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Performance of the Indian Banking Industry over the Last Ten Years

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Abstract

This paper analyzes the performance of Indian banks over the period of the last ten years. It uses the CAMEL Framework to determine the performance of public and private banks in India. The paper also conducts an empirical analysis to determine the share price performance of Indian banks relative to the share price performance of banks in Hong Kong, Europe and the US. This paper finds that private banks perform better than public banks overall based on the CAMEL Framework. In addition it also finds that the Indian banks share price performance is dependent on the share price performance of Hong Kong and European banks, and it has a significant positive relationship with the overall Hong Kong stock market, and this relationship strengthens after 2007. On the whole, this paper seeks to offer as comprehensive a perspective as possible upon the conduct, structure and performance of the banking industry of India.

Chapter 1: Introduction

In the last decade the banking industry of India has experienced exponential growth. The CNX Bank Index[1] has grown by more than 1100% in absolute terms, and at a compounded annual growth rate of over 25% in the period from 2000 – 2010, while the Sensex[2] grew at a compounded annual growth rate of 14%. In the year 2010 the banking sector contributed 16.35% to the GDP of India.[3] This calls for an analysis of the performance of Indian banks.

The reforms of 1991 and 1998 have helped improve the performance, profitability and efficiency of the Indian banking system. Prior studies have shown the effectiveness of the reforms on Indian banks in helping improve total factor productivity, efficiency and profitability among other things. Much less has been done to examine how the banking industry of India has fared compared to other countries in recent years. In addition, there is insufficient published research on the performance of the public and private banks in the wake of the financial crisis, which is a true litmus test. The purpose of this thesis is to analyze the growth of the banking sector of India, starting in the 21st century. The analysis is conducted in two parts: (1) examination of the performance of private and public banks in India in the last ten years and (2) comparison of the performance of the Indian banking sector share price performance to the banking sectors and overall market indices of other developed and developing countries over the last ten years.

[1] CNX Bank Index is an index including the most liquid and large capitalized Indian Banking stocks trading on the National Stock Exchange (NSE) of India (NSE India).
[2] Benchmark index of the Bombay Stock Exchange comprising of 30 most actively traded stocks and is calculated on the free float capitalization method (Bloomberg).
[3] All data is from Reserve Bank of India and Bloomberg

The second chapter of the paper describes the evolution of the banking industry in India starting from the early 18th century. This chapter then explains the rationale for the two waves of nationalization and the reforms of the banking system. After that, this chapter examines the liberalization of the banking industry and the effects of ownership on the management, efficiency and profitability of the banks.

The third chapter of this paper explains the specific reforms enacted by the government in 1991 and in 2000. It then provides evidence on the effectiveness of these reforms, drawing from existing literature on this topic. This chapter also analyzes the effects of the reforms on the profitability of banks by performing a multivariate regression on the profitability ratios of both public and private banks for twenty years (1990 – 2009). In addition it analyzes the performance of private and public banks in India during the ten year period from 2000 – 2010 using the CAMEL framework.[4] This section then delves into the analysis of these performance indicators, before, during, and after the financial crisis of 2008.

The fourth chapter of this paper compares the Indian banking sector's share price performance to banking sector share prices in other developing and developed countries. Hong Kong, Europe and the US are the three regions to which the paper compares the Indian banking industry. It assesses how the CNX Bank index tracks the stock markets and the performance of other countries banking indices. This chapter also performs a multivariate regression on the CNX Bank index as the dependent variable to see how it tracks the banking indices of the other countries and how the overall stock markets of these countries affect the CNX Bank index.

[4] The CAMEL Framework is a bank rating system that analyzes bank performance by measuring five factors: Capital Adequacy, Asset Quality, Management, Earning, and Liquidity.

On the whole, this paper seeks to offer as comprehensive a perspective as possible upon the conduct, structure and performance of the banking industry of India.

Chapter 2: Banking History of India

Mr. W.E. Preston, member of the Royal Commission on Indian Currency and Finance, said "It may be accepted that a system of banking that was eminently suited to India's then requirements was in force in that country many centuries before the science of banking became an accomplished fact in England."(Saunders 1931) An extensive banking system has existed in India for many centuries. Chanakya, one of the most prominent political philosophers in India, wrote in the 4th century B.C., "The nature of transactions between creditors and debtors on which the welfare of the kingdom depends, shall always be scrutinized."(Shamastry 2009) In addition there are references to agricultural loans, deposit rules and lending rules (Mookerji 1988). Chanakya had also laid down regulations and procedures for banks if they were undergoing liquidation as early as 4th Century B.C.

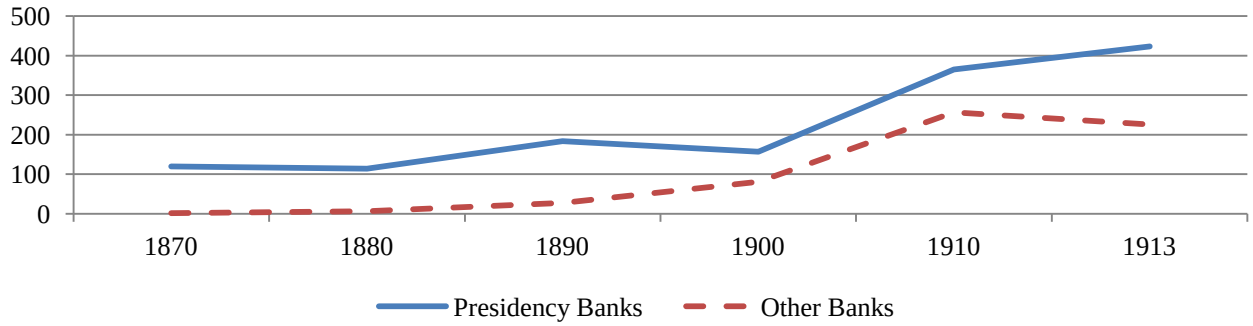
The first joint stock bank in India was the Bank of Bombay established in 1720 in Mumbai, failing shortly afterwards (Reserve Bank of India, 2008a). Calcutta was a major trading center in India, because of the establishment of the headquarters of the East India Company there by the British. This led to the growth of banking services in that city. The first bank established in Calcutta was the Bank of Hindustan in 1770, which was established by an agency house but closed in 1832 (Saunders 1931). Presidency Banks in India were banks that were incorporated by a royal charter and acted as quasi central banks. The Bank of Bengal established on June 2nd, 1806 with a capital of Rs. 5 million was the first Presidency Bank in India. By 1843 three Presidency Banks had been established, in Calcutta, Mumbai and Madras. These were governed by royal charters and had the ability to issue notes; however the Paper Currency Act (1861) transferred this privilege to the government in 1867 (Reserve Bank of India 2011). In 1850 the

Companies Act was established, which stipulated unlimited liability for the banks. An amendment in 1867 permitted the principle of limited liability, which increased the number of banks in existence (Reserve Bank of India 2008a). These banks were organized as private shareholding companies with Europeans as the majority shareholders. In addition to the Presidency Banks, private banks were slowly coming into existence. These private banks were not governed by a royal charter and did not have the ability to issue notes.

A group of Europeans founded the Allahabad Bank in 1865, which is the oldest joint stock company in existence today. The other two big banks founded under private ownership were the Punjab National Bank in 1895 in Lahore and the Bank of India in 1906 in Mumbai. All these three banks are still in existence today (Reserve Bank of India, 2008a). The Swadeshi movement of 1906 was aimed at making India self reliant as a country and to be used as a mechanism to oust the British. Swadeshi means self-sufficiency and the movement provided a great impetus to joint stock banks of Indian ownership and about five more Indian owned banks came into existence. However in spite of the establishment of other banks, the banking sector was dominated by Presidency Banks measured in terms of paid up capital and deposits. As can be seen from Figure 2.1 even though the number of commercial banks increased from two to eighteen, the increase in deposits was still nominal and the three Presidency Banks still held majority of the deposits. The gap between the deposits increased in the period from 1910-1913. The Swadeshi movement did increase the reach of co-operative banks in the country (Reserve Bank of India 2008a). It also increased the number of deposits in the banks. If we look closely at Figure 2.1, we notice that the number of deposits from 1900 to 1910 more than double from their previous amount. One reason that might account for the increase in the number of deposits could be the switch of the Indian currency standard from silver to gold in 1894 (Burdekin, Mitchener,

and Weidenmer 2011). This shift also closely followed the end of the worldwide deflation in the 1890's.

Figure 2.1 Deposits in Banks (Millions of Rupees)

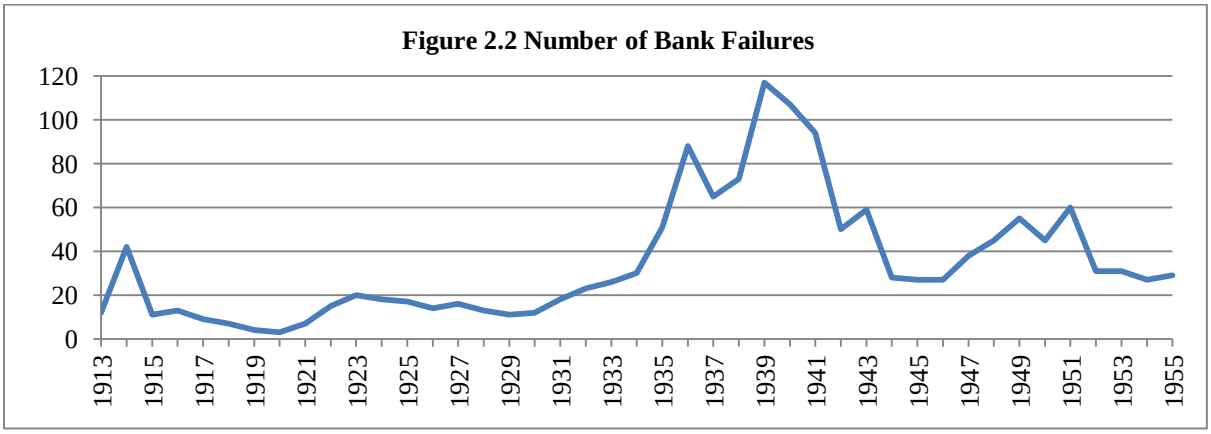


Before the establishment of the Companies Act (1913), many companies registered themselves as banks and had low paid up capital, and small reserves. These entities, which were operating as banking companies had a very low proportion of cash and other liquid assets as compared to their total assets, leading to many bank failures. Bank failures in India during this time were attributed to individual imprudence, manipulation of accounts by managers and incompetent management. From 1913 -1914 the number of failed banks increased from twelve to forty two (Reserve Bank of India 1954). Cooperative banks being based on a mutual trust system, experienced fewer failures. Shortly after World War I ended, in 1921 the government merged the three Presidency Banks to form the Imperial Bank of India. The Imperial Bank of India performed three main functions: (1) commercial banking, (2) central banking, and (3) the role of the banker to the government. Due to lack of regulation by 1930, the number of institutions in the banking sector that were registered under the Companies Act (1913) increased to 1,258 institutions (Reserve Bank of India 2008a). The Great Depression soon came along and had a huge impact on the Indian financial sector with the collapse of 51 banks in 1935 (Reserve Bank of India, 2008a). The Great Depression precipitated the creation of the Indian Central

Banking Inquiry Committee in 1929 to measure and analyze the problems that were deep rooted in the Indian Banking System. The Committee called for the establishment of a central bank and the incorporation of some extra provisions in the Companies Act of 1913.

