions in Myanmar so as to unify the formats under systemization project.

Figure 3-1-10. Organizational structure of the Administration Department



Source: CBM website

3.2. Commercial Bank

1) Overview

The main role of commercial banks is financial intermediation, cash possessions, settlement, and collecting money from the depositors. Nowadays, in Myanmar the rate of depositors is about 2%, and only few wealthy individuals or companies take advantage of deposit and loan services. Given such circumstances, it is hard to say that such financial service has permeated widely to the people across the country. The cause of this situation might be found in the history of finance of the country. The modern history of finance in Myanmar started in 1990, when the country enacted the *Financial Institution Law*, and the *Central Bank of Myanmar (CBM) Law*. After that, the opportunities for private companies to take part in financial businesses have been created. During 1992 to 1996, 20 private banks were established, and after that, economy and financial system had grown rapidly for 15 years. In 1997, however, Asian financial crisis hit the country and the macro-economy of Myanmar became unstable. Moreover, after the bank crisis occurred in 2003, the restrictions on financial business have been tightened up and financial businesses hung low consequently. Since then, many people in Myanmar tend to think that the banks are not trustworthy.

As the money market has not been maintained well, main method of fund raising for commercial banks is limited to deposit and lending from central bank with national government bonds as collateral. The main revenue for banks is margins of deposits/ loans and fees of services, and there are no such things as paper profits and profits on sales which can be seen in advanced countries.

As deposits and loans are restricted to one year contract, it is necessary to renew the contract of the loan every year. Thus, operating procedures for borrowers and financial institutions is burdensome. Also, because of such a restriction, it is difficult for financial institutions to forecast and plan cash flow for mid and long-term.

(1) The inspection by the central bank, and reports required

CBM conducts the regular inspection twice a year which covers almost all the aspects of commercial banks such as management, business, and so on. Also the commercial banks are required to send reports to CBM every day by 17:00 regarding daily balance, and amount of receivables and payables of deposit/ loan, as well as cash balance.

In addition to annual statements, the commercial banks need to submit periodical reports for CBM as follows:

- liquidity ratio and reserve position on weekly basis;
- balance sheet, statement of income, and capital adequacy ratio on monthly basis; and
- situation of nonperforming loan every 3 month.

The titles of the main statements are: Deposit Account Balance, Trial Balance, Daily Progressive Record, Total Deposit Payment, Statement of Reserve Position, Statement for the Liquidity ratio, Capital Adequacy Measurement, Loan & Advances Due from Banks, and Balance Sheet.

So far, above statements are submitted by papers to be posted and sent by fax or e-mails, while a new reporting system via the Banking Network has been developed and under testing, with which the reports are sent in electrical form such as Excel.

(2) State-owned Bank and Private Bank

Commercial banks are categorized by types of ownership: state-owned and private bank.

Private banks can be further divided into two categories: semi-governmental banks and purely private banks (hereinafter simply described as private banks). The semi-governmental banks are established and invested jointly by the government and private organizations. Semi-governmental banks tend to clearly focus on certain business targets, which could be corporations related industry parks, Ministry of Commerce, Ministry of Livestock and Fisheries, and other various associations.

Private banks are established and invested by private organization, and most of them are a part of conglomerates. In many cases, the private banks' branches are located in large cities and conduct business for individuals as well as corporates, with massive funding ability.

The state-owned banks, which are owned by government, are Myanmar Economic Bank (MEB); Myanmar Foreign Trade Bank (MFTB); Myanmar Investment and Commercial Bank (MICB); and Myanmar Agricultural Development Bank (MADB). The state-owned banks, established in late 1970s, had been solely underpinning financial services of Myanmar until private banks were established in 1990s. Still state-owned banks continue to perform activities in each role such as supporting whole economy, foreign trading, investment, and agriculture. MEB, MFTB, MICB are under control of Ministry of Finance and Revenue, and MADB is under control of Ministry of Agriculture and Irrigation. Conceptually, the role of state-owned banks is to put emphasis on the service to whole people of Myanmar, supplying cash to private

banks, and dealing with trade, which cannot be done by private companies. Compared to private banks, state-owned banks are slow to implement ICT systems, and are clearly behind in terms of their operational efficiency.

(3) Current common topics of commercial bank system, and settlement mechanism between commercial banks

As one of the common approaches of commercial banks, on September 14th, 2012, a system of joint ATM usage was launched and started running by MPU. MPU has been established by 17 of Myanmar domestic commercial banks associated with 3 of state-owned banks with fund of 4 million US dollar. The main office is located in the Yangon branch of CBM. At the time of the publication of this report, the additional systems are under development considering the use of debit and credit card.

The central bank processes settlements based upon the information via Fax and telephone given by each commercial bank. On the other hand, utilization of the Electronic Fund Transfer System (EFT) has been considered as the new communication base. The system has already been running on Banking Network and used for transferring funds between the current account balance of each bank at CBM. The EFT system is still in the test phase and only five banks have taken part in so far. Therefore central bank is asking all banks to join.

A sort of national settlement system like Japan's network banking system called "Zengin System", which enables to relay the online transactions of remittances between banks and to make real time settlement along with those transactions, has not been in place yet. So, each commercial bank has alliance with other banks individually in order to transfer money. Also, as most of the private banks do not have branches in small cities and country sides, most of them cooperate and associate with MEB, which has largest branch network across the country, and try to improve service level for the customers.

Although the progress of ICT introduction of each bank varies, the daily operations of the basic banking business can be summarized as follows:

-Business hours of branch counter operation	9:30~15:00
-Process and aggregation of daily data/ create statements	15:00~16:00
-Dead line of daily report submission to central bank	16:30
-ATM operation hours	24 hours (365 days)

As the centralization of data to headquarters of the banking system is not sufficient, normally the original data are stored and managed in each branch while copies are sent to headquarters. Because of obsolete system functions, it seems to be common that processing of daily data aggregation, and creation of statements remains very inefficient, and inspection by hand requires considerable work. Due to such time-consuming daily operations, the branch staffs have to work for long hours.

(4) Shortage of human resources of ICT at commercial banks

Each bank has certain but not sufficient number of ICT human resources. Shortage of human resources is one of the common issues among banks. For instance, highly skilled engineers tend to seek for better salary and are eager to work abroad. While it is believed that the effort by banks to retain and train necessary ICT staffs is inevitable, the banks highly expect the support program of Japan in this aspect as well.

(5) Constraints of ICT modernization for commercial banks

Unexpectedly the core banking functions, to some extent, has already been introduced to most of the commercial banks in Myanmar. Also, some of the major banks have ATMs and deliver the 24 hour services supported by the maintenance services of 24 hour, although the service is limited to withdrawal.

However, it is foreseen that further modernization of the financial system will be required to be truly modernized financial system which can contribute to and underpins Myanmar's economic growth as well as convenience for the people. Therefore measures to mitigate the constraints are examined throughout this study. The core banking systems of commercial banks basically treat domestic transactions, while some of these banks used to have some experience of international transactions in the past. The banks will need a system upgrade to meet international compliance requirements as the Myanmar financial market globalizes in the future. As to core banking function for international service, most of the banks still do not have the systems. Since Asian financial crisis, such business have been restricted by CBM, and it is likely to take some time for all the banks to equip such systems. However, each bank's preparation has rapidly advanced. For instance, they invite specialists from overseas, dispatch their staffs to the foreign banks, after the international business restriction was lifted in 2012.

Figure 3-2-1 below shows the constraints on the system modernization for the commercial

banks in Myanmar. It is strongly recommended to remove these constraints with highest priority in order to modernize the bank systems and improve the services for bank customers.

The study team expects that once such constraints are removed, the modernization and improvement of financial services will be accelerated. As a matter of fact, before the government set strict restriction to bank business in 2003, the economic growth was prominent and bank industry enjoyed the sharp growth of total asset. The study team also recognized that currently each bank is expanding its branch network and improving the services by introducing new services for the customers.

Figure 3-2-1. Constraints of modernization

1. Unstable and insufficient electrical and communications infrastructure	<ul style="list-style-type: none"> ▪ Rolling blackouts occur routinely ▪ The satellite communication system (current banking network backbone) is also unstable because of frequent disconnection caused by weather conditions.
2. Regulations on business operation	<ul style="list-style-type: none"> ▪ After new government was formed in 2011, deregulation is promoted. However the obsolete restrictions given during military regime era have not been abolished completely yet, while some permissions are given as special cases. ▪ CBM is still partially independent organization and need to act under the control of MOFR. ▪ No specific master plan of financial system is authorized.
3. Lack of the trust of the people in national financial system	<ul style="list-style-type: none"> ▪ Investment is not prosperous because of inconvenience and uncertainty of financial services quality and stability ▪ Bank run occurred in the past and the people saw the bankruptcy of the largest private bank. Concerns of uncertainty still remains, although gradual improvement of financial services are in progress.

Source : Study team

2) Subjects of survey

Private banks were rationalized from 20 banks to 15 banks by the business restriction after 2003. And currently there are 19 private banks including 4 banks newly established after 2010. The investigation target of the study is all banks in the country listed below, because the study aims to contribute to modernization of the entire financial sector.

Figure 3-2-2. List of banks

	Category	Name of banks	Established	Headquarters
(1)	Semi-governmental	Co-Operative Bank	1992	Yangon
(2)	Semi-governmental	Innwa Bank	1997	Yangon
(3)	Semi-governmental	Sibin Tharyaryay Bank *1	1996	Naypyitaw
(4)	Semi-governmental	Myanma Industrial Development Bank *2	1996	Yangon
(5)	Semi-governmental	Myanma Livestock and Fisheries Development Bank	1996	Yangon
(6)	Semi-governmental	Myanmar Citizen Bank	1992	Yangon
(7)	Semi-governmental	Myawaddy Bank	1993	Yangon
(8)	Semi-governmental	Yadanarbon Bank	1992	Mandalay
(9)	Semi-governmental	Yangon City Bank	1993	Yangon
(10)	Private	Asia Green Development Bank	2010	Yangon
(11)	Private	Asia Yangon Bank	1994	Yangon
(12)	Private	Ayeyarwady Bank	2010	Yangon
(13)	Private	First Private Bank	1992	Yangon
(14)	Private	Kanbawza Bank	1994	Yangon
(15)	Private	Myanma Apex Bank	2010	Yangon
(16)	Private	Myanmar Oriental Bank	1993	Yangon
(17)	Private	Tun Foundation Bank	1994	Yangon
(18)	Private	United Amara Bank	2010	Yangon
(19)	Private	Yoma Bank	1993	Yangon
(20)	State-owned	Myanma Agricultural Development Bank	1979	Yangon
(21)	State-owned	Myanma Economic Bank	1976	Yangon
(22)	State-owned	Myanma Foreign Trade Bank	1977	Yangon
(23)	State-owned	Myanma Investment and Commercial Bank	1978	Yangon

*1. The bank name is changed to Rural Development Bank in October, 2012.

*2. The bank name is changed to Small & Medium Industrial Development Bank in July, 2012.

Source : Study team

3) Current situation of commercial banks (semi government and private bank)

(1) Co-Operative Bank

The bank was established in 1992 and focuses business for corporates but provides similar services to other commercial banks. It merged with Co-Operative Promoters Bank and Co-Operative Farmers Bank in 2004, and it has been operating as a semi-governmental bank. The bank currently has 20 branches, and has plans to increase them to 50. The corporate customer is few though there are 130,000 individual customers or more (The share of the major depositors of the total depositors is about 2-3%) .

In the banking field in Myanmar, there is a mechanism that The Bankers' Association gather the staffs from each bank and give them training about banking business. Each bank pays 100 million Kyats fee when participating in MPU. In this bank, about 150 staffs take training course about the internet. The person with business experience in Oversea Chinese Banking Corporation (OCBC) in Singapore takes charge of this lecturer.

The bank is developing core banking system by its own. At the moment, the bank has been preparing to introduce a system named as “T24” from Temenos Group AG, US company, as their core banking system, and 5 engineers are working on that project. Because it is expected to take long time to transition, the bank is planning to gradually introduce the system to a new branch one by one, not to all branches simultaneously, so that they can check the data conformity, and transit by stages. This system has accommodated about 20 ATMs and it is scheduled to set up two ATMs in each branch, and to increase the number up to about 50 ATMs in the future. However, a lot of system troubles occurred due to unstable network, mentioned as “Constraint 1 of Figure 3-2-1”. In comparison with other banks, this bank is more progressive regarding ICT and has better knowledge about ICT technology - as its executive officer mentioned to the risk management of test/transition span and sequence during system introduction.

Having been approved for foreign exchange services in 2011, they have already begun handling foreign currency both domestically and internationally. Among them, about 1.5 million/day of domestic transactions are dealt. The bank has just started providing remittance services via banks of the neighboring Asian countries such as Malaysia and Thailand. At this stage, the allied banks are Maybank, KBank, Bangkok Bank, and SBC. The bank and Ayawaddy Bank are the only private banks in the country that can transfer money overseas. The bank started the foreign currency deposit service, and it handles US dollar, Euro, and a Singapore dollar though only the interim.

Anticipating business chances brought about by the SEA Games (South-East Asian Games)

and conference, the bank is now planning to start VISA card, internet banking, and telephone banking services. Also the bank intends to expand international business and dispatches its employees to CBM to be trained.

The bank has high awareness of the system development than other banks, and it seems to be developing an advanced management plan. The project approval of the credit card service such as VISA and Master is being requested as mentioned above, and the internet banking is being planned as the next step. The plan aims to provide remote banking service. The bank is to choose the representative people in the village where no branch is located and provide the necessary equipment at such representative's place and give them a service, in the future.

Unique service of the bank is a special deposit service for newly married couple named "Wedding Deposit". When the depositors of this service go to honeymoon, they can enjoy 20% discount of accommodation expense at the hotel of the same group company as the bank. According to the bank people, such services for its own do not require the permission of the CBM.

(2) Innwa Bank

The bank is semi-governmental and military related like Myawaddy Bank mentioned later. However, the bank provides ordinary services such as deposit and loan like private banks, except for salary payment for highly ranked military officers, a special loan for military serviceman and servicewomen, and the business report (balance and primary balance) to Ministry of Defense. The bank has 32 branches, and scheduled to add a new branch in August, 2012. When branches are newly established, system construction can be done in relatively short term of about one week with an ICT team of four people. With the current system, however, account information such as balance is not centralized and cannot be handled in real time, and information between branches is exchanged via fax and/or telephone. Majority of the loan is for corporate customers while most of the deposit is for individuals. Most of such corporate customers are engaged in public works by the state government such as road construction, as the bank is semi-governmental.

The current core bank system is developed in-house. Suspense receipt/ payable (explained as "pre-paid") are also managed by the system. Six sets of ATMs have been purchased, but they are not in service yet, as the service contents are not decided, although the bank originally intended to prepare such services in cooperation with Myawaddy Bank and Asia Green Development Bank.

In the remittance business, the bank's system issues a warning when there is a remittance more than 100 million Kyat, in order to prevent from crime cases of money laundering. In such a case, the bank needs to report to CBM.

The bank is highly trusted because the bank has the largest amount of current account balance in CBM. Therefore, it takes just one day to cash the cheque, while other banks take a couple of days. The bank handles cheque and the settlement method is only negotiation. Although the bank is also allowed to handle collection, the bank do not provide such service. When the cheque is issued, the issue number is managed in the system. Even if a customer lost the cheque, it is possible to reissue the cheque upon request. In that case, actually the bank cancels the lost cheque and issue another one newly. At least 1,000 Kyat is required for checking account.

