

FINANCIAL SECTOR LIBERALIZATION AND ITS CHALLENGES TO THE LOCAL BANKS – THE EXPERIENCE OF SINGAPORE¹

Tan Swee Liang*, Gilbert Tan Yip Wei**

Abstract

The main theme of the paper is about the challenges that financial sector liberalization poses to local banks. It reviews the experience of Singapore. We begin by explaining the unique circumstances surrounding Singapore. A small city-state controlled by a single party with about 65% majority in Parliament, Singapore has a paternalistic government that can be protective of industries that are strategic to the development of the country. Yet its government is also pragmatic, forward-looking and pro-reformists. Because of its unique circumstances, the Singapore experience with liberalization is worth studying. Three key ideas will emerge in the paper. First, the results of our econometric studies illustrate the extent of influence that financial sector reforms have on integrating the domestic stock market in Singapore with major markets in US and Japan. The results confirm strong statistical evidence of financial market integrations. The second idea studies the impact that liberalization poses to the management strategy of the local banks. We saw a range of responses such as consolidation, regional expansion, search for efficiency, best risk management practices to adoption of technology. The third idea is to gain insights on the prospects of financial intermediation activities as a result of market liberalization. The findings in the paper are reinforced by the results of a market survey we conducted. The survey was conducted to review how reforms have influenced the perception of market players on banking environment.

Key words: Financial Services Liberalization; Bank Management, Financial Institutions and Services

JEL classification: G2.

1. Introduction

This paper discusses the experience of Singapore with regards to the challenges that financial sector liberalization poses to local banks. Because of its unique political-economic structure, the Singapore experience with liberalization is worth studying. A small city-state controlled by a single party with about 65% majority in Parliament, Singapore has a paternalistic government that can be protective of industries that are strategic to the development of the country. An interesting structure of the corporate landscape is that the government owns, through its investment arm Temasek Holdings, stakes in many of Singapore's largest companies, such as in telecommunications giant ([SingTel](#)), [Singapore Airlines](#), port services ([PSA International](#)), mass rapid transit ([SMRT Corporation](#)), utility ([Singapore Power](#)) and in shipping ([Neptune Orient Lines](#)). It holds investments in public icons like the [Raffles Hotel](#) and the [Singapore Zoological Gardens](#). It also holds a stake in [Singapore Pools](#), the only legal betting company in Singapore. And in banking, the largest of the local banks Development Bank of Singapore (or, DBS Group) is 28% owned by the Temasek Holdings. Thus seen, the government has been protective of industries that are strategic to the development of the country. In the recent decade however, the government has been gradually removing its protective policies as well as its stakes in key sectors of the economy such as banking, telecommunications and utility.

* School of Economics and Social Sciences, Singapore Management University, Singapore.

** Lee Kong Chian School of Business, Singapore Management University, Singapore.

¹ We wish to thank Tse Yiu Kuen for his comments on the paper that led to its improvements. We wish to thank Zheng Yi for her excellent research assistance skills and to Ng Chong Geng for his input. We are grateful to the bankers in the local and foreign institutions who participated in our market survey.

Much has already been written about the liberalization process of the financial sector in Singapore (for review, see Tan, 2005). In this paper, the focus instead is to present a framework to analyze the challenges that liberalization poses on the local banks. To begin, we briefly describe the background of the banking sector. We discuss the approach the state has adopted and the circumstances that compel the state to pursue liberalization. We discuss the extent that financial sector liberalization in a country has led to integration of its domestic equity market with foreign equity markets. The discussion leads to several interesting issues: how regulatory changes have affected the management strategy of local banks. What impact would they have on intermediation financial activities? How have they affected the banks' search for efficiency and their quest for markets?

The financial sector is dominated by the banking industry with a two-tier structure that consists of wholesale and retail banking. In retail banking, foreign banks face more operational restrictions as compared to wholesale banking. Moreover for strategic development reasons, the local banking groups have a strong presence in the retail banking sector. Recently however, the government has taken some steps to relax its control on the retail banking sector. Phased over two stages between the periods 1999 to 2004, the first phase was about creating the environment for domestic financial institutions to develop their capabilities, strengthen their management teams, seek out global opportunities and expand their presence in the region. The outcome was numerous industry consolidations, which resulted in a decline in the number of Singaporean banks from five units to three units, as well as some prominent regional acquisitions by the local banks.

In the second phase beginning in 2001, the government granted what is called "qualifying full bank" (QFB) licenses to six foreign banks which are recognized to have established an important presence in the Singapore economy. With the licence, foreign banks can increase their number of service locations to a maximum of twenty-five from the previous limit of fifteen, effective 1 January 2005. The twenty-five locations could either be brick-and-mortar branches or offsite Automatic Teller Machines (ATM) locations. The foreign banks could share among themselves their network of about 150 ATMs located across Singapore. Coupled with a change in ruling after June 30, 2006¹ that allowed the qualified foreign banks to apply for access to local ATM networks, these measures would provide the foreign banks with significant scope to expand their presence in the domestic market. They also could provide electronic funds transfer, point-of-sale debit services, accept Central Provident Fund (CPF) fixed deposits, and provide Supplementary Retirement Scheme and CPF Investment Scheme accounts. Many of these services had happened in recent years.

The timing of the five-year program of banking reforms was planned ahead of Singapore's impending negotiation of Free Trade Agreements (FTAs) with its major trading partners (for example, US, Canada, Mexico, India, Sri Lanka, Jordan, Bahrain, Panama and New Zealand). Singapore's goods sector has been recognized as being fairly open to free trade already², which leaves the services sector, especially the financial sector as a possible target of negotiation for freer trade, and hence greater competition for the local institutions. Thus, the timing of banking reforms was seen as critical in setting the pace for the local banks to be ready to hold their own when competition comes into force. The idea is to nurture healthy and fair competition that can strengthen the incentives for local banks to improve efficiency and grow in resilience and maturity.