The report by the Indian Central Banking Inquiry Committee was taken seriously, and led to the Reserve Bank of India Act (1934) which established the Reserve Bank of India (RBI) in 1935. The act gave the bank powers to regulate the banking system of the nation. The four main functions of the Reserve Bank are: (1) banker to the government of India, (2) issue notes, (3) acts as a banker to banks, and (4) to maintain the exchange ratio (Reserve Bank of India 2009). However, the Reserve Bank of India did not have sufficient powers to be able to regulate the economy and the monetary system. For example the permission of the Reserve Bank was not needed to set up a new bank (Reserve Bank of India, 2009). Commercial banks were governed by the Companies Act applicable to ordinary companies as well. In addition, there existed a free entry and free exit system for the establishment of banks, which led to a substantial increase in the total number of banks in operation. In 1940 the number of scheduled and non-scheduled commercial banks that were registered was 654 (Reserve Bank of India, 2008a). Indian financial markets were facing many problems under this extreme laissez-faire economy, featuring massive bank failures and governance issues. Figure 2.2 shows the number of bank failures in India during that time frame. The Reserve Bank of India submitted a proposal to the Central Government for implementing new banking legislations arguing that the main cause of bank failures was lack of regulation. The Indian Companies Act (1913) was established to ensure a stable financial system; however, the Indian Companies Act (1913) did not govern banks differently as compared to other organizations and had many other inefficiencies and loopholes in it. The Indian Companies (Amendment) Act, (1936) now included a provision for separate

regulation and governance of banking companies. It included provisions on minimum capital, and cash reserve requirements, among others. After a few years of its implementation, a sharp decline in the number of bank failures can be noticed from 117 bank failures in 1939, to 50 bank failures in 1942. There was also a sharp increase in the number of bank failures in the period of the Second World War in the period before independence; however the average number of bank failures declined after independence as displayed by Figure 2.2 below.



Four years after the establishment of the Reserve Bank of India, World War II impacted the financial sector evermore than the Great Depression or World War I; however this effect was more positive than negative and it led to rapid branch expansion from 1940-1945. Due to government expenditure on defense and supplies, some sections of the economy experienced growth in income and this led to an increase in the deposit pool of banks and fostered development of the banking system; in particular it led to the expansion of the already existing networks of banks.

In 1947 India gained its independence and the five main banks in India were: Central Bank of India, Punjab National Bank, United Commercial Bank, Bank of Baroda, and Bank of India. In 1947 India also underwent partition, causing India and Pakistan to become two separate countries. The partition particularly affected the bigger banks. The year 1948 was definitely a

brutal one for India as 45 banks (from more than 637 banks) failed with paid up capital averaging Rs. 0.4 million (Reserve Bank of India 2008a).

The Reserve Bank of India had a mammoth task waiting for it after India gained its independence. It had to restore a sound banking system. According to Governor C.D. Deshmukh, the then Governor of the Reserve Bank of India, "the difficulty of the task of the Reserve Bank of India in dealing with the banking system in this country does not lie in the multiplicity of banking units alone. It is aggravated by its diversity and range. There can be no standard treatment in practice although the same theory governs all" (Reserve Bank of India 2008a). India had enjoyed a lassiez-faire system, which was not as well suited to a period when the economy was not developed. It was unclear whether social control was required or whether the markets should be liberalized and not so regulated. Economic development required banking services to be available to each person in the society; whereas, services were actually heavily concentrated in trade centers. Out of the 637 commercial banks in India in 1947, 200 were in Madras, 106 were in West Bengal and 40 were in Mumbai. This left only 291 banks to cover all the rest of India (Reserve Bank of India 2008a). However, before expansion of the banking system, the government had to ensure a stable financial system. This led to the creation of the Banking Regulations Act (1949), which came into effect on March 16th, 1949 (Banking Regulation Act 1949). The act formed separate legislation for companies operating as banks. It also vested the RBI with further powers such as: (1) control over opening new banks and branches, (2) power to inspect books of the companies that qualified as banks under this act, (3) prevent voluntary winding up of licensed banking companies, (4) regularly reporting financial statements to the Reserve Bank of India. In addition to granting and vesting the RBI with further powers, other important regulations that were put in action were: (1) protecting the interests of depositors, (2)

rules relating to paid up capital, and reserves. There were various other rules, relating to organization, management, and liquidation of banking companies. However, this act had some limitations. It did not provide protection against abuse of power by management, which had caused massive bank failures in the past. Nevertheless, bank failures were reduced after the establishment of the Banking Companies Act (1949), falling from an average of 47 bank failures in 1941-1949 to 37 bank failures in 1950-1955 (Reserve Bank of India 2008a). The decline is also noticeable in Figure 2.2 above, where the graph smoothens after 1949.

The first step the RBI took after Independence was consolidation of banks, either merging smaller entities or liquidating them. The Banking Companies Act, (1961) amended the Banking Regulation Act, 1961 and sought to "facilitate expeditious payments to the depositors of banks in liquidation" (Reserve Bank of India 2008a). It also vested the Reserve Bank of India with extra powers to help banks in times of financial crisis. During 1954-1959 approximately 106 banks were liquidated. Of these 73 underwent voluntary liquidation and 33 were forced to undergo liquidation (Reserve Bank of India 2008a). This led to massive consolidation in the banking industry. The powers of the RBI increased after 1960 to: (1) make surprise inspection of banks and branches, to better determine fraudulent activities, (2) have power to make appointments and remove executive personnel in banks' and, (3) restrict on banks' loans and advances (Reserve Bank of India 2008a). Legislation regarding banking had stronger enforcement and establishment after 1960.

With the extension of the RBI's powers and a more solid foundation of legislation for the banking industry, it was time to expand the reach of the banking sector. The Imperial Bank of India was given a target to open 114 offices within five years (Reserve Bank of India 2008a). The agricultural sector had been left behind in India's banking development. As per the All India

Rural Credit Survey Committee commercial banks only provided 0.9% of the total volume of advances and loans to the agricultural sector (Reserve Bank of India 2008a). Rural India continued to rely mostly on moneylenders that charged them very high interest rates on their loans. The government had to make some major changes to promote equal socio-economic development. The Government of India nationalized the Imperial Bank of India, with the purpose of, "extension of banking facilities on a large scale, more particularly in the rural and semi-urban areas, and for diverse other public purposes." The State Bank of India Act (1955) renamed the Imperial Bank of India as the State Bank of India (SBI). However to prevent it from being under administrative pressure its ownership was vested with the RBI. SBI underwent rapid expansion and opened 416 branches in 5 years all over the country (Reserve Bank of India 2008a). The security that the government owned SBI helped it compete against deposits in 'safe avenues' such as the post offices and savings at home. Five years later in 1960 eight more banks were nationalized and they formed the subsidiaries of the State Bank of India. With the nationalization of these eight banks one third of the banking sector was under the direct control of the government. The Indian banking system had made considerable progress since independence: (1) bank failures had decreased, (2) bank presence in the country increased, (3) banking legislation had a stronger foundation, and (4) deposits had increased. However, the benefits had still not flowed in their entirety to the general public, because credit was not reaching sectors that most needed it, and the banking industry did not have a national presence, because of its concentration in metropolitan and urban areas.

On December 1967, through the Banking Laws Amendment Act (Reserve Bank of India 2008a), the idea of social control was introduced. The main objective of social control was to achieve: (1) bank credit allocation to the right sectors, (2) prevent misuse of bank funds, and (3)

use banks to promote and help finance socio-economic development. The National Credit Council was established in 1968 to help allocate credit according to the Five Year Plan priorities. In 1969 by putting into effect the Banking Companies (Acquisition and Transfer of Undertakings) Ordinance, fourteen banks were nationalized.

Nationalization led to major structural changes in the banking sector of India. Branch expansion was accompanied by development of priority sectors of the economy, with credit being directed towards these sectors contrary to profit motives of the banks. The Credit Guarantee Corporation of India Ltd. was established for providing guarantees against the risk of default in payment, which increased the number of loans to smaller borrowers by the banks. The number of rural bank offices increased from 1,443 branches in 1969 to 19,453 branches in 1981 (Reserve Bank of India 2008a). The amount of credit outstanding increased from Rs. 1.15 billion in 1969 to Rs. 36 billion in 1981, which accounted for 11.9% of the total loans to the rural areas (Reserve Bank of India 2008a). RBI was monitoring the economy by controlling and changing micro factors affecting banks, to prevent banking failures during crises. In April 1980, there was a second wave of nationalization when an additional six banks were nationalized. All these banks had deposit liabilities of Rs. 2 billion or more. The number of public sector banks reached twenty, representing 92% of the deposits of the banking sector. The government increased the Cash Reserve Ratio (CRR) and the Statutory Liquidity Ratio (SLR).[5] Banks were earning less than the market rate eligible on CRR balances and yield on government securities was lower than

[5] **Cash Reserve Ratio** has been described as the amount of cash "Scheduled Commercial Banks are required to maintain with RBI an average cash balance, the amount of which shall not be less than three per cent of the total of the Net Demand and Time Liabilities (NDTL) in India, on a fortnightly basis and RBI is empowered to increase the said rate of CRR to such higher rate not exceeding twenty percent of the NDTL" under the RBI Act, 1934.
Statutory Liquidity Ratio has been described as "All Scheduled Commercial Banks in addition to the average daily balance which they (banks) are supposed to maintain under Section 42 of the RBI Act (CRR) are required to maintain in India, a) in cash b) in gold valued at a price not exceeding the current market price c) in unencumbered approved securities valued at a price as specified by the RBI from time to time, an amount of which shall not, at the close of the business of any day be less than 25 percent or such other percentage not exceeding 40 percent" as the RBI may from time to time specify in the Gazette of India of the total liabilities and demands of these banks as on the last Friday of the preceding fortnight.

the interest rate paid by the banks on deposits. The nationalization phase was marked by stringent controls on the banking industry. As of September 22nd, 1990 the Cash Reserve Ratio was 15.00% and the Statutory Liquidity Ratio was 38.5% (Reserve Bank of India), combined they amounted to 53.5% of all demands and liabilities being saved in liquid government securities or as cash with the RBI. The banks were being used by the government to fund their projects for economic development. This led the banks to be unprofitable forcing the government to adopt changes and thus, came about the reforms of 1991 led by the Narasimham Committee.

There are two main approaches to banking regulation. One endpoint is government ownership of the banking industry and the other endpoint is free banking system. Barth, Caprio and Levine (2008) describe the two main approaches as the "Public Interest Approach" and the "Private Interest View of Regulation." In India up until 1991 there was an increased amount of government regulation in the banking industry, and social control over the banks was mandated successful. Social control in banking would realize if the banks to manage to allocate resources efficiently while mobilizing credit in all sectors including the marked out priority sectors. Barth, Caprio and Levine (2008) define socially efficient as, "that the banking system allocates resources in a way that maximizes output, while minimizing variance, and is distributionally preferred." The government of India initially put in process the policy of social control to help regulate, stabilize and expand the banking system. The government had good intentions, and it led to a banking system that spanned across the nation and was undergoing fewer banking failures, and actually making profits while lending to priority sectors. The second round of nationalization that incorporated six more banks, and increased government regulation, made the banking system very inefficient and unprofitable; Joshi and Little (1997) said, "By 1991, the country had erected an unprofitable, inefficient, and financially unsound banking sector."

Therefore even though deposits increased, profitability decreased, and the average return on assets from 1984-1994 was -0.33% due to two losses in 1993 and 1994, excluding those losses we see that the average return on assets in the 1980's is 0.11% (Joshi and Little, 1997). It was not government ownership, but government's stringent regulation on the banking system, that decreased profitability. McKinnon and Shaw mention that high reserve requirements, interest rate floors and ceilings, and lending to priority sectors, as a large percentage of total lending is "harmful for resource mobilization and resource allocation." King and Levine (1993) state, that government intervention in the financial system has a negative effect on the equilibrium growth. Even if the government has no wrong intentions, it might just be unable, incompetent and incapable to run the banking system of the country. Effective regulation in the 1960's led to a decrease in banking failure. However repressive government policies made effective regulation impossible and Barth, Caprio and Levine's (2008) "ineffective hand view" states that "even if governments demonstrate exemplary integrity, official regulation might be generally ineffective at actually easing market failures."

The counterview of the "public interest approach" is based in two main assumptions (1) there are market failures (2) the government has incentives and power to reduce these market failures. The Private Interest View of regulation states that the second assumption does not hold. However Stigler (1971) and Peltzman (1976) have viewed regulation by the government as counterproductive and point to "regulatory capture." In banking government intervention may funnel resources towards sectors that are historically proven to be unprofitable but need capital to grow and don't have access to it because of their unprofitability.

There are various ways a government can interfere with the banking system of an economy, and the Indian government, participated in all the below mentioned measures. Barth,

Caprio and Levine (2008) outline the main ones as: (1) restrictions on banks, (2) entry restrictions, (3) capital requirements, (4) supervisory powers, (5) safety net support, (6) market monitoring and (7) government ownership.

