THE IMPACT OF INTERNATIONAL FINANCIAL REPORTING STANDARDS (IFRS) ON BANK LOAN LOSS PROVISIONING BEHAVIOUR AND BANK EARNINGS VOLATILITY

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Abstract

This thesis explores the impact of the adoption of IAS 39 under the new accounting standards, the International Financial Reporting Standards (IFRS), on bank income smoothing activities, bank pro-cyclical behaviour through loan loss provisions, and bank earnings volatility. It does this by looking at a sample of commercial banks from six countries in the Asia Pacific region over the period 1995 to 2009. By looking at the impact of IFRS (via IAS 39) on adopters and non-adopters, this thesis contributes to the literature by investigating the impact of IFRS adoption on IFRS adopting banks in this region.

The findings demonstrate that IFRS adoption leads to a reduction in income smoothing activities through loan loss provisions for IFRS adopters. With respect to the argument that IFRS adoption would cause more pro-cyclical behaviour of loan loss provisions, the findings from this thesis could not find enough evidence to support the suggestion that IAS 39 amplifies pro-cyclicality of bank loan loss provisioning among the adopters. For the suggestion that IFRS might cause more volatility of earnings for the adopters, there is evidence of more volatile earnings after IFRS adoption, but extra caution is needed in interpreting the findings as they may have been driven by the global recession in 2008. Finally, for the conjecture that IFRS adoption leads to higher earnings volatility for IFRS adopters than that of non-adopters, there is insufficient evidence to support this suggestion.

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1) The 14th New Zealand Finance Colloquium at the University of Auckland, New Zealand, 10-13 February 2010.

2) The 22nd Asian-Pacific Conference on International Accounting Issues at the Jupiter Hotel, Gold Coast, Australia, 7-10 November 2010.

3) The 15th New Zealand Finance Colloquium at the University of Canterbury, New Zealand, 10-11 February 2011.

4) The 2011 FMA Asian Meeting Doctoral Student Consortium, Queenstown, New Zealand, 6-8 April 2011.

5) The 2nd Finance and Corporate Governance Conference at the RACV Club, Melbourne, Australia, 26-29 April 2011.

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1 Introduction

1.1 Background

The controversial issue of *IAS 39[1] Financial Instruments: Recognition and Measurement* that governs loan loss accounting under the new accounting standards, International Financial Reporting Standards (IFRS)[2], has been the motivation of this thesis to investigate further the impact of IFRS on bank loan loss provisions behaviour and bank earnings volatility. To begin with, bank failures can be significantly associated with poor loan quality and weak credit risk management practices (Basel Committee on Banking Supervision, 2006). Because banks engage primarily in lending activities, they are regarded as a risky business, with loans as the main source of credit risk[3], although other factors such as economic conditions, management error, and illegal manipulation can also cause losses for banks (Rose and Hudgins, 2010). Credit risk is crucial as it could endanger bank solvency and place a burden on the taxpayers (Herring, 1999).

In addition, a deterioration in bank loan quality could weaken a bank's net worth as too many impaired loans in its financial statements may threaten its solvency (Sathye, Bartle, Vincent, and Boffey, 2003). This, in turn, may prevent banks from granting new loans that hinder economic growth and, in bad times, cuts in bank lending activity might trigger a credit crunch[4]. Therefore, to protect against problem

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[1] IAS stands for International Accounting Standards.

[2] IFRS came into effect in 2005 and previously known as the International Accounting Standards (IAS).

[3] The potential of a borrower or counterparty failing to meet its obligations in accordance with agreed terms.

[4] The term credit crunch can be defined as a substantial cut in bank lending activity, particularly during recessions. For further discussion on credit crunch phenomenon, see Bernanke, Lown, and Friedman (1991); Berger and Udell (1994); Brinkmann and Horvitz (1995); Hancock and Wilcox (1998); and Watanabe (2007).

loans, banks usually provide estimation for loan losses to absorb expected losses arising from loan defaults. It is an accrual expense for loan losses and charged on the bank's income statement as a non-cash expense, so that if loans turn bad, they would not affect current net income (Rose and Hudgins, 2010).

The study of bank loan loss provisioning is essential, as the way banks determine their loan loss provisions may significantly affect the banks' earnings and regulatory capital which, in turn, would affect the shareholders' returns (Ahmed, Takeda, and Thomas, 1999; Bouvatier and Lepetit, 2008; Hasan and Wall, 2004). However, bank managers usually have substantial discretion in determining loan loss provisions due to several reasons:

1. Private information, where bank managers know more about the loan quality compared to outsiders (Beattie, Casson, Dale, McKenzie, Sutcliffe, and Turner, 1995; Wahlen, 1994);

2. Lack of definitive standards in recognizing loan losses under the United States Generally Accepted Accounting Principles (US GAAP) (Beaver and Engel, 1996; Hasan and Wall, 2004) and the earlier (pre-IFRS) accounting standards in other jurisdictions; and

3. Both the Basel Committee and accounting standards-setters acknowledge the need for management judgement in determining loan loss provisions.

The discretion in accounting accrual plus the substantial judgement in determining loan loss provisions allows bank managers to manipulate reported earnings by overstating or understating expected losses. Previous literature has demonstrated that

bank loan loss provisioning is associated with the issues of income smoothing[5], capital management[6], signalling mechanism[7], and pro-cyclical[8] behaviour. An example of income smoothing in the banking industry is *Citicorp*, one of the largest United States (US) bank holding companies, which dramatically increased its loan loss provisions by US3 billion[9] in 1987 in order to achieve a desirable earnings target in 1988 (Koch and Wall, 2000). In addition, the issue of manipulating accounting information to manage reported earnings is not only limited to bank managers. The bankruptcy of the Enron Corporation of Houston in 2001 is as an example of weaknesses in accounting practices in that the flexibility of accounting standards permitted managers to hide losses and debt from investors (Benston and Hartgraves, 2002).

In banking, fraudulent accounting practices could threaten the credibility of financial reporting, which would, in turn, affect the confidence of investors, depositors, creditors, and bank regulators. The Japanese financial crisis in the 1990s provides a good example of lack of financial statement transparency as banks undertook window dressing[10] by purposely postponing the recognition of loan losses. The

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[5] Manipulate the accounting elements in order to achieve the target earnings. Specifically in the banking industry, income smoothing happens when bank managers preferably allocate higher provisions in the good years to back up the losses that normally happen in the bad years.

[6] Banks with low capital may manipulate loan provisioning to meet capital requirements imposed by the bank regulator.

[7] Bank managers tend to increase loan loss provisions to signal good news to investors as an increase in loan loss provisions implies that bank can deal with its problem loans prudently.

[8] Banks may reduce provisions during good times and increase the provisions during bad times. In bad times, an increase in loan loss provisions could weaken a bank's capital and force it to cut loan supply. This phenomenon could prompt a credit crunch and worsen the economic recession.

[9] The dramatic increase in the loan loss provisions also known as an occasional big bath.

[10] Window dressing is defined as the use of short-term financial transactions to manipulate accounting values around quarter-end reporting dates (Allen and Saunders, 1992).

reason behind this might be associated with a weakness in GAAP that provides companies with the opportunity to structure transactions to meet the requirements for particular accounting treatments, even if such treatments do not reflect the true economic substance of the transaction (Vincent, Maines, Bartov, Fairfield, Hirst, Iannaconi *et al.*, 2003, p. 74).

Therefore, high quality and transparent accounting standards are important in picturing the true conditions of companies, including banking businesses to foster investor confidence. International Financial Reporting Standards (IFRS) came into effect in 2005 with the main purpose of establishing a common set of accounting standards to promote the comparability of financial statements around the globe. The adoption of the IFRS was expected to improve the quality of financial reporting, increase the transparency of financial information due to increased disclosure requirements, and increase access to international capital markets. Therefore, IFRS might mitigate earnings management, increase market efficiency, reduce firms cost of capital, and reduce investors' costs to assess the financial information across firms.

However, IFRS has not been welcomed by businesses and organisations as they have been regarded as complex, costly, burdensome, lacking in guidance, and with unstable impacts on the profit and loss and account (Jermakowicz and Gornik-Tomaszewski, 2006; Larson and Street, 2004). This has triggered continuing debates among academics, accounting standard-setters, regulators, and industry particularly their relevance and benefit compared with the other accounting standards such as US GAAP and national accounting standards.

In the banking industry, the IAS 39 has been the most controversial standard. This is due to its use of fair value accounting for all derivative instruments (Gebhardt, Reichardt, and Wittenbrink, 2004) and the complex nature of IFRS that make them complicated and difficult to apply in practice, particularly in the recognition and measurement of financial instruments (Jermakowicz and Gornik-Tomaszewski, 2006; Larson and Street, 2004). In addition, there are arguments that the determination of loan loss provisions under IAS 39 is quite subjective and difficult to interpret and apply (Ernst and Young, 2006; Krishnakumar and Kulkarni, 2007).

1.2 Research problem

Borio and Lowe (2001) suggest that the treatment of financial instruments under IAS 39 tends towards a backward-looking approach as the 'objective evidence' in determining impairment losses likely denotes impairment that already occurred. This may promote pro-cyclical behaviour of loan loss provisions as it forces banks to recognise loan losses after the quality of the borrower has worsened. On the other hand, Borio and Lowe (2001) acknowledge the advantage of a backward-looking approach as it could limit the scope for management to manipulate reported earnings.

Another argument against IAS 39, put forward by some researchers is that the mixed measurement model under IFRS in recognising financial instruments (some are measured at fair value[11] while some are measured at amortised cost) could lead to a

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[11] According to Barth (1994), the term fair value can be used interchangeably with mark-to-market, market value-based, and market value accounting. Fair value accounting is defined as the amount for which an asset can be exchanged or a liability settle between knowledgeable, willing parties in an arm's length transaction (IASB, 2005).

volatility in financial results (Gray, 2003; Jackson and Lodge, 2000; Jermakowicz and Gornik-Tomaszewski, 2006). This is because not all financial instruments have a market value or price, which could contribute to measurement errors that might affect net income, as the changes in fair value would be recorded directly in the profit and loss account.

The above arguments have left some questions pertaining to the impact of the IFRS on banking institutions. If it is assumed that the IFRS would increase transparency of financial reporting with IAS 39 itself limiting managers' incentives to manage earnings, can it reduce income-smoothing activities in IFRS adopting banks? Do the income smoothing activities of IFRS adopting banks lessen after IFRS implementation and if so, is such activity less than for non-adopting banks? As some authors argue that IFRS promotes more pro-cyclical behaviour, do IFRS adopting banks show noticeable pro-cyclical behaviour compared to non-adopting banks? Some debate that fair value accounting has caused volatility in reported income, so what is the effect of the IFRS on the volatility of bank earnings? Do IFRS adopting banks show more volatile earnings than non-adopting banks? For IFRS adopters, what is the effect of IFRS on their earnings volatility before and after IFRS adoption?

1.3   Research objectives

This thesis intends to examine the impact of IFRS on income smoothing activities, pro-cyclical behaviour, and the earnings of banking institutions following its implementation in 2005. To answer the research questions, banks in six countries from the Asia Pacific region have been selected, particularly to examine the income smoothing, pro-cyclical behaviour, and earnings of IFRS-adopting banks: Australia, New Zealand, and Hong Kong[12]. Non IFRS-adopting banks: Malaysia, Singapore, and Thailand are included into the sample as a control group. Hence, the research objectives will be as follows:

1. To investigate the income smoothing activities of IFRS adopting banks in the Asia Pacific region;

2. To investigate the pro-cyclical behaviour of IFRS adopting banks in the Asia Pacific region;

3. To investigate the earnings volatility of IFRS adopting banks before and after IFRS adoption; and

4. To compare the earnings volatility of IFRS adopting banks relative to non-IFRS adopting banks.

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[12] Hong Kong is not a country; it is a Special Administrative Region (SAR) of the Republic of China. For simplicity, the word country is used.

1.4 Research contribution

This thesis contributes to the existing literature in three ways. Firstly, this study will be the first to analyse the effects of the introduction of IFRS reporting on banks in the Asia Pacific region, particularly a cross-country sample of banks. The shift to the new IFRS reporting across the world is one of the most influential policy issues in accounting standards. Hence, the findings could be of substantial interest to bank regulators and policy makers in many countries, including those that have not yet converged with IFRS. A better understanding of the impact of IFRS will enable the accounting standards-setters to promote IFRS more effectively to the non-adopting countries who are still preparing to adopt IFRS.

Secondly, by focusing on the experience of the Asia Pacific region, this study will add to the literature on Australia, New Zealand, Hong Kong, Malaysia, Singapore, and Thailand, as they have received little attention from previous scholars. Most of the previous literature particularly that pertaining to the IFRS and loan loss provisions has focused on developed nations such as the United States, the United Kingdom, and countries in the European Union. The combination of the sample countries in this study would provide valuable results as this thesis could compare the income smoothing activities, pro-cyclicality, and performance of adopters after the IFRS implementation and to see how good IFRS is compared to local standards particularly in reducing earnings management in banking institutions.

Thirdly, the IFRS is relatively new for both industry and academia. IAS 39 has received strong opposition from the banking industry due to the complex recognition of financial instruments. Therefore, IAS 39 is still under revision, with standards-

setters continually finding ways to improve and close the loopholes in the new standard. The results of this thesis are expected to shed some light on the potential impact of IAS 39 on the banking institutions.

1.5   Research outline

The organisation of this thesis is as follows. Chapter 2 reviews the previous literature and develops the hypotheses. Chapter 3 discusses the methodology that justifies the sample, data, and appropriate technique of analysis used to answer the research objectives. Chapter 4 presents the results and then discusses the findings. Finally, Chapter 5 summarises the thesis, underlines the limitations, and gives suggestions for further research.

2   Conceptual underpinning and literature review

This chapter reviews the previous literature to give a better understanding of the impact of the IAS 39 on the loan loss provisions behaviour and bank earnings. Section 2.1discusses the basic concept of loan loss provisioning. Section 2.2 describes the basic concept of accounting standards. Section 2.3 provides an overview of GAAP, and Section 2.4 explains a basic overview of IFRS. Section 2.5 distinguishes the treatment of loan loss accounting under GAAP and IFRS. Section 2.6 compares GAAP and IFRS in general, that possibly affect the loan loss provisioning behaviour and bank earnings. Section 2.7 addresses the issues of the income smoothing of loan loss provisions under GAAP. Section 2.8 discusses the issues of pro-cyclicality under IAS 39. Section 2.9 addresses the issue of fair value accounting and earnings volatility under IAS 39. Section 2.10 develops the hypotheses, and finally Section 2.11 provides a summary of the chapter.

2.1   Bank loan loss provisioning

Loan loss provisions[13] are defined as estimation for probable loan losses for the current year and this amount will be charged on the income statement as expenses on a yearly basis. The purpose of this accrual expense is to absorb any losses arising from loan default by customers. The reserve for loan losses (also known as allowance for possible loan losses or impaired loans) on the other hand is a contra asset account created to record loan loss provisions, accumulated loans charged off, and any loan recoveries for the current year. This account is recorded on the bank

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[13] Some banks use other terms, such as provision for doubtful debts or charge for bad and doubtful debts; under IFRS, it is called an impairment loss, impairment expense, or impairment charge on loans.

balance sheet as a deduction from total loans. The increase in the loan loss provisions will result in an increase in loan loss allowance and a reduction in current net income. The reserve amount (loan loss allowance) is important to the users of financial statements as it implies the risk and the quality of the loan portfolio (Walter, 1991). Figure 1 illustrates how loan loss provisions are recorded in the bank's income statement, shows the example of loan loss allowance account, and demonstrates the recording of loan loss allowance in the bank's balance sheet.

Generally, there are two categories for loan loss provisions: specific provisions and general provisions. Specific provisions refer to the expected losses for individual or specific loans that have been identified as impaired, while general provisions can be defined as groups of loans that have not been identified as impaired but may possibility contain some. Under the IFRS, loan loss provisions are called provisions for impairment charges, specific provisions are known as individual provisions, and general provisions are referred to collective provisions.

Banks determine loan loss provisions in different ways. Walter (1991) suggests that banks determine their loan losses size by using several techniques: 1) constant percentage-of-loans rule; 2) peer equivalent; 3) loss history; 4) income management; 5) tax management; and 6) loan analysis.

Figure 1: The illustration of loan loss provisions and loan loss allowance in the bank's financial statements

Loan loss provisions in the bank income statement

Interest income	xxxxx
Interest expense	(xxxxx)
Net interest income (net interest margin)	xxxxx
Other income	xxxxx
Net operating income	xxxxx
Impairment losses (loan loss provisions)	(xxxxx)
Operating expenses	(xxxxx)
Net profit before taxation	xxxxx
Taxation	(xxxxx)
Net income	**XXXXX**

Source: TSB Bank Annual Report, 2010

Loan loss reserves (allowance for loan losses) account

Beginning balance in the allowance for loan loss account (ALL)	xxxxx
+ This year's provision for loan losses (PLL)	xxxxx
- Actual charge-offs of worthless loans	(xxxxx)
Net allowance for loan losses (ALL) after all charge-offs	xxxxx
+ Recoveries from previously charged-off loans	xxxxx
Ending balance in the allowance for loan loss account (ALL)	**XXXXX**

Source: Rose (2002, p. 116)

Allowance for loan losses in the bank balance sheet

ASSETS	LIABILITIES
Cash & deposits due from banks	Deposits
Investment securities	Non-deposits borrowings
Gross loans	Other liabilities
Less allowance for loan losses	TOTAL LIABILITIES
Net loans	EQUITY
Bank premises and equipment	Common stock
	Preferred stock

Source: Rose (2002, p. 116)

Wetmore and Brick (1994) suggest that several factors, such as past loan losses, foreign loan risk, weakening in loan portfolio quality, and economic conditions, should be taken into consideration when determining loan loss provisions. Joyce (1996) proposes similar techniques to Walter (1991), as there are several ways to estimate loan loss provisions, namely loan analysis, constant percentage of loans rule, peer equivalent, and the aging schedule approach. More recently, Gray and Clarke (2004) point out that banks should consider several risks to determine the loan loss allowance, such as off-balance sheet risk, concentration risk, and economic risk.

Under recent accounting standards (IAS 39 Paragraph 63), banks should determine the amount of loss by measuring the difference between the assets' carrying amount and the present value of the estimated future cash flows, discounted at the financial asset's original effective interest rate. It is important to note that accounting standards (specifically referring to GAAP) require that a bank's loan loss reserve should be adequate to cover the known and inherent risk in the loan portfolio (Koch and MacDonald, 2010, p. 112).

Interestingly, the provision for loan losses has been a subject of attention by three different parties: bank regulators, accounting standard-setters, and the bank's management (Gray and Clarke, 2004; Ullmer, 1996). A bank regulator[14] refers to a

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[14] Internationally, the Bank for International Settlement (BIS) coordinates relations between regulators to promote discussion and collaboration, including the negotiation of agreed standards for regulation. The committee members are from Argentina, Australia, Belgium, Brazil, Canada, China, France, Germany, Hong Kong SAR, India, Indonesia, Italy, Japan, Korea, Luxembourg, Mexico, The Netherlands, Russia, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States (Source: http://www.bis.org).

central bank or banking authorities in a country, while the International Accounting Standards Board (IASB)[15] and Financial Accounting Standards Board (FASB)[16] are examples of influential accounting standard-setters that produce international accounting standards (IAS/IFRS) and generally accepted accounting principles (GAAP), respectively.