With the nature as semi-governmental bank, the bank aims to contribute to growth of the whole nation through providing the loan for the poor of local people, investment to the microfinance body, and lending for agriculture, fishing and the livestock industry. For instance, the bank has been investing to the microfinance for past five years by about 7 billion Kyat. Also, the installment payment service is provided to agriculture business such as 6% interest loan as purchase support of farm machine. In case of overdue the interest is raised to 13%.

Although the bank once began the foreign currency remittance business on July 7, 2012, the United States government requested to cease the services and the bank was forced to discontinue only four days after the service began. As of September 2012, the embargo is still effective, and the bank is experiencing difficulties in dealing with foreign currency business in US dollar. Private insurance business for deposit was permitted in 2012 and 12 insurance companies were authorized. The bank used to operate similar type of insurance business, however, CBM gave order of dissolution in the past. Currently the bank invests 10 % of its capital to the Myanmar Economic Corporation (MEC), an insurance company, and it also holds an insurance policy issued by MEC.

(3) Sibin Tharyaryay Bank²

This bank is controlled by Ministry of Boarder Affairs, and targets the people living in frontier. Development committees are organized under the control of the ministry in 278 locations in the country and the bank has been invested by the investment of the committees.

² The bank name was changed to Rural Development Bank in October, 2012.

This bank moved the headquarters from Yangon to Naypyitaw in 2008 following to the capital city move in 2006. It changed the bank name to Rural Development Bank in 2012 to clarify the mission as supporter of the farm villages. The number of the employees is about 200, and there are 15 engineers engaged in ICT. The bank uses the core bank system developed by MIT, while the bank has been using a system developed by ACE for account opening operations. In order to send reports from the branches to headquarters and from headquarters to CBM, the system of MIT has been chosen additionally. Regarding ATMs, the bank is still planning and has not introduced them yet. The bank cooperates with five banks (Kanbawza Bank, Yoma Bank, Myawaddy Bank, Myanmar Livestock and Fisheries Development Bank, and Ayeyarwady Bank) for the remittance business. This bank has its accounts in three state-owned banks for the purposes of: 1. account of foreign currency (Myanmar Foreign Trade Bank (MFTD)); 2. account of development committee, and payment of the surplus capital and payment to each development committee (Myanmar Economic Bank (MEB)); 3. account for ATM operation (Myanmar Investment and Commercial Bank (MICB)).

The bank cooperates with Kanbawza Bank for lending. The bank doesn't lend directly in self-employed individuals, but lend to the development committee, and the committee lends money to self-employed individuals at its own discretion. The credit limit is arranged according to the demand from each development committee, and decided by the minister of each ministry.

(4) Myanmar Industrial Development Bank³

The bank was formed in 1996 at the initiative of the Myanmar Industrial Development Committee under the Ministry of Industry to support the small and medium-sized enterprises of the nation. The bank is also engaged in poverty eradication.

The bank has started the foreign currency business and is planning to send staff to overseas banks as the knowledge is not sufficient. There are about 400 employees including 7 ICT engineers. In addition to those employees, another 100 people are scheduled to be hired by the end of 2012 in order to expand the international services and to open new branches. The employment of experienced person from overseas is also considered.

The core bank system is developed in-house. Account information of each branch is neither centralized nor controlled intensively with real time processing, and the data are exchanged via fax. ATMs have been tested, and planned to be in 24 hours operation.

³ The bank name was changed to Small & Medium Industrial Development Bank in July, 2012.

The alliance with other banks is only for domestic remittance, and such allied banks are selected according to the area coverage where the bank does not have branches. The bank name was Myanmar Industrial Development Bank when study team made the first visit on July 30, 2012, but after that it changed the name to Small & Medium Industrial Development Bank in order to clarify the mission as the only bank for the small and medium-sized enterprise in Myanmar.

The bank provides various services like deposit, financing, remittance, installments sales, and exchange. Now the bank is considering investment in microfinance business. As banks are not allowed to handle microfinance directly in the country, the bank will establish and invest to a microfinance institution. As for the loan business, the monthly interest rate is 1.5%-2.0%, and the maximum amount of the initial loan is 40,000-50,000 Kyat, while the 2nd time is 70,000-80,000 Kyat and the 3rd time is 100,000 Kyat. In addition, if 10% of the debt amount is repaid within a year, it is possible to extend repayment term for one year. Moreover, if stable income can be expected continuously and the business prospect is positive, it is possible to extend the term to ten years or less subject to the approval by the board of directors. The bad debts ratio of the bank is 0.5% (extremely low). In case of insolvency the bank will discuss with the court and put the hypothecated asset on the auction. When it is not possible to sell it off, the bank shall buy it. Regarding deposit, annual interest of saving account is 8.50% and that of fixed account is subject to the term: 8.75% (3 months); 9.00% (6months); 9.25% (9months); and 9.50% (12 months).

(5) Myanmar Livestock and Fisheries Development Bank

The bank is the only bank targeting livestock industry and fishing industry in Myanmar and the largest semi-governmental bank. The bank takes the 3rd place of the banking sector and 15th of all industry by the amount of corporate tax.

The bank has a lot of individual customers for the deposit and loan, and 40% of them is self-employed individuals engaged in the livestock industry and the fishing industry. However, the ratio used to be 70% five years ago and now the number of such kind of customers has been decreasing. And the scale of loan business has been shrinking because the interest rate for fishing industry is 13% which is higher than the ratio for transactions in other industry.

The bank uses the core bank system of ACE, a local ICT company,. Among the bank's 61 branches, 50 branches use the network via IPstar to exchange data. The rest of the branches

use fax to send data and headquarters input the data instead. ATMs have been tested. The bank said that all commercial banks will use magnet stripe card for MPU service.

When requests for loan are raised, the bank managers or equivalent rank staff proceed the local survey associated with inspection department. Afterwards, lawyers visit again in order to examine the reported situation. As stated above, most of the customers are engaged in livestock and fishery and sometimes the repayment stagnate due to the weather and the natural disasters. Therefore, partial repayment is admitted. Moreover, if it is not possible to repay due to the disaster, the industry of the debtor issues disaster certificates and the bank review the terms and conditions of the loan. Also, when it is foreseen that the debtor cannot be repaid on the due date, the bank sends notification one month prior to the due date. While CBM admits real estate as the only collateral asset, the bank is allowed to take the debtors' facilities, as the collateral, like farms or so.

The bank handles domestic remittance only. The same fees are applied to both recipients of the own bank and other banks.

At present, the bank is temporarily suspending loan service for ship purchase of fishery, because the imported ships became relatively expensive due to the exchange rate today.

(6) Myanmar Citizens Bank

The bank is a semi-governmental bank and the only private bank listed on the Myanmar Securities Exchange Center (MSEC). The business is split into two parts; the government related business and private sector business. A couple of board meetings are held in a month. It was possible to infer their strong interest to Japanese support to Myanmar financial system because not only the bank management but also one of the stockholders sat when we visited.

The bank has experience of foreign business in the past (1994-1998), and still has significant influence in the country, although it has only seven branches. For instance, in case that those who will do import/ export business needs to have accounts at the bank. It is because this bank is under the Ministry of Commerce. Also, the bank has innovative spirit as it can be seen in its attitude to learn the history of other banks' development in the neighboring countries and consider business alliances with several banks of Malaysia and Singapore.

The core bank system is developed in-house because there was no system vender when the bank was established. The bank introduced ATM in recent years. Interest is calculated based on the final balance on the fifth date of every month, and the interest is earned once every three

months. Upon the loan requests, the evaluation of the collaterals takes a week, and thereafter examination and approval of board of directors, held regularly biweekly, is required.

Prior balance confirmation of the checking account is mandatory upon cheque request.

The bank is currently requesting for permission to provide international services. The bank is currently preparing rules for handling foreign currencies, dispatching the employees to CBM for training of international business. Also the bank is eager to study banks in surrounding countries such as Vietnam, Cambodia, and Laos, as references aiming further business expansion in the future.

(7) Myawaddy Bank

The bank is a commercial bank, although it is known as a semi-governmental and military related bank because of its payroll for serviceman and servicewomen in the same way as Myanmar Economic Bank and Innwa Bank. Other than that the bank provides typical commercial bank services. The bank currently has less than 10 branches, but has plans to expand to 30 or 40 branches. These new branches are scheduled to be opened in the place where another bank doesn't have branches. When a branch is opened in the provinces, the headquarters staff will be sent and educate the staff hired locally. Once such training is completed, the local staff executes the branch operations.

The bank runs its core banking system of MIT and recently is considering Oracle's FLEXCUBE for international business. For the moment, the bank intends to customize and continue to use the current system, and security function and operation monitoring function will be built in it. To report to CBM, the system is operating until 21:00, though the branch operation is 9:00-15:00. ATMs are in 24 hours operation basically, depending on the business hours of the location such as supermarket which is closed in evenings. The bank has been considering mobile banking for the future, and is waiting for the permission of the Ministry of Communications, Posts and Telegraphs.

The bank has experience in international services from 1994 to 1998, and used to have alliances with more than 150 foreign banks during the period. The bank also has alliances with many commercial banks across the country, such as Kanbawza Bank, Ayeyarwaddy Bank, Shibin Tharyaryay Bank, Asia Green Development Bank, Myanmar Livestock and Fisheries Development Bank, and Yangon City Bank.

The bank reports daily balance of deposit, as well as the amount of transactions, to CBM. In case of larger amount of trade than designated standard, they need to submit report to CBM.

Also, they need to be audited every half year.

A long term loan (6 years) is provided as an unique service, while other banks can provide only 1 year loan. In this case, the rates varies based on the term such as: the 3rd year - 10%; the fourth year - 30%; the 5th year 30%. In some cases, subject to the price of real estate and board decision, the bank allows 50% amount of loan against the value of collateral, which is normally 40%.

Cheque is also one of their services and roughly 3,000 customers are using it. The bank doesn't handle promissory note as well as other banks because there is no requirement as the practice in Myanmar business.

They have a strong willingness to provide international services. Firstly the target would be the ASEAN countries, and then the trading partners like Japan, China, Korea, and others.

(8) Yadanarbon Bank

The bank was established as the first bank in Mandalay about 20 years ago. It is still the only commercial bank that has the headquarters in Mandalay. The branch is also limited in the Mandalay district including ones scheduled to be established in the future. There are 63 employees, including 12 engineers of ICT. The core banking system has been developed in-house by the engineers with system development experience in Tun Foundation Bank. The regulatory report system to CBM is made by MIT.

The bank provides the similar services with other banks, including deposit, lending and remittance. The loan on demand is the unique offer of the bank. It is possible to extend the term upon request by the customer, while the term is normally 1 or 2 years. Even ten years or longer period is possible if the request raised by excellent customers. The bank cooperates with Yoma Bank and Yangon City Bank on a domestic remittance. Especially, the amount of handling has increased with Yoma Bank because it is arranged via online. Currently, the bank doesn't have any plan of foreign currency business and doesn't cooperate with overseas banks. Although the trade business is prosperous in Mandalay, the trade is mainly imports and no need to change Kyats to foreign currencies.

While other Yangon based banks operate settlements after 17 o'clock, the bank does not take such operation. The budget management of the bank is extremely severe, as the local government manage the bank similar to Yangon City Bank. Therefore an increase of the credit limit for loans is not realistic. On the other hand, thanks to such a strict management, a bad debt

is extremely rare. The bank introduced rather flat organization in comparison with Yangon City Bank, and in many cases a single person takes multiple roles.

(9) Yangon City Bank

The bank is a semi-governmental bank which is 100% owned by Mayor of Yangon.

The core banking system is in-house, which is developed by the engineer sent by CBM. Account information on each branch is not centralized in real time, and the data is exchanged via fax. The bank says that it cannot afford to pay the MPU registration fee of 100 million Kyat considering its revenue.

The bank cooperates with Yoma Bank, Yadanarbon Bank, and Myawaddy Bank for domestic remittance, and there is a plan to increase the number of business partners in the future. There are three commission business, namely 1) commitment fee (1%), 2) overdraft setting (13%), and 3) issue of cheque with 125 Kyat.

The periodical audit is conducted by the CBM once a year, and also by audit evaluation association twice a year.

The foreign currency exchange business is scheduled to start in 2012. For foreigners, only passport is required while personal identification certificate called NRC is required for Myanmar people. If the amount is 10,000 dollars or more, such amount needs to be cashed into the deposit account first, and then it can be exchanged. Exchange up to 10,000 dollars can be done at counters of branches. Foreign currencies are limited to three currencies: the US dollar, the Euro, and the Singapore dollar. It doesn't require any commission. Regarding the foreign currency business, the bank had cooperated with Tokai Bank of Japan and City Bank of Singapore in 1995. However, it was dissolved in accordance with the instruction of CBM in 1998.

(10) Asia Green Development Bank

The bank is one of the four young banks established in 2010 with 18 branches. Atmosphere of this bank is bright and free. 60 employees among 400 staffs in total are engaged in ICT works while they deal with other tasks as well, and every five of them are stationed in each branch. Most of the bank staffs can speak English.

The bank plans to expand individual customer bases in the future while both individuals and

corporations are main targets.

The bank is using the core bank system of ACE. IPStar is used to exchange data between headquarters and branches, while fax is used for that between other banks because of inability to use the internet.

The bank has about 10 ATMs in Yangon, Naypyitaw, and Mandalay. The installation purpose of the ATM is for an urgent drawing after the business hours, and however, the ATM is not so frequently used and the service is offered at the counter during the business hours. ATM can be used 24 hours a day as well as Kanbowza Bank but for withdrawal only. Customers can withdraw their money up to 5 times a day, and 200,000 Kyat is the limited amount for each transaction. Each bank can set up the upper limit of the amount of money as long as it follows the law. The call center operates for 24 hours.

The bank is a member of MPU and currently takes training in CBM. As for its business operation, it has been confirmed five points as follows. 1) Nonresidents cannot have savings accounts. 2) The maturity term of time deposit account is either 3, 6, or 9 months and cancellation can be made in the duration. 3) CBM has been allowed the bank one year loan only. 4) The interest rate of deposit is 13%, while CBM rate is 8%. 5) The bank charges the fees for online transfer, online deposit, and withdrawal.

The bank has been testing SWIFT in order to start foreign currency trade. However, the remittance from foreign countries to Myanmar is possible.

(11) Asia Yangon Bank

The bank has clear future plans including service expansion even though the scale of its account balance is smaller than other banks. It is scheduled to open new branches in other places such as Mandalay and Naypyitaw in the future while there is a branch in Yangon now. Especially, it plans to open a branch in Lewe in the vicinity of Naypyitaw because other banks haven't opened branches in the area, where agricultural products such as red peppers and beans, and the forestry are prosperous. The bank seems to be preparing for the prospective export business in these industries. The training on ICT skill is done in cooperation with Kanbawza Bank though there still is a skill shortage of ICT.

The core banking system has not been introduced yet, and therefore staffs need to input data to PC by hand guided by the manuals. The hardwares are assumed not to be bought from specific ICT vendors, but from general stores. The bank seems to be using Excel from Microsoft

for a software.

Because of expensive registration fees of 100 million Kyat, the bank has decided not to join MPU.

It invests in the microfinance institution though the amount of the investment is not so large.

Currently, people bring a large sum of note to the bank for payment. As for this, the bank is well accepted by entrepreneurs because they can use Payment Order, which has high credibility. The mostly used amount of Payment Order is between 50 million to 100 million Kyat. The bank provide such kind of services for the customers in order to decrease the possession of a large sum of cash of the customers.