The paper is organized as follows. In section 2 we used econometrics techniques to measure the extent that financial sector liberalizations have brought about integration of the Singapore's stock market with the US, Japan and Hong Kong markets. The results provided some perspectives on the pace liberalizations preferred by the state. In section 3, we discuss the impact that liberalizations

¹A complete list of reforms can be found at this website http://www.ustr.gov/Document_Library/Fact_Sheets/2002/Free_Trade_with_Singapore_America's_First_Free_Trade_Agreement_in_Asia.html

² For social and environmental reasons Singapore levies high excise taxes on distilled spirits and wine, tobacco products, motor vehicles (all of which are imported) and gasoline.

have on management strategy of local banks. In section 4 we discuss the prospects of financial intermediation activities, based on the classifications that there are four types of intermediations within and between domestic providers and foreign users of capital. The last section gives the conclusion.

2. Financial Sector Integration

The financial sector in Singapore has grown rapidly over the past four decades, so much so it has become an integral part of the global financial system. By global ranking, Singapore is now the fifth largest derivative market, after London, Tokyo, New York and Paris – this is a major achievement for Singapore given its humble beginnings. The average daily turnover of foreign exchange transactions in Singapore in 2004 was US\$125 billion, placing Singapore the fourth largest global centre for foreign exchange activity.

To measure how integrated the market has been with the rest of the world, we conducted two econometric studies. In the first study, we examined Singapore's stock market integration with US and Japan markets by measuring and attributing the volatility of Singapore's equity prices vis-à-vis the two markets using Akdogan (1996) model. In the second study, we tested for the presence of long-term integration between Singapore's financial integration with US, Japan and Hong Kong using the Johansen co-integration test.

We explain the methodology of the two studies and make inferences about the results.

(i) Econometric model #1

In the first study we measured Singapore market's beta against the United States benchmark and Japan benchmark¹. The US market was chosen as a benchmark to represent the major developed markets, while the Japan market was used as a benchmark to represent the Asian regional market. The US market is a reasonable proxy to use to capture the integration of the Singapore with the major global markets, because as measured by the Morgan Stanley Capital International (MSCI) All Country World Index of equity markets, the weight of the USA index is more than half the world market capitalization. The Japan market is a reasonable proxy for the Asian regional market because of its geographical proximity, and being a single index, the advantage of using it is that it can capture the regional effect.

McGuire and Schrijvers (2003) measured the degree of financial market integration by studying the volatility of emerging market bond prices. We chose not to use bond market indices because the lack of liquid secondary bond market in Singapore and the region could mean that using the bond market indices may not truly capture the underlying degree of integration of a broad financial sector such as Singapore.

We extended the Akdogan (1996) model

$$R_{sgp,t} = c + \beta_{us} R_{us,t} + \beta_u U_{r,t} + \varepsilon_t, \quad (1)$$

where $R_{sgp,t}$ is the log return on the price index of the Singapore stock market and $R_{us,t}$ is the log return on the price index of the US stock market. ε_t is the residual of country i assumed to be normally distributed with mean zero and constant variance. $U_{r,t}$ is obtained as the residual from the following regression

¹ This paper is an extension of what was done in Akdogan (1996). See Zheng and Tan (2006) for alternative approach to modeling stock market returns using GARCH (1,1) model.

$$R_{jap,t} = c + \beta_1 R_{us,t} + U_{r,t}, \quad (2)$$

where $R_{jap,t}$ is the contemporaneous logarithmic return of country Japan. By construction, the term $U_{r,t}$ captures stock market shocks in the region that are unrelated to shocks in the major global markets. There is the possibility of common news driving both regional and major markets, thus some correlation is expected between these stock market indices. This means that if the standard market indices were used directly in the equation (1), the problem with multi-collinearity could lead to unreliable assessments of the relative strength of explanatory variables. To overcome this, the indices were orthogonalized as seen in (2).

Taking the variance of both sides of equation (1),

$$\delta_{sgp}^2 = \beta_{us}^2 \delta_{us}^2 + \beta_u^2 \delta_u^2 + \delta_\varepsilon^2. \quad (3)$$

Equation (3) says that total risk associated with Singapore portfolio can be divided into three components: the US (or global) risk, the Japan (or regional) risk and country-specific risk. Dividing both sides of (3) by δ_{sgp}^2 we obtain

$$A + B + C = 1 \quad (4)$$

$$\text{with } A = \frac{\beta_w^2 \delta_{us}^2}{\delta_{sgp}^2}, B = \frac{\beta_u^2 \delta_u^2}{\delta_{sgp}^2} \text{ and } C = \frac{\delta_\varepsilon^2}{\delta_{sgp}^2},$$

where term A is the measure of Singapore's integration with the global market, while B is the measure of Singapore's integration with the regional market. A higher value of A (or B) suggests that the Singapore market has become more integrated with the US (or Japan) benchmark market. By contrast, a lower value of A (or B) implies a greater degree of segmentation from the US (or Japan) benchmark market. The variable C measures the risk of the Singapore portfolio that is associated with its country-specific factor. It is a measure of the changes in the Singapore stock market price index that are due to circumstances that are unique and specific to Singapore itself.

The data used were the weekly equity indices between the periods of January 1985 to December 2004, expressed in US dollars, as compiled by Datastream. The indices used were the Singapore Straits Times Index (for Singapore), the Nikkei 225 Stock Average (for the Japanese benchmark) and the S&P 500 (for the US benchmark). We chose to use weekly returns for the following reasons. Firstly, weekly returns avoid the problems of day-of-the-week effects of daily data, as well as the well-known January/December effect of monthly data. The second advantage is that by computing the Friday-to-Friday period, it is possible for the weekly data on equity returns in different national markets to overlap, so that the market information that impacts the equity markets could be shared among countries.