Nevertheless, there are conflicting opinions between these parties in addressing the primary roles of bank loan provisioning. The standard-setters prefer the reserve for loan losses to become a mechanism to promote harmonisation and transparency of financial statements across countries and emphasise that loans should be valued objectively and fairly. In contrast, bank regulators want allowances for loan losses to stabilise bank safety and soundness. Finally, the bankers' motivation is to determine the allowance for loan losses based on their own judgment and flexibility to maximise shareholder value (Borio and Lowe, 2001; Gray and Clarke, 2004).

There are many reasons why there are conflicting opinions. The accounting authority is more concerned with the possibility of bank managers manipulating reported loan losses to mark the true performance of the banks which, in turn, affects investors' decisions. Bank regulators, on the other hand, believe that the priority of the banks is to maintain an adequate loan loss allowance to prevent them from collapse. In the

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[15] An independent private sector body based in London, made of members from 13 countries – the United States, the United Kingdom, Australia, Germany, The Netherlands, South Africa, Brazil, France, Japan, China, India, Sweden, and New Zealand (Source: http://www.ifrs.org).

[16] An independent body established in the United States, which has been granted authority by the Securities and Exchange Commission (SEC) to establish and improve financial accounting and reporting standards (Source: http://www.fasb.org).

wake of the recent 2008 financial crisis, Barth and Landsman (2010) discuss the disagreement between standard-setters and bank regulators with regard to bank financial reporting. Accounting standard-setters emphasise the useful information of financial reporting to satisfy investors and creditors, while regulators are more concerned with the prudential aspect, in that financial reporting should reduce the risk to banks' depositors and mitigate systemic financial risk.

It is beyond the scope of this thesis to comprehensively discuss the conflict between accounting standard-setters, bank regulators, and bank managers, although such an analysis could play a significant role in influencing the way banks determine their loan loss provisioning. However, this thesis focuses on the impact of the implementation of IAS 39 that governs loan loss accounting, which has triggered intense debate among academics, regulators, standard-setters, industry players, and users of financial statements due to its complexity and difficulty to understand. The next several sections, therefore, distinguish in detail between loan loss accounting under Generally Accepted Accounting Principles (GAAP) and loan loss accounting under International Financial Reporting Standards (IFRS).

2.2 Accounting standards

It is important to understand the meaning of accounting standards and their main purposes. *IAS 1: Presentation of Financial Statements* defines a financial statement as a structured representation of the financial position and financial performance of an entity (IAS 1, Paragraph 7). The objective of general purpose financial statements is to provide information about the financial position, financial performance, and cash flows of an entity that are useful to a wide range of users in making economic decisions (Bonham, Curtis, Davies, Dekker, Denton, Moore *et al.*, 2008; Epstein and Jermakowicz, 2010; Greuning, Scott, and Terblanche, 2011; NZICA, 2006). Therefore, an accounting standard is a standard produced by accounting bodies to guide entities in their financial reporting. Examples of accounting bodies include the IASB, FASB, and MASB (Malaysian Accounting Standards Board).

The purpose of accounting standards is to improve accounting information quality as well as to diminish the information asymmetry among market participants (Jorissen, Lybaert, and Poel, 2006). In addition, agency problems can be efficiently resolved with the existence of accounting standards (Brown and Tarca, 2001; Jensen and Meckling, 1976). This is also supported by Fields, *et al.,* (2001) who emphasise that accounting standards are important in mitigating agency costs, reducing information asymmetry, and improving the quality of financial reporting. More importantly, standardised accounting standards would let auditors[17] monitor and validate financial statements to ensure the consistency of the reported income. There are generally two types of accounting standards: national standards (such as the UK GAAP, US

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[17] Hackenbrack and Nelson (1996) find evidence that auditors could manipulate vague language in accounting standards to force clients to report financial information according to auditors' incentives. However, this is not the main interest of this thesis.

GAAP, German GAAP, NZ GAAP, and Canada GAAP) and international standards (IAS/IFRS).

2.3 Generally Accepted Accounting Principles (GAAP)

Long before the IFRS was introduced in 2005, the majority of countries around the world used various standards, such as GAAP, International Accounting Standards (IAS), and their own national standards, to prepare financial statements. Although this implies that most countries have already adopted international standards, their domestic GAAP differs from IAS and the US GAAP because there are fewer disclosure requirements. In addition, firms may have more discretion in the amount and detail of information in disclosures provided in their annual reports (Coopers and Lybrand, 1993).

There is no specific date on when the US GAAP, also known as GAAP, was formally established. It began with a demand from the Securities Exchange Commission (SEC) to the US publicly traded companies to have a standardised set of financial reporting so that investors could be well informed about the companies' current condition. In this regard, the American Institute of Certified Public Accountants (AICPA) was the first to set accounting standards in the US before the FASB was established in 1973. Since then, the FASB has been responsible for establishing high quality accounting standards in the US. The FASB's responsibility is monitored by SEC and assisted by the Governmental Accounting Standards Board (GASB) that deals mainly with state and local government reporting issues. The

cases of the SunTrust Bank[18], Sunbeam Corporation[19], and Citicorp in the 1980s and 1990s, in which these companies misused accounting practices through loan loss accounting to report a desired net income, have alerted the SEC to promote the importance of having a fair disclosure of financial reporting to avoid misleading disclosure.

To eliminate accounting differences, SEC requires non-US companies who wish to list their shares on the US stock exchange to reconcile their financial statements with US GAAP. However, this is deemed to be costly (Asbaugh, 2001; Biddle and Saudagaran, 1989) and time consuming (Hansen, 2004). In addition, the reconciliation process might cause foreign companies to lose important information and, consequently, fail to convey companies' actual condition (Chan and Seow, 1996). It is essential, therefore, to have globally accepted accounting standards to enhance the comparability and consistency of accounting practices internationally.

To harmonise accounting practices, since 2002, the FASB and the IASB have been working together to develop a mutual agreement (the Norwalk Agreement) to ensure the compatibility of US GAAP and IFRS is achievable. This coordination was reaffirmed in 2005 and, under the Memorandum of Understanding (MoU), the FASB and the IASB are working closely to develop standards that will converge and improve IFRS and US GAAP in several areas, such as financial instruments, revenue

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[18] See Brooks (1998) for a detailed discussion of the SunTrust Bank issue.
[19] For further discussion on the Sunbeam Corporation and Citicorp cases, see Koch and Wall (2000).

recognition, leases, statement of comprehensive income, and fair value measurement. Interestingly, after a mutual agreement in 2007, SEC has removed the reconciliation requirement, whereby non-US companies registered in the US may use IFRS without having to change their accounting standards in accordance with US GAAP.

2.4   International Financial Reporting Standards (IFRS)

The International Financial Reporting Standards (IFRS) gained greater credibility in 2002, when the European Commission ordered publicly listed companies in the European Union (EU) to prepare their consolidated financial statements in accordance with IFRS, beginning 1 January 2005. The idea was to unite EU countries with different cultural, economic, and political understandings by adopting a single set of accounting standards to standardise and harmonise financial reporting practices. These differences are understandable due to different legal and tax systems, dissimilar goals of financial reporting, as well as the varied sources of finance among EU countries (Bonham*, et al.*, 2008).

The harmonisation of accounting standards not only eliminates accounting differences and improves the financial information quality among EU countries, but also internationally by allowing companies to access capital markets globally. More importantly, investors would be able to understand and assess financial information clearly without spending too much time understanding multiple financial statements from different countries. The IFRS is not totally new as it was previously known as the International Accounting Standards (IAS), produced by the International Accounting Standards Committee (IASC), an IASB predecessor.

The main goals of the IFRS are to promote the transparency and comparability of financial statements, improve access to international capital markets, develop the quality of financial reporting, and increase the disclosure of financial information. Since its inception, many countries around the world require their domestically-listed companies to prepare their financial reports in accordance with the IFRS. European Union (EU) countries make up the largest countries to fully compliant with the IFRS since 2005, and for the Asia Pacific, Australia and Hong Kong were among the first adopters and New Zealand followed in 2007.

In the United States, although the SEC acknowledged the IFRS's role to serve as a single set of high-quality global accounting standards, particularly after the 2008 economic crisis, the convergence date remains uncertain. This is because there are several issues that need to be considered, such as disclosure changes, employee training, and systems overhaul. The SEC gives an assurance that the decision of how, when, or whether to incorporate with IFRS should have been finalised by the end of 2011[20]. Until the month of the submission of this thesis, the US still abides by its US GAAP.

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[20] Detailed discussion and a recent update can be found in the PWC publication – *IFRS and US GAAP: Similarities and differences*, October 2011 (Source: http://www.pwc.com).

2.5   The distinction between loan loss accounting under Generally Accepted Accounting Principles (GAAP) and International Financial Reporting Standards (IFRS)

Under US GAAP, loan loss provisioning is governed by Statements of Financial Accounting Standards (SFAS) No. 5, *Accounting for Contingencies*, and SFAS No. 114, *Accounting by Creditors for Impairment of a Loan.* Both of these standards guide bank managers as to the timing and adequacy of provision for loan losses. SFAS No. 5 (Paragraph 8) outlines that estimated losses are determined based on the following conditions:

1) Information available prior to issuance of the financial statements indicates that it is **probable** that an asset had been impaired or a liability had been incurred at the date of the financial statement. It is implicit in this condition that it must be probable that one or more future events will occur confirming the fact of loss.

2) The amount of the loss can be reasonably estimated.

SFAS No. 114, on the other hand, guides managers on how to measure the loan loss amount. According to SFAS No.114 (Paragraph 8), loans are impaired when "it is probable that a creditor will be unable to collect all interest and principal when contractually due according to the terms of the loan agreement". SFAS 114 (Paragraph 10) further defines the word 'probable', as "an area within a range of the likelihood that a future event or events will occur confirming the fact of the loss". In light of this, loan losses should be recognised through provisions when it is probable

that a loss has been incurred and the loss can be reasonably estimated by comparing the current loan balance to the present value of the workout, the observable price of the loan, or the fair value of the collateral (Handorf and Zhu, 2006, p. 100).

In contrast, under IFRS, loan loss accounting is governed under IAS 32[21]: *Financial Instruments: Disclosure and Presentation* and IAS 39[22]: *Financial Instruments: Recognition and Measurement.* IAS 32 requires an entity to classify financial instruments (from the perspective of the issuer) into financial assets, financial liabilities, and equity instruments; related interest, dividends, losses and gains; and the circumstances in which financial assets and financial liabilities should be offset.

IAS 39, generally, guides the entity in the aspect of recognising and measuring financial instruments, including providing guidelines for asset impairment. The following are the guidelines on impairment and uncollectibility of financial assets under IAS 39:

1. An entity shall assess at each balance sheet date whether there is any objective evidence that a financial asset or group of financial assets is impaired (Paragraph 58).

2. A financial asset or a group of financial assets is impaired and impairment losses are incurred if, and only if, there is *objective* evidence of impairment

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[21] Effective from 1 January 2007, it been superseded in part by IFRS 7 *Financial Instruments: Disclosures*

[22] Due to the controversial issue of this standard, IASB is replacing IAS 39 phase by phase. Phase 1 took place on 12 November 2009, known as IFRS 9 *Financial Instruments*. The first phase covers classification and measurement of financial assets. On 28 October 2010, IASB redrafted IFRS 9 by incorporating new requirements on accounting for financial liabilities. IASB foresees full adoption of IFRS 9, beginning 1 January 2015, although it has allowed early adoption, starting from 2009 (Source: http://www.iasplus.com).

as a result of one or more events that occurred after the initial recognition of the asset and the loss event has an impact on the estimated future cash flows of the financial assets or group of financial assets that can be reliably estimated (Paragraph 59).

The examples of objective evidence are:

a) significant financial difficulty of the issuer or obligor;

b) a breach of contract, such as a default or delinquency in interest or principal payments;

c) the lender, for economic or legal reasons relating to the borrower's financial difficulty, granting to the borrower a concession that the lender would not otherwise consider;

d) it becoming probable that the borrower will enter bankruptcy or other financial reorganisation;

e) the disappearance of an active market for that financial asset because of financial difficulties; or

f) observable data indicating that there is a measurable decrease in the estimated future cash flows from a group of financial assets since the initial recognition of those assets, although the decrease cannot yet be identified with the individual financial assets in the group, including:

    i. adverse changes in the payment status of borrowers in the group (for example, an increased number of delayed payments or an increased number of credit card borrowers who have reached their credit limit and are paying the minimum monthly amount); or

ii. national or local economic conditions that correlate with defaults on the assets in the group (for example, an increase in the unemployment rate in the geographical area of the borrowers, a decrease in property prices for mortgages in the relevant area, a decrease in oil prices for loan assets to oil producers, or adverse changes in industry conditions that affect the borrowers in the group).

In addition, this standard also explains the appropriate measurement for financial asset carried at amortised cost (loans and receivables and held-to-maturity investments):

1. If there is objective evidence that an impairment loss on loans and receivables or held-to-maturity investments carried at amortised cost has been incurred, the amount of the loss is measured as the difference between the assets' carrying amount and the present value of estimated future cash flows (excluding future credit losses that have not been incurred) discounted at the financial assets' original effective interest rate (that is, the effective interest rate computed at initial recognition). The carrying amount of the asset shall be reduced either directly or through the use of an allowance account. The amount of the loss shall be recognised in profit and loss (Paragraph 63).

Ernst and Young (2006) argue that the above requirements under IAS 39 are difficult to interpret and apply, especially pertaining to loan provisions. They state that the standard does not prescribe when is the appropriate time the provisions should be charged off against the impaired loan. This would involve substantial judgement to determine the provisions and, consequently, managers may overstate or understate the provision for loan losses. Table 1 shows the different approaches between the IFRS, US GAAP, and local accounting standards for the IFRS adopters prior to IFRS adoption, looking specifically at criteria to determine provision for loan losses.

Table 1: Comparison between the IFRS, US GAAP, and local accounting standards

LOAN LOSS PROVISIONING

IFRS	US GAAP	Australia Banking Act 1959 & Australian Accounting Standards	New Zealand Financial Reporting Act 1993 & The Registered Bank Disclosure Statement Order	Hong Kong Statements of Standard Accounting Practice (SSAP) and Interpretations
A financial asset is impaired and impairment losses are incurred only if there is objective evidence of impairment as the result of one or more events that occurred after initial recognition of the asset (a loss event) and if that loss event has an impact on the estimated future cash flows of the financial asset or group of financial assets that can be reliably estimated (Refer to IAS 39, Paragraph 58-59). Once impairment is triggered, the loss is measured by discounting the estimated future cash flows by the original effective interest rate. The carrying amount of the asset shall be reduced either directly through use of an allowance account. The amount of loss shall be recognised in profit or loss (Refer to IAS 39, Paragraph 63).	Impairment for losses should be recognized when, based on all available information, it is probable that a loss has been incurred based on past events and conditions existing at the date of the financial statements (Refer to SFAS No. 5, Paragraph 8). U.S. GAAP does not contain specific examples of loss events. U.S. GAAP does not contain requirement for estimated cash flows to be discounted (see SFAS 114 in statements on page 19 and 20) in measuring impairment of group of loans. Once triggered, impairment is measured with reference to expected credit losses as described for available-for-sale debt securities.	No specific guidance provided Based on Westpac's 2004 Annual Report, the provision for loan losses is determined as follows: A specific provision is raised as soon as a loan has been identified as doubtful and when the estimated repayment realisable from the borrower is likely to fall short of the amount of principal and interest outstanding. A general provision is maintained to cover expected losses inherent in the existing overall credit portfolio (including off-balance sheet exposures), which are not yet identifiable. In determining the level of the general provision, reference is made to historical experience, business conditions, the composition of the portfolio, industry best practices and publicly available default data.	No specific guidance provided Based on Kiwibank's 2004 Annual Report, the provision for loan losses is determined as follows: A specific provision is established to cover all identified doubtful debts and is recognised when there is reasonable doubt over the collectability of principal and interest in accordance with the loan agreement. Amounts provided for are determined by specific identification and by estimation of expected losses in relation to loan portfolios where specific identification is impracticable. A general provision for bad and doubtful debts is maintained to cover unidentified possible losses and risks inherent in the loans and advances portfolio.	No specific guidance provided Based on The Bank Of East Asia's 2004 Annual Report, the provision for loan losses is determined as follows: Provision is made against specific doubtful debts as and when they are considered necessary by the Credit Committee with authority delegated by the Board of Directors and, in addition an amount has been set aside as a general provision for advances.

Source: Deloitte (2008) and PricewaterhouseCoopers (2010) and respective banks' annual reports for the year 2004 (period before IFRS adoption).

2.6   GAAP versus IFRS

There are few differences between GAAP and IFRS that affect loan loss provisioning behaviour and bank earnings. GAAP is broadly associated with historical cost accounting, which has caused bank supervisors to be late to recognise or close down insolvent institutions in a timely manner (Berger, King, and O'Brien, 1991). Furthermore, cross-company comparison is difficult to execute under historical cost accounting and it fails to recognise the market value of a bank's loan (Beattie, *et al.*, 1995). In a similar argument, Benston and Wall (2005) suggest that GAAP tends to understate the economic value of a bank's loan portfolio due to the application of historic cost, making the value of a bank's loan neither current nor relevant.

On the other hand, IFRS is allied with the use of a mixed measurement model for financial instruments, some of which are measured at fair value while others are measured at amortised cost. The reason why fair value accounting was introduced is to ensure banks report the current value of financial assets and liabilities on the balance sheet to reflect the actual value of their performance. However, this might cause more volatility of bank profit because the changes in fair value accounting will be reported in net income, and the determination of fair value may involve high subjective judgment. The weakness of GAAP is discussed in Section 2.7, and the controversial issues of IFRS will be discussed further in the Section 2.8 and 2.9.

2.7 GAAP and income smoothing activities of loan loss provisions

Much of the previous literature argues that GAAP allows substantial leeway for managers in preparing financial statements, particularly in reporting accruals, such as loan loss provisions, allowance for bad debts, realised security gains and losses, write-downs, deferred tax valuation allowance, depreciation, and unexpected pension provisions (Fields, *et al.*, 2001; Fudenberg and Tirole, 1995; Healy and Wahlen, 1999).

In relation to this, the underlying assumption under positive accounting theory is that managers' choice of accounting methods is based on their own self-interest to maximise their utility (Beattie, Brown, Ewers, John, Manson, Thomas *et al.*, 1994; Watts and Zimmerman, 1978). This leads to incentives for managers to manage earnings, particularly to reduce earnings fluctuations, which has opened room for numerous accounting studies on earnings management[23].

Healy and Wahlen (1999, p. 368) define earnings management as managers using judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers. Beattie, *et al.,*(1994), (as cited in Davidson, Stickney, and Weil, 1987) define earnings management as a process of taking deliberate steps within the constraints of generally accepted accounting principles to bring about a desired level of reported earnings.

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[23] See McNichols (2000), Healy and Wahlen (1999) and Ronen and Yaari (2008) for extensive discussion on earnings management studies.