It doesn't cooperate with other banks but considering alliance with Kanbawza Bank.

While the loan collateral was only real estates in the past, nowadays gold, jewels, and trade contracts can be collaterals. The bank considers that stocks would be the object of the collateral in the future. The international services are not handled except for foreign exchange, as lack of human resources. The remittance is now under consideration for the future, supported by a Vietnamese bank.

(12) Ayeyarwady Bank

The bank is operated by the MAX Myanmar group enterprises, and is developing the business in Yangon, Naypyitaw and other cities. It has more individual depositors than corporate customers.

The bank is aggressive for ICT investment and assigns about 50 ICT engineers in the headquarters as one or two engineers in each branch. The engineers are internally trained.

The bank originally used system developed by MIT but replaced with MAX7, a system developed by a Vietnamese vendor. Centralization and real-time operation of account information is in operation for the first time in the country. Information is always gathered to the centralized system, and each branch is defined as channel. According to the bank, current situation of the economy and system usage in Myanmar is similar to that of Vietnam 10 years ago. Therefore the bank seemed to think Vietnam is the best reference for Myanmar promoting the modernization, and that is the reason why the system of Vietnam is suitable. The bank also considers in respect of the infrastructure environment, the situation of the electricity shortage and the network maintenance were common to old Vietnam, and the Vietnam company can

share such constraints and their resolution. For that, although people from Malaysia and India visited Myanmar for survey in the past, it did not work well.

Regarding the international service, the bank has already started overseas remittance, and it cooperates with Oversea Chinese Banking Corporation (OCBC), China Development Bank (CDB), and United Overseas Bank (UOB). There are the following three factors that this bank was able to remit the foreign currency for the first time in Myanmar. Firstly, the head manager who is not a banker but an entrepreneur prioritized business expansion. Secondly, the managers have experience in overseas banks and well familiar with foreign currency business. Thirdly, a foreign staff with 30 years of experience in an overseas bank is employed.

Both the registered form and the bearer form of cheques can be used. The cheque cashing of another bank should be exchanged to cash in CBM on next business day basis, and therefore requires two days.

As for the ATM, the bank schedules to cooperate with VISA and Master. There is 24 hours operation maintenance of the system. Most of the troubles occurred so far is caused by the communication infrastructure.

(13) First Private Bank

The top manager also holds a post of a board member in the Myanmar Bank Association. The following points were given through his remarks, although information related the bank itself was not shared at all. 1) Each bank, apart from the CBM, does not have an authority in decision making regarding their business activities because of the strict restrictions set by the CBM. 2) The Myanmar Bank Association does not have much authority, while it creates some guidelines for banking activities.

(14) Kanbawza Bank

The bank is the largest private bank and has largest number of branches and employees among the private banks and even covers provinces like Shan state and Kachin state. The bank has increased its branches to about fifty in the last six months, and is planning to increase them to 100 during 2012. Moreover, the investment related to ICT is also positive, and a Singaporean is employed as the ICT manager. Therefore, it could be said Kanbawza Bank is the best bank to measure the ICT introduction level of Myanmar. The vast majority of its customers are individual proprietors, farmers, investors. Recently the bank plans to obtain business persons in

order to expand its customer base. Despite deregulations, people of the country have not yet been aware of the necessity of deposits, and therefore most of the people save cash in their own home. The bank intends to add more branches across the country to raise people's awareness, therefore to increase account balance.

The bank is using the core banking system for domestic business which has been developed by ACE, the local vendor. The bank also has about 10 ATMs available in 24 hours located in big cities such as Yangon or Mandalay, and it provides 24 hours support with a limited service for Q&A at night. The functionality is, however, limited to withdrawal of Kyat and they cannot deposit money. Since being authorized for foreign currency services in 2011, they are expanding these services faster than any other banks, and are planning to implement international package software from Oracle for its forex system. This system is expected to be launched in six months at the earliest. The main services are corporate loans and trading. As for the domestic business, the bank is doing the similar business to those of advanced countries such as Japan.

The bank sends regular reports to CBM via fax or e-mails every day and posts original documents the next business day. The regular reports, sent after closing business at 15:00, consist of the amounts of deposit and withdrawal as well as loans and collaterals. The settlement method against CBM is gross settlement. The evaluation standard for collaterals are decided and given by CBM: 30% of evaluated amount is the limit of loan if the collaterals are real estate and 8% if they are deposit amount, but can be expanded to 10% subject to negotiation if requested.

Auto-link is a special deposit service which is not provided in Japan. In the service, a certain amounts will be automatically transferred from a savings account to a check account, when the deposit amount becomes zero in an saving account. Withdrawal from saving accounts is limited to once a week.

Only currency exchange is provided in the area of the international service. It is planning to handle remittance and other banking business in the near future.

(15) Myanma Apex Bank

The bank is one out of the four new banks established in 2010. Although the number of the branch is 15, the employees are only 80, where a lot of young bank clerks were observed. For that, a basic training about the use of ICT and general banking training is provided regularly.

The bank is using MIT's core banking system for domestic business. Each branch and office

has their own business data stored on site, and the headquarters has only summary data sent by branches as the master data. The business data has been managed and taken multiple backups to the backup servers, disks, and other media such as CD. The bank has no concern about such system configuration, scattered data store, as most of the business is cash handle at the counter of the branches only. Five ATMs have been introduced. The bank is one of the first participants of MPU, and is now undertaking establishing cooperation with other banks. Also the bank has been preparing for SWIFT. The main business seems to be a corporate financial service, especially the financing and trading.

The number of regular reports sent to CBM is 10 for daily, three for weekly and five for monthly, and they are sent via fax or emails. In accordance with the current business process, following four points were observed. 1) Applications for saving and checking account needs to be done separately. Nonresidents are allowed to apply checking account only. CBM's authorization is required. 3) Balance check of deposit/ loan needs to be done by CBM. 4) Cheques can be settled between different banks but needs to be changed to cash at the point of settlement. At the moment, the bank is preparing to expand the branches to deal with the increase of domestic demand and to start credit card and foreign currency transaction.

(16) Myanmar Oriental Bank

The bank's shareholder is Chinese. The bank is medium-sized with the 19 branches.

The number of employees is about 700, and 200 PC terminals are in place. However, the number of engineers related to ICT is only 7. Moreover, overseas training is planned because the bank recognizes shortage of ICT skill is a problem. The bank is considering to introduce China made core banking system. With the system, information on each branch will be able to be operated in real time and centralized. Moreover, the internet banking is also planned for the future.

The bank provides a sort of commercial loan for the business person, and offers one year finance with land and the building as collaterals. As unique service of the bank, the leasing company has been established, and installment selling and leasing business are provided. The targets are electronics, cars, and equipment for agriculture and the business is upward with positive expectation.

It cooperates with Kanbawza Bank, Ayeyarwady Bank, Co-operative Bank, Myawaddy Bank, Myanmar Livestock and Fisheries Development Bank, and Myanmar Citizens Bank, in its banking business operation.

The fixed deposit is few, and an increase cannot be expected in the future although there are a lot of savings accounts. A long-term loan of one year or longer is not authorized by CBM and not to be expected to be permitted even in the future.

As for reporting to CBM, the bank sends reports from each branch to the headquarters by fax, as well as reports sent from the headquarters to CBM with EFT. The bank uses the format provided beforehand by CBM. This has been written in both Myanmar language and English. About international business, the bank has already started remittance and the deposit, though the letter of credit for export and the import is under preparation. In the field of the remittance business, the bank cooperates with May Bank of Malaysia, United Overseas Bank and Development Bank of Singapore and handling US dollar, Euro, and Singapore dollar. The introduction of VISA and Master, JCB, and CUP is being examined to meet the SEA Game at the end of 2013. It will give credit card function to the card that this bank issues though it is for domestic usage.

Permission of the investment trust business is obtained, and the bank will be preparing it aiming at beginning in the future.

(17) Tun Foundation Bank

The bank is one of the members of the company group of bottling and selling of Pepsi Cola as well as social welfare services such as planting campaign, hospitals, clinic, and educational support for children of the poor, which the group has donated 1 million US dollar for that.

It seems that any core banking system is not yet introduced to the bank because of lack of skilled people, and systematization has not been successfully achieved yet.

Neither MPU nor SWIFT is prepared.

The bank addressed that there was a survey visit from Malaysia, Singapore, and South Korea under the pretext of the financial modernization support, and, therefore, support of the modernization of a financial system of this Japan is highly expected.

(18) United Amara Bank

This bank is a new bank established in 2010. It focuses on individual customers, hence new branches are planned in the places like supermarkets where many customers are likely to visit. where individual customers can be expected to visit the branches. The number of employees are

about 600 including a lot of foreign staffs.

The core bank system is developed by Blitz, a Singapore company. Although information on each branch is not centralized in real time, the bank does not see any problem considering business requirements. Customization on its current system is planned to be done by the bank itself.

To incorporate with the expansion of foreign currency business, the bank is considering to introduce risk management such as ALM (Asset Liability Management) and customer services, such as introduction of the fixed deposit as the deposit amount will increase in accordance with economic growth.

On remittance business, it cooperates with May Bank, United Overseas Bank, and Standard Chartered in foreign countries, and Kanbawza Bank and Co-operative Bank in Myanmar. The tie-up with the bank in Europe and America is being planned for the future.

The regular withdrawal function that is called GIRO (direct debit) is this bank's unique service. The alarm would be raised in case of large amount of debit. For the future, connecting with other companies is considered in order to provide a services such as payroll for the employees of private companies.

(19) Yoma Bank

The bank experienced bankruptcy and could not do business for several years when a run on a bank taken place in 2003. It used to be one of the largest private banks before 2003. The number of branches is classified on large scales as 51 stores. The bank was, the one and only bank that was able to resume its business in 2008. Recently its business is limited to money transfer only, but has largest share for such business among the country's private banks. All the private banks are allowed to treat money transfer. The bank provides real time money transfer with online system. The bank is able to leverage its business base obtained in the past when the bank was ranked as the third largest bank in the private bank industry. The bank has been waiting for the permission enabling full business as a commercial bank, and is willing to expand its business. The bank has not, however, joined MPU yet, while seven banks has already joined initially. The bank has been watching the situation carefully and now moving forward to participation.

The bank is running in-house core banking system, developed by the bank. The mark of this system is English including the report for the CBM. The server for the system is SQL Server,

and .NET and C++ are the application development language. Recently the bank has changed the OS of PCs from Windows XP to Windows 7 for the core banking system.

With regard to the money transfer, several facts have been confirmed. Firstly, limited amount is defined. Secondly, the customers can send money without any accounts at the bank and most of the transactions are cash remittance consequently. Thirdly, the money transfer to the different banks is limited to the those for allied banks such as Myanmar Economic Bank, Yadanabon Bank, Shubin Tharyaryay Bank, and Yangon City Bank. Furthermore, basically 5 minutes is required at longest for the money transfers which go through its headquarter with real time processing. Moreover, the remittance processing is done after the personal identification by both the identification card that is called NRC and the telephone number. There is no maximum of the remittance. Remittance is until the last customer's remittance ends though the usual remittance time is 15:30 (business end time) basically. As the risk management function, STR report (Suspicious Transaction Report) and CTR (Cash Transaction Report) for illegal prevention are made automatically and managed.

The bank is willing to start and has been preparing for international finance business. A special team has been assigned for foreign exchange business in association with a Malaysian consultant hired who has over-20-year relation with the bank. Also the bank pays much attention to human resource training and therefore it sent some employees to CBM to be trained.

4) Current situation of commercial banks (state-owned banks)

(20) Myanmar Agricultural Development Bank

The bank is established in 1957 as State Agricultural Bank. In 2007 the name was changed to Myanmar Agricultural Development Bank. Branch number 205 is the second largest in Myanmar, following Myanmar Economic Bank's 327. Among the total of 340 in Myanmar, the branch network covers almost all rural area except for the dangerous area such as border of Thailand. The number of account is nearly 1.7 Million which is almost equivalent to Myanmar Economic Bank.

Agriculture is quite important industry in Myanmar which earns 70% of GDP in Myanmar. The bank provides short term seasonal loan and term loan. Seasonal loan utilize expected harvest provided by Land Record Department of Myanmar as collateral and group of farmer as guarantor whereas term loan utilize real estate as collateral. The bank's asset consists of funding from Myanmar Economic Bank (90%), owned capital (5 Billion Kyats) and deposit from farmers (2%).

Deposit interest rate for farmer is 8% whereas loan interest rate for farmer is 8.5%. Therefore the bank's profit from spread is not big. However since loan rate from Myanmar Economic Bank is 4% most of profit is gained from this gap. Loan interest for farmer 8% is much lower than loan interest rate of other commercial bank 13%. This special rate is not offered to all farmers. Only the farmer whose farm is less than 10 acre can open loan account in the bank.

As for the core banking system, the bank deploys simple banking system to 46 branches out of 205 branches. The banking system support transaction entry of loan/deposit and electronic general ledger. Since inter-branch network is not implemented each banking system is separated branch by branch. Therefore general ledger is also separated by branch. Surprisingly only 11 branch out of 46 branch is equipped with e-Mail. Branch report is sent to head office by FAX normally.

The bank has Research & Computer Department in charge of system development and Administration Department in charge of system support. However like other state-owned bank, the bank has lack of ICT budget and developers therefore system development relies on fortnight visits of system vendor to check all systems.

(21) Myanmar Economic Bank

The bank is the largest commercial bank in Myanmar, which occupies 50% of deposit in Myanmar banks and has 327 branches that cover all over Myanmar in order to provide banking service to Myanmar people. Approximately 70% of deposit is from individuals. It is similar to Post Bank in Japan. They did not disclose actual number of accounts but it is assumed to be between 1 million and 2 million.

The bank has 2 major roles. One is general commercial bank. The other one is the agent of Central bank, By utilizing wide branch network the bank supports treasury business and currency business of Central bank that has only 3 branches in Yangon, Naypyitaw and Mandalay. In addition, during Bank run in 2003 the bank acted very crucial role of supplying fund to other commercial banks.

Private banks, such as Kanbawza bank, focus on gaining profit therefore they tend to deploy branches to urban area such as Yangon and prioritize on transaction from business owners or corporates. On the contrary, the bank focuses on retail business which serves to individual of Myanmar people.

The bank differentiates itself from other commercial banks by bland image of state-owned and deposit protected by government. People in rural area are proud that their town has the branch of the bank. Therefore many towns in rural area request the bank to open their branch. In 2012 the bank plans to open 2 to 3 branches.

As for banking system, the bank has simple banking system running on MS-DOS platform, which has old fashioned user interface. The bank developed the banking system in 1990 by their internal resources. So far it has deployed to 70 branches. At the time of development, the bank gathered their internal resources separated from current Yangon office for development. After completion the candidates of system operators from each branch to deploy the banking system were called to the office to get trained system operation. The developers now remained only 3-4 people in Yangon office.

During these 22 years after cutover of the banking system, hardware was replaced periodically but application has not been changed. Those branches without the banking system has been using paper based general ledger.

The bank developed semi-auto ATM called online banking system to seven branches in urban area (4 branches in Yangon, 1 branch in Naypyitaw, 2 branches in Mandalay) which achieve centralized electric general ledger even though very simple way. By online banking system, customer is authenticated by magnetic stripe ATM card and PIN then the customer can perform transaction by touch screen. Then the customer bring slip printed by the online banking system to the special counters to get cash.

As for ATM the bank introduced 20 ATMs from NCR. The bank is conducting pilot test by their own staffs. After MPU's cutover the bank will open these ATMs to customers.