(1) Restrictions on Banks: It can be in the form of activity restrictions. It is critical to impose activity restrictions on banks, and that helps define the term bank. Regulatory restrictions can decrease efficiency of the banks and reduces their ability to diversify their income streams and decrease overall risk of operations. A cross country data study by Barth, Caprio and Levine (2001) finds that greater regulatory restrictions lead to a higher probability of a country suffering from a major bank crisis and lower banking sector efficiency. The Indian banks operated under many regulatory restrictions which limited their activities in off balance sheet activities.

(2) Entry restriction: Governments have control over the banking system by regulating the entry of new private and foreign banks. Jayaratne and Strahan (1998) have performed studies that suggest when US created a more competitive environment by removing branching restrictions, "the rate of economic growth within those states accelerated and quality of bank lending improved." The Indian government had placed restrictions on entry of foreign banks and private banks. These banks required government licenses to operate in India. In 1993 the RBI permitted private entry into the banking sector, but imposed restrictions on branch expansion. Various studies have shown that entry restrictions are not favorable for the banking industry and for the overall economy.

(3) Capital Requirements: In addition to entry restrictions, governments can enforce regulations on minimum capital requirements. It can affect risk taking activities and it helps create a pseudo cushion in times of crisis. However, proponents of the private management of banks disagree

with the benefits derived from imposition of capital requirements by the government. Studies on this topic by various authors such as Genotte and Pyle (1991), Lam and Chen (1985), and Besanko and Kanatas (1996) all suggest that "higher capital requirements might increase risk taking behavior." It could be that the size of the balance sheet decreases and banks could undertake riskier activities under limited liability. In addition studies done by Gorton and Winton (1999) show that the higher the capital requirements imposed by the government the higher is the cost of capital. The Indian government had imposed capital restrictions on the new private banks.

(4) Supervisory Powers and Market Monitoring: It can be combined into one category and it refers to official supervision of banking activities in the country. Developing countries usually have directed credit programs and high reserve and liquidity requirements, this helps provide a cushion in times of crisis and as they liberalize these requirements, the banks need to have proper supervision of their activities. However, the private interest view argues otherwise. However there are not many studies on this that promote either view. The private interest view argues that excessive supervision can lead to corruption by government officials. It also says that government employees have no motivation to work in the government as the government pays them lesser than private banks and they would be willing to take bribes to produce a good report on a bank. India has instituted agencies that monitor banks' performance. RBI also has supervisory powers and it places them in effect by looking at the financial statements of banks on a regular basis through the course of the year.

(5) "Safety Net Support": It has two main parts, one being the "lender of the last resort" and the other an "explicit deposit insurance system." Proponents of the private interest view feel that it is a moral hazard and present several other ways to protect small depositors. The view states that

due to the presence of deposit insurance depositors monitor bank performance lesser and that reduces risk premium in their cost of funds. The Indian government has a deposit insurance scheme in place along with the establishment of the Credit Guarantee Corporation of India.

(7) Government Ownership: This is the other extreme pole of view for the two views of banking regulation. According to the private interest view, the government does not have enough incentives, to lead investments to socially required sectors, which need credit to grow. Instead it ensures the funding of politically beneficial projects, even though they might be non performing assets in the long run. Barth, Caprio and Levine (2001), state that "greater government ownership is generally associated with less-efficient and less well-developed financial systems."

The academic discussion reinforces the need for the liberalization of the banking industry in India. A Committee on the Financial System was instituted by the government in 1990, headed by Shri M. Narasimham. The Committee's report to the parliament formed the basis for most of the ensuing regulatory changes in India. The committee asked for the following measures to be taken by the Government of India: (1) reducing the current (1990) rate of CRR and SLR for the banks, (2) slowly decreasing the percentage of directed credit to priority sectors, (3) interest rate determination should be done by markets and not the government, (4) structural reorganization of the banking sector, (5) development of an asset reconstruction fund to help tackle the issue of non –performing assets, (6) removal of control of the banking system from the Banking Division of the Ministry of Finance, and that (7) public sector banks should be free and autonomous, in order to operate effectively in a competitive environment. Some, not all of these recommendations were accepted by the Government of India and later became reforms in the banking industry.

In 1998 the Committee submitted another report with further changes to the banking sector. This report was focused more on bank legislation and the expansion and growth of the banking industry. The main reforms suggested were as follows: (1) healthier and stronger financial system in India, which can handle problems regarding liquidity and exchange rate fluctuations, (2) "Narrow Banking Concept" was recommended where weak banks with high non-performing assets (NPA's) can only make safe investments, (3) increase in the capital adequacy ratio requirement, (4) review of functions of the board of directors of the banks and the adoption of professional corporate strategy and (5) review of main banking laws such as RBI Act, Banking Regulation Act, SBI Act, etc. Recommendations were also made for better technology, training of staff, and a higher professionalism level in banks. The impact of the performance of banks after these measures were instituted is analyzed in Chapter III.

Box 2.1

Timeline of Banking Regulation in India

		1850	1) Companies Act: Stipulated unlimited liability for banks
1) Presidency Act: Prohibition of banks from dealing in risky foreign bills Prohibition from borrowing or lending from abroad for more than six months 2) Amendment to the Companies Act: Permitted principle of limited liability	1867		
		1913	1) Amendment to the Companies Act and repealing of the original Companies Act (1850)
1) Presidency Banks merged to create the Imperial Bank of India	1921		

		1934	1) Reserve Bank of India Act established, and outlined the powers of the Reserve Bank of India
1) RBI Companies Ordinance: Vested RBI with further monitoring powers 2) Banking Companies Act was established and prevented branch expansion of banks and vested RBI with further powers	1946		
		1949	1) Banking Companies Act is revised to address key issues of bank failure: Vested RBI with the following powers: i) supervision powers ii) control over the establishment of new banks and new branches iii) power to inspect banking companies It also focused on basic features such as protecting interests of depositors
1) State Bank of India Act: Nationalized the Imperial Bank of India, and ownership was vested with the Reserve Bank of India. The Imperial Bank of India was renamed the State Bank of India	1955		
		1960	1) Eight more banks are nationalized, and are integrated as subsidiaries of the State Bank of India
Banking Companies Act is modified again to clarify and supplement the provisions under Section 45 of the Banking Companies Act which relates to compulsory reconstruction or amalgamation of banks.	1961		
		1962	1) Chapter IIIA in RBI Act: Changes in policy regarding inspection of banks. RBI is now vested with the power of making random inspections of banks and their branches 2) New Branch Licensing Policy: Placed entry

			level norms on branch expansion
1) Deposit Insurance Corporation Act: Provided insurance cover against loss of all or part of deposits with an insured bank	1963		
		1964	1) RBI's powers over banks management is increased. They have the ability to appoint and remove banks' executive personnel
1) Credit Authorization Scheme: Commercial banks were required to obtain prior permission from RBI for sanctioning any fresh working capital limits above the prescribed norms	1965		
		1968	1) National Credit Council was established to help RBI allocate credit according to Five Year Plan priorities
1) Credit Guarantee Corporation of India Ltd. was established for providing guarantees against risk of default in payment	1971		
		1973	1) Minimum lending rates prescibed on all loans except for the priority sector
1) Maximum rate for bank loans was prescribed in the wake of the oil crisis	1976		
		1980	1) Second wave of nationalization occurs where six more banks are nationalized.
1) CRR raised by ten percentage points from 5.0% in1973 to 15.0% in 1989	1989		
		1991	1) SLR raised by 12.5 percentage points from 26% in Februrary 1970 to 38.5% in September 1990

Chapter 3: Impact of Reforms and Performance of Banks by Ownership

"Liberalization of the banking sector is a part of the internal liberalization of the economy" (Roland 2006). Stabilization of the banking system occurs hand-in-hand with liberalization, because it helps put the government owned banks in par with the new private and foreign banks. Stabilization of the banking system refers to the recapitalization of state owned banks, which helps reduce their non performing assets and increases the amount of existing capitals in these banks. To ensure stabilization the government infused Rs. 40 billion in the state owned banks before changing the policies for the banking sector. In the years from 1993 to 1999, an additional Rs.120 billion was injected in the nationalized banks (Reserve Bank of India 2001). India enacted four main reforms in 1991 and in 1998, which are described later in this chapter. The impact of these reforms on the banking sector has been analyzed by many economists in the past. In some studies, mentioned later in this chapter, the reforms are argued to have helped increase efficiency and profitability but other studies find no such significant impact. This chapter of the paper analyzes the impact of the reforms and the performance of the private and public banks in the period before, during and after the Great Recession using the CAMEL framework.

3.1 Outline of the main reforms in India in 1990

The four main reforms are briefly described below:

1) **Reduction in CRR and SLR:** The CRR and SLR stood at 15.0% of Net Demand and Time Liabilities (NDTL) and 38.5% of NDTL, respectively in 1991. Together they comprised 53.5% of NDTL. However by 2001 the government slowly reduced the CRR to 8.0% of NDTL and the SLR to 25.0% of NDTL. Such high reserve requirements

meant lower returns on these substantial investments that fell below the amount the banks were paying to its depositors. Table 3.1 outlines the decrease in CRR and SLR over the years 1974 to 2001.

Table 3.1: CRR and SLR as % of NDTL		
Year	CRR (% of NDTL)	SLR (% of NDTL)
1974	4.0	33.0 (July)
1981	7.5	35.0 (October)
1987	10 (October)	37.5 (April)
1991	15.0 (May)	38.5 (September, 1990)
1994	15.0 (August)	31.5 (October)
1997	10 (December)	25.0b (October)
1999	9.0 (November)	25.0
2000	8.5 (August)	25.0
2001	8.0 (March) 7.5 (May)	25.0

2) **Interest Rate Changes:** The Government of India fixed lending rates and deposit rates and reduced the interest margin slowly and gradually. In 1977 the ceiling on lending rates was 16.50% and the floor on lending rates was 12.50%. The deposit rate was fixed at 8.00% -10.00% for varied lengths of deposits. In 1988 the ceiling on the lending rates was still fixed at 16.50% and the deposit rates were increased to 9.0%-10%. The real interest rate for loans was 7.115% and on deposits was (0.385%) - 0.615%. The mandatory CRR and SLR deposits made with the government yielded 5.18%-6.47% for varying periods in 1971 which increased to 7.03%-9.36% in 1988. The real interest rate for government deposits in 1988 was (2.35%) - 0.025%. So the banks were making substantially less than the lending rate or the amount they were paying to the depositors. In addition to combat inflation the government of India changes the repo rate or the bank rate. This changes the lending rates of the banks substantially in a shorter time span. The

repo rate is the rate at which the RBI lends money to the banks. The government decreased the repo rate after 1992 as well, decreasing the lending rate of the banks in India. The recent increase in repo rates has been placed to curb increasing inflation in India. The historical repo rates are outlined in Table 3.2

Table 3.2: Repo Rates in India

Year	1974	1981	1987	1991	1992	1997	2001	2007	2009	2011
Repo Rate (%)	9.00	10.00	10.00	11.00	12.00	9.00	6.50	7.75	4.75	8.50

3) **Priority Sector Lending:** The Narasimham Committee concluded that priority sector advances were a key component of the losses in the state owned banks in India. The recommendation of the committee was to reduce priority sector lending from 40% to 10% of net bank credit. However this recommendation was not taken into account and the targets were not reduced; however the list of industries included in the priority sectors has been expanded. As of 2011, the priority sector includes (1) agriculture, (2) small scale industries, (3) small road and water transport operators, (4) small business, (5) retail trade, (6) professional and self employed people, (7) state sponsored organizations for scheduled castes and scheduled tribes, (8) education, (9) housing, (10) consumption loans, (11) micro-credit to self help groups and NGO's, (12) software industry, (13) food and agro processing sector and (14) venture capital funds (Reserve Bank of India). The limit for foreign banks is 32% and for domestic banks (private and public) is 40% of net bank credit (Reserve Bank of India). The increase in the list of industries included in the priority sector provides banks the freedom to advance loans to only credit worthy industries.

4) **Introduction of Private and Foreign Banks:** Entry of new foreign and domestic banks started in 1994. Since then thirty new domestic and foreign banks have entered the Indian market.

After these set of reforms were enacted, the Narasimham Committee submitted a second report for another set of reforms in 1998. These reforms can be categorized into four main groups: (1) strengthening the banking sector: (2) improving asset quality, (3) banking regulation and supervision, (4) structure of banks. Based off the recommendations from the second report, the government implemented the following changes.