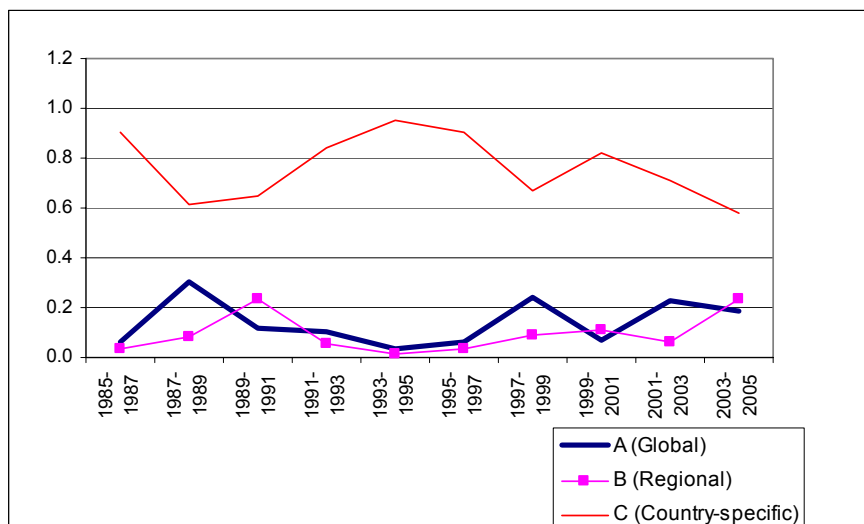
We carried out the estimation of the econometric model over two-yearly sub-periods starting from 1985 and ending 2004. Computations of the integration scores are reported in Table 1 and Figure 1. The degrees of Singapore's stock market integration with the major global markets and regional market are represented by lines A and B respectively, while line C measures risk due to country-specific factor.

Table 1

Financial Sector Integration Scores

	Variable		
	A (Global)	B (Regional)	C (Country-specific)
1985-1987	0.06	0.04	0.91
1987-1989	0.30	0.08	0.61
1989-1991	0.12	0.24	0.65
1991-1993	0.10	0.05	0.84
1993-1995	0.03	0.01	0.95
1995-1997	0.06	0.04	0.91
1997-1999	0.24	0.09	0.67
1999-2001	0.07	0.11	0.82
2001-2003	0.23	0.06	0.71
2003-2005	0.19	0.23	0.58

Note: 'A' measures Singapore's integration with the global market, 'B' measures Singapore's integration with the regional market, and 'C' measures the risk of the Singapore portfolio that is associated with its country-specific factor.



Note: Country-specific factor (line C) has decreased over time. By contrast, the degree of Singapore's stock market integration with the global market (line A) and with the regional market has increased over time.

Fig. 1. Financial Sector Integration Scores

It is observed that the score for Singapore's country-specific factor has decreased in value between the periods from 1985-1987 to 2003-2005; the integration score fell from 0.91 to 0.58. By contrast, the degree of integration with the global market has increased over time; the global factor score rose from 0.06 to 0.19. Likewise, the degree of integration with the regional market has increased over time; the regional factor score rose from 0.04 to 0.23. There were crisis periods when the global factor score registered unusually sharp rises. These were seen during the 1987-1989, 1997-1999 and 2001-2003 when the scores rose by more than twenty-fold, compared to normal periods.

External factors, namely the US stock market crash and the Asian financial crisis, could provide explanations of these.

(ii) Econometric model #2

In the second study, we tested for the presence of long-term integration between Singapore's financial integration with the global and regional markets using the Johansen co-integration test¹. Co-integration theory states that if two or more stock market indices are co-integrated, then there exists a long-run equilibrium relationship between the two series. Thus, by studying whether there is a co-integration relationship between the Singapore stock market and other stock markets, we could test statistically if the process of financial liberalizations in Singapore over time has caused Singapore's financial market to be integrated into the world market and regional market.

The economies used in this comparison are the United States, Japan and Hong Kong and the time period examined were from January 1985 to January 2005. The estimation periods were divided into three sub-periods: (i) January 4, 1985 to January 2, 1987; followed by (ii) January 9, 1987 to January 3, 1997; and (iii) January 10, 1997 to December 31, 2004.

Similar to the first study, weekly equity index returns, in US dollar terms, were obtained from Datastream. The stock market indices were the Singapore Straits Times Index (for Singapore), the Nikkei 225 Stock Average (for Japan), the S&P 500 (for the United States) and the Hang Seng Index (for Hong Kong). The Johansen co-integration test was then used to test for co-integration between these equity indices.

Co-integration theory states that if two time series, y_t and x_t , are integrated of order 1, which is denoted as an I(1) process, then in general, the relationship $y_t - \beta x_t$, is also integrated of order 1, for any number β . Nevertheless, it is possible that for some $\beta \neq 0$, the relationship $y_t - \beta x_t$ has an I(0) process. In our study, we first tested the stock indices for the respective countries for stationarity, using the Augmented Dickey-Fuller (ADF) test. The test is based on the OLS regression with the null hypothesis of $a_1 = 0$.

$$\Delta y_t = \beta_0 + \alpha_0 t + \alpha_1 y_{t-1} + \sum_{i=1}^p \beta_i \Delta y_{t-i} + \varepsilon_t.$$

We applied the ADF test on the four equity market indices, for each of the three sub-periods. The analysis showed that the null hypothesis could not be rejected in all the countries we considered, which suggested that the equity price series are non-stationary.

Next, we conducted the test for co-integration between the Singapore stock market with the US, Japanese and Hong Kong markets using the Johansen co-integration test. Following the Johansen (1988) procedure, we focused on the model

$$X_t = A_0 + A_1 X_{t-1} + \varepsilon_t.$$

This can be rewritten as

$$\Delta X_t = A_0 + \Pi X_{t-1} + \varepsilon_t \quad \Pi = A_1 - I,$$

where r is the rank of the matrix Π , with the rank of Π equals the number of co-integrating vectors. If $\text{rank } \Pi = 0$, the matrix is null. Since there is no linear combination of the (X_{it}) processes that is stationary, the variables are not co-integrated. Instead, if Π is of rank n , the vector process

¹ Similar use of this methodology can be found in the works by Sheng and Tu (2000) and Cheung and Liu (1994).

is stationary; if $\text{rank } \Pi = 1$, there is a single co-integrating vector; if $1 < \text{rank } \Pi < n$, there are multiple co-integrating vectors. The results of the Johansen test are presented in Table 2 below.