As the nature of state owned bank, the bank is quite profitable but their profit belong to the government. Therefore the bank cannot spend the profit for ICT investment. However the bank is making effort to introduce ICT system for better service by utilizing limited ICT budget from the government.

(22) Myanma Foreign Trade Bank

The bank is specialized in international business. Both retail and corporate customer's oversea transaction and government sector's transaction must be made through the bank. The bank has only one branch located in Yangon with 630 employees. Since the most of customers are located in Yangon area, number of branch is not a big issue at this moment.

The bank have 270 corresponding banks including major Japanese banks, Mizuho Corporate Bank, The Bank of Tokyo-Mitsubishi UFJ, Sumitomo-Mitsui Banking Corporation. The number of daily oversea remittance transaction is 300 for outgoing and 200 for incoming.

Besides oversea remittance the bank offers foreign currency deposit. Deposit account is used only for settlement of oversea transactions. Also the bank offers various trade finance services. However they have difficulty to handle a lot of export and import documents because of a complicated procedure required upon international transactions.

The bank has extensive know-how of international banking business. Therefore the bank dispatch their skillful staffs to private banks to transfer their skill. In a sense it is helping potential competitors but the bank considers this will help Myanmar banking industry.

The bank has only accounting system and SWIFT terminal as well. But the bank does not have either core banking system or STP to interface core banking system with SWIFT terminal. Therefore there are huge demand of ICT systems to support their business operation including AML.

(23) Myanma Investment & Commercial Bank

The bank handles both retail and corporate customers. The bank offers not only domestic but also international business such as foreign currency deposit, oversea remittance. As for international business, the bank handles private sectors whereas Myanma Foreign Trade Bank handles government sectors. The bank has 174 corresponding banks including major Japanese banks such as Mizuho Corporate Bank, The Bank of Tokyo-Mitsubishi UFJ, Sumitomo-Mitsui Banking Corporation. The number of daily oversea remittance transaction is 600 for outgoing and 400 for incoming.

The bank has around 35,000 accounts. 70% of accounts belong to corporate customers. The bank has only 2 branches in Yangon and Mandalay. The bank is currently interested in internet or mobile banking that seemed to be more convenient for their corporate customers.

The bank has simple banking system which manages general ledger and various transaction entries. However report function is not sufficient hence the bank must create the report for central bank manually. The banking system has international business function and some functions are linked to SWIFT terminals. But due to central bank regulation, the bank still use paper based general ledger as well.

The bank is now testing ATM. Currently their ATM is linked to the bank only but after MPU cutover it will be linked to other banks.

3.3. Securities and Exchange Market

1) Current situation of the securities exchange system

Myanmar Securities Exchange Centre Co., Ltd. (MSEC) was founded in June 1996 as a joint venture company between Daiwa Institute of Research Ltd. and MEB as an organization designed to be positioned as a forerunner for the future exchange. Currently, shares of two companies are traded over-the-counter, and in addition retail investors can buy government bonds at MSEC.

Since the ASEAN Community shall be formed by 2015, Myanmar undertakes to prepare for regional integration and cooperation. To facilitate the development of financial markets, Capital Market Development Committee (CMDC) was organized in 2008, led by Minister for Ministry of Finance and Revenue (MOFR). CMDC designed the development roadmap of capital market, which covers various issues including legal framework, regulatory authorities, and relevant infrastructures. In roadmap, most tasks are included in the phase 1 from 2008 to 2009, and the Phase 3 will be implemented from 2013 to 2015.

(1) Equities

Currently shares of two companies (Forest Products Joint Venture Co., Ltd. and the Myanmar Citizens Bank Co., Ltd.) are traded over-the-counter at MSEC although the trading volumes are very low. Under Myanmar's *Company Act*, there are only twenty or so public companies which are allowed to transfer ownership of shares. Some of the public companies' shares, excluding those of the two traded at MSEC, are traded between shareholders directly with help of these companies' administration departments. *The Securities and Exchange Law* is not enacted yet in Myanmar and there are no rules to prevent public companies shares to be traded outside of MSEC.

Business operations related to transactions conducted at the MSEC have not yet been systematized and a lot of inefficiencies are observed. For example, investors basically need to visit MSEC upon buying, selling shares or receiving dividends. Payments are made only by cash or cheques.

(2) Bonds

Government bonds are only bonds available in Myanmar currently. There are no other types of bonds such as municipal bonds, government-agency bonds, bank debentures and corporate bonds. Similar to stocks, investors need to visit MSEC or MEB's eight branches (four in Yangon, three in Mandalay and one in Naypyitaw) to buy government bonds or receive coupons. Payments are made by cash or cheque.

(3) Profile of MSEC

Figure 3-3-1. Profile of MSEC

Employees	12
Number of securities accounts opened (=Number of customers)	Approximately 1,400 accounts (as of end-August 2011)
Geographical Distribution of Customers	Yangon and suburbs ... 95% Other (further away).....5% ※Contacts to customers located further away are made by post.
Shares traded	There are two issuing companies with a total of three securities. <ul style="list-style-type: none">▪ FPJVC 75% paid(Trading unit: 1 share)▪ FPJVC 50% paid(Trading unit: 1 share)▪ MCB (Trading unit: 1 share)
System usage	6 PCs are in use. 1 PC for accounting use, 5 PC for customer/transaction management use, The processing procedures for order issuance, order booking and receiving and making payments do not make use of the system.

(4) Current procedure of operation at MSEC

Main operating procedures at MSEC are as follows: (1) Opening accounts; (2) receiving payments; (3) Paying out funds; (4) Paying dividends; (5) Succession/inheritance etc. These procedures are not carried out face-to-face but on paper.

a) Managing accounts

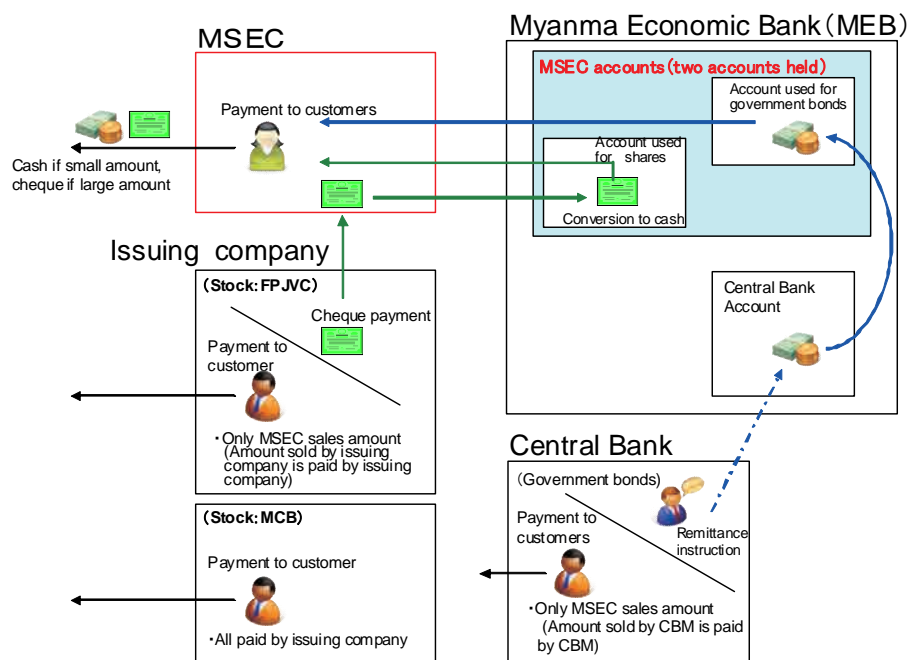
Account numbers in account books are issued as serial numbers but because these numbers are issued simply to identify clients, account numbers differ in cases where both shares and government bonds are held. Certificates are directly handed over to clients at the counter, in exchange for equivalent amount of the cash, there is no concept of managing outstanding balances.

Once the cashless and scripless securities system is introduced, it will be necessary to manage outstanding balance of cash and securities whenever any changes are made and this process can clearly not be successfully carried manually with account books.

b) Payment procedures for dividends and coupons

MSEC currently makes payments only for dividends for two shares as well as government bond coupons. Workflow for these payments is illustrated in Figure 3-3-2.

Figure 3-3-2. Workflow for payment of dividends and coupons



Source: Study team

<MSEC overview>



<Share certificates>



Note: Shareholders' names are written on the back of the share certificates. Any changes in the shareholder's (registered name) details deriving from trading or succession/inheritance are rewritten/overwritten by the issuing company.

2) Framework for capital market

As mentioned above, developing capital markets in Myanmar has not made much progress in the past. As the government aims to open the securities exchange in 2015, it is necessary to develop the supporting system infrastructure urgently.

In developing the capital market and its system infrastructure, it is not appropriate just to copy and introduce the ICT system used in the developed countries. They have been developed to suit their own historical background and their specific conditions. Hence, the system used in those mature markets may not be applicable to Myanmar.

In general, the transaction volume is not large and the variety of the financial products is rather limited at the early stage of the development of the market. It is reasonable to first introduce simple ICT system in Myanmar then renew when the market grows.

Even if system introduced initially in Myanmar is relatively simple and small-scale, the system should be carefully designed so that it will be compatible with other financial systems which may be introduced in the future.

Prior to developing the system for the securities exchange, it is necessary to define the requirements for trading rules, commission fee structure, regulations etc. It is quite challenging to develop the system under the current situation, when *the Securities and Exchange Law*, is not in place yet.

Nevertheless, it is critically important to set forth the basic ideas for the following five issues which are prerequisite for the systemization of the exchange and critical to determine the appropriate direction of the development.

- (1) Taxation systems
- (2) Listing requirements and standards
- (3) Profile of commission structures
- (4) Scripless securities
- (5) Transaction reports for clients

In considering those issues, comparison with the markets in ASEAN countries is useful as Myanmar will be integrated into ASEAN economic community in 2015 and as some of the

markets at ASEAN countries are just about to take off, which can be a reasonable benchmark for Myanmar.

(1) Taxation systems

Currently, there is only stamp duty (0.3% of the transaction value) for securities trading in Myanmar while various taxes are levied on securities transactions both in the ASEAN nations and across the world. With the ASEAN economic community approaching in 2015, Myanmar may need to take into consideration of the structure of the taxation systems adopted in the ASEAN nations as illustrated in Figure 3-3-3 when Myanmar formulates a multifaceted system of taxation in relation to securities transactions.

Obviously, government revenues will increase with introduction of a new securities-related tax scheme. On the other hands, incentives such as lowering the corporate income tax rates and introducing tax benefits for listed companies should definitely be considered for the sake of encouraging a lively market for securities transactions. If the number of listed companies is to increase as a result of such favorable taxation measures, it will not just benefit the development of the capital markets but also provide a boost to the economic activities.

Figure 3-3-3. Comparison between the securities taxation systems in ASEAN countries

Tax rate(%)	Tokyo	Thailand	Vietnam	Lao PDR	Cambodia	Philippines	Indonesia	Malaysia	Singapore
Sales Tax (contract fee)	0	0	0.1	0.3		0.5	0.1		
Capital Gain Tax	10	0	20				income tax rate		
Dividends Tax	10	10	5	10	0	10	15	25	
Stamp Duty	0.02	0.1						0.3	
Value Added Tax (Commissions)	5	7			10	12	10		
For Reference (interest received: individuals)	20	15	Tax-free	10	7.5 - 15	5 - 20	20	15	Tax-free
Favorable Taxation Systems for Listed Companies									
Reduction in Corporate Income Tax Rate				-5%	-10%		-5%		
Reduction in Individual Income Tax Rate for founders (of companies) / entrepreneurs exists	Exists						Exists		

Source: Study team

(2) Listing requirements and standards

One of the most important functions for a securities exchange is raising funds. When

companies list on a securities exchange, they gain the access to large amounts of financing at low cost supplied by the investors. The funds raised on a securities exchange are likely to prove useful to companies in expanding the scale of their business operations. Providing opportunities to list on securities exchanges to as many companies as possible also results in boosting the development of the economy.

However, it is not the case that listing is suitable for all companies. If a company should prove to be unattractive to investors, trading in its securities will languish. If a listed company should go bankrupt, its investors will lose the funds they have invested in it. If only companies with weak earnings bases list, the securities exchange will lose its credibility.

At the same time as making it easy for companies to be listed, it is essential that securities exchanges be established in such a way investors be properly protected. In order to ensure that both aims are met, a balance must be struck between rendering the quantitative standards for listing relatively loose whilst at the same time ensuring that the qualitative criteria are maintained at a high level.

Currently, MSEC's criteria for the company to be traded over-the-counter is 1) the entity is registered as a public company, 2) minimal capital of 50m Kyats, 3) more than 100 shareholders.

a) Quantitative requirements

Important points for quantitative requirements are: (1) profitable in the past couple of years; (2) share capital is above a certain level; and (3) there are a certain number of shareholders. Quantitative requirements used in the ASEAN countries can provide suitable yardsticks for Myanmar in this area (Figure 3-3-4).

b) Qualitative requirements

Key points for qualitative standards are: (1) sustainability and profitability of the company; (2) soundness of the company; (3) corporate governance and internal control scheme; (4) disclosure framework; and (5) other factors.

Sustainability and profitability of a company means whether or not it is able to continue to maintain its operations and whether or not it has a foundation capable of generating stable earnings. Determining a company's soundness requires a judgment as to whether it is carrying out its operations in a fair and diligent manner. It is critically important to ascertain whether or not the company's corporate governance and internal control structure are properly set up and functioning. Moreover, a system for ensuring that disclosures of the company are made in a fair

and full manner is indispensable. In addition to this, another essential component is the establishment of a structure to guard against shareholders' rights being infringed, serious disputes or trouble breaking out or antisocial groups exerting influence over the company's management. Adoption of similar qualitative criteria should ensure that the candidates approved for listing are limited to reasonably fair companies.

Figure 3-3-4. Quantitative standards adopted

Criteria	Thailand	Vietnam		Lao PDR	Cambodia	Philippines	Indonesia	Malaysia	Singapore	Myanmar	Tokyo
		Ho Chi Minh City	Hanoi								
Sales	X	X	X	O	X	X	X	X	X	X	X
Income	O	O	O	O	O	O	O	O	O / X	O	O / X
Total assets / Fixed assets	X	X	X	X	X	X	O	X	X	X	X
Net assets / Shareholder's equity	O	O	O	O	O	O	X	X	X	O	O
Market capitalization	X	X	X	X	X	O	X	O	O / X	X	O / X
Number of shareholders	X	O	O	O	O	O	O	O	O	O	O
Shareholder distribution / allocation	X	O	X	O	O	X	X	X	O	X	O

○: Applied, ×: Not applied

Source: Study team

(3) Profile of commission structures

MSEC receives commissions from clients for carrying out services including brokerage of stocks upon buy or sell transactions.

Moreover, securities transactions do not just depend upon the services provided by the securities companies but also include all the various services supplied by the securities exchange itself. These services include, for example, authorizing trades conducted by securities companies on securities exchanges and approving the listing of the shares of companies that are listed on such exchanges. Furthermore, it is envisaged that, in Myanmar, the settlement and payment of accounts related to securities trading will also be executed on the securities exchange.

In this connection, it will be necessary to carefully determine the best way to create a commission structure in preparation for the establishment of a securities exchange.