1) **Strengthening the Banking Sector:** This entailed changing or drafting regulations that would help improve performance measures for banks. The risk weights for the capital adequacy ratio were changed. Government securities which were initially riskless now held a weight of 2.5%. Minimum CRAR ratio was raised from 8% to 9%. This helped measure the performance of banks in a more realistic setting, providing the markets with a more accurate value of the banks.
2) **Improving Asset Quality:** The Government of India changed the definition of doubtful assets to be classified as doubtful if it was in the substandard category for 18 months; and in March 2005 changed the definition to include assets in the substandard category for 12 months. For banks with a high NPA portfolio the government created the first Asset Reconstruction Company in June 2002, this company would issue NPA swap bonds.
3) **Banking Regulation and Supervision:** Most banks have now established an independent loan review system to identify and curb potential NPAs. The committee suggested the need to redefine the scope of "external vigilance and investigation agencies" (Major Recommendations by the 2nd Narasimham Committee on Banking

Sector Reforms 2011) with regard to banking business; however, the government took no action in this field.

4) **Structure of Banks:** A developmental financial institution[6] over a period of time could now convert itself into a bank. Another main recommendation taken into consideration was to reduce the shareholding of the government in public banks to 33%, and banks such as Punjab National Bank had started coming up with IPO's and most public banks today are publicly traded on the stock exchanges of India.

3.2 Effects of these reforms on the private and public banking system

An obvious question that emerges from the reforms is whether or not they were helpful for the Indian Banking system, and there exists a vast amount of literature that states that these reforms were helpful in improving the efficiency of the Indian banks. Bhattacharya (1997) conducted a study using 23 years of data from 1970-1992 and found that total factor productivity was increasing at a rate of 2%, but during the deregulation period the growth rate for total factor productivity was 7%, indicating that the reforms were effective in the early stages. Ram Mohan and Ray (2004) conducted a study where they used 8 years of data from 1992 – 2000 and concluded that there was a convergence in performance between public and private banks in the post reform era and that public sector banks performed significantly better than private sector banks in terms of revenue maximization efficiency. They allocate the superior performance of the public banks to higher technical efficiency. A study done by the Reserve Bank of India (2008) states that efficiency has improved across all bank groups over the period 1991-2007. The report performs a comprehensive study on "resource mobilization, management of risk and capital and lending and investment operation" of banks to come to this conclusion.

[6] Developmental financial institutions is defined by the RBI as "an institution promoted or assisted by Government mainly to provide development finance to one or more sectors or sub-sectors of the economy" (RBI, May 2004)

The period from 1980 – 2010 has not been studied in the existing literature. This period is interesting because two sets of reforms were introduced in the span of this 30 year period. This period ensures enough time for the implementation and for the effects for these reforms to take place. However, this paper analyzes the effects of the reforms on the profitability of these banks over this period. The positive effect of these reforms on loans, savings, and other balance sheet items has been studied by many notable economists in India and worldwide. As mentioned above, economists have found positive effects from the reforms; however, very few studies have focused on profitability of the banking sector. The two main publications used to gather all the data were the Handbook of Statistics on the Indian Economy and Statistical Tables Relating to Banks of India. RBI published a compilation of bank data for the past 30 years on March 3rd, 2011. This was the main source of data for all the regressions and ratios in this chapter. GDP Growth Rate was downloaded from IMF's World Economic Outlook database. This section analyzes the profitability of the banks in the wake of the first and the second set of reforms using yearly data from 1980-2009.

Table 3.3 and 3.4 display the regression results for the profitability indicators on the public and private banks. Equation (1) in table 3.3 and 3.4 suggests that CRR has a negative relationship with return on assets (ROA) and is statistically significant. CRR affects private banks more than public banks, a one percentage point increase in CRR will lead to a 1.02 percentage point decrease in ROA for private banks holding everything else constant; however a one percentage point increase in CRR will decrease the ROA of public banks by only -0.3 percentage points, holding everything else constant.

Table 3.3: Regression Results for Public Banks

Dependent Variable	ROA	ROE	Net Interest Margin to Assets
Independent Variable	(1)	(2)	(3)
CRR	-0.30**	-0.34**	0.06
	(0.10)	(0.09)	(0.08)
SLR	-0.06	0.00	-0.06
	(0.07)	0.00	(0.05)
GdpGrowth	-0.03	-0.03	0.01
	(0.09)	(0.09)	(0.08)
Minimum_Lending_Rate	0.35*	0.29	-0.05
	(0.16)	(0.15)	(0.13)
Constant	-0.89	-21.08	4.92***
	(1.84)	(49.96)	(1.36)
Observations	20	20	20
Adj. R-Squared	0.51	0.51	-0.03

Standard errors in parentheses *** p<0.001, ** p<0.01, * p<0.05;

Table 3.4: Regression Results for Private Banks

Dependent Variable	ROA	ROE	Net Interest Margin to Assets
Independent Variable	(1)	(2)	(3)
CRR	-1.02**	-0.08*	-0.19*
	(0.31)	(0.03)	(0.09)
SLR	-0.15	-0.02	-0.03
	(0.20)	(0.02)	(0.06)
GdpGrowth	0.62*	0.06	0.15
	(0.28)	(0.03)	(0.08)
Minimum_Lending_Rate	0.9	0.09	0.21
	(0.48)	(0.05)	(0.13)
Constant	4.66	0.19	0.11
	(4.96)	(0.55)	(1.38)
Observations	20	20	20
Adj. R-Squared	0.51	0.51	-0.03

Standard errors in parentheses *** p<0.001, ** p<0.01, * p<0.05;

Equation (2) in table 3.3 and 3.4 outlines the relationship between ROE and CRR. Since the equity multiplier of the public banks is so high, the effect of CRR on ROE is greater on public banks than on private banks. ROE and CRR have a strong negative relationship,

statistically significant as well. If CRR decreases by one percentage point the ROE of public banks should increase by 0.34 percentage points, and the ROE of private banks should increase by 0.08 percentage points holding everything else constant. The ROA of public banks have a positive relationship with the minimum lending rate, statistically significant at the 90% level. If the minimum lending rate increases that will increase interest income for the banks and lead to a higher net income which would lead to a higher return on assets. Equation (1) of table 3.3 suggests that a one percentage point increase in the minimum lending rate should increase the ROA of public banks by 0.35 percentage points, holding everything else constant. Net Interest Margin to Assets has a negative relationship with CRR statistically significant at the 5% level, as stated by equation (3) in table 3.4. For a one percentage point increase in CRR the net interest margin to assets ratio will decrease by 0.19 percentage points holding everything else constant. The reforms in 1991 that helped decrease the CRR and the SLR were definitely profitable for the private and public banks, as they helped increase the profitability of the banking industry of India. [7]

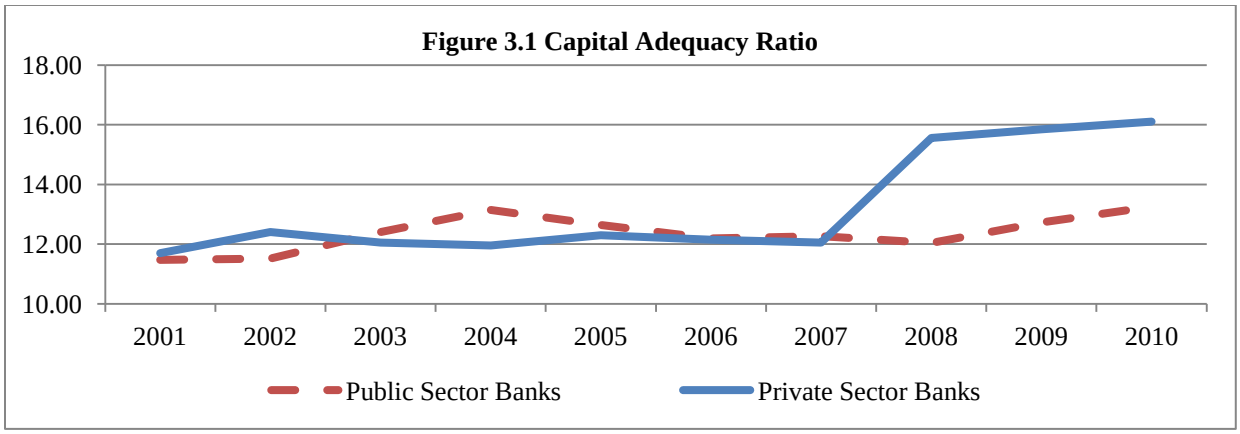
3.3 Comparison of private and public banks using the CAMEL framework

This section of the paper analyzes the comparison of the private and public sector banks based on performance indicators. The CAMEL Framework which helps measure banks performance through five different categories is broadly used to help measure performance. The CAMEL Framework is distributed as (1) capital adequacy ratio, (2) asset quality, (3) management quality, (4) earnings performance, and (5) assessing liquidity (Asian Development Bank 2005).

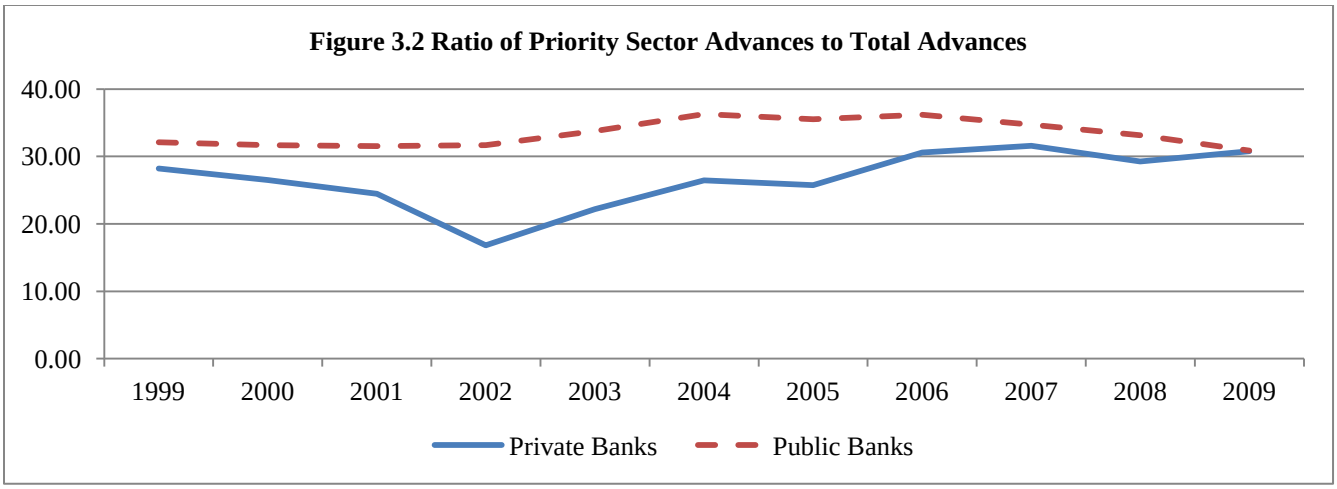
[7] A regression analysis of the effect of these reforms on loans alone was performed and nothing was found statistically significant so they were not reported.