Table 2

The Johansen Test for Financial Integration

			Null	Trace Statistic	CV* (5%)	p-value
Singapore	1985-1987	US	$r=0$ ^{1/}	4.28	15.49	0.88
			$r \leq 1$ ^{2/}	0.74	3.84	0.39
		Japan	$r=0$	10.04	15.49	0.28
			$r \leq 1$	1.04	3.84	0.31
		Hong Kong	$r=0$	7.47	15.49	0.52
			$r \leq 1$	1.48	3.84	0.22
Singapore	1987-1997	US	$r=0$	6.49	15.49	0.64
			$r \leq 1$	1.97	3.84	0.16
		Japan	$r=0$	9.47	15.49	0.32
			$r \leq 1$	0.12	3.84	0.73
		Hong Kong	$r=0$	6.13	15.49	0.68
			$r \leq 1$	0.19	3.84	0.66
Singapore	1997-2005	US	$r=0$	15.07	15.49	0.06
			$r \leq 1$	2.90	3.84	0.09
		Japan	$r=0$	10.89	15.49	0.22
			$r \leq 1$	3.18	3.84	0.07
		Hong Kong	$r=0$	25.95**	15.49	0.0009**
			$r \leq 1$	6.49**	3.84	0.01**

1/ The null $r=0$ is tested against the alternative of $r>0$.

2/ The null $r \leq 1$ is tested against the alternative of $r>1$.

* CV: Critical value

The low p-values suggest at the 10% confidence level, the presence of long run equilibrium exists between the Singapore stock market index and each of the countries' stock price indices.

From Table 2, we noted that the p-values during the periods of 1985-1987 and 1987-1997 were very large. The large p-values suggest that statistically, there was no evidence of long run equilibrium between the Singapore stock price index and any of the other countries' stock price indices. However during the period of 1997-2005, the p-values dropped to less than 0.1 (with the exception of when we are testing for integration with Japan using the null hypothesis of $r=0$). This suggests, at the 10% confidence level, that long run equilibrium exists between the Singapore stock market index and each of the countries' stock price indices.

The econometric test suggested that there was statistical evidence of integration of the financial sector between Singapore and the US, and Singapore and the regional economies¹. The econometric estimate showed that the pace of liberalization, as measured by the financial integration score, has been relatively slow over the last two decades. The results of our econometric estimates were consistent with the market view that the Singapore government has been inclined to take a "mini-bang" instead of a "big bang" approach to liberalization. The Singapore government is known to

¹ Our empirical findings, that the Singapore's financial market is integrated with the rest of the world, are consistent with the results in the paper "Financial Market Integration in Singapore: The Narrow and the Broad Views", by the MAS, where three macroeconomic benchmarks for evaluating the degree of financial market integration were conducted.

prefer a gradualist approach to liberalizing the financial sector to foreign competition without compromising the soundness of the domestic financial system or conduct of the monetary policy, or jeopardizing the stability of the economy. Examples of the gradualist approach could be seen in the government's relaxation of the policy of the non-internationalization of the Singapore dollar. Another example was the five-year program of banking reforms which were phased over two stages between the period of 1999 to 2004. The results of the econometric estimates provided interesting study of how a gradualist, pragmatic interventionist approach to liberalization in the case of Singapore could work in the real world, as opposed to the much touted neo-classical approach that often called for rapid liberalization with minimum government intervention.

3. Impact on Management Strategy of Local Banks

In Section 2, we measure the extent that financial sector liberalizations have brought about integration of the Singapore's stock market with the US, Japan and Hong Kong markets. The results showed strong statistical evidence of financial market integrations, and the discussions provided some perspectives on the pace liberalizations preferred by the state. In this section, we study the impact of liberalizations on management strategy of local banks, which saw a range of responses from consolidation, regional expansion, search for efficiency, best risk management practices to adoption of technology. We also consider the impact of liberalizations on management strategy from the perspective of what we call the product/market matrix. In the next section we provide a different perspective on liberalization by studying the impact on the financial intermediation activities using the following classification of activities (within and between domestic providers).

To begin, the government has been prodding the local banks to consolidate and strengthen their positions in the local market. The Chairman of the central bank, the Monetary Authority of Singapore (MAS) Lee Hsien Long (2001) noted that "...being big is no guarantee for success, as shown by the persistent difficulties of the Japanese banks over the last decade But being a small bank is definitely a significant handicap". This seemed to suggest that the state feared local banks cannot remain niche players, sizeable in the domestic market, yet small by international standards. The fear is justifiable as competition is expected to intensify with continued consolidation in the banking industry globally (more so in US and Europe). The past decade already saw numerous very large bank mergers, like JP Morgan Chase with Bank One (2004); JP Morgan with Chase-Manhattan Bank (2000); Citicorp with Travellers Group (1998); UBS with Swiss Bank Corp (1997); Mitsubishi Bank with Bank of Tokyo (1996); and Chase Manhattan with Chemical Bank (1996).

The outcome of the state's persuasion was a major banking consolidation that resulted in three banking groups, down from seven groups previously – in less than five years. DBS Bank became the largest Singapore bank followed by UOB Bank (which merged with OUB Bank in 2001) and OCBC Bank (which bought Keppel-Tat Lee Bank in 2001). Despite the consolidation, the asset size of the three major local banks adds up to less than US\$ 0.1 trillion (see Table 3 below). Combined, the asset size of the three major local banks is small according to international standards, in comparison with the asset size of the top global banks such as US Citigroup at US\$ 1.19 trillion, JP Morgan at US\$1.1 trillion, and BOA/Fleet Boston at US\$0.97 trillion.