The incentives to manage earnings can be associated with several factors such as compensation, job security, regulators' monitoring, shareholders' interest, and auditors' pressure. A common form of earnings management is income smoothing. It can be defined as manipulating accounting methods (as a result of discretion in accounting principles) to smooth the variability of a firm's earnings[24]. In the banking industry, it happens when bank managers purposely allocate higher provisions in good years (when income is high) to back up losses that normally happen in bad years, when income is low (Greenawalt and Sinkey, 1988; Joyce, 1997; Wetmore and Brick, 1994). It also occurs when bank managers understate expected loan losses to increase net income and capital in the current year (Benston and Wall, 2005). Income smoothing lessens the volatility of reported income, but it does not reflect the true performance of banks, effectively deceiving the shareholders and regulators.

In this sense, the manipulation of loan loss provisions under GAAP is understandable, probably due to the SFAS 5 (Paragraph 8) guidance regarding how impairment is determined:

> "When it is **probable** that an asset had been impaired or a liability had been incurred at the date of the financial statement. It is implicit in this condition that it must be probable that one or more future events will occur confirming the fact of loss and the amount of the loss can be **reasonably estimated**".

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[24] For a thorough discussion on income smoothing see Copeland (1968), Barefield and Comiskey (1972), Beidleman (1973), Lambert (1984), Moses (1987) and Ronen and Yaari (2008).

Probable in this standard is referring to the event or events that are likely to occur (FAS 5 Paragraph 3). Benston and Wall (2005, p.21) believe that 'probable' is characterised as 'more likely than not' or having at least 50 percent chance of occurring. This leaves managers substantial judgmental leeway because the standard provides the factors banks should consider in setting loan loss allowance, but does not provide the exact formula for calculating it (Wall and Koch, 2000, p. 8). Hackenbrack and Nelson (1996) emphasise that the term 'can be reasonably estimated' can be interpreted in two ways: as an accrual of bad debts (conservative strategy) or as a footnote disclosure of the contingency (aggressive strategy), which may affect the way banks report their loan loss expenses.

Studies by Greenawalt and Sinkey (1988), Ma (1988), and Bhat (1996) show that banks in the United States use loan loss provisions to smooth income. In addition, Beatty, Chamberlain, and Magliolo (1995) also support the evidence of earnings management in US banks where, in particular, profitable banks use loan loss provisions to manage earnings. In contrast, Wetmore and Brick (1994) do not find evidence of income smoothing activities in American bank holding companies. Beatty, *et al.,* (1995) on the other hand, demonstrate that US banks use miscellaneous gains (losses) to manage earnings while loan loss provisions are used to manage primary capital ratios.

Different from previous studies on income smoothing, Ahmed, *et al.,* (1999) explore the 1990 change in capital adequacy regulations to investigate the manipulation of loan loss provisions to manage earnings and capital and as a tool for signalling. The authors find that there is no evidence of earnings management or signalling under the new regime, but demonstrate that banks in the 1986-1995 period used loan loss provisions to manage regulatory capital.

Beatty, Ke, and Petroni (2002), alternatively, investigate the evidence of earnings management in the banking industry by comparing publicly and privately held bank holding companies in the US. Their results reveal that public banks manage earnings more than private banks in the sense that they report fewer small declines in earnings than private banks.

Liu and Ryan (2006) examine the behaviour of bank managers in managing the provision for loan losses and loan charge-offs in two economic conditions: a bust period (1974-1990) and a boom period (throughout the 1990s). Their study is the first to investigate the use of loan charge-offs for income smoothing in the United States. The results suggest that during the 1990s boom, banks smoothed their income using loan loss provisions and more profitable banks that hold more homogeneous loans[25] showed stronger behaviour of income smoothing. With regard to loan charge-offs, the findings demonstrate that in the 1990s boom, profitable banks used loan charge-offs to hide income smoothing activity by accelerating charge-offs of homogeneous loans.

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[25] Include consumer loans, 1-4 family residential mortgages, loans to financial institutions, and acceptances of other banks.

Following Ahmed, *et al.,* (1999) but employing Australian bank data, Anandarajan, Hasan, and McCharthy (2007) explore the use of loan loss provisions for capital management, earnings management, and signalling in Australian commercial banks. The findings indicate that Australian banks manipulated loan loss provisions for capital management after the implementation of the 1988 Basel Accord. They also find that earnings management behaviours exist, with listed banks more involved in earnings management activities than unlisted banks.

Perez, Salas-Fumas, and Saurina (2008), on the other hand, examine the impact of statistical[26] provisions on loan loss provisions of banks in Spain. The findings show that, even though strict regulations on loan loss provisions have been imposed, it appears that Spanish banks still practise income smoothing activities, although there is no evidence to prove that they use loan loss provisions to manage capital.

Fonseca and Gonzalez (2008) employ a sample of banks around the globe to test the determinants of income smoothing via the manipulation of bank loan loss provisions. The findings indicate that investor protection, disclosure, regulation and supervision, financial structure, and financial development significantly influence bank income smoothing activities in the selected countries.

In a recent study of earnings management in the banking industry, Kanagaretnam, Lim, and Lobo (2010) examine the impact of auditor reputation on banks' earnings management by utilising samples from international banks in 29 countries. Being the

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[26] Refer to the loan loss provisioning system in Spain and also known as dynamic, anti-cyclical, or countercyclical provisioning.

first of its kind to study the impact of auditing on bank earnings management, the authors hypothesise that auditors particularly those who are specialists in the banking industry, may better assess the adequacy of loan losses and, hence, be able to lessen earnings management activities through loan loss provisions. Covering the period 1993 to 2006, their tests on income-increasing abnormal[27] loan loss provisions suggest that auditor type and auditor expertise could hinder the activities of earnings management through abnormal loan loss provisions.

Similar to Kanagaretnam, *et al*., (2010), DeBoskey and Jiang (2012) investigate the impact of auditors' specialisation in restraining the activity of earnings management through loan loss provisions in the banking industry. Their study diverges from that of Kanagaretnam, *et al.,* (2010) by mainly focusing on US banks and looks at the differential role of auditor specialisation in mitigating earnings management for different types of discretionary provisioning behaviour. The study period, 2002-2006, covers the time of the implementation of the Sarbanes-Oxley Act 2002 (SOX) in the US. As expected, their results support the findings of earlier studies where auditor specialisation is effective in diminishing the activities of earnings management in the banking industry.

In summary, empirical evidence from a majority of earlier studies indicates that banks generally use loan loss provisions to manage earnings although external factors, such as auditor speculation and reputation, may play a role in mitigating earnings management through loan loss provisions. These manipulating activities happen because bank managers know more about what happens inside the bank than

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[27] This refers to the absolute value of negative abnormal loan loss provisions.

outsiders do and they have substantial discretion (Beattie, *et al.*, 1995; Griffin and Wallach, 1991; Wahlen, 1994). This reinforces the need for good corporate governance and high-quality accounting standards to ensure financial institutions are transparent in reporting their financial position. Nonetheless, it is beyond the scope of this thesis to study the issue of corporate governance in the banking institutions. The next section discusses the empirical findings of earlier studies on earnings management after IFRS implementation.

2.7.1 Could IFRS mitigate earnings management activities?

IFRS is a principle-based standard that requires extensive disclosure of financial information. This is in line with the main objectives of IFRS: to enhance the comparability of financial statements of firms around the globe and reduce manipulation activities. In the banking industry, for instance, IFRS requires banks to show an accurate allowance for bad debts, which could lower the opportunity for managerial manipulation to smooth earnings (Ball, 2006). In addition, IFRS limits the number of available options as well as prohibiting hidden reserves (Leventis, Dimitropoulus, and Anandarajan, 2010).

Following IFRS implementation in 2005, a number of studies explore the effects of IFRS adoption on earnings management using European Union (EU) samples. However, the majority of the studies exclude banking and financial institutions due to different reporting regulations. Tendeloo and Vanstraelen (2005) investigate whether the earnings management of German companies reduced after IFRS implementation. Their analysis is based on the comparison between voluntary IFRS

adopters and companies reporting under generally accepted accounting principles (GAAP). The findings reveal no evidence that IFRS could lower earnings management of IFRS adopters in Germany.

Jeanjean and Stolowy (2008), examine the impact of IFRS adoption on earnings management in Australia, France and the UK. Parallel with Tendeloo and Vanstraelen (2005), they suggest that earnings management does not decline after IFRS implementation. Both studies use non-financial companies and exclude banking and financial services companies.

On the other hand, Zeghal, Chtourou, and Sellami (2011) support the notion that IFRS reduces earnings management. Their findings demonstrate that the mandatory adoption of IFRS has reduced earnings management among French companies that have good corporate governance and are listed on foreign financial markets. Similar to Tendeloo and Vanstraelen (2005) and Jeanjean and Stolowy (2008), Zeghal, *et al*., (2011) also exclude financial institutions in their sample due to specific regulations and differences in financial reporting.

Using bank sample data, Leventis, *et al*., (2010) study the impact of IFRS on earnings management and capital management through bank loan loss provisions. They utilise 91 EU listed commercial banks to see whether IFRS adoption could lower the activities of bank income smoothing. The findings show that IFRS significantly lessened the income smoothing activities of the selected sample. In addition, they also find that the earnings management of risky banks reduces after IFRS implementation. Using the same setting, Gebhardt and Novotny-Farkas (2011)

examine the implications of mandatory IFRS adoption on the accounting quality of banks in 12 EU countries. Their findings support Leventis, *et al*., (2010) in the sense that the incurred loss approach under IAS 39 reduces income-smoothing activities of listed banks in the EU jurisdiction.

2.7.2   Research gap

This thesis differs from that of Leventis *et al*., (2010) and Gebhardt and Novotny-Farkas (2011) in the sense that while both of the studies utilise EU banks as a sample, this thesis employs Asia Pacific region banks to see the impact of IFRS adoption on income smoothing activities through loan loss provisions. Specifically, it compares the effects of IFRS adoption (particularly IAS 39) between IFRS adopters (Australia, New Zealand, and Hong Kong) and non-IFRS adopters (Malaysia, Singapore[28], and Thailand). Australia, New Zealand, and Hong Kong are among the first adopters of IFRS in the Asia Pacific region. Malaysia starts using IAS 39 beginning from 1 January 2010, Singapore is in 2012, and in Thailand, IAS 39 will not be applicable until 2013. This combination allows us to control of the actual effects of IAS 39 by incorporating the non-adopters group in the model estimation. This would also provide a better insight into the effectiveness of IAS 39 in reducing earnings management among IFRS adopters.

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[28] Angklomkliew, George, and Packer (2009) and Daske, Hail, Leuz, and Verdi (2008) claim that Singapore has already adopted IAS 39 since 2005. However, according to the report by Deloitte, Singapore will fully adopt IFRS in 2012. Based on DBS's annual report 2008, it can be seen that despite banks applying IAS 39 for financial instruments, the loan loss provisioning recognition and measurement are modified by the requirements of Notice to Banks No. 612 "Credit Files, Grading and Provisioning" issued by the Monetary Authority of Singapore. Therefore, it can be concluded that Singapore is a non-IFRS adopter.

The thesis also utilises a longer period of analysis, 1995 to 2009, which covers two major crises in the Asia Pacific region: the 1997 Asian financial crisis and the 2008 global financial crisis. According to Walter (2008), poor disclosure standards, weak accounting rules, and poor corporate governance are among the contributing factors to the Asian financial crisis in 1997. The findings, therefore, would justify the needs for applying IFRS not only to increase the comparability of financial information, but also to withstand any economic shock, particularly in the Asian countries. The next section discusses the issue of pro-cyclicality in the banking system and highlights the potential effects of IFRS to cause the pro-cyclicality of loan loss provisions.

2.8 Pro-cyclicality

The issue of pro-cyclicality in the banking system has been widely discussed in the economic and finance literature. It debatably stems from the new minimum capital requirements under Basel I and Basel II regulations[29] and IAS 39 under the new accounting standards, IFRS. There have been arguments that Basel II could cause the pro-cyclicality of capital requirements and, alternatively, IFRS could encourage more pro-cyclical behaviour through loan loss provisions. Section 2.8.1 and 2.8.2 discuss in detail the association between pro-cyclicality and capital requirements and pro-cyclical behaviour of bank loan provisioning.

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[29] These came into effect in 2008.

2.8.1 Pro-cyclicality and capital requirements

The first strand of literature on pro-cyclicality correlates it with the minimum capital requirements under Basel II regulations. The new requirements demand that banks determine capital based on risks, with capital requirements increasing corresponding to an increase in asset risk. In this regard, banks have a propensity to estimate more risks (particularly loans) during the downturns that would require higher capital and in turn, reduce the capability of banks to supply loans, a phenomenon called 'credit crunch' that could worsen an economic slump.

The pro-cyclicality of capital requirements has been extensively discussed theoretically and empirically, with previous studies suggesting that the capital requirements under Basel II regulations might encourage pro-cyclicality of bank lending (Agénor and Pereira da Silva, 2012; Andersen, 2011; Angelini, Enria, Neri, Panetta, and Quagliariello, 2010; Bikker and Metzemakers, 2007; Borio, Furfine, and Lowe, 2001; Catarineu-Rabell, Jackson, and Tsomocos, 2005; Estrella, 2004; Fillat and Montoriol-Garriga, 2010; Gordy and Howells, 2006; Heid, 2007; Jokipii and Milne, 2008; Repullo, Saurina, and Trucharte, 2010; Repullo and Suarez, 2009).

Since the implementation of Basel II in 2008, most of the empirical studies employ a simulation model to look into the pro-cyclical effects of the new prudential framework. Of late, in response to the 2008 global financial crisis, Tripe, Kirkland, and Adzis (2010) carry out a preliminary investigation into the effects of Basel II and IFRS implementation on the financial reporting disclosure of New Zealand banks. The exploratory findings reveal some inconsistencies in the way banks identify their credit problems and losses under both sets of regulations. This leaves a question

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mark whether Basel II or IFRS would alter banks' behaviour to be more pro-cyclical or counter-cyclical. Some put forward that bank regulators should pay profound attention to the risk of pro-cyclicality because it could influence loan portfolio behaviour and bank lending that could threaten the stability of the financial system (Agénor and Pereira da Silva, 2012; Angelini, *et al.*, 2010; Borio, *et al.*, 2001). In responding to this issue, the Basel Committee therefore has issued proposals to rectify the problem, with these intended to be fully implemented by the end of 2012[30].

2.8.2 Pro-cyclicality and bank loan loss provisioning

The second strand of studies describes the behaviour of bank loan loss provisioning as pro-cyclical as banks usually build up more loan loss provisions during the bad times and lower them in good times. This is because in an expansionary period, there is an expectation that few loans will default and banks reduce their level of loan loss estimation. As a result, banks tend to increase the expected loan losses during recessions because generally, during those times, loan defaults are usually high. In bad times, increasing loan loss provisions would affect a bank's profit, weakening the bank's capital and, in turn, diminishing its lending activities to creditworthy borrowers. Eventually, this could trigger a credit crunch that might worsen the economic depressions (Wall and Koch, 2000).

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[30] See Basel Committee on Banking Supervision (2009) for further discussion on this proposal.

According to Berger & Udell (2004), there are two stylised facts of pro-cyclicality: 1) banks increase their loan disbursement during economic booms and reduce the loan disbursement during economic downturns, which may eventually elicit a credit crunch; and 2) banks set low past due, low non-accrual, low provisions and low charge-offs during economic growth, increase them slowly during and at the end of growth, and increase rapidly during the recession. Berger and Udell stress that the issue of pro-cyclicality of loan loss provisioning should be addressed prudentially as it could prompt systemic risk. Because of this, several empirical studies have been carried out to address the issue of pro-cyclicality of loan loss provisioning of the banking system.

Cavallo and Majnoni (2001) explore the effect of the lack of regulation in loan loss provisioning practices that may amplify the pro-cyclicality of bank capital. They conjecture that an inadequate loan loss reserve because of weak regulation of loan loss provisions could have an effect on banks' capital. The shortage of a bank's capital will contract bank lending activities, which could lead to a credit crunch that may worsen the economic downturns. Using a sample of 36[31] countries in the period from 1988-1999, the results show that the level of institutional development significantly affects loan loss provisioning practices across countries. Their findings also suggest that sound provisioning practices should be integrated as a component of capital regulation to help reduce the pro-cyclical effects on bank capital.

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[31] Including Australia, New Zealand, Hong Kong, Thailand, Malaysia, and Singapore (were classified as non-G10 countries).

Bikker and Hu (2002) study the pro-cyclical behaviour of OECD[32] banks under the Basel I regime and using time series data between 1979-1999. Specifically, the authors investigate the effect of business cycle on bank profits, loan loss provisioning, and bank lending of OECD countries, including Australia and New Zealand. The findings indicate that profits follow the pattern of business cycles: they increase in the economic booms and decrease in the economic downturns. In addition, loan loss provisions are high during economic downturns, which support the evidence of pro-cyclicality, but they lessen if the bank net income is relatively high. Finally, the lending behaviour also follows the economic pattern but, surprisingly, the behaviour is driven by demand factors, not supply factors as perceived by bank lending channel theory.

Laeven and Majnoni (2003) further analyse the cyclical patterns of bank loan loss provisions as a component of bank capital regulation. Emphasising the issue of the pro-cyclical effect of risk-based bank minimum capital requirements on the economy, Laeven and Majnoni investigate the income smoothing behaviour of banks across the globe[33] and its affiliation with the economic cycle. The results demonstrate that, on average, banks around the world increase loan loss provisioning during the economic downturns and reduce their provisioning during economic expansions. This supports the evidence of pro-cyclical behaviour of loan loss provisions. In addition, the authors stress that the Basel Committee's efforts to standardise capital regulations around the world might be worthless if they do not address the issue of different provisioning practices of banks around the world.

[32] This is stand for Organisation for Economic Co-operation and Development.

[33] Including Australia, Malaysia, New Zealand, Singapore and Thailand.

Berger and Udell (2004) employ individual US bank data over the period 1980-2000 to investigate the link between the institutional memory hypothesis and the pro-cyclicality of bank lending behaviour. Their study addresses the issue of the weaknesses of bank credit officers to recognise potential loan problems by lessening the credit standards rules during expansions, thus eventually causing a cyclical pattern of business lending during recessions. Focusing on commercial and industrial lending and commercial real estate lending patterns, the results indicate that the two types of loans increase as time passes since the banks' last loan default problem. This supports the theory of pro-cyclicality where bank managers tend to loosen their lending standards and the monitoring of problem loans several years after a recession. In relation to this, Berger and Udell (2004) suggest that bank supervisors should impose stringent rules to make the lending pattern of banks more countercyclical.

Bikker and Metzemakers (2005) extend the studies done by Cavallo and Majnoni (2001) and Laeven and Majnoni (2003) by including additional variables, using the latest period, analysing levels of loan loss reserves, and criticising the Cavallo and Majnoni model. Similar to the previous studies, Bikker and Metzemakers examine the relationship between bank provisioning behaviour and the business cycle. Employing data from OECD countries, the study supports the pro-cyclical theory of bank loan provisioning whereby banks increase the loan loss provisions during economic downturns and cut the loan provisioning during the good times. In addition, there is evidence of the capital management hypothesis as the loan loss provisions rise when the capital ratio is small. Bikker and Metzemakers (2005) urge

bank regulators through the Basel II to strengthen the provisioning policy of the banking system.