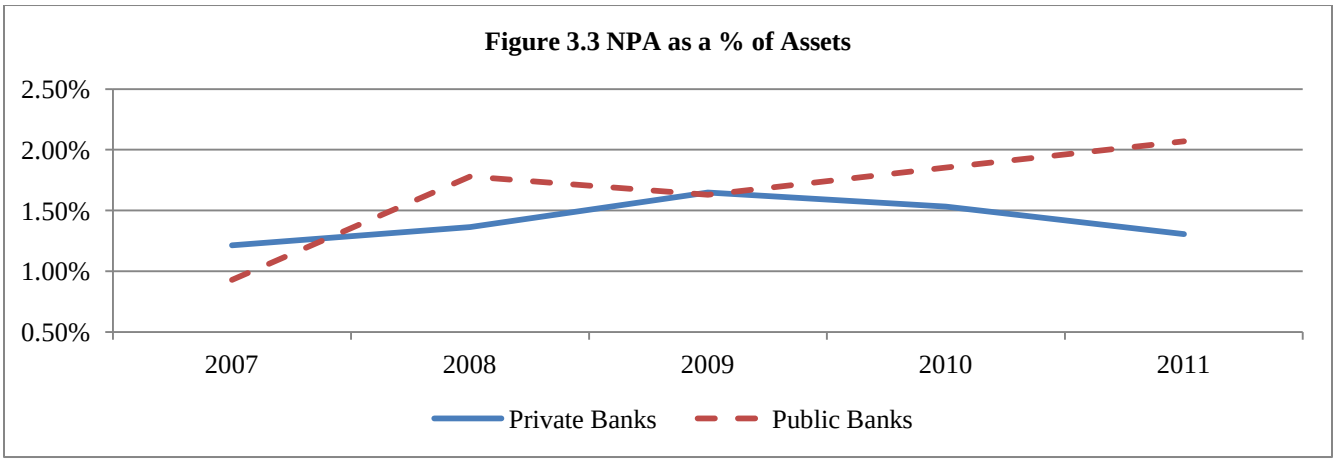
The capital adequacy ratio measures the financial strength of a financial institution. Section 17 of Indian Banking Regulation Act (1949) states that every banking company in India is required to create a reserve fund and it should hold at least 20% of the firms' disclosed profits in the fund (RBI Publication). However prior to the reforms in 1991 there existed no measure of measuring the financial strength of banks in India. One of the many suggestions of the Narasimham Committee was to initiate a capital to risk asset system. The Basel Committee released guidelines on capital measures and standards in July 1988. These guidelines were implemented in India in 1992 (RBI, 2000). Starting from March 2000 Indian banks were required to maintain CAR at 9% and it is 10% for new private banks and banks undertaking. The guidelines for capital and risk weighted assets have been outlined in detail by the Reserve Bank of India.

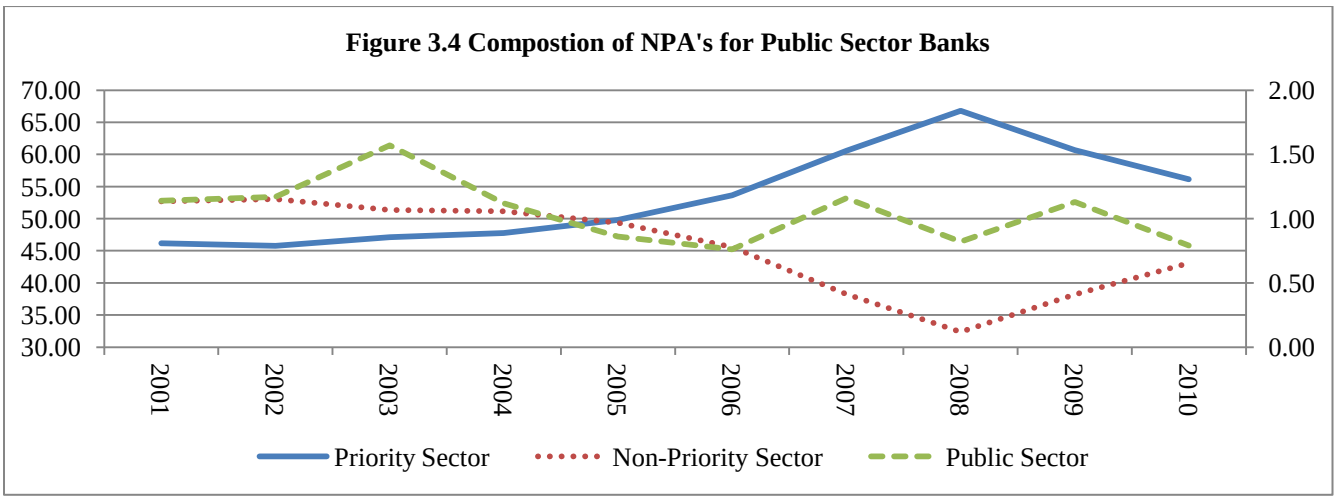
Figure 3.1 below displays the capital adequacy ratio of private and public banks in India. It shows that the public and private sector banks were closely following each other at an average of approximately 12% and during the recession there is a sharp discrepancy in the ratio between public and private banks. The CAR increases if riskless assets such as cash and investments in government securities increase or if capital increases. The capital adequacy ratio for private banks could have increased as cash in hand and balances with RBI increased by 73% in 2007; however the increase was only 19% for public banks (RBI). A higher CAR displays greater financial strength for an institution. After the crisis the private banks seem to be performing better if measured in terms of financial strength.



The asset quality of a bank can be assessed by concentration of loans to different industries, the number of non-performing assets (NPA's) and loans and loan loss provision ratio. The ratio of priority sector advances is monitored by the government and has a floor of 40% of net bank credit for private and public banks in India and 32% for foreign banks operating in India. Figure 3.3 graphs non-performing assets as a percentage of total assets. However upon closer examination of these advances in 2010, the percentage of NPA to total assets increases by 13.81% for public banks whereas it decreases by 6.93% for private banks. The private and public banks closely follow each other till 2009 and start diverging after that. In Figure 3.4 the composition of NPA's by sector is graphed. The number of nonperforming assets from priority sector for public banks increases to 66.8% and only 32% come from non-priority sectors (RBI). Public banks, of which the government of India still has a majority stake, are not forced to lend to the government for its own projects because the percentage of NPA's from public sector for public banks is at a mere 2% at its maximum. However the priority sector and the non priority sector composition of NPA's which was diverging from 2005 – 2008 now seems to be converging.







Assessing management quality can be a very challenging task, so the metrics used in the CAMEL framework to assess it are: operating costs and operating profits. Figure 3.5 below displays percentage of operating profits to total assets. It is evident that public banks had higher

operating profits as compared to the private sector banks. However, private banks show an upward trend before and after the crisis and the public banks show a downward trend before and after the crisis. So based of this metric the management of the public firms by the Government of India, is not really healthy for the banks. In Figure 3.6 the ratio of wage bills to total income suggests that the public sector banks are making their operations more efficient with time, and are coming closer to the ratio exhibited by the private banks. Although in Figure 3.7 operating expenses as a percentage of total expenses show a downward trend from 2006 -2009, an upward trend develops after 2009, this may reflect the effects of the financial crisis. Further breakdown of operating expenses in the years 2007-2009 reveals that payments to and provisions for employees in private banks increases on average by 28% whereas in public banks the average increase is only 10%. The biggest increase in operating expenses is the law charges for private banks which increase by 46% on average in 2007-2009. For public banks the largest increase on average is 25% in advertisement and publicity. In addition the total contribution of employee payments and provisions declines in private banks from 66.65% to 39.15% and in public banks the decline is only 6.17%.

Figure 3.5 Ratio of Operating Profits to Total Assets (%)

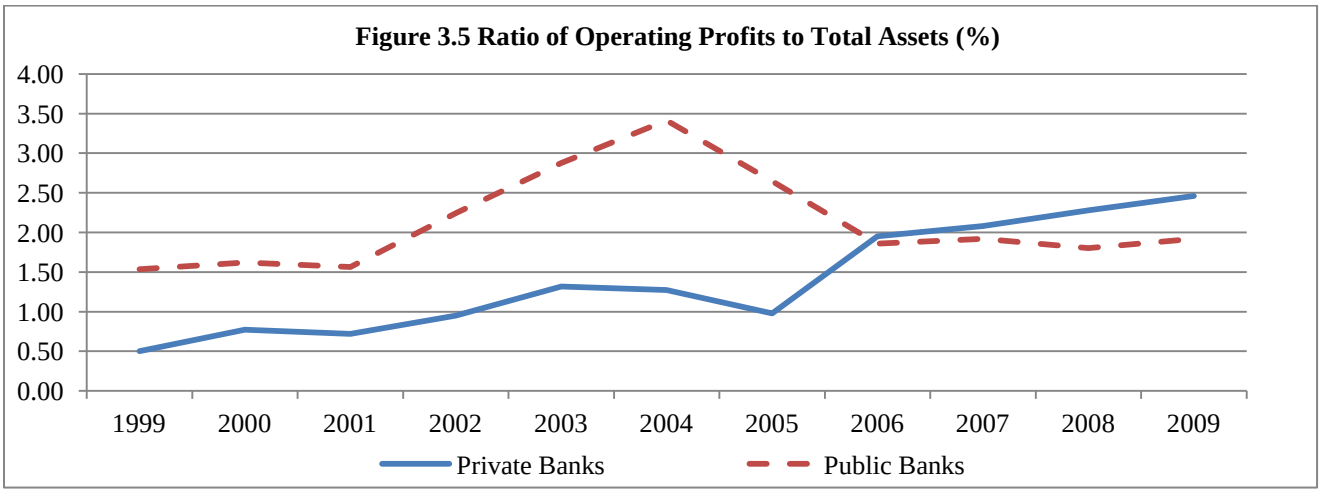


Figure 3.6 Ratio of Wage Bills to Total Income

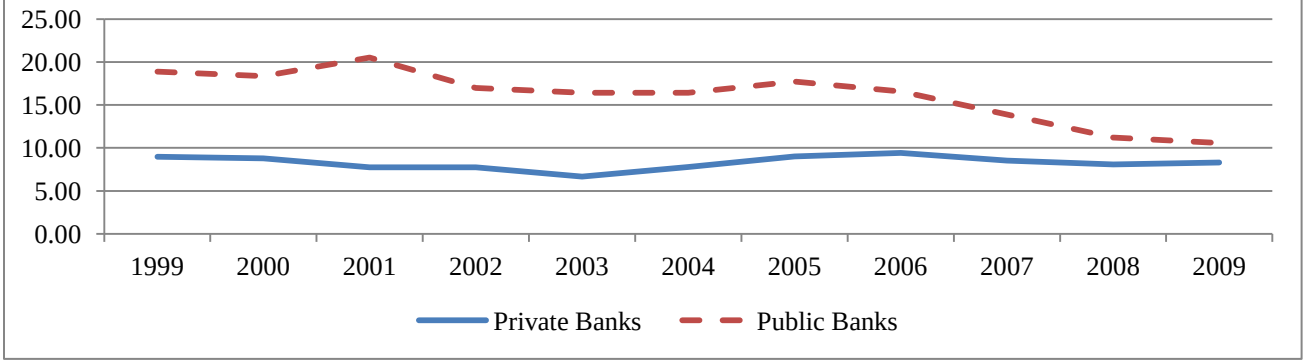
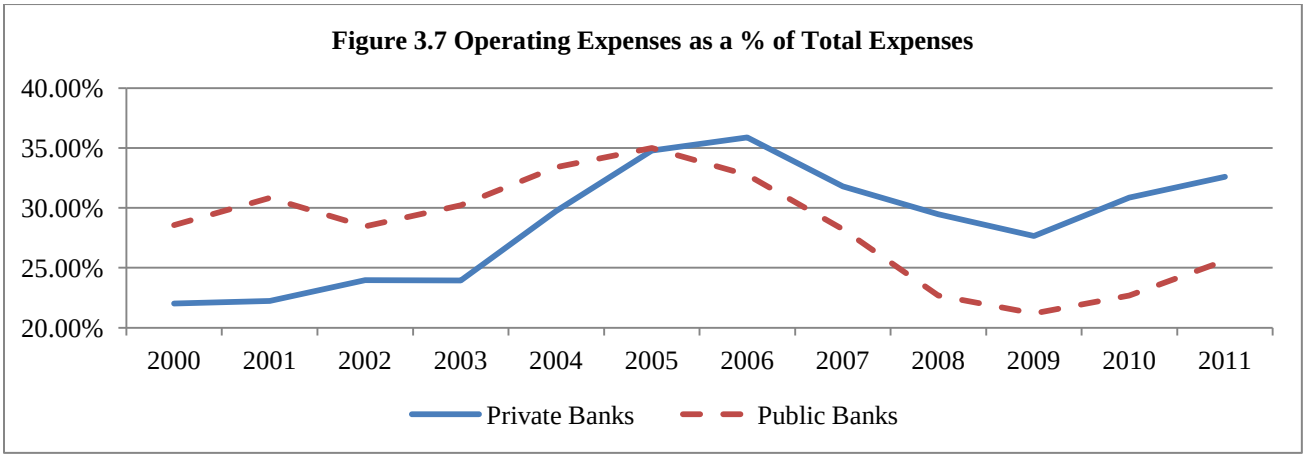


Figure 3.7 Operating Expenses as a % of Total Expenses



All the categories of the CAMEL Framework are closely linked and effectively measure a bank's performance. To assess the earnings performance of a bank, it will be helpful to look at a variety of ratios and measures; these include: (1) return on equity (ROE), (2) return on assets (ROA) and (3) net interest margin to total assets.