Table 3

Total Assets of Singapore Banks, as of end of 2003

	Assets (S\$ million)
Development Bank of Singapore (DBS)	159,959
United Overseas Bank (UOB)	113,446
Oversea-Chinese Banking Corp (OCBC)	83,497

Note: The combined asset size of the three major local banks is small by international standards.

Source: Monetary Authority of Singapore.

In addition to the government's urge for consolidation, it has also prodded the local banks to take the acquisition route for further growth. Fortuitously market deregulation in neighboring economies has increased acquisitions opportunities for Singapore local banks. As their economies grow, banks would need to support business expansion and risk management requirements. This means that less developed banking systems in the region will be seeking additional capital, as well as world class management and operational expertise which can likely be met by foreign investors. Singapore banks have been taking advantage of the opportunity to invest into growing economies in Asia. Local banks acquired retail subsidiaries in Hong Kong, Indonesia, Philippines and Thailand. For example, DBS' acquisition of Thailand's Thai Danu in 1998 and Hong Kong's Dao Heng Bank in 2001; DBS' joint venture with Indonesia's PT Bank in 2000; UOB's 75% equity stake in Thailand's Radanasin Bank, and UOB's signing of a Memorandum of Understanding with Beijing Securities Co. Ltd. in June 2003 to set up a fund management company in China.

Besides the activities of local banks, the government has carried out its regionalization drive through its investment arm, Temasek Holdings. In Malaysia, it invested in the holding company of Alliance Bank Malaysia, Malaysian Plantations in 2005; in Pakistan it invested in NDLC-IFIC Bank in 2005; in Thailand it invested in Siam Commercial Bank in 2004; and in Indonesia it acquired PT Bank Danamon Indonesia through a consortium with Deutsche Bank in 2003, and PT Bank International Indonesia through a consortium with Kookmin Bank, ICF Financial Group Holdings and Barclays Bank in 2004. On a global stand, Temasek Holdings acquired a 12% stake in Standard Chartered Bank in 2006.

Table 4 gives an interesting illustration on the stages of consolidation, market characteristics and government involvement.

Table 4

Stages of Consolidation in the Banking Sectors

	Domestic consolidation (Stage I)			Attract cross-border Investments (Stage II)	Regional / Global expansion (Stage III)	
Stage of Consolidation	India	Taiwan	Japan China Malaysia	Korea Indonesia Thailand	Australia N. Zealand Singapore Hong Kong	North America, Developed European countries
Market characteristics	Fragmented domestic market. Large numbers of small and medium sized banks.			Improved bank infrastructure. Fewer, but stronger banks. Reduced risk for investors.	Home market saturation.	
Government involvement	Policies and guidelines to encourage domestic consolidation. Schemes to restructure national and state owned banks. Changes to banking regulators to reduce cross-shareholding. Increase capital adequacy ratios (CAR). Initiate deregulation initiatives			Implementation of banking standards, eg Basel Accord, corporate governance, tax laws and accounting transparency. Implement deregulation programs. Develop capital markets, e.g. debt markets.		

Source: The Changing Banking Landscape in Asia Pacific: A report of Bank Consolidation, Deloitte and Touche, 2005.

Singapore is considered to be at stage III of consolidation, while Japan is considered to be at stage I. This ranking is not surprising, given Singapore's unique circumstances of being a small city state with small handful of domestic banks and having a strong-willed government insistent on regional expansion. It is also helped by the fact that with DBS being 28% owned by the government, one would expect it to be used as a vehicle by the state to take a lead role in the state's pursuit for liberalization. Japan, on the other hand, is a large country with many banks (large and small), and has not had a strong visionary government for many years.

One ruling that has been relaxed is the foreign shareholding limits on locally-incorporated banks, in anticipation that when local banks operate outside the domestic market, they may need to grow bigger in order to hold their own and be viable. In this regard, the government has removed foreign shareholding limits on locally-incorporated banks to allow the local banks to tap the equity market more flexibly. When the time is right and the opportunity arises, they can form strategic partnerships with foreign banks.

Liberalization dictates the need for banks in Singapore to improve on their efficiency. Leong, Dollery and Coelli (2002) highlighted a few factors that can influence bank efficiency. One of them is through changes in structure of regulation and organization. In the case of Singapore, the MAS' change in regulation that requires banks to divest non-core assets and invest into core business in financial services is one example of how regulatory factors are used to raise the standard of efficiency. Another example is the MAS ruling on requirements for board nomination and compensation committees, as well as for a majority of directors who are separately independent of management and substantial shareholders. As Berger, Hunter and Timme (1993: 243) observed: "It seems likely that regulation has also had effects on efficiency by influencing a financial institution's organizational structure".

Another factor that Leong, Dollery and Coelli (2002) highlighted was effective risk management practices. In the face of informational asymmetry, successful identification of risk can enable banks to determine effective protection strategies against unanticipated losses. A balanced risk-reward profile may lead managers to greater competitive flexibility in terms of pricing, capital allocation and business strategy. With the expansion of regional operations, local banks would be subjected to a higher degree of business risk. So risk management plays a critical role in maintaining the safety and soundness of banks. This is especially important since the MAS' supervisory approach towards all banks has moved away from tooth-combing for compliance with regulations towards one of assessing the quality of governance, controls and risk management processes. In Singapore the banks are mandated to have systems and risk management practices that are commensurate with the scale and complexity of their operations. Higher banking disclosure standards, greater transparency in corporate finance and processes related to the Stock Exchange of Singapore were also introduced. The *Committee on Banking Disclosure's* recommendations in 1998 aimed to raise the standard of financial disclosure to be closer to European and US standards. In 1998, for the first time banks disclosed doubtful loan provisions classified into specific and general, loan portfolio by industry, current market values of investments, sources of revenue and expenses, and details of off-balance sheet transactions.

Another factor that Leong, Dollery and Coelli (2002) highlighted was the adoption of technology. Banks worldwide have invested a lot in information technology to develop e-banking as a new generation of customers will want to do business over the internet. The assumption is that large banks with a large customer base will be able to spread out the fixed costs; smaller banks will not be able to do so effectively. There is counter-argument that small, yet specialist players have the opportunities to thrive, for example in niche areas such as investment banking, if they distinguish themselves through depth of expertise and distributional reach.