Handorf and Zhu (2006) examine the pro-cyclicality of loan loss provisioning of US banks over the period 1990-1999. Their research tries to answer two questions: Do banks in the US set up their loan loss provisions based on historical credit losses and/or projected loan losses and do bank managers manipulate the provisioning process to level the volatility in net income in order to report stable earnings? Their analysis signifies that, in general, US banks exercise prudential behaviour by following the regulatory guidance and accounting standards (GAAP) in setting up provisions. Their findings, however, do not support the evidence of the pro-cyclical behaviour of loan loss provisioning for average-sized banks, which may also indicate that these banks engage in income smoothing activities that lead to the countercyclical pattern. Nonetheless, the existence of pro-cyclicality, is found among smaller banks and the largest banks in the US.

Bouvatier and Lepetit (2008) test the impact of non-discretionary and discretionary components of loan loss provisions on European banks' lending activities particularly in the aspect of credit fluctuations. Covering the period 1992-2004, Bouvatier and Lepetit (2008) employ a methodology established by Ahmed, *et al*., (1999). The findings demonstrate that the non-discretionary component of loan loss provisions has a significant relationship with the business cycle. However, the non-discretionary component has no significant relationship with credit fluctuations. The authors strongly support the implementation of dynamic provisioning as is applied in

Spain as it promotes a forward-looking approach and hence, reduces the pro-cyclical behaviour of loan loss provisions.

To address the pro-cyclicality issue, Bouvatier and Lepetit (2009) develop a model to evaluate how provisioning rules influence loan market fluctuations by looking at the effects of loan loss provisions on the loan market. Their model compares banks' behaviour in the loan market in three types of provisioning systems: the backward-looking provisioning system[34], forward-looking provisioning system[35], and capital buffer system[36]. The findings conclude that the backward-looking provisioning system magnifies the pro-cyclicality of loan market fluctuations. In light of this, Bouvatier and Lepetit (2009) support the recommendation by the Basel Committee to implement a forward-looking provisioning system to deal with the pro-cyclicality issue.

A recent study by Beatty and Liao (2011), exploits the capital crunch theory to examine whether the incurred loss model of loan loss provisions has a significant impact on the pro-cyclicality of bank lending for the period 1993-2009. Covering the period after the implementation of the 1988 Basel Risk Based Capital Regulation and the Federal Depository Insurance Corporation Improvement Act of 1991 (FDICIA) in the United States, their findings confirm the capital crunch theory where there is a strong connection between lending and risk-based capital ratios during depressions. In addition, the results also support the pro-cyclical hypothesis as banks that delay

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[34] Loan loss provisions are triggered by past due payments.
[35] Loan loss provisions comprise two components: one related to past due payments and another one related to expected losses.
[36] Bank applies backward-provisioning rules and uses a capital buffer to cover expected losses that are not covered by loan loss provisions.

expected loss recognition reduce their lending activities more than that of banks that delay less, particularly during recessions.

In summary, the majority of the previous literature concludes that bank loan loss provisioning is highly cyclical and most of the studies suggest that bank regulators should take proactive action to contain this behaviour. The recent arguments also associate IFRS (through IAS 39) with pro-cyclical behaviour, as it emphasises an incurred loss model to measure loan losses. The next section discusses the debates about IFRS and pro-cyclical behaviour of bank loss provisioning.

2.8.3 Does IFRS cause more pro-cyclicality of bank loan loss provisioning?

IAS 39 that governs loan loss accounting under the new accounting standards (IFRS) has been debated as one of the contributing factors to the pro-cyclical behaviour of bank loan loss provisioning (Angklomkliew, *et al.*, 2009; Borio and Lowe, 2001; Craigie and Munro, 2010; Gebhardt and Novotny-Farkas, 2011). This is because in determining loan loss impairment, IAS 39 emphasises an incurred loss approach[37], contrary to the expected loss approach allowed under local accounting standards and Basel II.

The reason is clear: the incurred loss approach is expected to reduce the activities of manipulating financial information. However, it has also been criticised as one of the causes of the serious illness of financial institutions at the beginning of the 2007-

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[37] The incurred loss model has been effective since 2005 and, due to the controversial issue of this approach, in November 2009, the IASB issued an Exposure Draft "Financial Instruments: Amortized Cost and Impairment" with the plan of switching to expected loss approach. The IASB will update the exposure draft during the second half of 2012.

2009 financial crisis (Balla and McKenna, 2009). Under the incurred loss approach, provisions are only raised for losses that have already been incurred for exposures that are known to be impaired. This means that banks are not allowed to make provisions based on the likelihood that loans might default, but on objective evidence that the loans will default.

In relation to this, Ernst & Young (2006) stresses the potential pro-cyclicality of IAS 39 by outlining three aspects of loan impairment rules under IAS 39:

1. IAS 39 is an incurred loss model, and provisions are not permitted to be made in respect of expected future losses, no matter how likely they are to arise.
2. The levels of provisions should reflect current economic conditions.
3. Loan loss calculations under IAS 39 must reflect the net present value of future recoveries, discounted at the original effective interest rate on the loan.

Following the above rules, banks are expected to make more provisions during downturns and lower them in boom times, as losses will only be recognised after they have already occurred and the amount should depend on economic conditions. The new loan impairment rules could be associated with the IASB's policy, as the accounting body does not permit banks to use loan loss provisions as a buffer to absorb losses throughout the economic cycle.

2.8.4   Research gap

The question whether IFRS encourages more pro-cyclical behaviour of loan loss provisions has motivated this thesis to further investigate this issue. While previous arguments are discussed theoretically, little empirical analysis has been conducted. This thesis, therefore, explores the impact of IFRS adoption on the pro-cyclical behaviour of loan loss provisions by examining the pro-cyclical effects on IFRS adopters in the Asia Pacific region.

2.9   Fair value accounting

Fair value is defined as the amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm's length transaction (IASB, 2005). According to Barth (1994), the term fair value can be used interchangeably with mark-to-market, market value-based, and market value accounting. The aim of fair value accounting is to report the most recent value of assets and liabilities on firms' balance sheets, making the reported income more informative to the investors and the shareholders. The move to fair value accounting is expected to outperform historical cost accounting, which has been alleged to lack transparency and to be unable to reflect the current value of assets and liabilities. Fair value accounting is typically used for financial assets and liabilities under both US GAAP and IFRS (Laux and Leuz, 2009) and therefore, can be broadly applied to banks and financial institutions.

Previous literature on fair value accounting has extensively focused on the United States because the concept of fair value has been applied there since 1992. Barth (1994), Cornett, Rezaee, and Tehranian (1996) and Eccher, Ramesh, and Tiagarajan (1996) believe that in the United States, the fair value of bank investment securities is more value relevant than historical cost. Bernard, Merton, and Palepu (1995) study the Danish banking experience with mark-to-market accounting (MTM) and find that mark-to-market accounting is more reliable than the historical cost. However, bank earnings and capital are more volatile under MTM adjustments due to the recognition of gains and losses on unhedged investments in long-term, fixed-rate bonds.

Gray (2003) disagrees with the concept of fair value accounting because the mixed use of fair value and amortised cost to measure financial assets and liabilities could cause the volatility of bank income, especially during changes in the interest rates. Nissim (2003) points out that banks tend to overstate fair value of loans to manipulate the market evaluation of their risk and performance. In contrast, Gebhardt, Reichardt, and Wittenbrink (2004) agree with the application of full fair value for financial instruments as they suggest that it could reflect the banks' economic activities. However, their study was only based on a simulation model.

Plantin, Sapra, and Shin (2008) develop a parsimonious model to compare the real effects of historical cost and mark-to-market measurement regimes on financial institutions. Their findings demonstrate that both historical cost and mark-to-market have their own weaknesses, with historical cost associated with inefficiencies, while mark-to-market accounting is linked to other kinds of inefficiencies, such as the introduction of artificial risk. More recently, Laux and Leuz (2009) discuss the

potential of fair value to worsen the financial crisis, while Khan (2010) suggests that in the wake of the recent financial downturn, fair value accounting has increased banks' systemic risk. However, it is beyond the scope of this thesis to thoroughly discuss the other facets of the impact of fair value accounting on bank risk and the financial system. The next section therefore, explains the application of fair value accounting in the new accounting standards, IFRS.

2.9.1   IFRS and fair value accounting

The notable feature of IFRS is the use of fair value accounting for financial instruments. For example, fair value is being applied in IAS 16 (fair value option for property, plant, and equipment); IAS 36 (asset impairments to fair value); IAS 38 (intangible asset impairments to fair value); IAS 39 (fair value for financial instruments other than loans and receivables that are not held for trading, securities held to maturity, and qualifying hedges); and IAS 40 (fair value option for investment property).

In relation to this, the International Accounting Standards Board (IASB) believes that the application of fair value in the development of new accounting standards is essential in addressing financial crises, especially during the aftermath of the Asian financial crisis in 1997, the failure of Japanese banks in the 1990s, and the crisis of the US savings and loan in the 1980s and 1990s. David Tweedie (2008, p. 119), the chairman of the IASB from 2001 until June 2011, emphasises that IFRSs are designed to provide an economic assessment of an entity at a particular date to record the value of an entity today, not what it was worth yesterday or to predict the value

of it tomorrow. Therefore, the determination of fair value under IFRS is based on 1) the quoted price in an active market such as an exchange, dealer, broker, industry group, pricing service or regulatory agency, and prices represent actual and regularly occurring market transactions on an arm's length basis; and 2) valuation technique, if the market for a financial instrument is not active.

Although fair value is aimed to report the economic value of financial assets and liabilities to make earnings more informative, it might also promote net income volatility due to estimation error and subjective judgment of fair value itself, particularly when the market is illiquid (Ball, 2006; Jackson and Lodge, 2000; Kothari, Ramanna, and Skinner, 2010). A recent study on fair value measurement under IFRS suggests that there is little motivation to use fair value to measure assets and liabilities for firms (the sample excludes banks and insurance companies) when the use of fair value is optional, particularly in the area of intangible assets, plant and equipment and investment properties (Cairns, Massoudi, Taplin, and Tarca, 2011). Their findings imply that firms are relatively hesitant to use fair value because the particular IFRS standard (*IAS 16 Property Plant & Equipment)* has the effect that profits will always be lower for firms that adopt fair value, and managers have no interest in making such a change. The next section therefore, discusses the impact of the application of fair value generally, and IAS 39 specifically, on the performance volatility of banks.

2.9.2 IAS 39, fair value accounting, and bank performance volatility

Amongst the IFRS, greater attention has been given to *IAS 39 Financial Instruments: Recognition and Measurement.* The mixed-attribute measurement model, which combines the components of fair value, historical cost, and hedge accounting under IAS 39, has made it the most controversial standard for the banking industry (Whittington, 2005). Traditionally, under GAAP, financial instruments were measured on the basis of historical cost, which was deemed incapable of revealing the true economic value of corporations and financial institutions (Eccher, *et al.*, 1996).

In relation to this, the banking industry will be largely affected by fair value accounting under IAS 39 as financial assets and liabilities constitute a large portion of banks' balance sheets (Gray, 2003; Hodder, Hopkins, and Wahlen, 2006; Landsman, 2007). Figure 2 shows how the Westpac Banking Corporation determines the fair value of financial assets and liabilities, while Figure 3 summarises the carrying value and fair value of all financial instruments. Figure 4 demonstrates how the movement in fair value amount is recorded in the comprehensive income statement.

Figure 2: Example of valuation for fair value of financial assets and liabilities

| | Consolidated | | | | | | | |
| | 2010 | | | | 2009 | | | |
	Quoted Market Prices $m	Valuation Techniques (Market Observable) $m	Valuation Techniques (Non-Market Observable) $m	Total $m	Quoted Market Prices $m	Valuation Techniques (Market Observable) $m	Valuation Techniques (Non-Market Observable) $m	Total $m
Assets								
Derivative financial instruments	860	35,233	9	36,102	253	32,906	28	33,187
Trading securities[1]	267	39,699	45	40,011	1,371	41,637	106	43,114
Other financial assets designated at fair value	1,986	826	652	3,464	932	1,467	664	3,063
Available-for-sale securities[2]	412	11,245	51	11,708	442	833	-	1,275
Life insurance assets	11,919	391	-	12,310	11,970	414	-	12,384
Total assets carried at fair value	15,444	87,394	757	103,595	14,968	77,257	798	93,023
Liabilities								
Deposits at fair value	-	53,249	-	53,249	-	58,491	-	58,491
Derivative financial instruments	1,179	42,816	44	44,039	75	36,329	74	36,478
Trading liabilities and other financial liabilities designated at fair value	114	4,736	-	4,850	52	10,796	-	10,848
Debt issues at fair value	-	33,218	109	33,327	-	34,272	136	34,408
Total liabilities carried at fair value	1,293	134,019	153	135,465	127	139,888	210	140,225

[1] In the current year we have revised our presentation and reclassified other bank issued certificates of deposit from receivables due from other financial institutions to trading securities. To improve presentation, we have revised comparative periods. Refer to Note 1(a)(ii) for more details.

[2] At 30 September 2010 financial instruments with a carrying value of $416 million were included in available-for-sale securities, however as their fair value could not be reliably measured these were carried at cost (2009 $355 million). These amounts have not been included in the table above.

Source: Westpac Banking Corporation Annual Report 2010 p. 238.

Figure 3: Carrying value and fair value of financial instruments

	Consolidated			
	2010		2009	
	Amount $m	Fair Value $m	Amount $m	Fair Value $m
Financial assets				
Cash and balances with central banks	4,464	4,464	3,272	3,272
Due from other financial institutions	12,588	12,588	9,974	9,974
Derivative financial instruments	36,102	36,102	33,187	33,187
Trading securities[1]	40,011	40,011	43,114	43,114
Other financial assets designated at fair value	3,464	3,464	3,063	3,063
Available-for-sale securities[2]	12,124	12,124	1,630	1,630
Loans (net of impairment provision)	477,655	476,597	463,459	462,879
Life insurance assets	12,310	12,310	12,384	12,384
Regulatory deposits with central banks overseas	1,322	1,322	766	766
Other financial assets	2,671	2,671	2,443	2,443
Total financial assets	602,711	601,653	573,292	572,712
Financial liabilities				
Due to other financial institutions	8,898	8,898	9,235	9,235
Deposit at fair value	53,249	53,249	58,491	58,491
Deposits at amortised cost	284,136	284,642	270,965	271,534
Derivative financial instruments	44,039	44,039	36,478	36,478
Trading liabilities and other financial liabilities designated at fair value	4,850	4,850	10,848	10,848
Debt issues at fair value	33,327	33,327	34,408	34,408
Debt issues at amortised cost	117,009	116,845	96,945	97,070
Acceptances	635	635	1,671	1,671
Loan capital	9,632	9,186	11,138	11,143
Other financial liabilities	7,041	7,041	6,057	6,057
Total financial liabilities	562,816	562,712	536,236	536,935

[1] In the current year we have revised our presentation and reclassified other bank issued certificates of deposit from receivables due from other financial institutions to trading securities. To improve presentation, we have revised comparative periods. Refer to Note 1(a)(ii) for more details.

[2] At 30 September 2010 financial instruments with a carrying value of $416 million were included in available-for-sale securities, however as their fair value could not be reliably measured these were carried at cost (2009 $355 million). These amounts have not been included in the fair value hierarchy tables, however have been included in the tables above.

Source: Westpac Banking Corporation Annual Report 2010 p. 242.

Figure 4: Example of how the changes in fair value is recorded in comprehensive income statement

Statements of comprehensive income for the years ended 30 September
Westpac Banking Corporation

	Consolidated			Parent Entity	
	2010 $m	2009 $m	2008 $m	2010 $m	2009 $m
Net profit for the year	6,412	3,517	3,932	6,160	2,037
Other comprehensive income:					
Gains/(losses) on available-for-sale securities:					
Recognised in equity	92	33	33	33	(5)
Transferred to income statement	(1)	18	3	8	13
Gains/(losses) on cash flow hedging instruments:					
Recognised in equity	(104)	(435)	(220)	(155)	(348)
Transferred to income statement	(2)	(11)	(5)	(5)	(4)
Defined benefit obligation actuarial gains/(losses) recognised in equity (net of tax)	(99)	41	(378)	(85)	34
Exchange differences on translation of foreign operations	(122)	(121)	86	87	(152)
Income tax on items taken directly to or transferred directly from equity:					
Available-for-sale securities reserve	(28)	(15)	(21)	(11)	(4)
Cash flow hedging reserve	36	136	67	48	105
Foreign currency translation reserve	6	7	17	(21)	30
Other comprehensive income for the year (net of tax)	(222)	(347)	(418)	(101)	(331)
Total comprehensive income for the year	6,190	3,170	3,514	6,059	1,706
Attributable to:					
Owners of Westpac Banking Corporation	6,124	3,099	3,441	6,059	1,706
Non-controlling interests	66	71	73	-	-
Total net income recognised for the year	6,190	3,170	3,514	6,059	1,706

The above statements of comprehensive income should be read in conjunction with the accompanying notes.

Source: Westpac Banking Corporation annual report 2010 p. 3

In relation to Figure 2, IAS 39 Paragraph 48A outlines how fair value is measured:

"The best evidence of fair value is quoted prices in an active market. If the market for financial instrument is not active, an entity establishes fair value by using a valuation technique. The objective of using a valuation technique is to establish what the transaction price would have been on the measurement date in an arm's length exchange motivated by normal business considerations. Valuation techniques include using recent arm's length market transactions between knowledgeable, willing parties, if available, reference to the current fair value of another instrument that is substantially the same, discounted cash flow analysis and option models……."

Ball (2006), Gray (2003), and Jermakowicz and Gornik-Tomaszewski (2006), stress that the use of fair value accounting for recognition of financial assets and liabilities in IAS 39 could lead to the volatility of financial results. This is due to the complicated nature of IAS 39, as the determination of fair value might involve managerial judgment because not all financial assets have market value. This, in turn, could contribute to the measurement error that might affect net income as the changes in fair value are recorded in the profit and loss account and some are recorded as other comprehensive income items. In addition, the complexity in determining loan loss provisions under IAS 39, as suggested by Krishnakumar and Kulkarni (2007) and Ernst and Young (2006), might also affect bank earnings, as loan loss provisions have a direct effect on net income.

Previous research on the US banking industry that investigates the potential impact of fair value on earnings volatility has yielded mixed findings. Hodder *et al.,* (2006) find that the income volatility of US commercial banks under full-fair-value is three times greater than that of comprehensive income and five times more than that of net income. They also suggest that earnings volatility of full fair value is a reflection of risk that is not being captured by net income or comprehensive income volatility.

Contrasting this, Song (2008) discovers no evidence to relate the adoption of the fair value option under FAS 159[38] with the earnings volatility. The results show that earnings volatility does not vary significantly before or after fair value adoption.

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[38] *FAS 159 The Fair Value Option for Financial Assets and Financial Liabilities*. This is a standard produced by the FASB, similar to IAS 39 but not identical to the fair value option in IAS 39.

Utilising public bank holding companies in the US, Song also suggests that banks with higher earnings volatility are less likely to use the fair value option.