Return on equity helps measure the firm's profitability by measuring the amount of profit a firm generates with the money invested by shareholders. Figure 3.8 graphs the return on equity of private and public banks. Return on equity is increasing for both private and public banks till 2006, however after 2006 they start diverging, and private banks display a downward trend and public banks display an upward trend. Return on Equity can be further broken down into three more components, by the DuPont Analysis technique, to help understand the difference in the

ratio between two different companies in the same industry or within different industries (Hitchner, 2011). The DuPont model was created by F. Donaldson Brown an electrical engineer. It is a technique that is used to examine the profitability of a company by integrating the elements of the income statement with the balance sheet. It can be broken in three main parts: (1) profit margin, (2) asset turnover, and (3) and equity multiplier.

Table 3.5: Profit Margin

Profit Margin	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
Private Banks	8.65%	7.00%	8.55%	9.21%	10.50%	10.83%	11.48%	10.45%	10.82%	10.56%
Public Banks	4.28%	3.27%	6.70%	9.78%	12.75%	10.72%	10.48%	10.87%	10.75%	10.69%
Difference	4.37%	3.73%	1.85%	-0.57%	-2.25%	0.11%	1.00%	-0.42%	0.07%	-0.13%

Table 3.6: Asset Turnover

Asset Turnover	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
Private Banks	10.37%	10.16%	7.78%	10.71%	9.03%	7.63%	7.58%	8.30%	9.36%	10.02%
Public Banks	10.26%	10.23%	10.26%	10.06%	9.29%	7.94%	7.63%	7.65%	8.14%	8.46%
Difference	0.11%	-0.07%	-2.48%	0.65%	-0.26%	-0.31%	-0.05%	0.65%	1.22%	1.56%

Table 3.7: Equity Multiplier

Equity Multiplier	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
Private Banks	703.1	789.5	983.6	957.2	993.0	874.5	1532.9	1580.7	1326.0	1076.2
Public Banks	2408.7	2512.3	2438.2	2402.3	2328.0	2296.2	1831.6	1922.0	1954.3	1996.1

The DuPont Analysis suggests, that the reason public banks return on equity is higher than private banks is because their equity multiplier is higher. The asset turnover of public banks is lower than private banks and the profit margin is almost the same. Return on assets helps measure profitability of a company relative to its total assets. It is an indicator of the management's efficiency in using its assets to generate earnings. Figure 3.9 displays that nationalized banks have a better ROA as compared to private banks pre crisis. Post 2007 the ROA of public sector banks declines and private sector banks see a sharp increase in their ROA, which they maintain through the crisis and appear above the public sector banks.

Net interest margin to total assets measure the profitability of the bank's lending and borrowing activities. Once again as displayed by Figure 3.10 public banks outperform the private banks earlier on. As soon as the crisis hits, however, we see a sharp decline in the net interest margin ratio of public banks whereas, private banks are still able to maintain their growth and continue their rise through the crisis.

Figure 3.8 Return on Equity

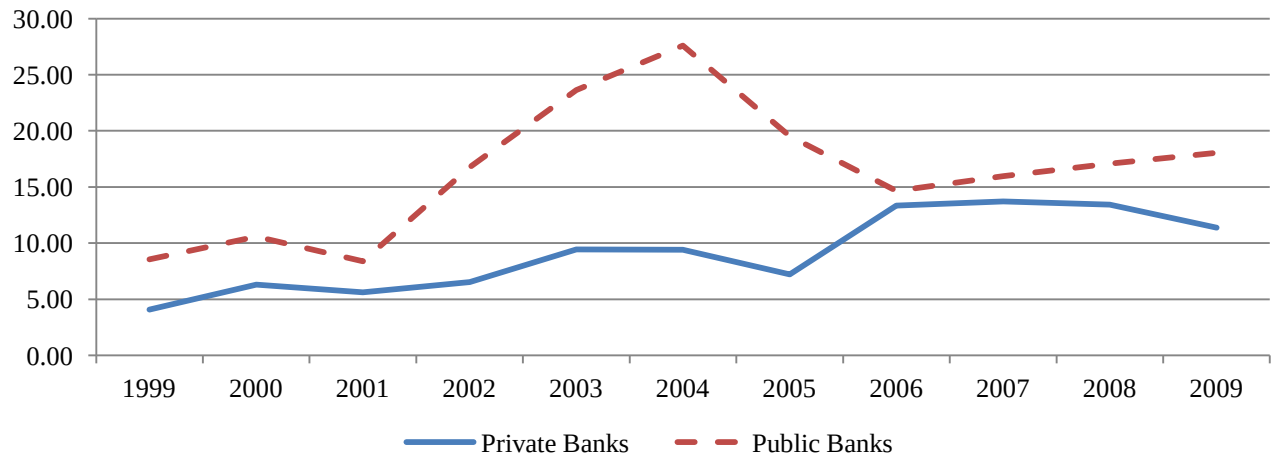


Figure 3.9 Return on Assets

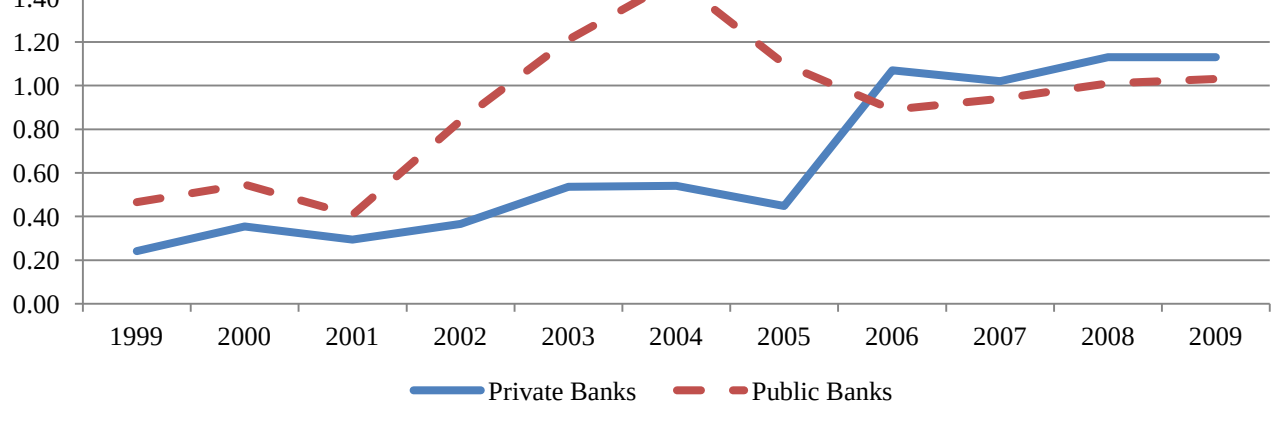


Figure 3.10 Net Interest Margin to Total Assets

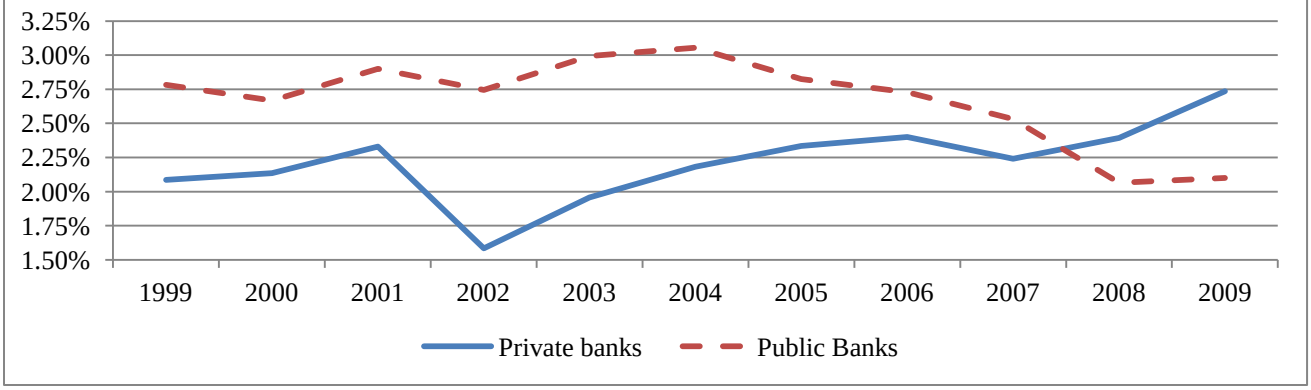
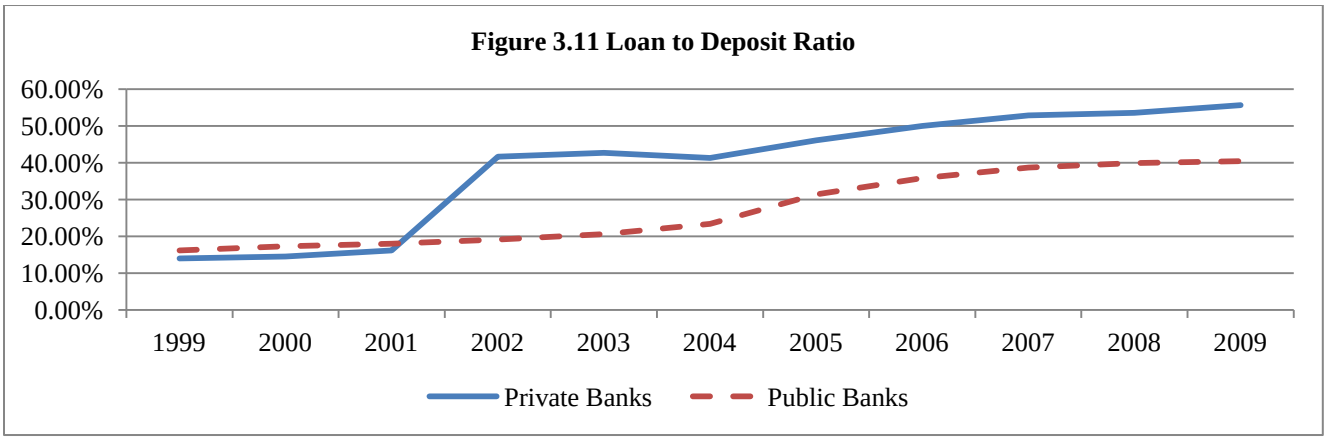


Figure 3.11 Loan to Deposit Ratio



The last element measured by the CAMEL framework is liquidity. A financial institution must be liquid to meet the demand of creditors and depositors. Liquidity directly arises from the four factors of CAMEL mentioned above. Liquidity has an inverse relationship with profitability; therefore a financial institution must strike a balance between the two elements. Liquidity is usually measured by the current ratio or the quick ratio. Liquidity is directly related to holdings of cash and other assets that can be converted into cash within a year. Upon analysis of the Loan to Deposit Ratio it is displayed in Figure 3.11 that private banks loan Rs.0.55 and public sector banks loan Rs.0.40 for every rupee of deposit. The private and public sector banks start out at 20% in 1999; private banks are issuing more loans per rupee of deposit compared to public banks. The CAMEL Framework provides a holistic view on the performance of the banks.

Chapter 4: Share Price Performance of the Indian Banking Industry Relative to the World

This section analyzes the Indian Banking Sector's performance relative to the banking sectors of other developed and developing nations. The comparison set is Hong Kong, Europe and USA. For the comparison, stock price and index price data was downloaded from Bloomberg. The four banking indices used are: (1) Stoxx 600 Banking Index (SX7P), (2) Hang Seng Finance Index (HSF), (3) CNX Banking Index (CNX Bank), and (4) S&P Banking Index (S5BANKX). The four main market indices used are: (1) Stoxx Europe 600 (SXXP), (2) Hang Seng Index (HSI), (3) BSE India Sensex 30 Index (SENSEX) and (4) S&P 500 Index (SXP). There are two main stock exchanges in India, the National Stock Exchange (NSE) and the Bombay Stock Exchange (BSE). The Sensex is an index composed of the stocks of the BSE, and the BSE Banking Index tracks the performance of the leading banking sector stocks listed on the BSE.