Lastly, we consider the impact of liberalizations on management strategy from the perspective of what we call the product/market matrix. In Figure 2 we drew a two-by-two product/market matrix which forms the four strategic options available to banks.

	Existing Markets	New Markets
New Products	Option 2: Introduction of new products/ services, e.g. wealth management, investment products	Option 4: New products in joint-ventures/ acquisitions
Existing Products	Option 1: Operational efficiencies	Option 3: Joint venture / acquisition of retail subsidiaries

Note: We identify the two-by-two product/market matrix as a four-strategic option for local banks.

Fig. 2. Products/Markets Matrix

The first option is to compete within the existing market offering the same products/services as before. To compete well in this option, the banks would need to improve on their operational efficiency. This means that the banks would have to put their act together to offer banking products/services at a lower rate than their competitors. Another avenue of growth lies in the second option, which is to introduce new banking products and services in existing market. The recent proliferation in new wealth management and investment-related products in Singapore showed that the banks were aggressively pursuing this strategy. This strategy is supported by our finding in an exploratory interview of about 40 market players. We conducted the interview to gauge the perception of market players on the banking environment after the recent round of liberalization in 2001. It was shown that wealth management was the most promising sector by survey participants in the local banks (see Table 5).

Table 5

Promising Sectors in Singapore for the Financial Institutions to Grow

Local institutions	%	Foreign institutions	%
Retail lending	43.2	Retail lending	27.0
Corporate lending	45.9	Corporate lending	16.2
Fund management	35.1	Fund management	40.5
Wealth management	56.8	Wealth management	86.5
Risk management	27.0	Risk management	18.9
Insurance	18.9	Insurance	8.1
Stock broking	8.1	Stock broking	2.7
Fixed income (debt)	16.2	Fixed income (debt)	21.6
Derivatives	21.6	Derivatives	37.8
Universal processing	10.8	Universal processing	2.7
Alternatives investments (hedge funds, private equity, REITS)	29.7	Alternatives investments (hedge funds, private equity, REITS)	40.7

Note: We conducted an interview to gauge the perception of market players on the banking environment after the recent round of liberalization in 2001. It was shown that wealth management was the most promising sector by participants in the local banks.

The third strategy is to extend the existing operations to the region. Essentially the bank would be offering the traditional banking products and services overseas in the region. In practice, this is achieved through acquisition of a local bank in the region. In the market survey we conducted, our respondents were asked on their perceptions of the most promising markets for the local institutions. The three most important markets highlighted were China, Indonesia and India (see Table 6). 78.4% of the respondents indicated that China would be one of the most important markets for the local financial institutions; 45.9% indicated Indonesia and 43.2% indicated India. In contrast

only 16.2% indicated Singapore. Hence, the findings suggested that there has to be a push for the local institutions to look beyond Singapore for growth.

Table 6

What the Local Financial Institutions Considered as their Important Markets in The Future

	%		%
China	78.4	Singapore	16.2
Taiwan	5.4	Malaysia	29.7
Korea	21.6	Thailand	18.9
India	43.2	Philippines	2.7
Middle East	27.0	Indonesia	45.9

Note: In the market survey we conducted, our respondents were asked on their perceptions of the most promising markets for the local institutions. The three most important markets highlighted were China, Indonesia and India.

The fourth option may offer the most promise for growth. It involves the banks creating new products and services that are relevant in the foreign markets. But it is also the most challenging because it requires an understanding of a series of issues – the business and hence the needs of the bank clients, the market environment, the competitors and the regulatory environment. Thus not surprisingly, banks in Singapore have preferred to seek partners with local expertise in the target market, either through acquisitions joint ventures.

4. Challenges of Liberalization from Perspective of Financial Intermediation

In this section we provide a different perspective on liberalization by studying the impact on the financial intermediation activities using the following classification of activities (within and between domestic providers and foreign users of capital, see Table 7).

Table 7

Classification of Financial Market Activities

Type (providers – users)	Activity
1 (D – D)	Intermediates between domestic providers of capital and domestic users of capital.
2 (F – D)	Intermediates between foreign providers of capital and domestic users of capital.
3 (D – F)	Intermediates between domestic providers of capital and foreign users of capital.
4 (F – F)	Intermediates between foreign providers of capital and foreign users of capital.

D – Domestic; F – Foreign.

Note: We explain that banks engage in four types of intermediations activities; they are classified as activities within and between domestic providers and foreign users of capital.

Local banks faced intense competition with liberalization and little growth opportunities in Type 1 activities, a result of Singapore's small domestic market size. There is limited potential for Type 2 activities to grow because of structural factors inherent to the country, namely its high rate of savings and large government surpluses. There is good potential for Type 3 activities for local banks to grow given the government's policy to gradually relax its policy of non-internationalizing the Singapore dollar. Of all the types of activities, Type 4 activities of local banks have the best poten-

tial to grow because of the government's liberalization policy which forced local banks to venture abroad. This would mean more intermediation businesses between foreign providers of capital and foreign users of capital. The government's policy to expand the presence of government-linked companies into the region can also result in more Type 4 activities taking place.

In the remaining section we relate the impact of liberalizations on each of the four types of intermediation activities.

Type 1

Until recently, local banks in Singapore have played a dominant role in Type 1 activities by providing financial intermediation between domestic providers of capital and domestic users of capital. This type of intermediation activity has been protected from foreign competition largely because of national interest. The government's belief was that Singapore needed strong and well-managed local banks with a significant share of the home market for a resilient and stable financial system. However, as FTA negotiations would mean demand from trading partners for a more liberal services sector, including the financial sector, it would be not possible for the government to protect the local banks from foreign competition for too long.

With a small domestic market and the need to maintain market share, innovation of products and services has been another critical strategy for local banks. Examples include selling products and services that generate fee-based income (wealth management), packaging of attractive home mortgages, innovative products catered to entrepreneurs and mid-sized enterprises.