(4) Scripless securities

Shares and government bonds are issued by paper in Myanmar. Upon transaction of shares, paper certificates are delivered to a buyer from a seller. Government bond certificates in paper

form are handed to a buyer at MSEC. In other words, scripless trading is not implemented in Myanmar's securities market. Vietnam, Lao PDR, Cambodia, the Philippines, Malaysia, and Singapore have already completed the scripless shares, Indonesia has nearly completed going scripless and 85-90% of listed shares in Thailand are dematerialized. Myanmar needs to go scripless when a stock exchange opens in 2015.

In Japan, efforts for going scripless started in 2000 and completed in 2009. The process proved to be extremely challenging and took many years because of the large number of securities certificates that had already been issued in the past and were still in circulation by the time the issue of the scripless securities finally arose. Clearly, it would be desirable, in terms of supporting the development of the capital markets in Myanmar, to take advantage of the fact that the volume of securities certificate issuance is still tiny by introducing the scripless securities as soon as possible.

(5) Transaction reports to clients

Usually, regulations stipulate that transaction reports be provided by securities companies to their clients. Clients naturally want such trading reports and other documentation detailing transactions and securities trading account balances to be sent to them quickly and securely. At MSEC, while the transaction notes are issued at the counter when the transaction is made, they are not in the form of electronic media, but of the physical paper.

In light of the current state of the postal service in Myanmar, the anticipated increase in the number of issues traded, and the likelihood that the markets will become considerably more active in the future after the establishment of a securities exchange, it is very possible that not all of the trading reports and other documents will arrive exactly on time for the settlement date for the trades they refer to if they are delivered by the postal service.

What's more, the postal service is very susceptible to the influence of the weather. Moreover, the timeliness of the delivery is also subject to the available capacity for printing the trading reports in the first place. Obviously, a quick glance at the differing prospects facing the postal service and the ICT sector suffices to reveal that the development of the latter looks a lot easier to achieve than that of the former.

In Japan, a system of legal and regulatory control has been revised so that the use of electronic delivery has been encouraged. The global tide is heading in the same direction with internet and email and ICT usage steadily encroaching on and replacing the postal services. As mentioned above, it is clearly far preferable that use be made of electronic transmission to send electronic files across the internet to deliver trading reports etc. than that they be sent as post in the mail.

4. ICT Environment in Financial Market

4.1. ICT system in CBM

1) PCs

CBM constitutes of more than ten departments (Figure 2-2-4), but the four main departments that use computer terminals are the Currency Department, the Internal Audit and Bank Supervision Department, the Accounts Department, and the Administration Department. The study team held meetings/interviews about the OA environment with the persons responsible for the bank system at each of the four departments.

The total number of computer terminals in the bank is less than 150 consisting of 89 terminals at the Naypyitaw headquarters and 55 terminals at the Yangon branch office. Given that, there were a total of approximately 1,500 bank employees at CBM as of April 2012, this means that the ratio of terminals per capita remains at the level of less than 10% (Figure 4-1-1).

Figure 4-1-1. Results of survey of CBM's OA environment

Place	Department	No. of staff	No. of PC	BankNW ^{※2}	Internet ^{※3}	No. of printer	No. of file server	OS	LAN
Naypyitaw	Internal Audit and Bank supervision ^{※1}	79	23 20	0 0	1 0	1	1	Windows7	available
	Account	60	16	3	2	4	0	Windows7 WindowsServer2003	available
	Admin	90	21	2	5	5	0	Windows7	not available
	Currency	100	9	1	1	4	0	Windows7	not available
Yangon	Internal Audit and Bank supervision ^{※1}	27	9	2	1	3	0	WindowsXP WindowsServer2003	not available
		58	17	3	3	7	2	Windows7 WindowsServer2003	available (8 PCs only)
	Admin	94	21	0	7	19	0	WindowsXP	not available
	Currency	197	8	2	1	4	0	Windows7 WindowsXP	not available

※1 There is a plan to split this department in the future.

※2 Network web linking the commercial banks and the CBM.

※3 It is possible to use the circuits of both providers (MOFR and MPT). Management teams simultaneously use both circuits.

※As of April 2012

Source: Study team

Staffs of the departments mentioned above share PC terminals which are set up in common-use areas (separate room from their working space) as they do not have their own PC. While such setting enables those wishing to access PC whenever necessary, it is not

recommendable in terms of efficiency and security. Many users share same user ID and password when they want to use the terminal. In cases bank employees are unable to use the terminals when they want to, it causes inefficiency as the flow of business operations is interrupted by the delays. Numerous staffs strongly claimed the necessity for every bank employee having a terminal for their own sole use (Figure 4-1-2).

Figure 4-1-2. Offices with no computers, shared computer rooms



Source: Photograph taken on local field survey

As the business operations conducted in the bank without using computers are naturally done on paper, huge volumes of paper are piling up in the offices as a result and taking up a great deal of space (Figure 4-1-3). The consolidations of the amount of space needed for the storage of documents and the time check data are considerable challenges.

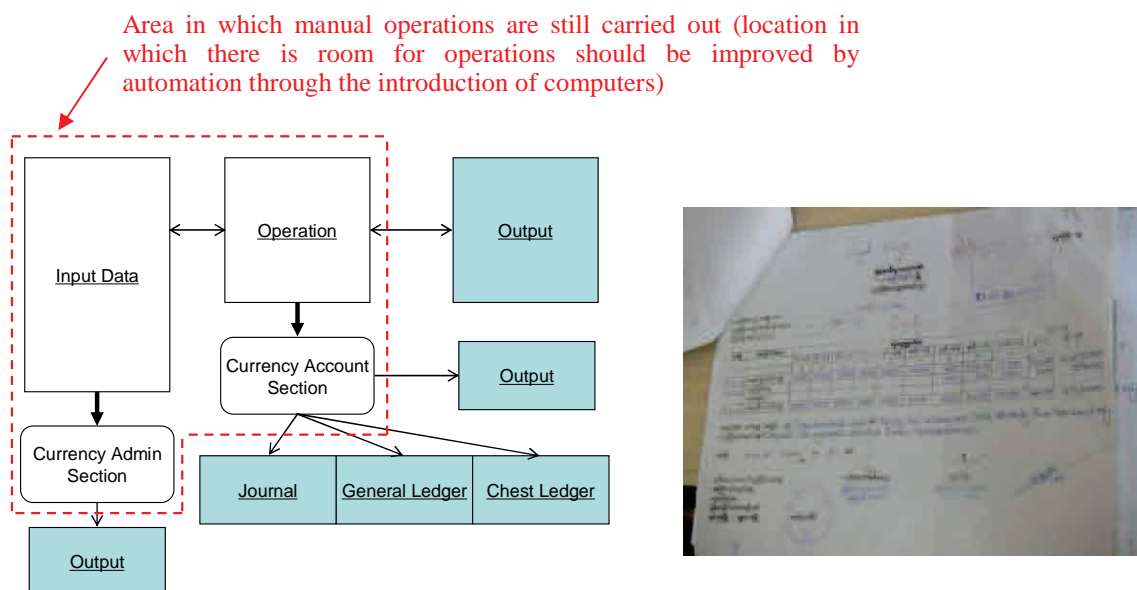
Figure 4-1-3. Offices spaces piled high with mountains of paper documents



Source: Photograph taken on local field survey

For example, in the 'Currency Department', data received from commercial banks and state-owned banks by telephone, fax, email etc. is gathered together and compiled into documents including transaction records (journals) and general ledgers. The fact that procedures for carrying out manual operations still remain (the area with the white background in Figure 4-1-4) illustrates that there is still plenty of room for improving operational efficiency by the introduction of automation through the use of computers.

Figure 4-1-4. Schematic workflow at the CBM Currency Department

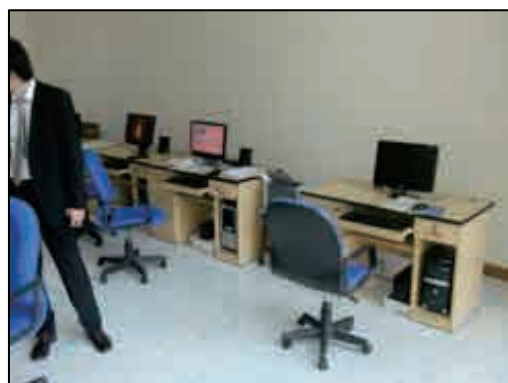


※The area shaded in blue is already converted to electronics/computerized

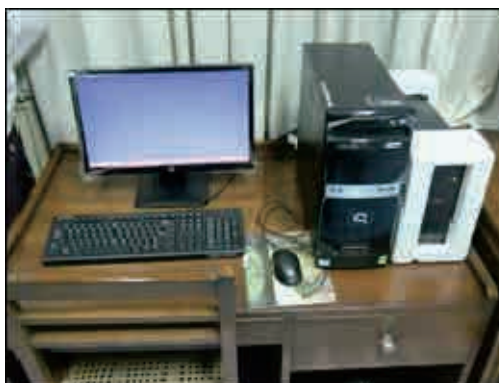
Examples of handwritten documentation

Source: Study team (based on materials provided by CBM)

Figure 4-1-5. UPS for use on computer terminals



UPS units installed on each individual terminal



UPS units installed still wrapped in expanded polystyrene

Source: Photograph taken on local field survey

Simple UPS (Uninterruptible Power Supply) units are installed as a countermeasure to deal with the effects on computer terminals of power outages (Figure 4-1-5).

2) File servers

There is one file server installed in the Internal Audit and Banking Supervision Department at the Naypyitaw headquarters and two file servers are installed at the Accounting Department of the Yangon branch office. In other departments without file servers installed, data is transmitted and received by USB in which possible leakage of confidential information to third parties or data being falsified could occur, hence security issues must also be well addressed elsewhere regardless of servers installed.

3) Printers

There are fourteen printers installed at the Naypyitaw headquarters and nineteen at Yangon branch office making a total of 33. All four departments that study team visited in the course of their survey had one or more printers installed. However, most of these printers are not connected to the bank's internal LAN and thus directly connected to PCs (Figure 4-1-6).

Figure 4-1-6. Printers in offices



Printers directly connected to PCs



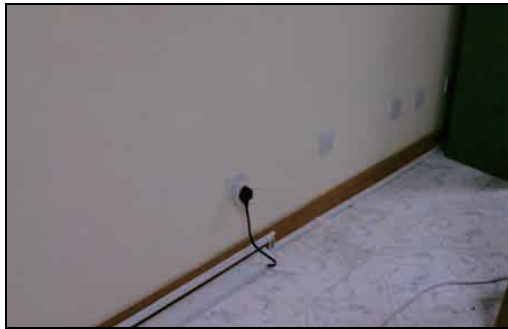
Printers positioned in various locations

Source: Photograph taken on local field survey

4) LAN

The LAN network at Naypyitaw headquarters of the bank connects network equipment in the machine room (which is called the “data center”) with network equipment located in every office by fiber optic cables running above the ceiling (Figure 4-1-8). Media convertors⁴ located in the offices convert the transmission media of the data which is then relayed by network equipment inside the offices themselves to the individual PCs which are linked by LAN cables (copper wire cable) running through mouldings⁵ in the floors and walls. The mouldings snake its way across the floor surfaces of the offices because the tiled office floors are not raised (Figure 4-1-7).

Figure 4-1-7. Photographs of wiring inside offices (left) and of offices floors (right)



Mouldings are directly attached to and run across the surface of the floor



Tiled office floor

Source: Photograph taken during field survey

In contrast, the Yangon branch office’s LAN connects network equipment installed inside the machine room (which is also called the “data center”) with the network equipment in each office by a direct Category 5 cable⁶ link (100Base-T/ 100Base-TX) (Figure 4-1-9). Because this cable has a limit (of approximately 100 meters) to its effective transmission distance due to its technical specifications, Yangon branch office terminals which can connect to the network are not located any further away from this particular room. The LAN environment within the office space is virtually identical to that at the Naypyitaw headquarters and so the connection between the network equipment in the office room and the individual employees’ PCs is effected in

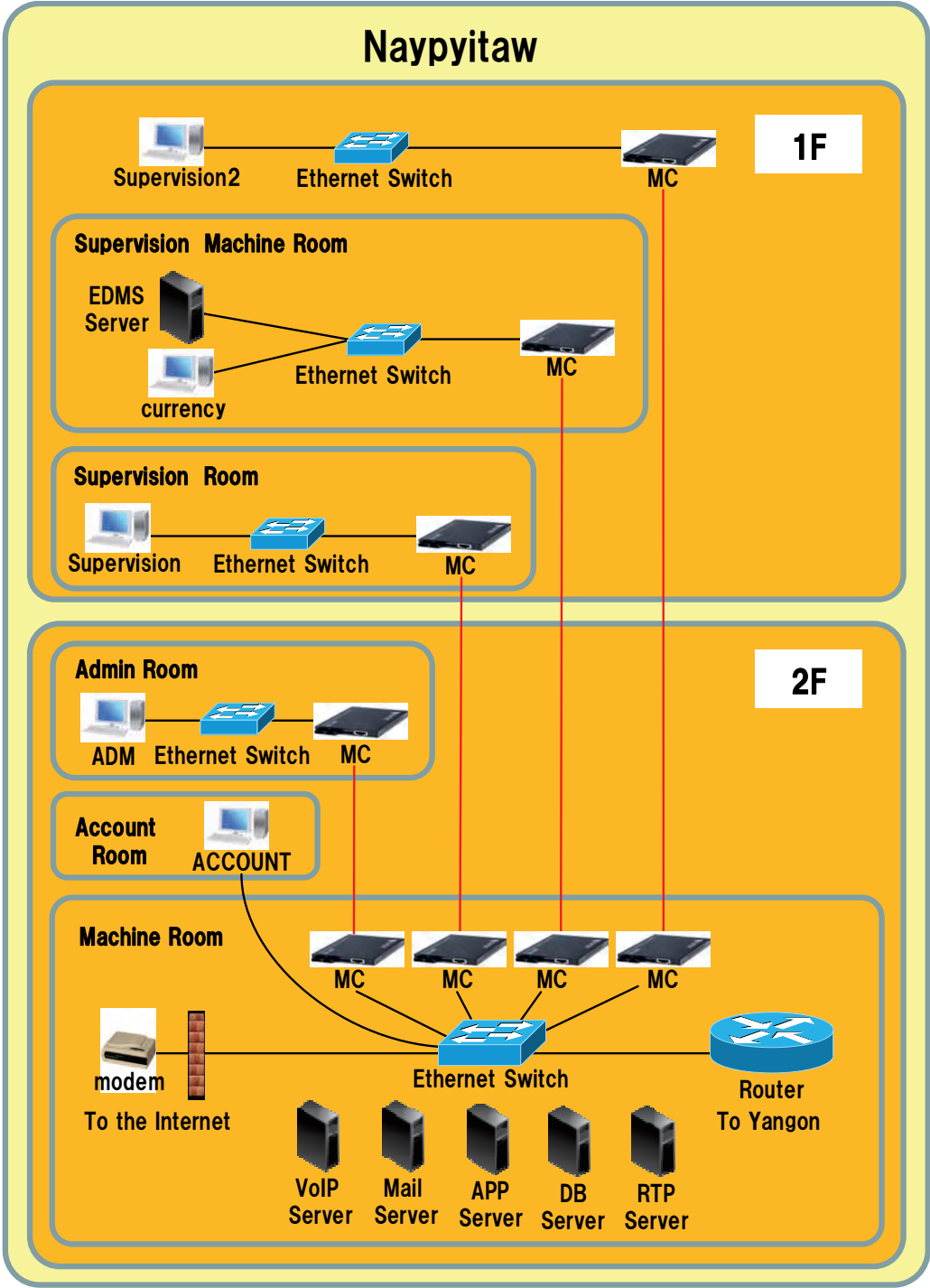
⁴ Equipment used for two-way conversion of signals passing through different types of transmission media and along optical fiber cables and copper wire cables

⁵ Moulding is a cover used for cables to prevent them from becoming disconnected.