The CNX Bank Index tracks the performance of the most liquid and large capitalized Indian Banking Stocks. The index comprises of 12 stocks that trade on the NSE. A bank can list on both the exchanges, and the reason for choosing the CNX Bank Index over the BSE BANKEX is because the CNX bank Index was developed as of January 1, 2000 and the BSE BANKEX was developed as of January 1st, 2002. CNX Bank allows the analysis of the performance of the index for 10 years rather than 8 years in the case of BANKEX Index. All the indices are converted into log growth rates to assure stationarity. There is an existence of a dummy variable that helps us look at the relationship between the Indian Banking Indices and the Hong Kong, Europe and American Banking Indices. The dummy variable takes the value of

1 after June 10th, 2007 when Bear Sterns suspends redemption. The variables are described below in Table 4.1. The regressions are listed as follows:

$$(1) CNXBank = \propto + \beta_1 hkbank_{lng} + \beta_2 Stoxx\ bank_{lng} + \beta_3 S\&PBank_{lng} + \beta_4 time + \beta_5 cnxbank\_lag$$

$$(2) CNXBank = \propto + \beta_1 hkbank_{lng} + \beta_2 Stoxx\ bank_{lng} + \beta_3 S\&PBank_{lng} + \beta_4 hkbank\_d0 + \beta_5 Stoxx\ bank\_d0 + \beta_6 S\&PBank\_d0 + \beta_7 datedummy + \beta_8 time + \beta_9 cnxbank\_lag$$

$$(3) CNXBank = \propto + \beta_1 hk\_lng + \beta_2 Stoxx\_lng + \beta_3 S\&P\_lng + \beta_4 time + \beta_5 cnxbank\_lag$$

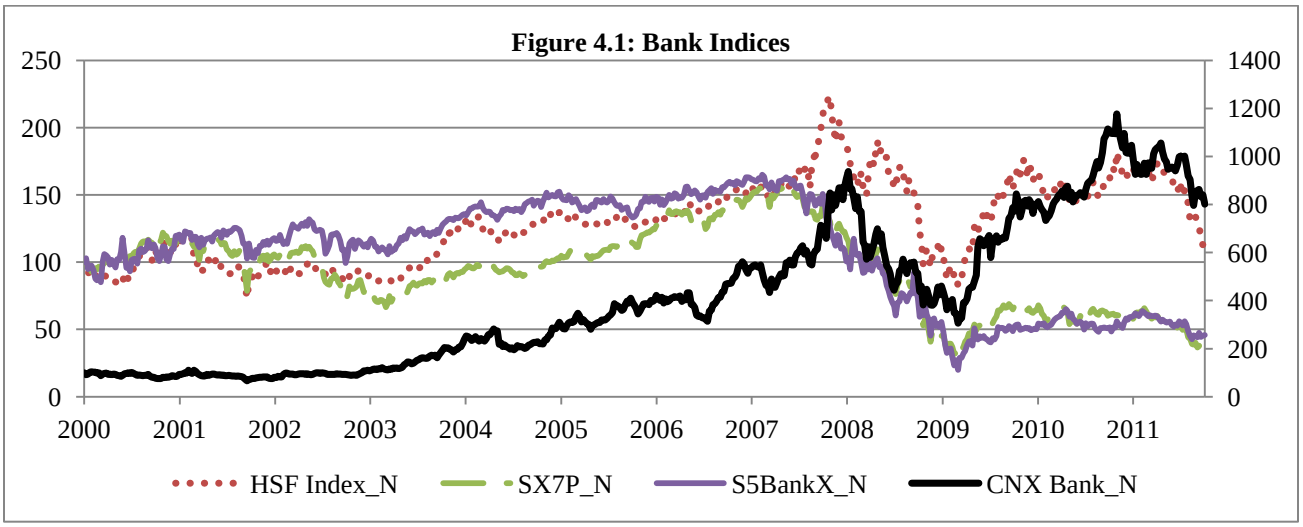
$$(4) CNXBank = \propto + \beta_1 hk_{lng} + \beta_2 Stoxx_{lng} + \beta_3 S\&P_{lng} + \beta_4 hk\_d0 + \beta_5 Stoxx\_d0 + \beta_6 S\&P\_d0 + \beta_7 datedummy + \beta_8 time + \beta_9 cnxbank\_lag$$

Table 4.1: Description of Variables

Variables	**Description**
Dependent Variables	
cnxbank_lng	Log Difference of CNX Bank Index
Independent Variables	
indexbank_lng	Log Difference of Index
index_d0	Dummy variable interaction indicating values after June 10th 2007
Time	A time variable accounting for time trend
cnxbank_lag	Lagged Dependent Variable calculated as the previous weeks value of the index
datedummy	Dummy variable taking the value 1 for the period June 10th 2007 – Oct 9th 2011

Figure 4.1 and 4.2 graphically illustrate the relationships between the various banking indices. Figure 4.1 normalizes the bank indices to 100 to better analyze the way the CNX Bank Index tracks the other banking indices. The CNX Bank Index is on the left vertical axis and the other three indices are graphed on the right vertical axis. The vertical axis is graphing the price of the indices normalized to a

starting point of 100. It seems as though the Indian banks are tracking the banking indices of the other countries only after 2007, because the upward trend is not similar to the varying trends of the other banking indices. However, it is clear, that after the crisis the CNX Bank Index is following the HSF Index very closely and the relationship between the two indices gets stronger. It appears that the CNX Bank Index begins to track the S5bankX and the SX7P indices after 2007. Another important takeaway from Figure 4.1 is the exponential growth in the Indian Banking Industry.



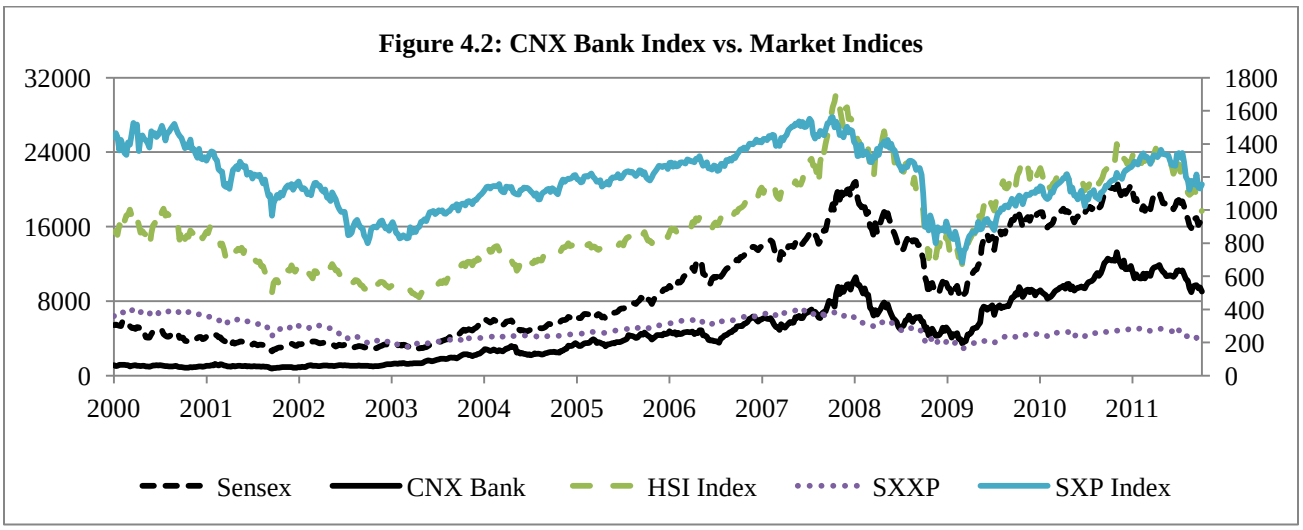


Figure 4.2 graphs the CNX Bank Index against the other countries' overall market indices. The SXP Index and the SXXP Index's prices are on the right vertical axis and the

other indices are graphed on the left vertical axis. The CNX Bank Index follows the Sensex very closely as one would expect. It is also noticeable that the CNX Bank follows the Hang Seng Index closely and the relationship gets stronger after 2007. In addition, it looks as if the CNX Bank Index starts tracking the S&P 500 very closely after the year 2007. However a graphical analysis should be followed by an empirical analysis to help confirm the movements and relationships displayed.

Table 4.2 displays the correlation between CNX Bank Index, and the market indices of developed and developing countries over two time periods. The first time period, represented by d0, is from Jan 2000- Jun, 2007 and the second, represented by d1, is from June, 2007 – Oct, 2011. The correlation table shows that over time, the correlation between all the indices and the CNX Bank Index increases. The Hang Seng Index has the highest correlation with the CNX Bank Index.

Table 4.2 Correlation

	cnxbank_lng
cnxbank_lng	1
stoxx_d0	0.18*
hsi_d0	0.21*
S&P_d0	0.16*
stoxx_d1	0.36*
hsi_d1	0.45*
S&P_d1	0.33*

* denotes 5% significance level

To perform empirical analysis, a multivariate linear regression is performed, with the log growth in the price of the CNX Bank Index as the dependent variable. Table 4.3 helps explain the relationships between the banking indices and the overall market indices of U.S.,

Europe, and Hong Kong and the CNX Bank Index.

Table 4.3 : Bank Index Regression Result

Dependent Variable: Log Growth of CNX Bank Index		
Independent Variables		
	(1)	(2)
hkbank_lng	0.48***	
	(-0.07)	
Stoxx bank_lng	0.22***	
	(-0.07)	
S&PBank_lng	-0.01	
	(-0.04)	
Stoxx_lng		0.21
		(0.11)
hk_lng		0.53***
		(-0.06)
S&P_lng		0.05
		(-0.11)
Time	0.00	0.00
	(0.00)	(0.00)
Cnxbank(-1)	-0.02	-0.02
	(0.04)	(0.04)
Constant	0.00	0.00
	0.00	0.00
Observations	612	612
Adjusted R Squared	0.23	0.23

Standard errors in parentheses; *** p<0.001, ** p<0.01, * p<0.05;

Equation (1) in Table 4.3 shows the regression for the relationship between the CNX Bank Index and the bank indices of the other countries. There is a strong relationship between the Hang Seng Finance Index (HSF) and the CNX Bank Index, significant at the 0.1% level. There is a similarly strong relationship between the CNX Bank index and the Stoxx 600 Banking Index (SX7P), again significant at the 0.1% level. This indicates that Indian banks tend to follow the trends of both the Hong Kong and European banking sectors. The magnitude of the

relationship is greater with respect to the Hong Kong banking index; a 10 percentage point increase in the HSF index produces a 4.8 percentage point increase in the CNX Bank Index

Table 4.4 describes the relationship of the HSF Index with the bank indices of the other countries in the set. Equation (1) in Table 4.4 suggests that a one percentage point increase in the SX7P index produces a 0.45 percentage point increase in the HSF index, indicating a better integration of the Hong Kong banking index with the banking indices of other developed countries. By comparison, equation (1) in Table 4.3 results has the CNX Bank Index increasing only by 0.22 percentage points for a one percentage point increase in the SX7P index. Meanwhile equation (2) in Table 4.3 suggests that a one percentage point increase in the Hang Seng Index has the CNX Bank Index increasing by 0.53 percentage points.

Table 4.4 : Bank Index Regression Result

Dependent Variable: HSF Index		
Independent Variables		
	(1)	(2)
stoxxBank_lng	0.45***	0.53**
	(0.03)	(0.03)
S&PBank _lng	0.00	0.00
	(0.03)	(0.03)
cnxbank_lng	0.17***	
	(0.02)	
Time	0.00	0.00
	(0.00)	(0.00)
hkBank(-1)	0.03	0.05
	(0.03)	(0.03)
Constant	0.00	0.00
	(0.00)	(0.00)
Observations	612	612
Adjusted R Squared	0.46	0.42

Standard errors in parentheses; *** p<0.001, ** p<0.01, * p<0.05

Equation (1) in Table 4.3 shows the strong relationship between the Hang Seng Finance Index and the CNX Bank Index, significant at the 0.1% level. This indicates that Indian banks stock prices are affected by the share prices of the Hong Kong banks. Such a finding is not surprising given the importance of the banking sector in Hong Kong. In the regressions performed in Table 4.3, the Indian banks are clearly highly correlated with the overall Indian stock market, and the overall Indian market index had to be omitted because of high multicollinearity.