Type 2

For Type 2 activity, which involves the intermediation between foreign providers of capital and domestic users of capital, Singapore is relatively less developed compared with the major international financial centres such as London and New York for the following reasons: In bank lending, there is limited intermediation between foreign providers and domestic users of capital; this is not surprising in Singapore because the nation's domestic savings already provide adequate financing for domestic investment. Likewise, in bond finance, activities between foreign providers and domestic users are limited. Again the lack of bond market development in foreign-to-domestic intermediation is not surprising. The government has been prudent in the fiscal management of the nation, and hence there is no major need for the government to issue securities for raising funds. However changes in rulings to spearhead the bond market have resulted in decent corporate and government bond activities taking place¹. On the other hand, there is active intermediation between foreign providers and domestic users in Singapore's equity market, and this is evidenced by the heavy participation of foreigners in Singapore's stock market.

Type 3

In the past, the activities in the intermediation between domestic providers and foreign users of capital were more limited, in all three types of financing: bank lending, bond and equity financing (for Type 3 activity). This was not surprising because the Singapore government has only recently relaxed the non-internationalization policy of the Singapore dollar. The primary reason for discouraging the internationalization of the Singapore dollar is to support the country's monetary policy which is centered on the exchange rate, since Singapore is an open economy that is exposed to large capital flows. The trade-off of the non-internationalization policy was of course, a less vibrant Type 3 market activity. The government is aware of the limitations and in recent years, it has raised the ceiling on the lending of Singapore dollars to non-residents. The change in rulings is one of the many examples where the government has been more willing to accept calculated risks in order to promote the development of its financial sector. In the case of non-internationalization of the Singapore dollar, the government has gradually allowed the Singapore dollar to be used outside the country as long as they are for non-speculative activities. Given the change in regulation,

¹ For more elaboration on the state's involvement in other service areas of the financial sector, see Tan (2005).

we expect to see more intermediation between domestic providers and foreign users of capital (Type 3), which can spillover to more banking transaction opportunities for the local banks. Likewise, the government's policy to expand the presence of government-linked companies into the region will result in demand for local banks to provide intermediation activities between domestic providers of capital and foreign users of capital.

Type 4

The local banks have benefited from active intermediation between foreign users and foreign providers of capital in both bank lending and bond financing (Type 4 activity). In bank lending, the banks have participated either directly or indirectly with foreign banks in project financing, corporate financing and personal finance for clients in South East Asia. In bond finance, banks have benefited from the strong growth seen in the Asian Dollar Bond market (the foreign-to-foreign intermediation of the bond market has in some ways helped to make up for the lack of bond market development in foreign-to-domestic intermediation, as mentioned earlier). Similarly, in the financial futures market, major contracts such as the ten-year Japanese government bond, the Nikkei 225 stock average and Taiwan stock index are actively traded. However, in the equity market, despite Singapore's excellent telecommunications infrastructure and the presence of international fund management houses, the level of activity in stock transactions between foreign parties is still limited, due partly to availability of developed stock market exchanges in the region to facilitate their own domestic markets' needs.

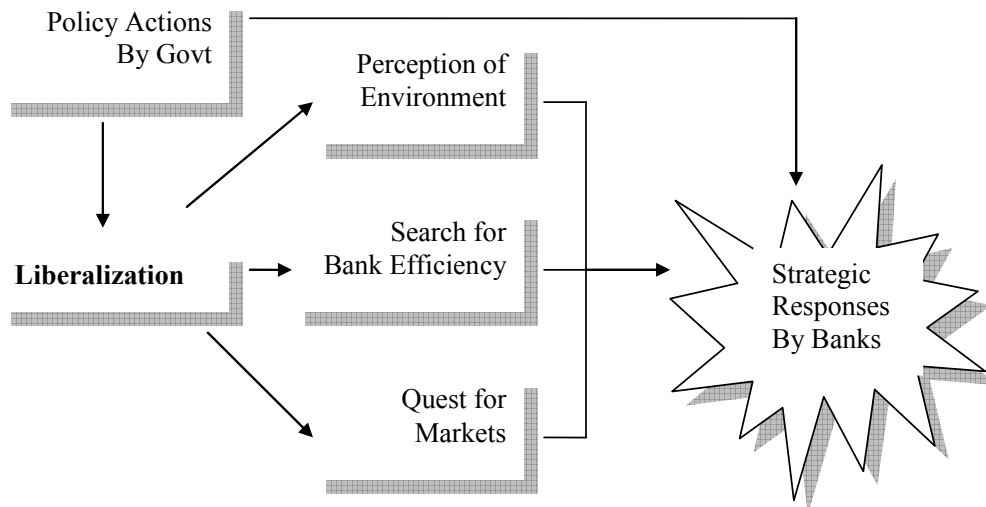
We expect a different Type 4 activity to grow in the form of local banks and companies expanding their presence overseas. The expansion, a result of the government's liberalization policy which forced local banks to venture abroad, would mean that there will be more intermediation businesses between foreign providers of capital and foreign users of capital from the local banks' perspective. Likewise, the government's policy to expand the presence of government-linked companies into the region will result in demand for local banks to provide intermediation activities between foreign providers of capital and foreign users of capital.

5. Conclusion

We began by using some econometric techniques to measure the extent that financial sector liberalizations have brought about integration of the Singapore's stock market with the US, Japan and Hong Kong markets. The results showed strong statistical evidence of financial market integrations, and the discussions provided some perspectives on the pace liberalizations preferred by the state. Next, we studied the impact of liberalizations on management strategy of local banks. In reaction to the phased liberalization measures of the Singapore government, local banks have worked on improving their operational efficiencies. These were evidenced in the restructuring exercises by banks to divest non-core assets and the reconstitution of their board to enhance their corporate governances. Another avenue banks took to improve efficiency was through sound risk management practices. Banks were required to install sound systems to ensure that risk management practices were in line with the scale and complexity of their operations. Banks resorted to investment in technology to improve their efficiencies. Besides the search for bank efficiency, banks saw the need to expand their markets beyond the shores of Singapore as the domestic market was getting more and more competitive and saturated.