⁶ Cable standard used for connecting computers and other items of equipment - particularly in LAN environments.

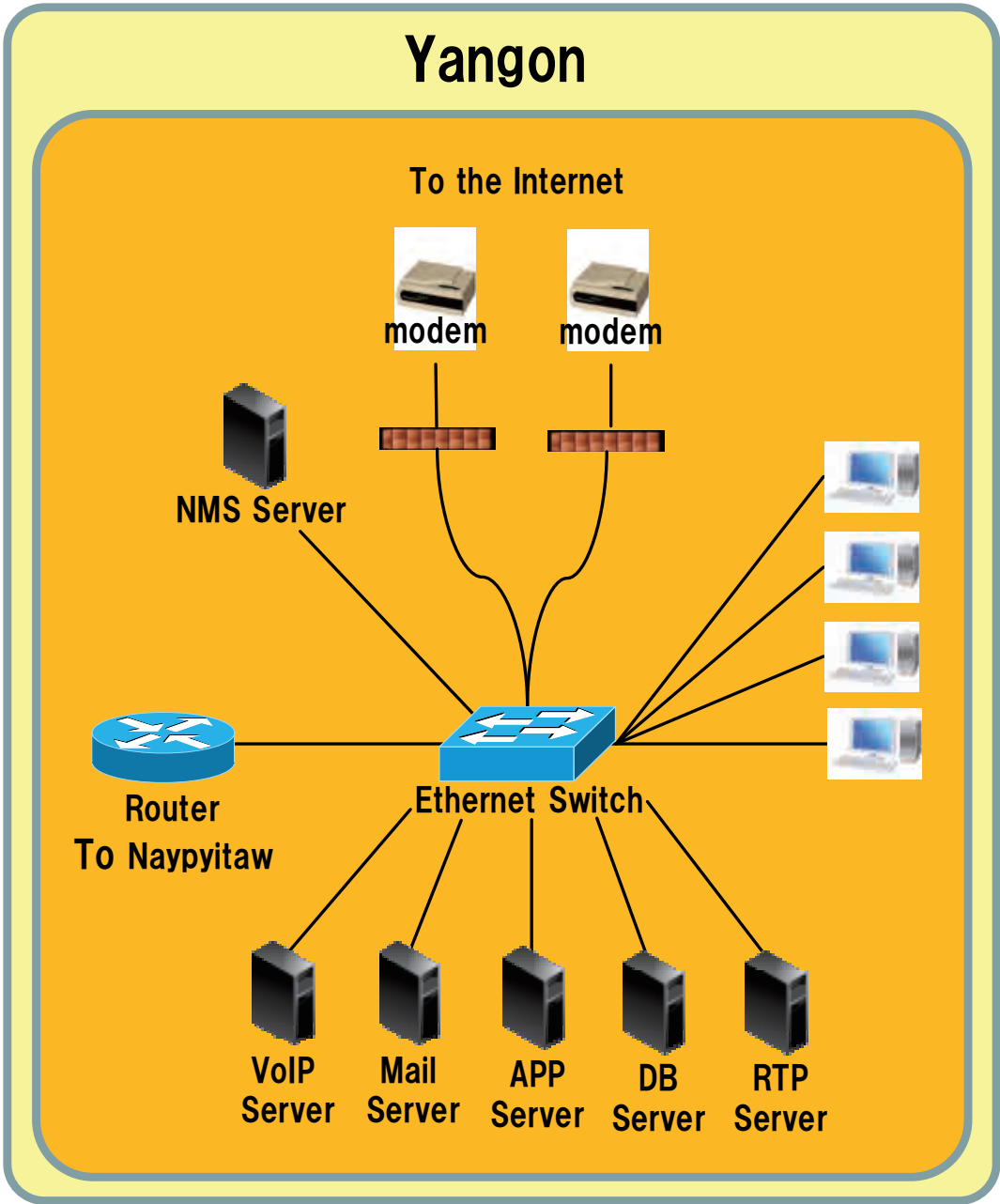
exactly the same way with LAN cables, protected by mouldings, running along the walls and floors. As a result, significant numbers of the PCs are not connected to the network as a result.

Figure 4-1-8. LAN environment at CBM (Naypyitaw headquarters)



※Network connecting the machine room and the offices is linked by optic fiber cable.
Source: Study team (based on materials provided by CBM)

Figure 4-1-9. LAN environment at CBM (Yangon branch office)



※Network connecting the machine room and the offices is linked by Category 5 cable.
Source: Study team (based on materials provided by CBM)

5) WAN

Current Configuration of WAN between branches is described in 3.2-4)-(2).

6) Internet & email

Regarding the external network connectivity environment for the computer terminals installed at the bank, the Banking Network (BankNW), a network which links CBM and the commercial banks, was introduced in 2006. However, only limited number of terminals is connected with BankNW. There are only six of such terminals at the Naypyitaw headquarters and seven terminals at the Yangon branch office making a total of thirteen. Additionally, the total number of computer terminals that can be linked to the internet is very limited with just nine at the Naypyitaw headquarters and twelve at the Yangon branch office.

Employees at CBM use email for daily work. Only highly ranked bank officers are assigned their own mail accounts at the Myanma Posts and Telecommunications (MPT) domain and working-level staffs use of the webmail such as g-mail provided by Google. As far as PC and browser are connected to the internet, such e-mail can be retrieved anywhere any time. Although it is very convenient, it weakens supervisory function and increases security risks, such as missing files and data. In common practice, webmail usage in business is rather rare amongst financial institutions in particular. Therefore it is expected that CBM, which is an organization that needs to ensure maintaining security at the highest possible level with top priority, should consider in designing its own internal mail system.

4.2. ICT Infrastructure in the Financial Sector

A rapid economic development is expected in Myanmar in the coming future, hence the establishment of a capable ICT infrastructure that could meet an expected increase in the volume of business operations is clearly an urgent priority for the country's financial institutions. At present, however, the head offices and branches of only six banks are connected online and the reception and transmission of data and remittance operations are conducted by phone and fax at the state-owned banks. Such a situation illustrates financial ICT infrastructure in Myanmar is very immature and even inadequate. During field surveys, study team has conducted multiple interviews and visits to CBM which is by nature the center of all the existing financial institutions in the country, as well as relevant ICT companies in order to examine the current state of the data centers, ICT equipments, and financial networks.

Figure 4-2-1. Interviewees in the ICT companies

Company name	Position	Name of interviewee	Notes
Global Net	Senior Manager	Thein Kyaw Min	Responsible for the construction and maintenance of the ICT infrastructure at the CBM
MIT (Myanmar Information Technology)	CEO	Tun Thura Thet	Responsible for the development and maintenance of applications at the CBM
	Director	Ni Ni Tun	
	General Manager	Kyi Kyi Khaing	
ACE Data Systems	Chairman & CEO	U Thein Oo	Chairman of the MCF (Myanmar Computer Federation)
	Director	U Zaw Moe Thant	

Source: Study team

1) The Current state of ICT equipment at CBM

Most of the ICT products used at CBM are either US, Chinese or Taiwanese while the Japanese products were limited to other peripherals such as copy machines and monitors etc.

Servers made by a single manufacturer have been installed within the data centers but these are only rack-mounted servers and not the blade servers that it has become the trend to use in developed countries (Figures 4-2-2, 4-2-3). Because there is a variety of generations used for each server - ranging from the relatively new generation units to those dating back several generations - processing time and functionality differ considerably among the machines. As study team didn't see enterprise storage equipment, internal disc drives in the servers are most likely used for the data storage, which are inferior in terms of both reliability and functionality.

Overall, the actual functionality provided by the servers is rather low. Moreover, the configuration of the servers differs greatly from one to another.

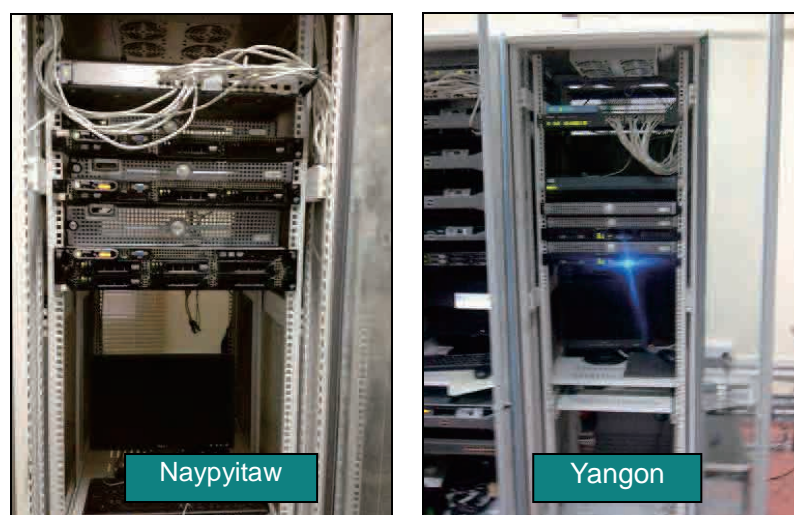
Closer inspection of the ICT equipment reveals that the environment is considerably poor across the board. At the moment, it looks difficult to cope with the anticipated expansion in the CBM daily operations. Most of the ICT equipments installed are products from the US.

Figure 4-2-2. Main ICT equipment installed within the machine room of CBM

Main ICT Equipment	Naypyitaw headquarters			Yangon branch office		
	manufacturer	country	units	manufacturer	country	units
Servers	Dell	USA	13	Dell	USA	7
Ethernet switching equipment	Cisco	USA	9	Cisco	USA	7
	TRENDnet	USA		TRENDnet	USA	
Routers	Cisco	USA	2	Cisco	USA	2
Network security products	Cisco	USA	2	Cisco	USA	4
	Fortinet	USA		Fortinet	USA	
IP Telephone connector	Welltech	Taiwan	29	Welltech	Taiwan	6
Media convertor	RAISECOM etc.	China	7	RAISECOM etc.	China	3

Source: Study team (based on materials provided by CBM)

Figure 4-2-3. The condition of CBM's ICT equipment



Because they are only rack-mounted servers, the cabling used to connect the network equipment and servers has not been put together, resulting in a large number of cables cluttering up the area.

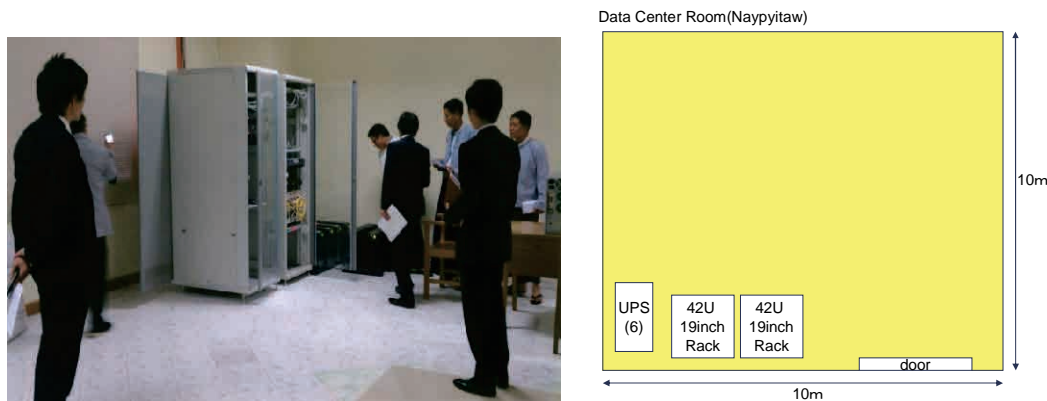
Source: Photograph taken on local field survey

2) Data centers and electric power supply for CBM

CBM's data centers both located at Naypyitaw and Yangon, are placed at empty offices within its building (Figures 4-2-4, 4-2-5). None of the security measures such as IC card or biometric identification security checks that are commonly practiced in Japan or in any other developed countries. Those measures are installed at the entrances to these rooms for the purpose of checking and confirming the status of those entering and leaving the facility.

Two racks (42U⁷ high and 19 inch-wide) are installed in the room both at Naypyitaw and Yangon. There is a plenty of space inside the room at the Naypyitaw facility but the room itself at the Yangon site is smaller than the one at Naypyitaw and it looks very cramped because of the large number of desks and chairs squeezed into it. This means that the installation of additional racks will require sorting and fixing the interior of the room (Figures 4-2-4, 4-2-5).

Figure 4-2-4. The Naypyitaw facility (left) and floor plan⁸ (right)

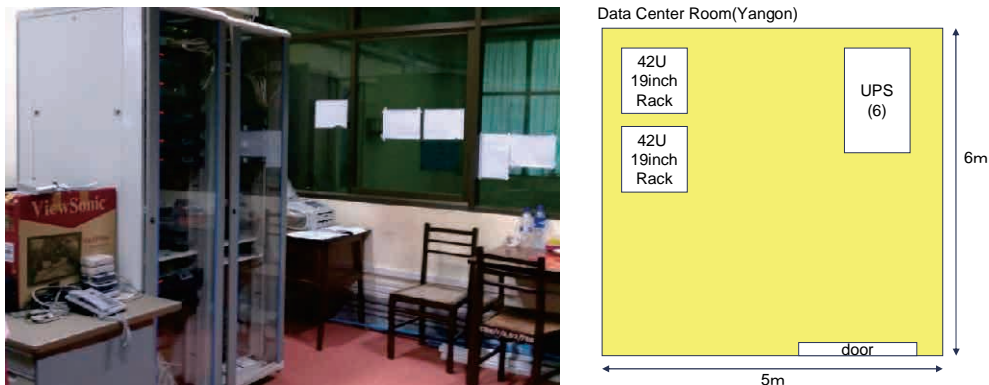


Source: Study team for the photograph taken inside the Naypyitaw facility during site visit (left) and the floor plan (right)

⁷ 1U = 1.75 inches (44.45mm) of vertical rack space.

⁸ The figure given for the length of the floor derives from a rough measurement (calculated on the basis of the number of paces taken) during a visit to the local site.

Figure 4-2-5. The Yangon facility (left) and floor plan (right)

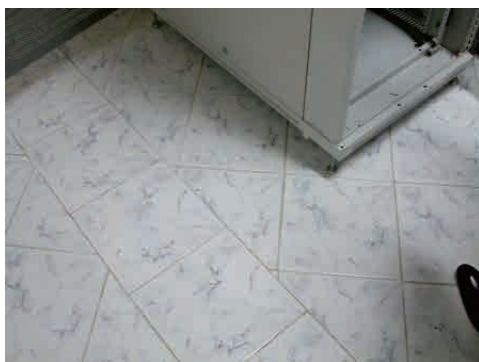


Source: Study team for the photograph taken inside the Yangon facility during site visit (left) and the floor plan (right)

Neither the floor of the data center of Naypyitaw nor that of Yangon is raised from installing cables (Figure 4-2-6 left-hand photograph). It is a standard practice to raise floor with a considerable height in computer rooms amongst developed countries like Japan to prevent wiring (or cables) from being disconnected by accidents, and to easily facilitate the change of the floor layout and the wiring and cabling.