Table 4.5 : Bank Index Regression Result

Dependent Variable: CNX Bank Index	
Independent Variables	
	(1)
hkBank	0.48***
	(0.07)
stoxxBank_lng	0.24***
	(0.07)
S&PBank_lng	-0.01
	(0.05)
hkBank_d0	0.12
	(0.09)
stoxxBank_d0	-0.00
	(0.08)
S&PBank_d0	-0.01
	(0.05)
Time	0.00
	(0.00)
Cnxbank(-1)	-0.02
	(0.04)
datedummy	0.00
	(0.01)
Constant	0.00
	(0.01)
Observations	612
Adj. R-Squared	0.23

Standard errors in parentheses *** p<0.001, ** p<0.01, * p<0.05

Table 4.5 shows the regression output for the bank index with a dummy variable breaking the series into two time periods, each side of the 2007 onset of the financial crisis. The results suggest that there has been no shift in the relationship between the Indian and the Hong Kong and European banking indices before and after June 10th 2007. Even though Figure 4.1 and Table 4.2 suggest that the CNX Bank Index starts tracking the Hong Kong and European banks more closely after 2007, this is not corroborated by the regression results. The post 2007 interactive dummy for the HSF Index and the Stoxx Banking Index is not statistically significant. The regression suggests that if the HSF index increases by ten percentage points the CNX Bank Index should increase by 4.8 percentage points holding everything else constant. The relationship of the CNX Bank Index with the European banks is also statistically significant at the 0.1% level. A ten percentage point shift in the European banking index, would induct a 2.4 percentage point shift in the Indian banking index. The relationship between Indian and European banks suggests that the Hong Kong banks have a larger effect on Indian banks than the European banks. The weak relationship with the European banks and no relationship with the banking industry of USA, suggests that the banking industry of India, is not as integrated with the US bank stock prices to experience shifts in its stock prices with a shift in the US banks stock prices. So even though the Indian banks are becoming more global, they still have to integrate with the banking industry of developed countries such as the USA.

Table 4.6 shows the regression output for the Indian bank index against the overall indices of the Hong Kong, European and US stock markets, with the same set of post 2007 dummies. As time moves on, the Indian banking index displays a stronger positive relationship with the overall Hong Kong stock market. In the period 2000-2007, a ten percentage point shift in the Hang Seng Index would induct a 3.3 percentage point shift in the CNX Bank Index

holding everything else constant, significant at the 0.1% level. After 2007 the relationship gets stronger and a ten percentage point increase in the Hang Seng index leads to a 7.4 percentage point increase in the CNX Bank index, holding everything constant, significant at the 0.1% level.

Table 4.6 : Bank Index Regression Result

Dependent Variable: CNX Bank Index	
Independent Variables	
	(1)
Stoxx_lng	0.17
	(0.16)
hk_lng	0.32***
	(0.09)
S&P_lng	0.09
	(0.14)
Stoxx_d0	0.15
	(0.22)
hk_d0	0.41**
	(0.13)
S&P_d0	-0.22
	(0.22)
Time	0.00
	(0.00)
cnxbank_lag	-0.02
	(0.04)
datedummy	0.00
	(0.01)
Constant	0.00
	(0.01)
Observations	611
Adj. R-Squared	0.25

Standard errors in parentheses *** p<0.001, ** p<0.01, * p<0.05

The overall stock markets of Europe and USA have no effect on the Indian Banking Index, over a period of ten years, however the relationship of the banking industry of India is strengthening with stock markets of developing countries such as Hong Kong. This indicates that

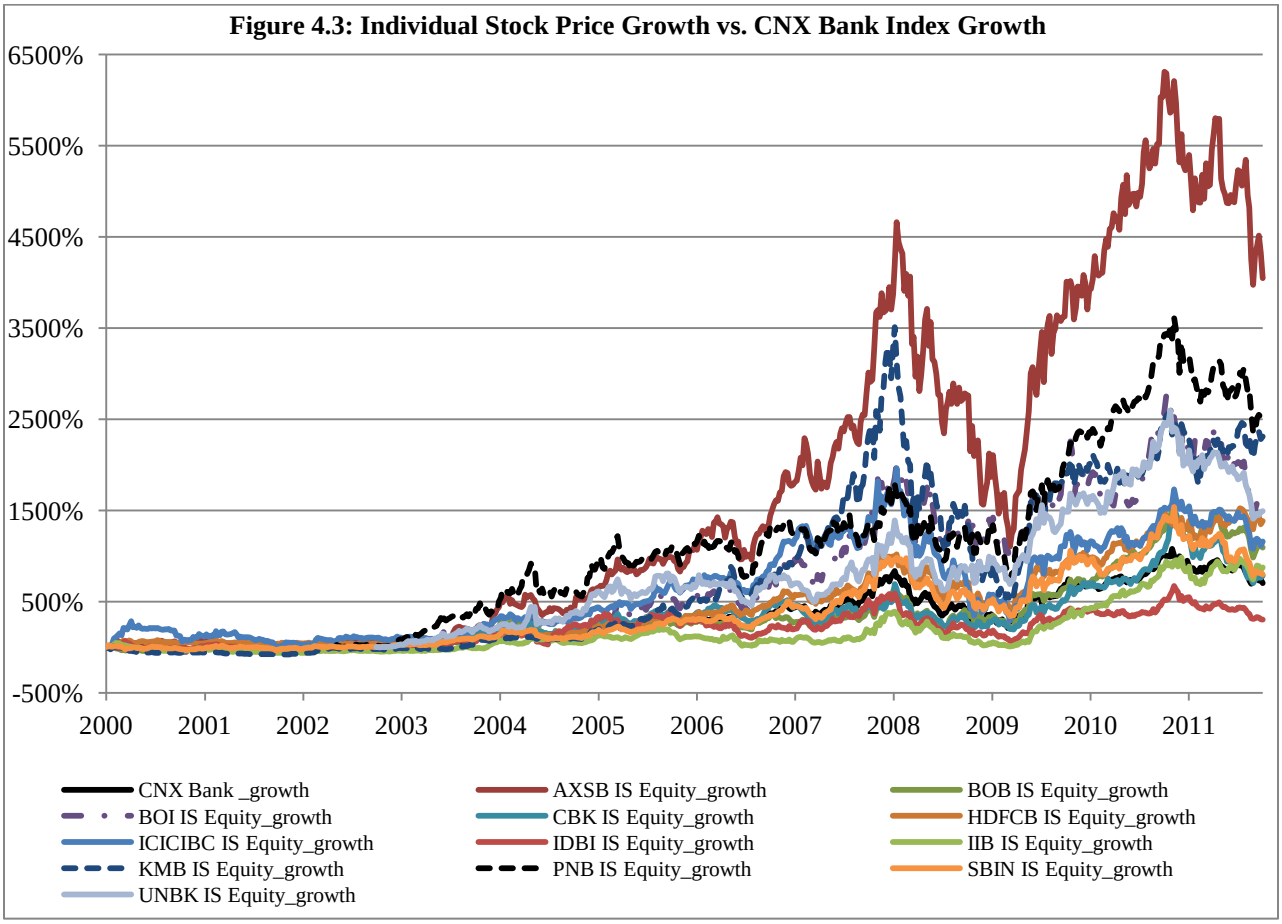
the Indian banking system may indeed be integrating globally with the banking sectors of other countries; however the stock markets of developed countries still have no impact on the banking industry of India. The Indian banking industry is integrating globally at a slower pace than its growth in India in the span of ten years.

The Indian banking industry is still developing. Even though it has been present for many centuries, the banking industry is not as well developed as banking industries in more developed countries; however, it is developing and growing at an exponential growth. As can be seen in Figure 4.1 average Indian banks share prices increase almost tenfold in the period from 2000 – 2008. Usually financial and economic growth goes hand in hand, and there are lots of studies that suggest that one precedes the development of the other. Rosseau and Sylla (2003) and Levine (1997) argue in various papers, that financial development leads to economic growth. A study done by Tennant, Kirton, and Abdulkadri (2010) develops proxies for Levine's five functions of the financial sector and models the relationship between these five functions (Levine 1997) and economic growths. The study finds that policy makers should not expect instant results from policies and or financial reforms; they have statistically significant results on long term GDP growth but none on short term growth. Considering the fact that India implemented its reforms in 1991 and another set in 1998, it is not surprising to see a tenfold growth in the Indian banking industry as compared to other developing and developed nations.

Returning to India's growth story after comparing it to a set of other countries, Figure 4.3 suggests that the banking index of India is in line with the individual share price performance of most banks, however Axis Bank in Figure 4.3 outperforms all the other banks with a 600 times increase in its value over the course of ten years. It also has the largest drop in the wake of the crisis, but manages to reach a record high, within a year of its drop. Upon even further

analysis, there are four top performing banks, Axis Bank, Kotak Mahindra Bank, Bank of India, and Punjab National Bank that outdo the average. Axis Bank and Kotak Mahindra Bank are private players in the industry. Punjab National Bank and the Bank of India are public banks. The CNX Bank index is actually an underrepresentation of the banking industry of India. It does not capture the full growth of the top players in the banking industry.

Figure 4.3: Individual Stock Price Growth vs. CNX Bank Index Growth



Indian banks might be experiencing exponential growth; however they are still tracking the main banking indices in their movements. Figure 4.2 shows that even though the Indian bank index started off with a marked difference from the other banking indices, however, by 2007 it had started following the trends of the other banking indices, the Hong Kong banking index in particular. Figure 4.2 is helpful in illustrating the growth of the Indian banking index, and the

increase in convergence after 2007 as shown by the regression results above. It can be said that the Indian banking industry is today in its developing stages and is experiencing massive growth and will become more globally integrated in the years to come, if it continues to reform and grow at the same speed it is today.

Chapter 5: Conclusion

The Indian banking sector has undergone various stages of development, starting in the 18th century, from a period of frequent failures to a more stable banking system, to one that was nationalized in the 1960's, to one that became unprofitable in the 1990's, to one that is today experiencing exponential growth in the 21st century. The Indian banking sector has performed very well in the past ten years based on the metrics of the CAMEL framework and the data analysis. In addition, it is now more affected by shifts in the banking sectors and the overall stock markets of other developed countries. The Indian banking sector is still developing and has a long way to go. It is not as mature as the banking systems of the developed nations. It still does not feature in the top fifty banks in the world, published by the Bankers Almanac. Interestingly, six Chinese banks are featured on this list. Thus, even though both China and India are fast paced developing countries, the Chinese banking system, is more massive in size and somewhat more concentrated in a few very large players, than the Indian system.

Privatization and liberalization has benefitted the Indian banking system, with gains accruing to public and private banks alike. Public banks have performed very well according to the CAMEL Framework and have performed better than private banks in some instances. Two of the four largest growing banks in India are public banks. However, this paper finds that the private banks perform better than the public banks on all measures of the CAMEL Framework, so even though the public banks have come a long way, they have a long way to go to compete with the operational efficiency levels of private banks. In addition, this thesis finds that the Indian banks have recovered from the crisis and most of the private banks are displaying an upward trend in terms of profitability and liquidity.

The analysis of the CNX Bank Index against other country's indices, leads us to believe, that the Indian banking industry is slowly integrating with other countries' banking sectors. The Indian banking industry is linked closely to both the Hong Kong and the European banking industries in terms of share price. In addition, the Indian banking industry's relationship with the Hong Kong overall stock market has strengthened over the years. However, there is no significant relationship with the US Stock Market or the US Banking Index.

However, despite this phenomenal growth and recovery from the Great Recession, Indian banks have a long way to go. One of the most important tasks is to improve operating efficiency while optimizing operating costs, by improving technology and catching up with foreign banks. There is scope for further research on the exponential growth of the Indian banks. In addition the private banks experienced even higher growth than most public banks in the same time span. It will be very interesting to know what particular factors caused such rapid growth in the Indian banking industry. Two questions that arise out of the last section are: (1) can Indian banks attain global size? and (2) should they aspire to this? According to the Reserve Bank of India, latest report on the performance of the Indian Banking Industry, Indian banks will not make it to the top ten banks in the world even after consolidation of the few biggest banks in India. Competition for customers has increased, as the public banks no longer have the upper hand arising from being the only banks in India. Deregulations on minimum lending rate and the recent deregulation on October 25th, 2011 of the savings deposit interest rates, will lead to further competition.

With more globalization, deregulation, the banking system is becoming more complex riskier. Thus, this thesis gives way to questions that require further research.

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