In a different setting, Iatridis and Rouvolis (2010) investigate the impact of IFRS implementation on the performance of publicly listed companies in Greece. They also analyse whether IFRS adoption reduces earnings management and improves the value relevance of IFRS-based accounting numbers. The findings demonstrate that IFRS has caused volatility in the profit and loss account and balance sheet items in the first year of the adoption period (2005), most probably because of the application of fair value accounting. In the aspect of earnings management, IFRS adoption has reduced earnings management and enhanced the value relevancy of accounting measures.

Besides studying the impact of IFRS on Greek firms, Iatridis (2010) also examines the impact of IFRS adoption on United Kingdom firms. Similar to his previous findings, the author notes that firms in the UK also experience greater earnings volatility after IFRS implementation. This might explain why, in spite of different legal traditions (Greece is a non-common law country; the UK use common law), IFRS has provided a similar impact on profit volatility.

Close to this thesis, Fiechter (2011) investigates the effects of the fair value option under IAS 39 on bank earnings volatility. Using an international sample of 227 banks that apply IFRS, he concludes that the fair value option under IAS 39 is more effective to mitigate earnings volatility than that of hedge accounting. In addition, he

discovers that banks applying fair value show lesser earnings volatility than non-applier banks.

2.9.3 Research gap

This thesis differs from prior literature and Fiechter (2011) on fair value and income volatility in two ways. Firstly, in contrast to the earlier studies that employed US and Europe samples, this thesis investigates the impact of IFRS adoption on bank earnings volatility using a sample of banks in the Asia Pacific region. This may provide an insight into the impact of IFRS adoption from the perspective of this region. Secondly, this thesis differs from Fiechter (2011) because it uses a longer period. Fiechter (2011) uses a short period analysis[39] to see the impact of fair value adoption on earnings volatility. This might not be enough to capture the actual effects of fair value accounting on earnings volatility.

2.10 Hypotheses development

There are three hypotheses to test the inference regarding the impact of IFRS implementation on bank loan loss provisions behaviour and bank financial performance. The next three sub-sections will further discuss these suppositions.

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[39] 1 January 2006 – 31 December 2007

2.10.1 Income smoothing hypothesis

The IFRS are principle-based accounting standards that are associated with robust disclosure requirements. Besides promoting the comparability of financial statements, the introduction of IFRS was also expected to improve the quality and transparency of financial information across the globe (Daske and Gebhardt, 2006; Schipper, 2005). According to Jermakowicz and Gornik-Tomaszewski (2006), the robust disclosure requirements under IFRS should improve financial transparency and, therefore, reduce management incentives to manage earnings. This is also supported by Barth, Landsman, and Lang (2008) and Ewert and Wagenhofer (2005) who suggest that the efforts put in by standards-setters to remove accounting options in the international accounting standards could improve accounting quality and mitigate earnings management. In addition, Shen and Chih (2005) further support this theory with their empirical findings, showing that the stringent accounting disclosure requirements are effective in reducing earnings management in the banking industry.

In relation to the banking industry, the guidelines under IAS 39 pertaining to the determination of loan loss provisions could restrict manipulation activities. This is because accounting discretion is reduced and bank managers are no longer allowed to make provisions based on an expected loss approach. Instead, they have to make provisions following the incurred loss approach. In this regard, empirical studies done by Leventis, *et al*., (2010) and Gebhardt and Novotny-Farkas (2011) support the notion that IFRS lowers earnings management in the banking industry. Gebhardt and Novotny-Farkas's findings, in particular, emphasise that the incurred loss

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approach under IAS 39 reduces income smoothing activities in the EU listed banks. The similarity of Leventis, *et al*., (2010) and Gebhardt and Novotny-Farkas (2011) studies is that they explore an EU banks sample and focus on listed banks only.

While the above studies focus on the European Union jurisdiction where the adoption of IFRS is mandatory, this study focuses on the Asia Pacific region in which the adoption of IFRS is not mandatory, particularly in the East Asia countries. The thesis sample comprises IFRS adopters and non-IFRS adopters where the actual effects of IAS 39 on income smoothing activities can be controlled by incorporating non-IFRS adopters in the sample as a control group to see the significant differences before and after IFRS implementation. The first hypothesis is as follows:

H1: Banks that have adopted IFRS engage less in income smoothing through loan loss provisions than non-adopting banks.

2.10.2 Pro-cyclicality hypothesis

The current incurred loss model under IAS 39 for recognising loan loss provisions might promote the pro-cyclical behaviour, as suggested by Angklomkliew, George, and Packer (2009), Borio and Lowe (2001), Craigie and Munro (2010) and Gebhardt and Novotny-Farkas (2011). Ernst and Young (2006) further emphasise the potential pro-cyclicality of IAS 39 by stressing that under the incurred loss model, provisions are not permitted to be made in respect of expected future losses, no matter how likely they are to arise. This is against the basic concept of loan loss provisions itself

— it is supposed to cover expected losses that are likely to arise when loans turn default.

The pro-cyclicality issue of loan loss provisions is profoundly associated with the economic cycle. Bikker and Hu (2002), Bikker and Metzemakers (2005), and Laeven and Majnoni (2003) have proved in their research findings that the behaviour of loan loss provisions is pro-cyclical in the sense that banks tend to lower their provisions during economic booms and build up more provisions during downturns. This is understandable, as the pro-cyclical behaviour of bank loans is widely discussed in the theories of disaster myopia (Guttentag and Herring, 1984), herd behaviour (Rajan, 1994), and institutional memory hypothesis (Berger and Udell, 2004).

In this regard, the incurred loss model has added more potential for pro-cyclicality. This is because provisions are set based on objective evidence of a loss trigger event or if it is highly probable that a loss has occurred but has not been reported as yet (Hronsky, 2010, p. 56). In relation to this, banks would tend to recognise loan losses at a later stage, which might cause provisions being set aside more during unpredictable economic downturns. The determination of objective evidence and the timing of a trigger event might also drive inconsistencies among banking institutions themselves that would abuse the comparability of impairment provisions (Hronsky, 2010).

Although there has been considerable academic and professional debate on the potential pro-cyclicality of loan loss provisions under IAS 39, much of the published works are analytical rather than empirical. Since this thesis is concerned with the potential pro-cyclical behaviour after IFRS implementation, the second hypothesis is:

H2: Banks that have adopted IFRS exhibit more pro-cyclical behaviour in loan loss provisions than non-adopting banks.

2.10.3 Income volatility hypothesis

One of the main attributes of the IFRS (IAS 39 specifically) is the use of fair value accounting to measure financial instruments, which differs from the concept of historical cost accounting previously applied under local GAAP. In this regard, banking institutions will be largely affected by fair value accounting under IAS 39 as financial assets and liabilities constitute a large proportion of bank balance sheets (Gray, 2003; Hodder*, et al.*, 2006; Landsman, 2007). Gray (2003), Ball (2006), Jermakowicz and Gornik-Tomaszewski (2006), and Barth *et al.,* (2008) point out that the use of fair value accounting for the recognition of financial asset and liabilities in IAS 39 could lead to the volatility of financial results. This is due to the complicated nature of IAS 39, as the determination of fair value might involve managerial judgement because not all financial assets have market value. This, in turn, could contribute to the measurement error that might affect net income, as the changes in fair value are recorded in the profit and loss account.

Jones and Higgins (2006), in their study of Australian accounting standards, report that the IFRS are more complex and difficult to understand than the former local accounting standards. The respondents of their study contend that IAS 39 is likely to promote the volatility of financial statements. Previous empirical studies on the impact of IFRS on performance volatility have yielded mixed results. Iatridis and Rouvolis (2010) and Iatridis (2010) present evidence that IFRS has caused the volatility of the financial statements of Greek and United Kingdom (UK) firms, respectively. Opposing this, Fiechter (2011), finds that the fair value option under IAS 39 is more effective in mitigating earnings volatility than that of hedge accounting.

Krishnakumar and Kulkarni (2007) and Ernst and Young (2006) also suggest that the complexity in determining loan loss provisions under IAS 39 will also affect the bank's earnings because loan loss provisions have a direct effect on a bank's net income. In relation to that, this thesis conjectures that the requirements under IAS 39 in determining loan loss provisions promote a volatility of reported income because of its complexity, inconsistency, and highly involved substantial judgment. Corresponding to that, hypothesis three and four are as follows:

H3: Banks that have adopted IFRS have more volatile earnings after IFRS adoption.
H4: Banks that have adopted IFRS have more volatile earnings than non-adopting banks.

2.11 Chapter summary

This chapter has discussed differences in loan loss accounting treatments under Generally Accepted Accounting Principles (GAAP) and International Financial Reporting Standards (IFRS) that have an impact on bank provisioning behavior and bank earnings volatility. The discussion highlights the main purpose of the new standards to reduce leeway in preparing financial statements to lessen managerial manipulation and suggests that IFRS might mitigate the activities of income smoothing through loan loss provisions. This chapter also discusses the potential problems of IFRS adoption in causing the pro-cyclicality of loan loss provisions due to the implementation of an incurred loss model in determining loan losses. A potential volatility of the reported income caused by the IFRS implementation has also been debated in this chapter due to the use of fair value accounting for financial instruments. This chapter ends with the development of hypotheses to be examined in the empirical analysis and these will be discussed further in Chapter 3: Methodology.

3 Methodology

The critical part for any research is to determine the data and to identify a proper and well-justified method of statistical analysis to properly test the hypotheses. In this regard, careful consideration has been given to the data and methodology employed in this thesis in order to test the income smoothing hypothesis, pro-cyclicality hypothesis, and earnings volatility hypothesis. Section 3.1 describes the selected sample used and Section 3.2 defines the data used in this thesis. Section 3.3 explains the model for the income smoothing test, Section 3.4 discusses the pro-cyclicality model, and Section 3.5 explains the method used to test the earnings volatility after IFRS adoption. Section 3.6 explains in detail important econometric issues that need to be addressed and Section 3.7 provides a summary of the chapter.

3.1 Data

This thesis uses bank accounting data extracted from consolidated[40] income statement and balance sheets of the selected banks. The banks' financial information was obtained primarily from the Bankscope database. Bankscope is a database provided by Bureau Van Dijk, which contains comprehensive financial information on banks across the globe. This database has been widely used in other research that uses bank data. Although data for the Australian and New Zealand banks were initially collected from banks annual reports, it was also used interchangeably with the Bankscope data, as information in the Bankscope database is consistent with the original information in the annual report. Macroeconomic data, such as Gross

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[40] Only consolidated statements are used because all adopters are required to report consolidated financial statements according to the IFRS (Ball, 2006).

Domestic Product (GDP), were taken from the World Development Indicators (WDI). To eliminate differences in the local currency of each country, all accounting data were transformed into ratios. Outliers were treated by excluding observations that exceeded three standard deviations from their respective means.

The period of analysis is from 1995 to 2009. The longer period thus covers a sufficient number of business cycles, such as the 1997 Asian financial crisis[41] and the global recession which began in December 2007[42]. Malaysia, Thailand, and Hong Kong were severely affected by the Asian financial crisis in 1997, while the impact was small on Singapore (Agusman, Monroe, Gasbarro, and Zumwalt, 2008). On the other hand, all the chosen countries have been badly hit by the global recession in 2007[43] but have quickly recovered from the crisis, particularly the East Asian countries. The selected analysis period also covers the time before IFRS adoption (1995-2004) and after IFRS adoption (2005-2009).

Commercial banks information is employed in order to get homogeneous data (Bikker and Metzemakers, 2005, p. 148) as well as to maintain consistency across countries (Kwan, 2003, p. 474). In addition, only locally-incorporated commercial banks are selected because foreign banks[44] that operate in one country may be subject to potentially confounding tax and regulatory influence in their home

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[41] Lemmon and Lins (2003) define the Asian financial crisis period as 1 July 1997 to 1 August 1998.

[42] The definition of this recession period is according to the National Bureau of Economic Research (NBER) (Huizinga and Laeven, 2009). According to the NBER, the global financial crisis began in December 2007 and continued until June 2009.

[43] Source: the International Monetary Fund (IMF) and Bank for International Settlements.

[44] The interpretation of foreign banks might differ across countries. Some countries, such as New Zealand, allow branches of foreign banks to operate. However, other countries do not. In Malaysia, for example, foreign commercial banks do not operate as a branch but are incorporated in Malaysia as locally incorporated banks.

countries (Collins, Shackelford, and Wahlen, 1995, p. 270). A few banks had to be excluded from the sample due to a lack of data on loan loss provisions and having less than 10 years[45] of accounting data. In addition, to be included in the sample, all IFRS adopting banks must have at least three years of data available for post-IFRS adoption. The final sample then comprises 62 commercial banks from the six countries. The biggest sample comes from Malaysia and the smallest from Singapore.

This thesis utilises an unbalanced panel data set. This refers to a sample in which some cross-sectional units (in this study, it refers to banks) have an unequal number of time-series observations. Such 'incomplete' panels are common in an economic empirical setting (Baltagi, 2008) and particularly in the banking industry, incomplete panels are unavoidable because some banks have to be dropped out from the sample due to mergers and acquisitions.

Panel data[46] provides several advantages. Firstly, it controls for bank- and time-invariant variables. Secondly, it offers richer data with more variability and less co-linearity among the variables. Thirdly, it gives greater freedom and efficiency. Fourthly, it enables the use of a dynamic model. Fifthly, it identifies and measures effects that cannot be detected in cross-section and time-series data. Sixthly, it tests more complicated behavioural models. Finally, it reduces biases resulting from aggregation over firms or individuals. The only limitations are that panel data may

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[45] Ten years of data is needed to cover at least one business cycle in order to capture both economic booms and recessions, particularly for the pro-cyclicality hypothesis.

[46] See Baltagi (2008) for a thorough discussion on the panel data model.

cause measurement error problems and may exhibit bias due to sample selection issues.

3.2   Sample

This thesis utilises a sample of commercial banks from six countries in the Asia Pacific region: namely, Australia, New Zealand, Hong Kong, Malaysia, Singapore, and Thailand. This region has received little attention from previous scholars with regard to the impact of IFRS adoption. Therefore, the findings could provide a better insight into the effects of IFRS implementation on bank loan loss provisioning behaviour and bank earnings volatility from the perspective of the Asia Pacific region. The region also offers a unique avenue to investigate the actual effects of IFRS implementation by providing a combined sample of IFRS adopters (Australia, New Zealand, and Hong Kong) and non-IFRS adopters (Malaysia, Singapore[47], and Thailand). According to Daske, *et al*., (2008), distinguishing between adopters and non-adopters (which act as a benchmark sample) is important in evaluating the impact of IFRS adoption.

Australia, New Zealand, and Hong Kong were among the first IFRS-adopters in the Asia Pacific region, with Australia and Hong Kong officially adopting the IFRS in January 2005, and New Zealand officially adopted the IFRS in 2007. However, there was flexibility for the New Zealand firms and banks to adopt the standards for periods commencing on or after 1 January 2005. In this regard, the four largest New

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[47] Singapore is a unique case. It claims to have already adopted IFRS but has modified the recognition and measurement principles of the original IFRS when applying them to local standards. In conclusion, Singapore continues to apply its own national standards (called the Singapore Financial Reporting Standards) until it fully converges with the IFRS in 2012.

Zealand banks[48] are subsidiaries of Australian banks, and they followed their parents' bank operations to adopt the IFRS in 2005. Of the 10 Southeast Asian countries[49], Malaysia, Singapore, and Thailand were chosen to be included into the sample because of their more developed accounting and regulatory institutions compared to the others (Saudagaran and Diga, 2000).

Some might argue that it is crucial to distinguish between early adopters and late adopters to mitigate the issue of self-selection bias, particularly involving the New Zealand sample. In this thesis, New Zealand banks only represent eight percent (with only five banks) of the overall sample. Of the five banks, only the TSB Bank officially adopted IFRS in 2007, while the rest adopted them in 2005. Kiwi Bank also adopted the IFRS in 2007, but it was excluded from the sample because available data is for less than 10 years.

All the countries in the sample share the same legal tradition: they are common law regions[50] that are of English origin; thus, it is not necessary to control for the different legal traditions of the sample. Controlling the dissimilarities in the legal tradition is important as the differences can lead to a disparity in accounting practices and accounting quality (Clarkson, Hanna, Richardson, and Thompson, 2011; Soderstrom and Sun, 2007) that might influence the results.

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[48] Bank of New Zealand, ASB Bank Limited, ANZ National Bank Limited, and Westpac New Zealand Limited.

[49]The other Southeast Asian countries include Indonesia, the Philippines, Brunei, Burma, Cambodia, Laos, and Vietnam. Saudagaran and Diga (2000) mention that Indonesia and the Philippines have good accounting and regulatory institutions, but the countries are excluded from this thesis due to their different legal traditions.

[50] Some argue that Thailand is not a common law country; it is a code law country. However, Thailand's first laws were based on common law and La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998) classify country origin according to the initial laws being adopted. Furthermore, Thailand's laws are highly influenced by the common law system (Triamanuruck, Phongpala, and Chaiyasuta, 2004).

In this respect, the accounting standards in Malaysia, Singapore, Hong Kong, and Thailand are derived from common law sources (Ball, Robin, and Wu, 2003), similar to Australia and New Zealand. Historically, Malaysia, Singapore, and Thailand's accounting standards were derived primarily from the international accounting standards (IAS), while Hong Kong's accounting standards were conventionally based on those from the UK (Graham and King, 2000; Saudagaran and Diga, 2000; Taplin, Tower, and Hancock, 2002).

According to La Porta, *et al*., (1998), common law tradition regions have unique characteristics in terms of stronger investor protection, with better accounting systems, and good law enforcement. Considering the above characteristics provided by La Porta, *et al*., (1998), it can be inferred that the financial statements of the six countries in the sample are comparable in that their financial information conforms to high-quality accounting standards.

This region also allows this thesis to study the impact of IFRS on bank loan loss provisioning behaviour (pro-cyclicality predominantly) and bank earnings as it experienced two types of economic downturns: the 1997 financial crisis and the 2008 global financial crisis. According to Rahman (2000), there was an urgency to have high quality accounting standards in the East Asia region following the financial crisis in 1997, while Walter (2008) suggests that weak accounting standards were one of the contributing factors to the Asian financial crisis in 1997.

The findings, therefore, may justify the necessity for the non-adopting countries (East Asia countries particularly) to adopt the IFRS in order to withstand any economic shocks as well as to be competitive in the international capital market, particularly for the purpose of raising external capital. In addition, the two economic downturns are essential to test the actual pro-cyclical effects of IFRS implementation, as pro-cyclical behaviour of loan loss provisioning is highly associated with the business cycle (Bikker and Metzemakers, 2005; Laeven and Majnoni, 2003). Table 2 shows the total number of locally incorporated commercial banks for the six countries in the sample. Table 3 shows a selection of sample banks, and Table 4 describes the accounting regulations of the chosen countries.