Figure 4-2-6. Non-raised floor of CBM data center (left-hand photograph – Naypyitaw facility) and an example of raised floor (right-hand photograph)

CBM data center floor (not raised)



Ordinary data center floor (raised)



Source: Study team for the photograph

Figure on left: Photograph taken on local field survey

Figure on right: from:

<http://ja.wikipedia.org/wiki/OA%E3%83%95%E3%83%AD%E3%82%A2>

Cable moulding is used to protect the wiring and cabling within the data center and to prevent it from being disconnected or burning out. Air conditioning is provided by large scale air conditioning units, as are normally installed for use in offices, to cool the equipment (Figure 4-2-7). The temperature and humidity at places used for the storage of ICT equipment should be controlled properly. For the time being, the air conditioning units currently installed should be sufficient as there is sufficient space in the rooms used for the servers and other equipment.

Figure 4-2-7. The data center's air-conditioning unit and cabling/wiring in Yangon facility



Source: Study team for the photograph taken on local field survey

Because the floor is tiled, the server racks are not secured in fixed positions for the installation of the equipment, which results all the equipment being unstable position. Moreover, ICT equipment is also directly placed on the floor surface or on top of desks without any fixation (Figure 4-2-8). Given this situation, small vibrations may cause drifting of racks which may result in cable disconnections even if they manage from not tripping over.

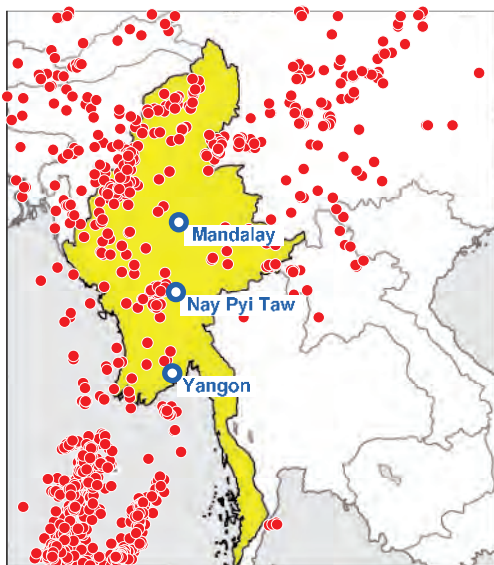
Taking into consideration that Myanmar is subject to frequent earthquakes (Figure 4-2-9), as is the case in Japan, it is an essential to adopt measure such as fixing, to protect the ICT equipment for financial operation system against earthquake damage as an urgent priority.

Figure 4-2-8. Racks not fixed to the floor (left-hand side) and ICT equipment placed directly on the floor (right-hand side)



Source: Study team for the photograph taken on local field survey

Figure 4-2-9. Hypocenter distribution for earthquakes occurring in the vicinity of Myanmar (since the year 2000, magnitudes of 4.5 or above)



Source: Study team (based on U.S. Geological Survey (USGS) data)

In terms of measures to overcome power outages that frequently occur during the day, simple power generation equipment would be installed within the bank which could supply sufficient electricity to power the system for about two hours. When the outage occurs, the electricity will be provided automatically to the locations that need it in a few seconds.

Additionally, each data center has some (mainly US and Singaporean made) UPS (Uninterruptible Power Supply) units installed as a countermeasure to deal with small-scale (of

a few minutes' duration) power outages⁹, and this assures the availability of servers, network equipment and other ICT facilities (Figures 4-2-10, 4-2-11).

Figure 4-2-10. UPS units installed between power sources and ICT equipment

Naypyitaw facility,

Yangon facility



Source: Study team for the photograph taken during local field survey

Figure 4-2-11. Types and units of UPS units at each location

Location	Manufacturer	Country	Units	Total
Naypyitaw	APC (American Power Conversion)	USA	6	18
	PowerTree	Singapore	1	
	-	-	11	
Yangon	APC (American Power Conversion)	USA	6	8
	PowerTree	Singapore	2	

Source: Study team (based on materials provided by CBM)

⁹ UPS units usually provide back-up potential for periods ranging from several minutes to some tens of minutes.

3) Survey of potential sites for the establishment of additional data centers for CBM

As mentioned above, the survey results confirmed that present ICT equipments are being placed in several empty office spaces at CBM building, some of which are data center rooms. There are clear issues to be addressed in terms of boosting functionality when financial sector systems being operated, both from the perspective of security and operational continuity (countermeasures for heat problem, earthquakes, etc.). These issues could be solved by securing servers, storages and other ICT equipments at additional data centers.

On the other hand, it is unrealistic, in terms of both cost and time aspect, to expect that additional independent data centers will be built separately for CBM's systems.

Under those circumstances, it is recommended to introduce modular-type data centers¹⁰. Modular-type data centers have several merits. For instance, they are cost effective and quickly installed at CBM. Furthermore, they have better security, cabling and earthquake resistance (Figure 4-2-12).

Figure 4-2-12. Comparison of current server rooms with additional data centers

Category	Current server rooms	Additional (modular-type) data centers※
Security	X	O
Air Conditioning	△ (Not Designed for ICT equipment)	O
Electric Power	O	O
Cabling(Wiring)	X	O
Earthquake Resistant	X	O

※ Establishment of new additional data centers is recommended by study team.

Source: Study team

As to examine feasibility of such case, study team has identified the following candidates as the sites for modular-type data centers within the premises on the basis of information gathered from meetings and survey conducted.

¹⁰ Modular-type data centers are data centers that are designed to offer the user the elements required in the capacity needed and arranged in containers by modularizing the essential components for a data center such as cooling and power generating equipment etc. Whilst continuing to provide the functions supplied by existing and older data centers, they make it possible to greatly reduce the time required for installation and service start up and, by cutting the volume of unnecessary features, they also offer a superior cost advantage.

Figure 4-2-13. Site photograph of CBM's Naypyitaw headquarters



Source: Study team for the photographs taken on local field survey

Both the photographs in Figure 4-2-13 are of the site on the northern side of the headquarters building. The inside of the white wall indicates the interior of the premises (photograph on the left). There is a sizable lawn area in the vicinity of the building of which a part is considered to be the most suitable within the site because it is away from the sun, the wind and the rain (photograph on the right).

In Yangon branch, there is a huge open space where lodging houses for employees used to be situated behind the government office buildings (the area of the photograph outlined in red in Figure 4-2-14). The center may be constructed within an existing building in case there is a desire to conceal the existence of a data center.

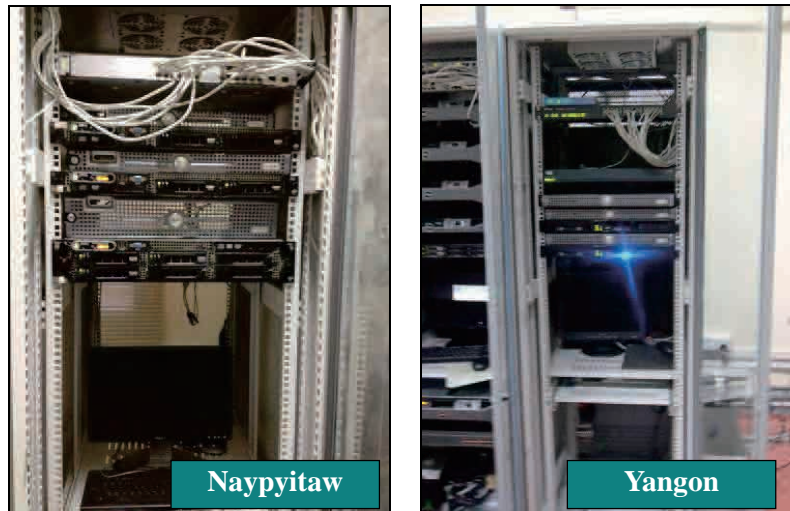
At the initial visit of the study team, CBM didn't have any plan to establish additional data centers. However, after study team recommend them to establish cost-effective modular-type data centers, CBM staffs changed their mind and mentioned that they were willing to establish ones.

Figure 4-2-14. Site photograph of CBM's Yangon branch office



Source: Study team (based on Google Maps content)

Figure 4-2-15. The condition of CBM's ICT equipment



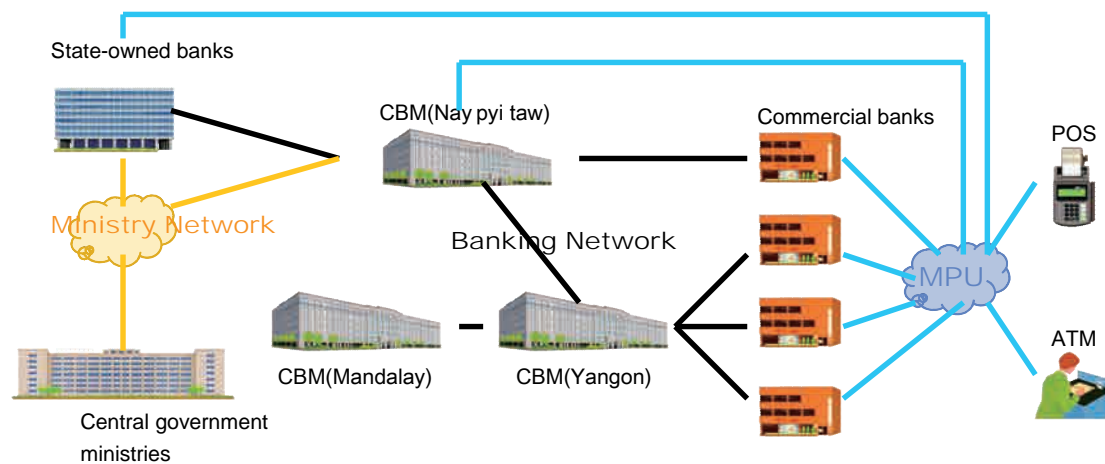
Because they are only rack-mounted servers, the cabling used to connect the network equipment and servers has not been put together, resulting in a large number of cables cluttering up the area.

Source: Photograph taken on local field survey

4) Major financial networks in Myanmar

The three major financial networks that exist in Myanmar are: (1) the Banking Network, (2) the MPU network, and (3) the Ministry Network (Figure 4-2-16).

Figure 4-2-16. Major financial networks in Myanmar

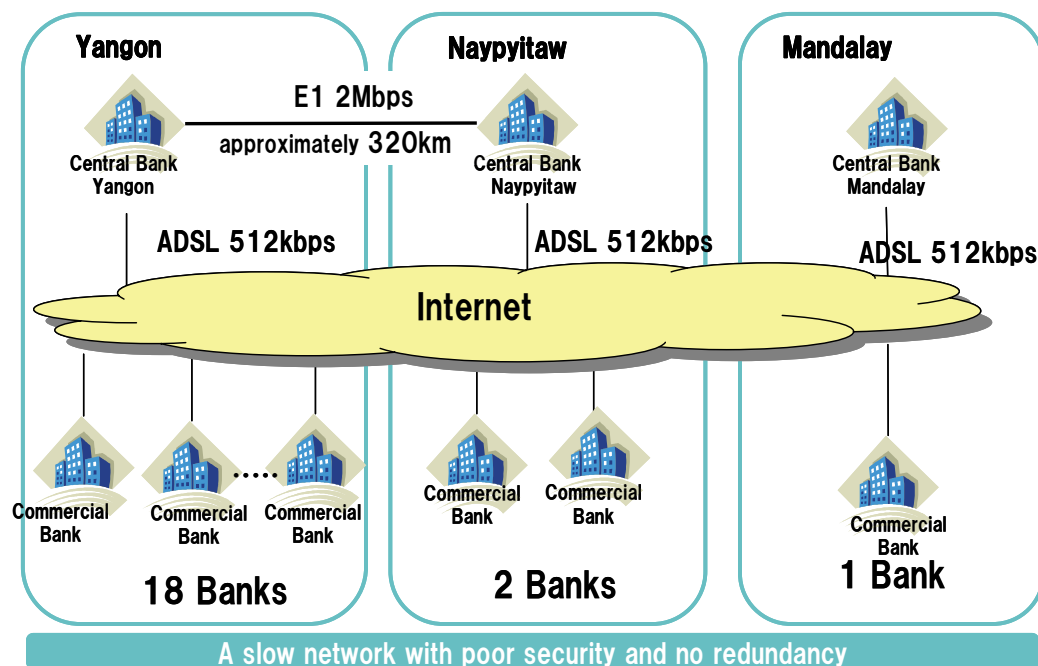


Source: Study team

(1) The Banking Network linking CBM and the commercial banks

The Banking Network linking CBM and the commercial banks was introduced and commenced operations in Myanmar in 2006. The circuits in the Banking Network connecting the CBM Naypyitaw headquarter and the Yangon Branch office with E1 circuits whilst the other commercial banks are connected to CBM by ADSL circuits (Figure 4-2-17). On the other hand, the CBM Mandalay branch is also connected by ADSL circuits. However, both of these ADSL lines are low speeds of 2Mbps and 512Kbps respectively. In addition, low quality of transmission is also major concerns. For instance, back-up circuits are not equipped, and transmission is frequently interrupted. The three major cities in the country are linked by a backbone consisting of optical fiber cables. As for bandwidth expansion, application to the Ministry of Communications, Posts and Telegraphs is necessary to obtain a specifically designated bandwidth. However, as the cost of usage is extremely high, expansion looks difficult on budgetary constraints according to the CBM. VPN connection by firewalls have been established both within the CBM and between the CBM and the commercial banks which have enabled masking from telecommunications protocols but only a minimal level of security is assured.

Figure 4-2-17. The current state of the financial network centered on the CBM



Source: Study team

(2) The MPU network

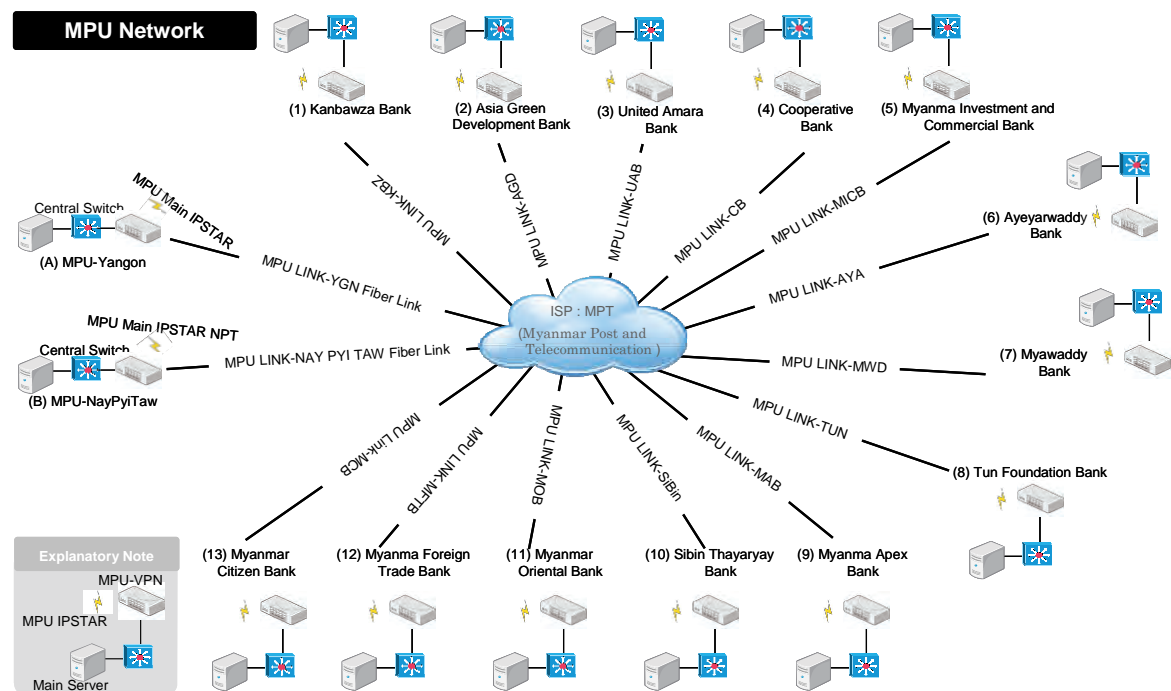
The other important financial network is the Myanmar Payment Union (MPU) network (Figure 4-2-18). It was built by consortium of CBM and commercial banks, to connect up its ATM and credit card network. MPT is the Internet Service Provider (ISP) and the membership of the network is made up of fourteen banks (CBM, Myanmar's state-owned banks and private commercial banks).