We also considered the impact of liberalizations on management strategy from the perspective of what we call the product/market matrix. Lastly, we provided a different perspective on liberalization by studying the impact on the financial intermediation activities using the following classification of activities (within and between domestic providers). Using the classification of Types 1 to 4 activities, we drew attention to opportunities and limitation for growth as a result of liberalization. While there is limited potential for Types 1 and 2 activities to grow, there is good potential for Types 3 and 4 activities.

For a summary of the main points in the article about Singapore's experience with financial sector reforms and the challenges it posed to management strategies of the local banks, see Figure 3 below.



Note: Given Singapore's unique eco-political structure, the nature and extent of liberation of the financial section have largely been driven by deliberate governmental policy actions.

Fig. 3. Diagrammatic Summary of the Impact of Liberalizations on Banks

We explained that given Singapore's unique eco-political structure, the direction and extent of liberalization of the financial section is extrinsically driven by deliberate governmental policy actions. The results of our econometric analysis showed that the Singapore government preferred multiple time delayed "mini-bangs" over a "big bang" approach to liberalizing the financial sector. The Singapore government realized the impracticality of protecting its financial sector from foreign competition in the long-run. And yet, it also preferred a deliberate phased-approach to liberalization, in order to give the local institutions sufficient time to restructure and refocus their strategies. We expect that for a less paternalistic government, the direction for liberalization would be more intrinsically driven by motives of the local institutions in the country. For future work, there is scope to develop and expand on this idea.

References

1. Akdogan, H. A Suggested Approach to Country Selection in International Portfolio Diversification // *Journal of Portfolio Management*, 1996. – Vol. 23. – pp. 33-39.
2. Ariff, M. and A. Khalid. Liberalization, Growth and the Asian Financial Crisis – Lessons for Developing and Transitional Economics in Asia // Edward Elgar Publishing Limited, 2000.
3. Austin, I.P. Goh Keng Swee and South East Asian Governance // Singapore: Marshall Cavendish Academic, 2004.
4. Bekaert, G. and C. Harvey. Emerging Equity Market Volatility // *Journal of Financial Economics*, 1997. – Vol. 43. – pp. 29-77.
5. Bowers, Tab. Banking In Asia: Acquiring a profit mindset, 2003. – 2nd edition, Wiley and Sons.
6. Cheung, P. and D. Liu. Common Stochastic trends in Pacific Rim Stock Markets // *Quarterly Review of Economics and Finance*, 1994. – No. 34, 3. – pp. 241-259.
7. De Brower, G. Financial Integration in East Asia, Cambridge: Cambridge University Press, 1999.

8. Deloitte and Touche. The Changing Banking Landscape in Asia Pacific: A report of Bank Consolidation. 2005.
9. EIU Country Finance, Economic Intelligence Unite, Singapore, September, 2004.
10. Huff, W.G. The Developmental State, Government and Singapore's Economic Development since 1960 // *World Development*, 1995. – Vol. 23, No. 8. – pp. 1421-1438.
11. Johansen, S. Statistical Analysis of Cointegration vector // *Journal of Economics Dynamics and Control*, 1988. – Vol. 12. – pp. 231-254.
12. Khalid, A. and A. Tyabji. Financial Sector Development: Strategies and Challenges // in Koh, A.T. , K.L. Lim, W.T. Hui, B. Rao, M.K. Chng. (eds), *Singapore Economy in the 21st Century: Issues and Strategies*, Singapore: McGraw Hill, 2002 – pp. 345-71.
13. Lee, H.L. Financial Sector Liberalization: Going global, Speech at MAS Workplan Seminar, 2000.
14. Lee, H.L. Consolidation and Liberalization: Building world class banks, Speech at the Association of Banks Annual Dinner, 2001.
15. Lee, H.L. Address At MAS Staff Seminar, 29th October 2002: http://www.mas.gov.sg/masmcm/bin/pt1Policy_Statements_Speeches_2002.htm
16. Lee, H.L. Financial Sector: Liberalization and Growth, Speech at the Association of Banks Annual Dinner, 17th June 2004.
17. Leong, Dollery and Coelli. Measuring the technical efficiency of banks in Singapore for the period 1993 to 1999: An application and extension of the Bauer et al. (1997) technique // The Centre for International Trade studies Discussion Paper Series 02-F-2, 2002. – Yokohama National University.
18. McGuire, P. and Schrijvers, M. Common factors in emerging market spreads // Bank of International Settlements Quarterly Review, December, 2003. – pp. 65-78.
19. Monetary Authority of Singapore, Financial Market Integration in Singapore: The Narrow and the Broad Views, May 2000. – Occasional Paper No. 20.
20. Montes, M. Tokyo, Hong Kong and Singapore as competing financial centres // *Asia Pacific Financial Deregulation*, G. Brouwer and W. Puppavesva (eds), Routledge. 1999. – pp. 151-170.
21. Pi, L. and Timme, S.G. Corporate control and bank efficiency // *Journal of Banking and Finance*, 1993. – 17(2-3). – pp. 515-530.
22. Sheng, H. and A. Tu. A Study of Cointegration and Variance Decomposition among National Equity Indices before and during the Period of the Asian Financial Crisis // *Journal of Multinational Financial Management*, 2000. –No. 10. – pp. 345-350.
23. Tan, C.H. Financial Services in Singapore, 2004. – Singapore, Ridge, NUS Publishing.
24. Tan, S.L. The Development of Singapore's Financial Sector: A review and some thoughts on its future prospects // *The Economic Prospects of Singapore*, W. Koh and R. Mariano (ed.), August 2005. – pp. 246-274.
25. Zheng, Y. and S.L. Tan. An Empirical Analysis of Stock Market Development and Integration: A Comparison Study of Singapore and Malaysia. Working Paper, 2006. – Singapore Management University.