Table 2: Number of locally incorporated commercial banks

Country/Region	No. of banks[51]	No. of commercial banks[52,53]	No. of locally incorporated commercial banks
Australia	58	22	13
New Zealand	19	12	8
Malaysia	56	22	22
Singapore	125	31	6
Thailand	33	30	14
Hong Kong	146	N/A	23
TOTAL	**437**	**117**	**86**

Source: Website of central bank of each country

Table 3: Sample selection

Country/Region	No. of locally incorporated commercial banks in Bankscope database:	Less: Number of locally incorporated commercial banks dropped from the sample	FINAL SAMPLE
Australia	10	0	10
New Zealand	7	2	5
Malaysia	20	3	17
Singapore	5	2	3
Thailand	14	0	14
Hong Kong	22	9	13
TOTAL	**78**	**16**	**62**

Source: Bankscope database

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[51] Every country has different categories of banks. For this category, banks include commercial banks, Islamic banks, retail banks, investment banks, foreign banks' subsidiary, and foreign bank branches.

[52] This category has two types of commercial banks: Foreign commercial banks and locally incorporated commercial banks.

[53] In Malaysia, Islamic banks belong to the commercial banks category. To standardise, only conventional commercial banks are included in the sample.

Table 4: Accounting regulation

No.	Characteristic	Country/Region					
		Australia	**New Zealand**	**Malaysia**	**Thailand**	**Singapore**	**Hong Kong**
1.	Bank supervisory authority	Australian Prudential Regulation Authority and Australian Securities and Investments Commission	Reserve Bank of New Zealand	Central Bank of Malaysia	Ministry of Finance Bank of Thailand	Monetary Authority of Singapore	Hong Kong Monetary Authority
2.	Accounting standards setting bodies	Australian Accounting Standards Board (AASB)	New Zealand Accounting Standards Review Board	Malaysian Accounting Standards Board (MASB)	Federation of Accounting Professions	Singapore Accounting Standards Council	The Hong Kong Institute of Certified Public Accountants
3.	Accounting standards used Source: www.iasplus.com	IFRS & A-IFRS	IFRS & NZ-IFRS	Malaysian Financial Reporting Standards (based on IAS)	Thai Accounting Standards (based on US GAAP)	Singapore Financial Reporting Standards (based on IAS)	Hong Kong Financial Reporting Standards (Fully converged with IFRS from 1 January 2005)
4.	Basis of preparation of bank financial statements (based on annual report year 2008)	Provisions under: Banking Act 1959; AASB; Corporation Acts 2001; Urgent Issues Group Interpretations A-IFRS; IFRS; US Securities and Exchange Commission	Provisions under: Companies Act 1993; The Financial Reporting Act 1993; NZ-IFRS; IFRS	Provisions under: Companies Act 1965; Bank Negara Malaysia guidelines; National accounting standards	Provisions under: Accounting Profession Act B.E. 2547; Bank of Thailand; Office of the Securities and Exchange Commission National accounting standards	Provisions under: Companies Act; Monetary Authority of Singapore; National accounting standards	In accordance with: Hong Kong Financial Reporting Standards (HKFRS) Hong Kong Companies Ordinance; Hong Kong accounting standards; The Stock Exchange of Hong Kong Limited

Source: Website of central bank of each country, selective bank annual reports, www.iasplus.com, and website of accounting standard bodies of each country.

3.3 Measuring income smoothing

Previous studies on bank income smoothing employ loan loss provisions as a dependent variable to test the evidence of manipulating loan loss provisions to smooth income (Ahmed, *et al.*, 1999; Fonseca and Gonzalez, 2008; Greenawalt and Sinkey, 1988). Following Ahmed, *et al.*, (1999), this study uses loan loss provisions scaled by average total assets (LLP_{it}) as a dependent variable to test the income smoothing hypothesis. It is important to note that loan loss provisions in this study refer to accrual expense in the income statement rather than the loan loss reserve in the bank balance sheet. This is in accordance with the controversial issue of bank managers who tend to manipulate accrual expenses (loan loss expense) to manage earnings, as being discussed in Chapters 1 and 2. Most importantly, the focus of this study is on IAS 39 that guides bank managers to determine loan loss provisions (impairment expense) rather than loan loss reserves.

For explanatory variables, lagged one period loan loss provisions scaled by average total assets (LLP_{it-1}) is included to capture the dynamic adjustment of LLP (Fonseca and Gonzalez, 2008; Laeven and Majnoni, 2003). A positive coefficient with the LLP_{it} is expected because banks should regularly revise their loan loss provisions over time to accommodate latent loan losses. While previous studies use a second lag to capture the dynamic adjustment of LLP, this study only uses the first lag to avoid losing a number of observations since the sample is relatively small. The use of a lagged dependent variable as an explanatory variable may also deal with potential endogeneity (Bertrand, Duflo, and Mullainathan, 2004) and serial correlation (Bikker and Metzemakers, 2005).

The main variable of interest is earnings before taxes and provisions of bank i at year t scaled by average total assets (EBTP$_{it}$). According to studies such as Ahmed, *et al.*, (1999), Fonseca and Gonzalez (2008), Greenawalt and Sinkey (1988), and Laeven and Majnoni (2003), this variable is used specifically to measure the evidence of income smoothing. The regression estimates whether earnings before tax and provisions (EBTP$_{it}$) have either a positive or negative relationship with loan loss provisions (LLP$_{it}$). A positive coefficient would affirm the evidence of income smoothing, where banks increase loan loss provisions when net incomes are high and reduce the loan loss provisions when net incomes fall. Earnings before taxes and provisions is used to measure earnings since the use of after tax profit could lead to potential bias given that the tax and provisioning systems do differ considerably among different countries.

To measure default risk, following Bikker and Metzemakers (2005), the change in total loans outstanding of bank i at year t scaled by average total assets (ΔLOANS$_{it}$) is used. Typically, the higher the loan growth, the higher the probability of default would be. Therefore, loan loss provisions should have a positive relationship with the change in total loans outstanding. The other measure of default risk is the beginning loan loss allowance, which is calculated by using the ratio of beginning loan loss allowance of bank i at year t over average total assets (BLLA$_{it}$). Besides controlling for default risk, this non-discretionary variable also captures prior provisions because the loan loss allowance account provides a summary of past decisions regarding loan loss provisions, loan charge-offs, and charge-offs' recoveries. According to Wahlen (1994) and Lobo and Yang (2001), a negative coefficient is expected for BLLA$_{it}$.

This is because this year's loan loss provisions are expected to be lower if in the previous periods the managers use their discretion to overstate expected loan losses. Another important variable to measure bank risk is total loans divided by total assets of bank i at year t (LOANTA$_{it}$). This acts as a proxy for the credit risk of a bank's loan portfolio, although Bouvatier and Lepetit (2008) emphasise that non-performing loans (NPL) perform better as an indicator of risk. However, the NPL data are not consistently available on the Bankscope database; therefore, loans to total assets are used as a measure for loan portfolio risk. Generally, the provisions amount is determined based on loan portfolio quality. The rise in the loan portfolio forces a bank to increase loan loss provisions due to higher default risk. Thus, the coefficient is expected to be positive.

The sample contains IFRS adopters and non-adopters. To see the effects of IFRS adoption, a dummy variable is used to differentiate between adopters and non-adopters. In view of this, IFRSADOP$_{it}$ denotes a dummy variable for IFRS adopters, equal to one for the post IFRS-regime years (2006-2009) and zero for the pre IFRS-regime years (1995-2005). Although IFRS was officially implemented in 2005, the year 2006 is used as a benchmark year for IFRS adoption to take into account the differences in the accounting year-end for each bank.

To test whether there is any reduction in income smoothing activities in IFRS adopting banks after the IFRS implementation, the interaction term of EBTP$_{it}$ x IFRSADOP$_{it}$ is used. This is a critical explanatory variable to prove that stringent accounting standards (IFRS) may reduce the activities of earnings management. The

coefficient is expected to be negative if the income smoothing activities through loan loss provisions reduce after IFRS adoption.

From the above explanation, a baseline regression is developed to test whether the adoption of IFRS reduces income smoothing activities through loan loss provisions for IFRS adopters. For this reason, a baseline regression model modified from Ahmed, *et al.*, (1999), Laeven and Majnoni (2003), and Fonseca and Gonzalez (2008) is employed and the specification is as follows:

$$LLP_{it} = \alpha + \beta_1 LLP_{i,\,t-1} + \beta_2 EBTP_{it} + \beta_3 \Delta LOANS_{it} + \beta_4 BLLA_{it} + \beta_5 LOANTA_{it}$$
$$+ \beta_6 IFRSADOP_{it} + \beta_7 EBTP_{it} \times IFRSADOP_{it} + \varepsilon_{it}$$

(1)

where LLP_{it} is the loan loss provisions of bank i at year t scaled by average total assets; $LLP_{i,t-1}$ is the lagged dependent variable of LLP_{it} scaled by average total assets; $EBTP_{it}$ is earnings before taxes and provisions of bank i year t scaled by average total assets; $\Delta LOANS_{it}$ is change in total loans outstanding of bank i year t scaled by average total assets; $BLLA_{it}$ is the beginning loan loss allowance of bank i year t scaled by average total assets; $LOANTA_{it}$ is the ratio of total loans to total assets of bank i year t; $IFRSADOP_{it}$ is the dummy variable 1 for IFRS adopters that adopt IFRS 2006-2009 and 0 otherwise; $EBTP_{it} \times IFRSADOP_{it}$ is the interaction term to test whether income smoothing activities are reduced after IFRS adoption; and ε_{it} is the white-noise error term.

Equation (1) is estimated using a generalised-method-of-moments (GMM) estimator for dynamic model of panel data due to the presence of a lagged dependent variable ($LLP_{i,t-1}$) among the regressors. Section 3.6 further explains why the GMM estimator is used to test Equation (1).

3.3.1 Robustness test

In addition to the baseline regression, additional variables are also included in Equation (1) for robustness tests. Control variables are needed to allow for any other possible explanatory variables that could influence the income smoothing activities of banks. According to Beatty and Harris (1998) and Beatty, *et al*., (2002), publicly held banks are more likely to manage earnings as compared to privately held banks due to agency problems and information asymmetry. Moreover, the political cost hypothesis assumes that larger firms are more likely to use accounting discretion to manipulate reported profit due to regulatory scrutiny (Watts and Zimmerman, 1990). Recent studies by Kanagaretnam, *et al*., (2010) and DeBoskey and Jiang (2012) suggest that auditor reputation could hinder the activities of earnings management in banks.

Accordingly, bank size, auditor reputation, and a publicly held bank dummy variable are included in Equation (1) to control for their possible effects on bank income smoothing activities. Bank size is measured by the natural logarithm of total assets of bank *i* year *t* ($SIZE_{it}$). Auditor ($AUDIT_{it}$) is a dummy variable that takes a value of 1

if the bank is audited by a Big 4 auditor[54], or 0 otherwise. Publicly held ($PUBLIC_{it}$) is a dummy that takes a value 1 if the bank is a listed bank, 0 otherwise. A positive coefficient of $SIZE_{it}$, a negative coefficient of $AUDIT_{it}$, and a positive coefficient of $PUBLIC_{it}$ is expected.

Besides that, year dummies 1997, 2005, and 2008 also need to be added to control for the 1997 financial crisis, 2005 IFRS implementation, and 2008 global economic crisis that may also affect the loan loss provisions in the period studied. In light of this, year dummies 1997, 2005, and 2008 are included in Equation (1).

It is important to note that, the sample of this study contains banks from six countries in the Asia Pacific region. In this regard, Bikker and Metzemakers (2005) and Agusman, *et al.* (2008) suggest that a country dummy variable ($Country_j$) should be incorporated to capture the differences in the banking structure, regulatory environments, tax and accounting standards, and economic and political backgrounds across countries. For this reason, five country dummies (AUS, NZ, HK, MY, and TH) are included in Equation (1). Singapore is not represented by a dummy variable and acts as a benchmark factor for comparison with the other countries. Note that bank fixed effects are not included in Equation (1) because the GMM estimator removes cross-section fixed effects.

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[54] PricewaterhouseCoopers(PwC), Deloitte, KPMG, and Ernst & Young.

For a further robustness test, Equation (1) is re-analysed using the subsample of banks in adopting countries only.[55] This is to seek strong evidence that IFRS adoption does reduce the income smoothing activities among IFRS adopters. It is important to note that for the robustness test using the adopters sample, panel least squares were employed because the sample size is fairly small, 28 banks. According to Roodman (2006), if N is small, the cluster-robust standard errors and Arellano-Bond autocorrelation test may become unreliable. Due to this, a static version of Equation (1) is estimated, where the lagged dependent variable (LLP_{t-1}) is omitted from the model to avoid the correlation with the error term. The basic equation then reads as follows:

$$LLP_{it} = \alpha + \beta_1 EBTP_{it} + \beta_2 \Delta LOANS_{it} + \beta_3 BLLA_{it} + \beta_4 LOANTA_{it} + \beta_5 IFRSADOP_{it} + \beta_6 EBTP_{it} \text{ x } IFRSADOP_{it} + \varepsilon_{it}$$

$$(2)$$

It is worth noting that panel least squares allow the regression analysis to control for bank specific effects and time fixed effects. A fixed effects model[56] is used to control for the unobservable behaviour of banks' specific characteristics, such as management quality and bank policies that may affect the loan loss provisions decision. Besides that, time fixed effects also need to be controlled due to unobservable factors, such as changes in regulations and economic conditions that may also affect the loan loss provisions. To summarise, the application of the fixed

[55]This is in order to avoid irrelevant noise from banks in non-adopting countries.

[56] Hausman's specification test was run using STATA 10 to test which one to apply: fixed effects model or random effect model. The results (not reported) show that the null hypothesis of fixed effects and random effects model do not differ substantially was rejected. This means that the fixed effects model is preferable to the random effects model.

effects model in this robustness test removes the time-invariant effects from the loan loss provisions so that only the net effect of loan loss provisions can be estimated. Therefore, bank specific effects and time specific effects are controlled for in Equation (2). The next section discusses the variable definition and model estimation for the pro-cyclicality hypothesis.

3.4 Measuring pro-cyclicality

Majority of the variables for the pro-cyclicality test are similar to the income smoothing model in Equation (1) except GDP_{it}, and GDP_{it} x $IFRSADOP_{it}$, which replace $EBTP_{it}$ and $EBTP_{it}$ x $IFRSADOP_{it}$. Pro-cyclicality is strongly associated with the business cycle, where banks tend to increase the loan loss provisions during economic downturns. Therefore, to measure the business cycle, this thesis uses annual growth of real per capita GDP of country j at year t (GDP_{jt}). This variable is included in Equation (1) to replace $EBTP_{it}$. The relationship between GDP growth and the LLP should provide evidence of pro-cyclical behaviour of the sample. A negative relationship implies that banks increase their loan loss provisions when the business cycle falls (Bikker and Metzemakers, 2005, Laeven and Majnoni, 2003). Only GDP is used as the main variable to measure business cycles in this study, because according to Guenther and Young (2000), economic growth rate (GDP) is considered to be the best proxy for the type of underlying economic activity compared to other real economic activity such as unemployment rate and money market interest rate.

To test whether IFRS adopters exhibit more pro-cyclical behaviour after IFRS adoption, the interaction term GDP_{jt} x $IFRSADOP_{it}$ is used to replace $EBTP_{it}$ x $IFRSADOP_{it}$ in Equation (1). Due to this, GDP_{jt} x $IFRSADOP_{it}$ is the main variable of interest to test the pro-cyclicality hypothesis because a negative coefficient suggests that IFRS adopters exhibit more pro-cyclical behaviour after IFRS adoption. To examine this, a dynamic model of pro-cyclicality is developed similar to the income smoothing model in Equation (1). The baseline model is as follows:

$$LLP_{it} = \alpha + \beta_1 LLP_{i,\,t-1} + \beta_2 GDP_{jt} + \beta_3 \Delta LOANS_{it} + \beta_4 BLLA_{it} + \beta_5 LOANTA_{it} + \beta_6 IFRSADOP_{it} + \beta_7 GDP_{jt} \text{ x } IFRSADOP_{it} + \varepsilon_{it}$$

(3)

where GDP_{jt} is the annual growth of real per capita GDP of country j at year t, and GDP_{jt} x $IFRSADOP_{it}$ is the interaction term to capture the evidence of more pro-cyclical behaviour of IFRS adopters after IFRS adoption. Similar to the income smoothing analysis, Equation (3) is estimated using a GMM estimator. As mentioned earlier, further discussion on the GMM estimator can be found in Section 3.6.

3.4.1 Robustness test

After running the baseline model, bank size $(SIZE_{it})$[57], country dummies, and time dummies are augmented into Equation (3) to control for other factors that may affect the loan loss provisions. For a further robustness test, Equation (3) is re-estimated using the subsample of banks in adopting countries to validate the inference that IFRS adopters exhibit more pro-cyclical behaviour after IFRS adoption. Similar to the income smoothing analysis, the above equation is re-estimated by omitting the lagged dependent variable in the explanatory variables. Therefore, only a static version of Equation (3) is estimated in the panel least squares analysis. The equation then reads as follows:

$$LLP_{it} = \alpha + \beta_1 GDP_{jt} + \beta_2 \Delta LOANS_{it} + \beta_3 BLLA_{it} + \beta_4 LOANTA_{it} +$$
$$\beta_5 IFRSADOP_{it} + \beta_6 GDP_{jt} \text{ x } IFRSADOP_{it} + \varepsilon_{it}$$

$$(4)$$

Bank and time dummies are also included in Equation (4) to control for any unobservable factors that may affect the loan loss provisions. The next section discusses the variable definition and model estimation for the earnings volatility hypothesis.

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[57] For pro-cyclical analysis, only bank size is controlled for because larger banks may have a mechanism to establish their loan loss provisions following the irregular up-and-down movements in business cycle.

3.5   Measuring bank's earnings volatility

This study uses the standard deviation of earnings before taxes and provisions (SDEAR) to see the impact of IAS 39 on earnings volatility because the changes in fair value amounts are recorded in profit and loss. As shown in Figure 4 of Subsection 2.8.2, items such as gains/(losses) on available-for-sale securities and gains/(losses) on cash flow hedging instruments are reported in the income statement. These items directly affect operating income, earnings before taxes and provisions, and net income. However, only earnings before taxes and provisions are used as main variables to measure earnings in this study. This is because earnings before taxes and provisions is commonly used as a profitability measure in the banking industry because tax and provisioning systems differ across countries (Bikker and Hu, 2002). In summary, comparing after tax income could lead to biased results (Iannotta, Nocera, and Sironi, 2007).

To determine earnings volatility, this thesis follows the method used by Fiechter (2011), where the standard deviations are calculated as follows:

$$\sigma EAR_{before} = STDV\ (EBTP_{it}/\text{Average total assets}_{it})$$
$$t_0 = 2001 \text{ to } t_4 = 2004$$

$$(5)$$

$$\sigma EAR_{after} = STDV\ (EBTP_{it}/\text{Average total assets}_{it})$$
$$t_0 = 2006 \text{ to } t_4 = 2009$$

$$(6)$$

Equation (5) is calculated to measure earnings volatility for the period before IFRS adoption, while Equation (6) measures the earnings volatility for the period after IFRS adoption. The next sections discuss in detail the reason why four years before adoption and four years after adoption are selected to measure the impact of IFRS (through IAS 39) on earnings volatility.