In 2012, mutual ATM connection system as well as debit card system between CBM and commercial banks is scheduled to be incorporated into this network, according to MPU. In 2013, credit card system will be further built in addition. However, both of them are greatly behind schedule.

As for the settlement function, it is not fully introduced in this network as of now.

Its registration fee is charged based on the amount of transaction, although fee system in detail was not revealed in this survey.

Figure 4-2-18. MPU network



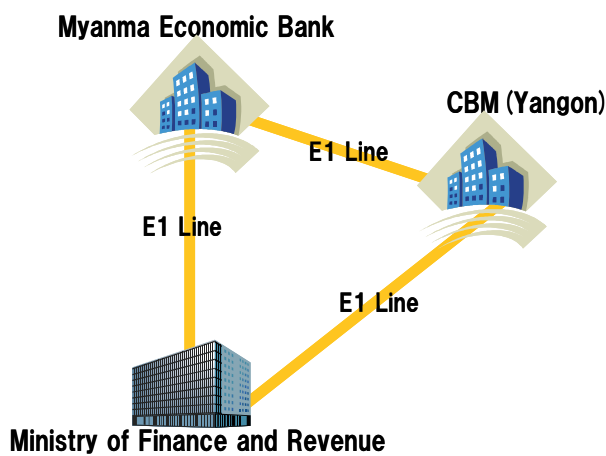
Source: Study team (based on materials provided by CBM)

- (3) The Ministry Network linking the central government ministries and agencies, the state-owned banks and CBM

The Ministry Network is the network system that links the central government ministries and agencies, the state owned banks and CBM. Within this, the network linking the Ministry of Finance and Revenue (MOFR), the state owned banks and CBM is known as the Ministry of Finance and Revenue network (MOFR Network) and it is connected together by E1 circuits¹¹, the exclusive lines. Specifically, it connects MOFR (Naypyitaw), CBM (Yangon Branch office) and Myanma Economic Bank (Figure 4-2-19).

This network is used for government ministries mainly to have contacts with state-owned banks, but is not used to exchange some financial data. Furthermore, it has nothing to do with other financial networks such as BankNW and MPU network. Therefore, it is not important in the financial sector.

Figure 4-2-19. MOFR network



Source: Study team (based on materials provided by CBM)

¹¹ E1 circuit is a standardized telecommunication system. E1 circuit simultaneously transmits multiple signals over a pair of copper wires. A dedicated or exclusive line is supplied by telecommunications service providers so that the user can have exclusive possession of a bandwidth linking locations of approximately 2Mbps (2.048Mbps).

5) Silo-type infrastructure: Lessons from the past history of the developed countries

As aforementioned, structural change of some departments within CBM is currently ongoing. Historical lessons in developed countries however implies that such separation may lead to less control on ICT system governance and rather increase cost in system maintenance and management due to the silo-type system derived from “open architecture” and “decentralization” system¹².

Silo-type system is one form where many systems exist independently without sharing common infrastructure. The following problems are said to arise in situations where individual organizations and departments have made their own systems silo-type: (1) each system requires its own maintenance and control staff; (2) the knowledge and experience possessed by the staff is wastefully scattered rather than concentrated; (3) there is unnecessary overlap in the purchase and maintenance of hardware equipment etc., and loss of the governance on ICT systems causes the increase in overall operation and maintenance costs as a result.

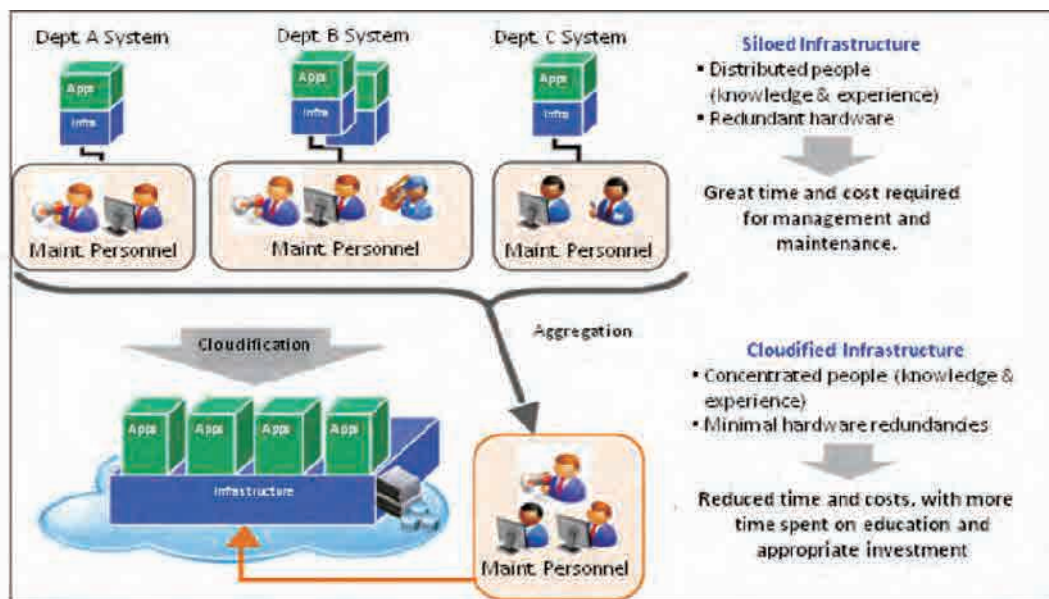
Adopting a cloud-based strategy would be one of the solutions to the problem. Cloud is the one form of computer-use where users need only minimum internet environment for various operations as most applications are provided over a server in a network.

By introducing this method, cloud would gather together scattered ICT equipments and workforce and enable the whole system to be controlled in an integrated fashion. This would, in turn, make it possible to reduce the time and costs to maintain separate, pointlessly overlapping, systems (Figure 4-2-20). In addition, expansion of systems in the future will become much easier.

For Myanmar to engage in the global financial markets in the coming future, accelerating transition from manual operation to systemization is absolutely crucial. If systemization in CBM and other financial institutions are to be continued in the existing uncontrolled manner, the problems experienced by the developed countries during the above mentioned development process will more likely be repeated resulting with considerable loss in time and money. Therefore, an efficient development of the financial markets might not well be achieved.

¹² The advent of the basic operating system (OS) known as UNIX which is used by the computers made by many different manufacturers and the establishment of network standardization through what are referred to as TCP/IP standards resulted in the ‘Open Computing’ movement in the IT industry. Moreover, the arrival of small computers (servers, workstations, PCs etc.) meant that the processing of operations that had formerly been done on large computers now transitioned over to lots of smaller computers in a movement known as ‘Decentralization’. This ‘Open/Decentralized’ development resulted in many hardware manufacturers producing and selling low-priced computers. Consequently the trend towards the purchasing, construction, maintenance and control of computers by groups of users or departments gained momentum, resulted in making their systems silo-type.

Figure 4-2-20. Concentration of ‘people’, ‘things’ and ‘places’ through cloud-computing



Source: Study team

The current state of Myanmar's domestic backbone network

It is quite obvious that network modernization plays a major role in the modernization of the financial system. In order to gather data from a wider area and to process it in greater volumes, it is essential to strengthen the network along with upgrading the servers and other ICT equipment used in the system.

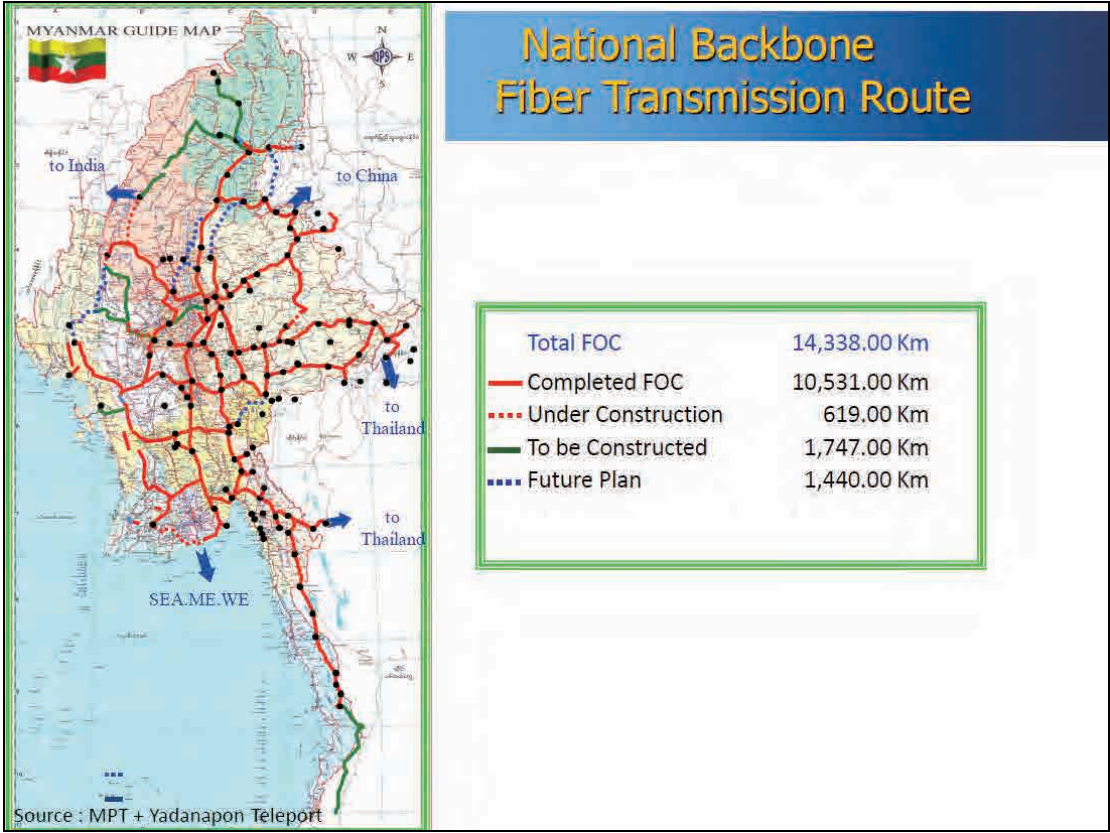
Consequently and with this in mind, study team conducted a survey of the current state of Myanmar's domestic backbone network in tandem with our survey of the country's financial network.

The domestic backbone network in Myanmar is administered by Ministry of Communication, Posts, and Telegraphs, controlled by the PTD (the Post and Telecommunications Department), and operated by two companies: the MPT (Myanmar Posts and Telecommunications) Corporation and Yadanabon Teleport (MPT has a 40% stake in Yadanabon Teleport, then effectively MPT has a monopoly of this business). At present, there are fiber optic cable circuits with a total length of some 100,000 km linking Yangon, Naypyitaw, Mandalay and the other major centers inside the country and it is planned to expand this to approximately 140,000 km in the future by laying more optical fiber cable (Figure 4-2-21). Moreover, the national backbone network has international links via two submarine cables and a land line (to India, China and Thailand).

A diagram illustrating the configuration of Myanmar's national backbone network is shown in Figure 4-2-21. The four major urban centers of Yangon, Naypyitaw, Mandalay and Yadanabon are linked by a dedicated line arranged in a serial connection and with a bandwidth of 10Gbps (STM-64). A core router is installed in each of these locations with the MPT supplying provider operations at Naypyitaw and Yadanabon Teleport operating the same service at Yadanabon.

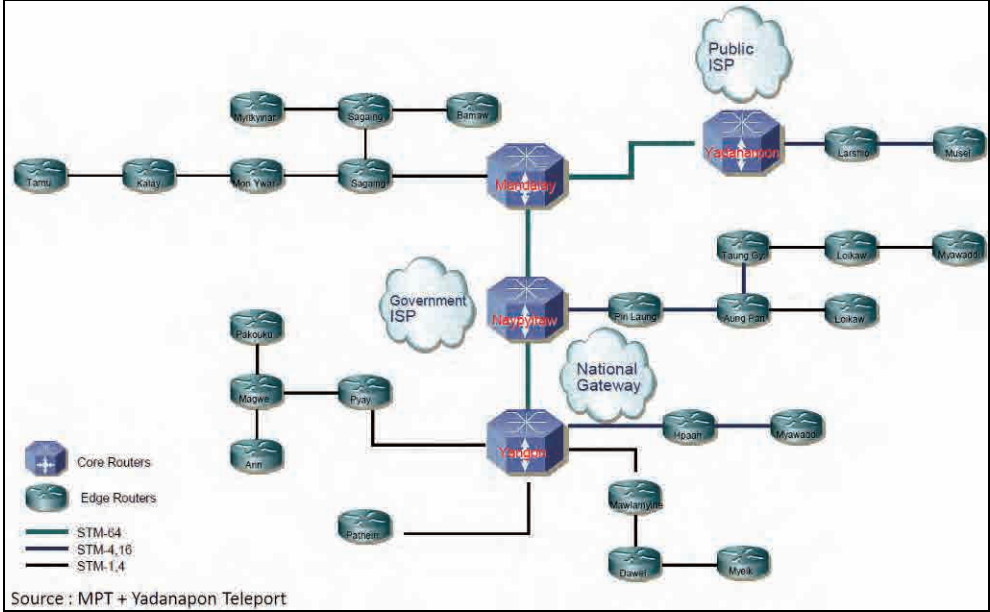
The two provider companies mentioned above supply internet access services via dial-up, ADSL, satellite circuits (iPSTAR), WiMAX, and optical fiber (FTTx) connections but the usable bandwidth (maximum of 4Mbps even for optical fiber) is quite narrow in comparison to that offered by services for instance in Japan. At present, the CBM uses an ADSL circuit with a bandwidth of 512kbps for its connections to the commercial banks.

Figure 4-2-21. Comprehensive schematic of Myanmar’s national backbone network (fiber optic cable circuits)



Source: ACE Data Systems

Figure 4-2-22. Transmission system for Myanmar’s national backbone network (fiber optic cable circuits)



Source: ACE Data Systems

Figure 4-2-23. Types of services available on Myanmar's national backbone network and a comparison between them

	Dial-Up	ADSL	iPSTAR	WiMax	FTTx
Setup Fee	\$230	\$1,500	\$3,050 - \$4,950	\$1,500	\$750 - \$900
Annual Fees	\$60	\$60	NIL	\$60	\$60
Monthly Fees	NIL	\$30 - \$200	\$40 - \$280	\$45 - \$130	
Usage Charges	\$0.6/Hr	NIL	NIL	NIL	NIL
Speed	56Kbps	256Kbps – 2Mbps	128Kbps – 384Kbps	128Kbps – 512Kbps	512Kbps – 4Mbps
Data Limit	NIL	400MB – 10GB	400MB – 10GB	NIL	

* Installation cost for FTTx depends on the location.

Source : ACE Data Systems