3.5.1   The impact of IFRS on adopters' earnings volatility

To test the impact of IFRS adoption on Australia, New Zealand, and Hong Kong bank earnings volatility, this thesis follows the method used by Megginson, Nash, and Randenborgh (1994) and Boubakri, Cosset, Fischer, and Guedhami (2005) where a univariate test is conducted to test the volatility changes by comparing the mean earnings volatility before and after IFRS adoption. Paired-samples *t*-test is used to compare the mean difference of the pre- and post-adoption earnings volatility for the adopters' sample. The null hypothesis is the earnings volatility of IFRS adopters before and after IFRS are the same.

The earnings volatility is determined for a period of eight years[58] (four years prior to IFRS adoption and four years after IFRS adoption, excluding the year of IFRS transition in 2005). The year of IFRS adoption (2005) is excluded from the standard deviations calculations to provide a transition period. The banks must have at least three observations for each period (before and after) to be included in the analysis. The TSB Bank from New Zealand is excluded from the analysis because it adopted IFRS in 2007. After the mean changes of pre- and post-IFRS adoption are compared

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[58] Boubakri, *et al*., (2005) and Megginson, *et al*., (1994) use a seven year period. However, since the data are available up to four years after IFRS adoption, this thesis covers an eight years period.

using Paired-sample *t*-tests, a non-parametric test, the Wilcoxon signed-rank test is then performed to test the significant changes in the median of earnings volatility. The Wilcoxon signed-rank test assumes non-normality of the data besides. The null hypothesis is that the median difference in earnings volatility before and after IFRS adoption is the same.

3.5.2   The comparison of earnings volatility between IFRS adopters and non-adopters

To compare the earnings volatility of IFRS adopting banks and non-IFRS adopting banks before and after IFRS adoption, Independent-sample *t*-tests are employed. Earnings volatility is calculated based on Equation (5) and Equation (6). Similar to the previous section, earnings volatility is calculated for a period of eight years (four years prior to IFRS adoption and four years after IFRS adoption, excluding the year of IFRS transition in 2005) for both adopters and non-adopters.

Banks must have at least three years observations prior to the IFRS regime and three years observations for the post IFRS regime in order to be included in the analysis. A non-parametric test, Independent-sample median tests are then used to test median differences before and after IFRS regime for adopters and non-adopters. This test assumes non-normality of the data, and to ensure the results are not driven by the outliers. The null hypothesis is that the median changes in earnings volatility for IFRS adopters are the same as non-adopters before and after IFRS adoption.

Much of the information in the thesis is recorded in the following tables. Table 5 describes all the variables used in this thesis, while Table 6 provides the descriptive statistics of the variables. Table 7 shows the correlation matrix for all the variables used in the income smoothing and pro-cyclicality analysis.

Table 5: Variable definitions

Variable	Definition	Source	Expected sign
LLP	Loan loss provisions scaled by average total assets	Bankscope database	N/A
EBTP	Earnings before taxes and provisions scaled by average total assets	Bankscope database	+
Δ LOANS	Change in total loans outstanding scaled by average total assets	Bankscope database	+
BLLA	Beginning loan loss allowance scaled by average total assets	Bankscope database	-
LOANTA	Total loans divided by total assets	Bankscope database	+
IFRSADOP	Dummy variable equal to 1 for IFRS adopters that adopt IFRS in year 2006-2009, 0 otherwise	Author's calculation	N/A
EBTP*IFRSADOP	Interaction term to capture the evidence of reduction in income smoothing after IFRS adoption	Author's calculation	-
GDP	Annual GDP growth	World Development Indicator	-
GDP*IFRSADOP	Interaction term to capture the evidence of more pro-cyclical behaviour after IFRS adoption	Author's calculation	-
SIZE	Bank size, measured by the natural logarithm of total assets	Bankscope database	+
PUBLIC	Dummy variable equal to 1 for publicly held bank, 0 otherwise	Author's calculation	+
AUDIT	Dummy variable equal 1 for bank audited by Big 4 auditor, 0 otherwise	Author's calculation	-
AUS	Dummy variable equal 1 for Australia, 0 otherwise	Author's calculation	N/A
NZ	Dummy variable equal 1 for New Zealand, 0 otherwise	Author's calculation	N/A
HK	Dummy variable equal 1 for Hong Kong, 0 otherwise	Author's calculation	N/A
MY	Dummy variable equal 1 for Malaysia, 0 otherwise	Author's calculation	N/A
TH	Dummy variable equal 1 for Thailand, 0 otherwise	Author's calculation	N/A
SDEBTP	Standard deviation of earnings before taxes and provisions scaled by average total assets	Author's calculation	N/A

Table 6: Descriptive statistics

Panel A: Full sample				
Variable	**Mean**	**Median**	**Standard deviation**	**Observations**
LLP	0.005	0.002	0.008	828
EBTP	0.018	0.018	0.009	842
ΔLOANS	0.072	0.060	0.124	849
BLLA	0.022	0.014	0.024	800
LOANTA	0.640	0.654	0.162	865
GDP	3.806	4.480	3.930	930
IFRSADOP	0.128	0.000	0.335	850
SIZE	24.70	24.65	1.690	849
PUBLIC	0.569	1.000	0.496	865
AUDIT	0.988	1.000	0.108	854
Panel B: IFRS adopters				
Variable	**Mean**	**Median**	**Standard deviation**	**Observations**
LLP	0.002	0.001	0.003	410
EBTP	0.017	0.017	0.005	414
ΔLOANS	0.082	0.072	0.106	415
BLLA	0.008	0.006	0.007	412
LOANTA	0.648	0.647	0.161	416
GDP	3.276	3.620	2.858	420
IFRSADOP	0.262	0.000	0.440	416
SIZE	24.69	24.65	1.559	415
PUBLIC	0.587	1.000	0.493	416
AUDIT	1.000	1.000	0.000	416
Panel C: Non-IFRS adopters				
Variable	**Mean**	**Median**	**Standard deviation**	**Observations**
LLP	0.007	0.005	0.010	418
EBTP	0.019	0.020	0.012	428
ΔLOANS	0.063	0.048	0.142	434
BLLA	0.043	0.030	0.057	393
LOANTA	0.632	0.659	0.163	449
GDP	4.243	5.330	4.587	510
IFRSADOP	0.000	0.000	0.000	493
SIZE	24.70	24.64	1.809	434
PUBLIC	0.552	1.000	0.498	449
AUDIT	0.977	1.000	0.150	438

Table 6 reports the descriptive statistics for the variables used in this study. On average, the banks in the sample have a LLP of 0.5% over the entire period from 1995 to 2009. The LLP of non-IFRS adopters is higher than those of IFRS adopters by 0.5%. The EBTP for the entire period is 1.8%, the loan growth is 7.2%, the BLLA is 2.2%, and the ratio of total loans to total assets (LOANTA) is 64%. This implies that loans make up approximately 64% of the bank assets in the sample, reflecting the concentration of the sample in lending activities. On average, the GDP growth is

3.81%, where the GDP growth for the non-IFRS adopters is higher than those of IFRS adopters, reflecting the high economic growth of the non-IFRS adopters (Malaysia, Singapore, and Thailand) compared to the adopters in the period studied. The average size in the sample is 24.7, publicly held banks represent 57% of the overall sample (with no major difference between the publicly and non-publicly-held banks) and 99% of the sample is audited by the Big 4 auditor[59]. Due to this, AUDIT variable is dropped out from all the regressions analysis because including this would not make any difference. Table 7 provides correlation analysis of the variables used in this study.

Table 7: Correlation matrix of variables used in this thesis

VARIABLE	LLP	EBTP	GDP	ΔLOANS	BLLA	LOANTA	IFRSADOP	SIZE	PUBLIC
LLP	1								
EBTP	-0.054	1							
GDP	-0.213***	0.110***	1						
ΔLOANS	-0.075**	0.074**	0.125***	1					
BLLA	0.281***	-0.043	0.162***	-0.059*	1				
LOANTA	0.123***	-0.089**	-0.119***	0.330***	0.109***	1			
IFRSADOP	-0.140***	-0.130***	-0.136***	0.066**	-0.304***	-0.002			
SIZE	0.158***	-0.070**	-0.086**	-0.062*	0.199***	0.028	0.167***	1	
PUBLIC	0.078**	-0.179***	-0.031	0.045	0.102***	0.219***	0.042	0.413***	1

***, **, and * represent significance at 1%, 5%, and 10% level, respectively

The correlation matrix in Table 7 indicates that LLP has negative coefficient but insignificant. GDP has negative coefficient and statistically significant, confirming the pro-cyclical effect of LLP. Loan growth has negative coefficient, contradicting the expectation that it shall have a positive relationship with the LLP. BLLA also exhibits a contradict sign, as it is predicted to have a negative relationship with the

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[59] A cross-check on the sample reveals that only Krung Thai Bank Public Company Limited was audited by non-Big 4 auditor, which is the Office of The Auditor General.

LLP. As expected, LOANTA shows positive coefficient and statistically significant. The negative coefficient of IFRSADOP implies that IFRS adopters reduce LLP after IFRS adoption. SIZE has positive coefficient with the LLP, signifies that the larger the bank, the higher the LLP. PUBLIC indicates a positive coefficient, implying that publicly-held banks set aside higher loan loss provisions than those of privately-held banks. The correlation matrix also shows that multicollinearity does not appear to be a problem in the analysis as the highest correlation is around 41% between PUBLIC and SIZE. The next section discusses econometric issues that need to be considered before running the regression analysis.

3.6   Econometric specification

This section discusses important econometric issues that need to be addressed to ensure the model estimations are robust. Each of the subsections describes the basic concept of the common econometrics issues, such as autocorrelation, heteroscedasticity, and endogeneity. For each issue, a specific test was conducted to test whether this study suffers from any of these problems and, subsequently, provides a solution on how to address them. This section also justifies the use of generalised-method-of-moments (GMM) in this study.

3.6.1 Heteroscedasticity

The issue of heteroscedasticity needs to be properly addressed because it could cause OLS estimators to be inefficient even though the estimation is unbiased and consistent. Ignoring heteroscedasticity could cause incorrect standard errors of estimated coefficients, which could lead to misleading inferences. In this study, a heteroscedasticity test[60] was conducted to see whether the data are suffering from heteroscedasticity problems. The results show that the null hypothesis of homocedasticity was rejected, meaning that there is a heteroscedasticity problem in the data. To control for this, results are reported with White's heteroscedasticity-corrected standard errors (also known as the robust standard errors).

3.6.2 Autocorrelation

Besides heteroscedasticity, the issue of autocorrelation among the error terms should also be addressed as ignoring it may cause serious misleading inference due to the inefficient estimates of the regression coefficients and biased standard errors of OLS. The classical linear regression model (CLRM) assumes that the disturbance term relating to any observation is not influenced by the disturbance relating to any other observation (Gujarati, 2003, p. 442) In literature, the term autocorrelation is used interchangeably with serial correlation, although technically, they carry slightly different meanings.

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[60] This test was run using STATA 10 and is a modified Wald test for groupwise heteroscedasticity in fixed effects regression models.

Sarafidis, Yamagata, and Robertson (2009) propose two kinds of diagnostic tests for checking cross-section dependence (serial correlation) for panel data: the Lagrange multiplier test proposed by Breusch and Pagan (1980) and the CD test proposed by Pesaran (2004). Following the above arguments regarding autocorrelation and serial correlation issues, the Lagrange-Multiplier and Pesaran CD tests were conducted to examine the presence of serial correlation in the regression model of this study. The results confirm that there is evidence of serial correlation in the model. Therefore, to ensure the model estimations are robust to heteroscedasticity, autocorrelation, and possibly outliers, several options can be applied in this study:

1. Use Newey robust standard error to correct for both heteroscedasticity and autocorrelation (Gujarati, 2003; Yaffee, 2003);

2. Employ generalised least squares (Hansen, 2007; Petersen, 2009);

3. Report standard errors clustered by firm and time (Petersen, 2009); and

4. Perform the model using a GMM estimator system (Petersen, 2009; Sarafidis, *et al.*, 2009; Yaffee, 2003).

3.6.3 Endogeneity

Another important econometric issue that requires special attention when running regression analysis is the endogeneity problem. Endogeneity or simultaneity bias happens when the explanatory variables are correlated with the disturbances in the equation. The endogenous variable is defined as the equivalent of the dependent variable in the single-equation regression model, and exogenous variables are the equivalent of the X variables, or regressors, in such a model, provided the X

variables are uncorrelated with the error term in that equation (Gujarati, 2003). When running the regression model, the normal assumption is that the dependent variable is endogenous and independent variables are exogenous. In this regard, the independent variable is said to be endogenous when it correlates with the error term. Ignoring this may cause bias in the coefficient estimates and produce inconsistent OLS. There are several reasons why this endogeneity problem arises, such as omission of relevant variables, measurement error, sample selectivity, and self-selection (Baltagi, 2008; Wooldridge, 2002).

There are three tests for endogeneity: the Wu-Hausman endogeneity test, F-test, and overidentifying Chi-squared test. In response to the above arguments regarding the endogeneity issue, the Wu-Hausman test was run to test for the endogeneity problem in this study. The results confirm that the data suffer from the endogeneity problem because the estimation output rejects the null hypothesis of exogenous variables. This means that the explanatory variables are endogenous. Following the above arguments regarding heteroscedasticity, autocorrelation, and the endogeneity problem, the next sub-section will discuss in detail the generalised-method-of-moments (GMM) estimator which has been suggested by Petersen (2009), Sarafidis, *et al.*, (2009), and Yaffee (2003) to rectify all the econometric issues discussed above.

3.6.4 Generalised-method-of moments (GMM)

Hansen (1982) was the first to introduce a generalised-method-of moments (GMM)[61] for estimating parameters in statistical models. In recent years, the popularity of GMM has grown rapidly, especially to estimate dynamic panel models — a model that uses lagged dependent variables as one of the regressors. From an econometric perspective, the use of lagged dependent variables (y_{t-1}) as a regressor renders OLS inconsistent and biased because it would correlate with the error term (endogenous) and give rise to autocorrelation. To address this, GMM estimators developed by Arellano and Bond (1991), Ahn and Schmidt (1995), Arellano and Bover (1995), and Blundell and Bond (1998) can be employed.

There are two types of GMM commonly used in the literature to estimate dynamic panels: the difference GMM estimator, first proposed by Holtz-Eakin *et al.,* (1988) and developed by Arellano and Bond (1991), and the system GMM estimator developed by Arellano and Bover (1995), and Blundell and Bond (1998). In the difference GMM, the data is first-differenced to eliminate fixed effects, while in system GMM, data is estimated simultaneously in differences and levels. According to Lokshin (2008), Blundell *et al.,* (2000), and Blundell and Bond (1998), the system GMM performs better than the difference GMM because it is more powerful to improve efficiency gains and may reduce the finite sample bias.

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[61] For a detailed discussion of the derivation of GMM estimation, see Baum and Schaffer (2003).

For an unbalanced dataset, the system GMM would probably deal with serial correlation better (Sarafidis, *et al.*, 2009). Moreover, Sarafidis, *et al.*, (2009) highlight that the 2-step system GMM estimator is more robust to the weak instruments problem[62] compared to the difference GMM. However, the standard error of the 2-step GMM estimator might be downward biased for an unbalanced panel (Arellano and Bond, 1991). To address this, Windmeijer (2005) introduces a corrected variance estimate for the 2-step estimator and has produced more accurate inferences than that of the 1-step estimator due to lower bias and standard errors.

To conclude, the GMM estimator has several advantages for this study. Firstly, it performs well for the unbalanced dataset. Secondly, it can reduce the endogeneity problem due to the potential correlation between regressors and the error term. Thirdly, it takes into consideration a dynamic adjustment of dependent variables. Moreover, the GMM model is also robust to heteroskedasticity and non-normality (Yafee, 2003) and more efficient than 2SLS (Roodman, 2006).

It is important to note that, to deal with endogeneity, GMM makes use of instrumental variables. GMM is only valid when the instruments are exogenous. The use of weak instruments leads to unreliability of the GMM that could lead to misleading inferences (Stock, *et al.*, 2002). A good instrumental variable is correlated with the endogenous variable and uncorrelated with the error term. In this respect, Arrelano and Bond (1991) suggest that the consistency and efficiency gains

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[62] Weak instruments arise when the instruments in linear instrumental variables (IV) regression are weakly correlated with the included endogenous variables (Stock, Wright, and Yogo, 2002, p. 518)

of the GMM estimator can be obtained by using all available lagged values of the dependent variables and lagged values of the exogenous regressors as instruments.

To test the validity of these instruments, the Sargan/Hansen test of over-identifying restrictions is used where the null hypothesis of the error term is uncorrelated with the instruments[63]. In this case, one should get high Sargan p-value or high Hansen p-value in order for the instruments to be valid. By default, the STATA programme reports the Sargan test, Hansen test, and the Arellano-Bond test for autocorrelation, AR (1) and AR (2) results.

The Arellano-Bond test for autocorrelation has a null hypothesis of no autocorrelation and is applied to the differenced residuals. The presence of first-order autocorrelation, AR (1), does not imply that the estimates are inconsistent. The presence of second-order serial correlation, AR (2), would render the GMM estimator inconsistent and this is the most important test. Due to this, the result for AR (2) should not reject the null hypothesis to ensure the consistency of the GMM estimator.

In this study, the regression models for income smoothing and pro-cyclical analysis are estimated using the 1-step system GMM with the orthogonal deviations option using STATA 10. The 'Robust' option in STATA 10 is used so that the standard errors are robust to heteroscedasticity and arbitrary patterns of autocorrelation between individuals. An orthogonal deviation is employed in the model estimation because Roodman (2006) suggests that this technique could maximise the sample

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[63] It can also be interpreted that in the null hypothesis over-identifying restrictions are valid.

size for an unbalanced panel. Following the suggestion by Judson and Owen (1999), the GMM 1-step estimator is chosen because it performs better than 2-step estimator when $T \leq$ than 20[64]. For determining suitable instrumental variables, following suggestions by Arellano and Bond (1991), this study uses lagged values of dependent variables and lagged values of independent variables as instruments.

3.7   Chapter summary

This chapter has explained the sample selection and defined the data set employed in this thesis to examine the research questions and objectives. The sample consists of 62 commercial banks from six countries in the Asia Pacific region, namely Australia, New Zealand, Hong Kong, Malaysia, Singapore, and Thailand, covering the period 1995 to 2009. The sample contains IFRS adopting banks (Australia, New Zealand, and Hong Kong) and non-IFRS adopting banks (Malaysia, Singapore, and Thailand). Unbalanced panel data is utilised, which are common in the banking industry because of mergers and acquisitions. In this sense, panel data provides several advantages as bank- and time-invariant effects can be controlled in the regression analysis.

A generalised-method-of moments (GMM) estimator is employed to analyse the income smoothing and pro-cyclicality hypotheses, while a univariate test is used to test the earnings volatility hypothesis. The GMM estimator has few advantages in this study because it performs well for an unbalanced panel, it may reduce the

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[64] This study covers the period 1995-2009.

endogeneity problem due to the potential correlation between regressors and the error term, and it takes into consideration a dynamic adjustment of dependent variables.

Econometrics issues and specifications have also been discussed in order to provide a robust estimation of the analysis and, hence, make correct inferences in the results. Among the issues are the unit root test, heteroscedasticity, autocorrelation, and endogeneity. After conducting several diagnostic tests and addressing the problems, the 1-step system GMM with orthogonal deviations is considered the best estimator to run the main regression analysis in this study. The next chapter presents the results of the analysis and discusses the findings.

4   Results and discussion

This chapter summarises the empirical results and discusses the findings of the three hypotheses proposed in Chapter 2. Section 4.1 reports the results for the income smoothing hypothesis; Section 4.2 notes the findings for the pro-cyclicality hypothesis; and Section 4.3 outlines the outputs for the earnings volatility hypothesis. Section 4.4 discusses the results, and Section 4.5 summarises the chapter.

4.1   Income smoothing analysis

This section discusses the findings for the income smoothing hypothesis. Hypothesis 1 states that the adoption of the IFRS in 2005 leads to a reduction in income smoothing activities through loan loss provisions for IFRS adopting banks. Section 4.1.1 reports the main results using the generalised-method-of-moments (GMM) estimator, and Section 4.1.2 presents the robustness test to verify the evidence that IFRS adoption reduces income smoothing activities for IFRS adopting banks.

4.1.1   Income smoothing test

Table 8 presents the analysis of income smoothing tests using the full sample containing IFRS adopters and non-adopters. There are six columns in Table 8; column 1 reports the estimation output of the baseline regression in Equation (1), column 2 reports the estimation that controlled for SIZE and column 3 reports the outputs that were controlled for PUBLIC. Column 4 controls for year dummies, while Column 5 controls for country dummies. The analyses involving control variables were estimated separately to avoid the noise of control variables on the main variables of interest that may distort the results.

As expected in the results in Table 8, the lagged dependent variable (LLP_{t-1}) produces a positive and significant coefficient in all columns. This may imply that banks in the sample regularly revise their loan loss provisions over time to accommodate latent loan losses. It also signifies that the previous year's loan loss provisions are used to determine the loan loss provisions for the current year; on average, with all other variables constant, the increase in the previous year loan loss provisions has led to an increase in the current year's loan loss provisions of 27%. The significant coefficients also indicate a high degree of persistence of loan loss provisions, giving a good reason to use the dynamic model in this study.

The income smoothing variable, earnings before taxes and provisions (EBTP) is not statistically significant in all columns. This indicates that on average, banks in the sample do not smooth their income in the entire sample period.

Table 8: Test of income smoothing - Full sample

Baseline model:

$$LLP_{it} = \alpha + \beta_1 LLP_{i,\ t-1} + \beta_2 EBTP_{it} + \beta_3 \Delta LOANS_{it} + \beta_4 BLLA_{it} + \beta_5 LOANTA_{it} + \beta_6 IFRSADOP_{it} + \beta_7 EBTP_{it} \times IFRSADOP_{it} + \varepsilon_{it}$$

(1)

Independent variables	Predicted sign	Dependent variable: Loan loss provisions				
		1	2	3	4	5
Constant	N/A	-0.0002	0.0264	-0.0002	0.0008	-0.0019
		(-0.1)	(1.62)	(-0.09)	(0.35)	(-0.18)
LLP_{t-1}	+	0.2753**	0.2352*	0.2752**	0.3432***	0.2200*
		(2.23)	(1.7)	(2.25)	(3.09)	(1.91)
EBTP	+	0.1223	0.1642	0.1170	0.1287	0.1705
		(1.44)	(1.67)	(1.26)	(1.48)	(1.28)
ΔLOANS	+	-0.0158**	-0.0215**	-0.0157**	-0.0090	-0.0163*
		(-2.58)	(-2.49)	(-2.6)	(-1.29)	(-1.85)
BLLA	-	0.0151	0.0438	0.0122	0.0185	0.0237
		(0.46)	(0.79)	(0.37)	(0.55)	(0.41)
LOANTA	+	0.0032	0.0040	0.0030	0.0007	-0.0074
		(1.17)	(1.08)	(1.08)	(0.21)	(-0.69)
IFRSADOP	N/A	0.0208**	0.0212	0.0193*	0.0264**	0.0201
		(2.39)	(1.64)	(1.75)	(2.24)	(0.91)
EBTP*IFRSADOP	-	-1.578**	-1.5580	-1.4844**	-1.8960**	-1.5787
		(-2.57)	(-1.63)	(-1.99)	(-2.44)	(-1.00)
SIZE			-0.0011			
			(-1.59)			
PUBLIC				0.0005		
				(0.21)		
AUS						0.0141
						(0.67)
NZ						0.0030
						(0.19)
HK						0.0061
						(0.48)
MY						0.0068
						(0.54)
TH						0.0089
						(0.7)
Year dummies		No	No	No	Yes	No
Hansen *p*-value		0.536	0.420	0.464	0.386	0.356
AR (1) test (*p*-value)		0.136	0.113	0.133	0.152	0.079
AR (2) test (*p*-value)		0.226	0.200	0.237	0.226	0.201
No. of observations		537	537	537	537	537
No. of banks		62	62	62	62	62
Instruments		$LLP_{t-3\ to\ t-4}$	$LLP_{t-3\ to\ t-4}$	$LLP_{t-3\ to\ t-4}$	$LLP_{t-3\ to\ t-4}$	$LLP_{t-3\ to\ t-4}$
		$EBTP_{t-4}$	$EBTP_{t-4}$	$EBTP_{t-4}$	$EBTP_{t-4}$	$EBTP_{t-4}$
		$\Delta LOANS_{t-4}$	$\Delta LOANS_{t-4}$	$\Delta LOANS_{t-4}$	$\Delta LOANS_{t-4}$	$\Delta LOANS_{t-4}$
		$BLLA_{t-4}$	$BLLA_{t-4}$	$BLLA_{t-4}$	$BLLA_{t-4}$	$BLLA_{t-4}$
		$LOANTA_{t-4}$	$LOANTA_{t-4}$	$LOANTA_{t-4}$	$LOANTA_{t-4}$	$LOANTA_{t-4}$

The dependent variable is loan loss provisions divided by average total assets (LLP). Independent variables are lagged one period of LLP (LLP_{t-1}), earnings before taxes and provisions over average total assets (EBTP), change in total loans outstanding scaled by average total assets (ΔLOANS), beginning loan loss allowance over average total assets (BLLA), and total loans to total assets (LOANTA). IFRSADOP is dummy variable for IFRS adopters who adopt IFRS (1 for 2006-2009, 0 otherwise), EBTP x IFRSADOP is the interaction term to capture the evidence of reduction in income smoothing for adopters, SIZE is the bank size, measured by the natural logarithm of total assets, PUBLIC is dummy variable for publicly held banks, AUS is dummy variable for Australia, NZ is dummy variable for New Zealand, HK is dummy variable for Hong Kong, MY is dummy variable for Malaysia, and TH is dummy variable for Thailand. The evidence of income smoothing is shown by the positive coefficient between EBTP and LLP while the reduction in income smoothing is shown by the negative coefficient between LLP and EBTP x IFRSADOP. Regressions were estimated using the Blundell-Bond 1-step system GMM estimator for the period 1995 to 2009. Robust *t*-statistics are given in parentheses. Hansen test refers to the test of overidentifying restrictions. AR (1) and AR (2) test refer to the test for the null of no first-order and second-order autocorrelation in the first-differenced residuals. ***, **, and * represent significance at 1%, 5%, and 10% level, respectively.

The loan growth (ΔLOANS) depicts the negative and significant coefficient in all columns and suggests that the average banks in the sample lower the loan loss provisions during periods when loan growth is on the rise. This finding is similar to that of Cavallo and Majnoni (2001), Laeven and Majnoni (2003), and Beatty and Liao . It might also explain the optimistic behaviour of banks with regard to lending activities, as bankers tend to ease their credit standards during expansion. This, in turn, may lead to lower monitoring efforts and, consequently, banks have a tendency to understate their loan loss provisions due to the possibility that the default rates are lower.

The variable measuring default risk, beginning loan loss allowance (BLLA), is not consistently statistically significant in all columns. This implies that, on average, there is no clear evidence to support the notion that the previous year's loan loss allowance determines the current year's loan loss provisions for banks in the sample studied. The proxy for the credit risk of a bank's loan portfolio, total loans to total assets (LOANTA), is also consistently insignificant in all columns, meaning that there is insufficient evidence to suggest that the loan portfolio risk determines the loan loss provisions for the average banks in the sample studied. The variable for IFRS adopters (IFRSADOP) is statistically and positively significant in all columns (except Column 2 and Column 6), suggesting that holding all other variables constant, on average, the IFRS adopters provision more after they adopted the IFRS.

Finally, the main variable of interest, the interaction term of EBTP x IFRSADOP, is negatively significant in all columns (except Column 2 and Column 6, although the sign is negative). This means that there is evidence of reduction in income smoothing activities for IFRS adopters after IFRS adoption. The significant and negative coefficient of -1.578 in column 1 implies that the stringent IFRS requirements diminish the income smoothing activities through loan loss provisions for the adopters by 157.8% over those of non-adopters.

Incorporating control variables in Columns 2 and 3 does not influence the main findings of the income smoothing analysis in Table 8. The insignificant coefficient of the SIZE variable in Column 2 suggests that bank size does not explain the way average banks in the sample determine their loan loss provisions. The insignificant coefficient of the PUBLIC variable in Column 3 also shows that, on average, there is no significant difference between publicly held and privately held banks in determining their loan loss provisions.

Column 4 controls for year dummies and, as discussed in Chapter 3, year dummies 1997, 2005, and 2008 are included in the analysis to control for 1997 Asian financial crisis, 2005 IFRS implementation, and 2008 global financial crisis. Results in Column 4 demonstrate that controlling for year dummies does not alter the main findings of this study. Column 5 controls for the country dummies because the sample in this study consists of banks from six countries in the Asia Pacific region. The results in Column 5 illustrate that controlling the country-specific effects has

caused the main variable of interest (EBTP x IFRSADOP) to be insignificant. This may suggest that the differences in the banking structure, regulatory environments, tax and accounting standards, and economic and political background may influence the way banks manage their loan loss provisions.

Having discussed the main results, the critical part of any econometric analysis is that the estimation techniques need to be carefully specified so that the results are robust. Table 8 reports the analysis for the income smoothing hypothesis in which all equations were estimated using the 1-step system GMM estimator proposed by Blundell and Bond (1998). As discussed in Chapter 3, the GMM estimator is used to estimate the regression model in income smoothing and pro-cyclicality hypotheses because the presence of a lagged dependent variable ($LLP_{i,\ t-1}$) among the explanatory variables leads to the correlation between $LLP_{i,\ t-1}$ and the error term (endogeneity problem). Because of this, the GMM estimator is employed to mitigate the endogeneity problem by taking into consideration a dynamic adjustment of the dependent variable.

In relation to this, the GMM estimator would be consistent and efficient if it satisfies two conditions. First, the test of the second-order of the Arellano-Bond serial correlation, AR(2), should give a non-significant result. This test detects the autocorrelation in the model. Second, the result of the Hansen[65] test should also give a non-significant result. The Hansen test is used to assess the validity of the overall

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[65] The Sargan test is also reported in the STATA output. Only the Hansen test is reported because this study applied robust GMM estimation in STATA. According to Roodman (2006,) the Sargan test statistic is inconsistent if one uses a robust GMM.

instruments. By default, STATA will report all of these values when the GMM is employed. The crucial part of using the GMM estimator in this analysis was to find the suitable instruments that are uncorrelated with the error term. In relation to this, Arrelano and Bond (1991) suggest that all available lagged values of the dependent variables and lagged values of the exogenous regressors can be used as instruments[66]. For this reason, following Arrelano and Bond (1991), this study used three-to-four-period lags of the dependent variable (LLP_{t-3} to LLP_{t-4}) and four-period lags of the explanatory variables ($EBTP_{t-4}$, $BLLA_{t-4}$, $\Delta LOANS_{t-4}$, and $LOANTA_{t-4}$) as instruments in the income smoothing model.

As shown in Table 8, the Hansen test for over-identifying restrictions fails to reject the null hypothesis in all models, indicating that the instruments used in this analysis are valid. The Arellano-Bond autocorrelation tests, AR(1) and AR(2), are also reported in Table 8 with the null hypothesis of no autocorrelation. In this respect, the AR(1) detects the first-order serial correlation in the differentiated residuals and the presence of the first-order serial correlation would not affect the consistency of the GMM estimator. The test for AR(2), on the other hand, is of importance because it detects the second-order autocorrelation in levels, and the test result should not reject the null hypothesis. As revealed in Table 8, the *p*-value for AR(2) fails to reject the null hypothesis of the absence of second-order serial autocorrelation. This means that the GMM estimator used to analyse the income smoothing hypothesis in this study is consistent.

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[66] Fonseca and Gonzalez (2008) use two-to-four-period lags of explanatory variables as instruments.

Overall, from the findings in Table 8, this study concludes that the adoption of the IFRS lessens the income smoothing activities for the IFRS-adopting banks in the sample studied. However, before reaching a definitive conclusion, robustness tests were conducted to see whether the results were affected by different econometrics specifications. Section 4.1.2, therefore, reports the empirical results for the robustness test.

4.1.2   Robustness test

For further analysis to capture the effects IFRS adoption on bank income smoothing activities, Equation (1) was re-estimated using the subsample of IFRS adopting banks. As discussed in Chapter 3, panel least squares were employed for the robustness test of the adopters' sample because the small sample size could have led to inefficiency of the GMM estimator.

Also mentioned in Chapter 3, a static version of Equation (1) was estimated. This is because including the lagged dependent variable (LLP_{t-1}) in the model will render the panel least squares estimator biased and inconsistent. Column 1 in Table 9 reports the results of the baseline regression using Equation (2). Column 2 reports the results that were controlled for control variables, column 3 reports the results that were controlled for country dummies, while column 4 and 5 report the results that were controlled for time fixed effects and bank fixed effects, respectively.

Table 9: Test of income smoothing - Robustness test

Baseline model:

$$LLP_{it} = \alpha + \beta_1 EBTP_{it} + \beta_2 \Delta LOANS_{it} + \beta_3 BLLA_{it} + \beta_4 LOANTA_{it} + \beta_5 IFRSADOP_{it} + \beta_6 EBTP_{it} \times IFRSADOP_{it} + \varepsilon_{it}$$

(2)

Independent variables	Predicted sign	Dependent variables: Loan loss provisions				
		1	2	3	4	5
Constant	N/A	-0.0010	0.0020	-0.0085***	-0.0021*	-0.0048**
		(-1.02)	(0.74)	(-5.83)	(-1.9)	(-2.16)
EBTP	+	0.1100***	0.1319***	0.1325***	0.1147***	0.2389***
		(3.45)	(3.93)	(4.31)	(3.71)	(6.28)
ΔLOANS	+	-0.0061***	-0.0064***	-0.0073***	-0.0028**	-0.0075***
		(-4.36)	(-4.57)	(-5.43)	(-2.06)	(-5.75)
BLLA	-	0.1227***	0.1307***	0.1062***	0.1062***	0.1196***
		(5.84)	(6.14)	(5.28)	(5.24)	(5.54)
LOANTA	+	0.0012	0.0008	0.0091	0.0003	0.0043
		(1.22)	(0.75)	(5.87)	(0.37)	(1.63)
IFRSADOP	N/A	0.0031***	0.0034***	0.0024***	0.0024	0.0028***
		(3.28)	(3.46)	(2.66)	(0.88)	(3.08)
EBTP*IFRSADOP	-	-0.1572***	-0.1574***	-0.1046**	-0.1003*	-0.1084**
		(-2.74)	(-2.75)	(-1.9)	(-1.84)	(-2.00)
SIZE	+		-0.0001			
			(-1.36)			
PUBLIC			0.0006**			
			(2.03)			
AUS				0.0014***		
				(3.47)		
HK				0.0038***		
				(6.74)		
Bank fixed effects		No	No	No	No	Yes
Time fixed effects		No	No	No	Yes	No
Adjusted R-squared		0.1311	0.1372	0.2167	0.2649	0.3141
F-statistics		11.18***	9.05***	15.01***	8.30***	6.62***
No. of observations		406	406	406	406	406

The dependent variable is loan loss provisions divided by average total assets (LLP). Independent variables are lagged one period of LLP (LLP_{t-1}), earnings before taxes and provisions over average total assets (EBTP), change in total loans outstanding scaled by average total assets (ΔLOANS), beginning loan loss allowance over average total assets (BLLA), and total loans to total assets (LOANTA). IFRSADOP is dummy variable for IFRS adopters who adopt IFRS (1 for 2006-2009, 0 otherwise), EBTP x IFRSADOP is the interaction term to capture the evidence of reduction in income smoothing for adopters, SIZE is the bank size, measured by the natural logarithm of total assets, PUBLIC is dummy variable for publicly held banks, AUS is dummy variable for Australia, HK is dummy variable for Hong Kong. The evidence of income smoothing is shown by the positive coefficient between EBTP and LLP while the reduction in income smoothing is shown by the negative coefficient between LLP and EBTP x IFRSADOP. Regressions were estimated using panel least squares for the period 1995 to 2009. White's heteroscedasticity-adjusted *t*-statistics are given in parentheses. ***, **, and * represent significance at 1%, 5%, and 10% level, respectively. The highly significant of *F*-statistic means that all explanatory variables have joint effect on loan loss provisions.

As shown in Table 9, the variable for income smoothing, $EBTP_{it}$, is strongly and positively significant in all columns. This suggests that, on average, banks in the adopters' sample smooth their income through loan loss provisions. The coefficient value of 0.1100 in Model 1 implies that holding all other variables constant, loan loss provisions increase by 11% of the increase in EBTP in the period studied.

Similar to the findings in Table 8, the loan growth (ΔLOANS) depicts a negative and significant coefficient in all columns in Table 9. This suggests that banks in the adopter sample lower their loan loss provisions during periods when loan growth is on the rise. The coefficient of beginning loan loss allowance (BLLA) is consistently statistically significant in all columns, but of the opposite sign. This suggests that BLLA plays a role in determining loan loss provisions in the adopters' sample where, on average, the increase in BLLA causes the LLP to increase by 12.27% (refer to Column 1). The proxy for credit risk of a bank's loan portfolio, total loans to total assets (LOANTA), is consistently insignificant in all columns, meaning that there is insufficient evidence to support the idea that credit risk of the loan portfolio influences the banks in the adopter sample to establish loan loss provisions.

The variable for IFRS adopters (IFRSADOP) is statistically and positively significant in all columns (except Column 4), suggesting that holding all other variables constant, on average, the loan loss provisions of IFRS adopters increases after IFRS adoption. Confirming the results in Table 8, the main variable of interest (EBTP x IFRSADOP), is negatively significant in all columns, affirming that there is

evidence that the income smoothing activities of IFRS adopters decreases somewhat after IFRS adoption.

Incorporating control variables in Column 2 does not influence the main findings of the robustness test. The insignificant coefficient of the SIZE variable in Column 2 suggests that bank size does not explain the way banks in the adopter sample determine loan loss provisions. The PUBLIC variable is positively significant, which suggests that, on average, the loan loss provisions of publicly held banks are higher than those of privately held banks. Columns 3, 4, and 5 were controlled for country dummies, time fixed effects, and bank fixed effects, respectively. The results demonstrate that controlling for these does not alter the main findings of this robustness test.

In conclusion, Hypothesis 1 of this thesis, where there is evidence of a reduction in income smoothing activities in the adopters sample after IFRS adoption in the period studied, is supported. This finding complements those of Leventis, *et al.,* (2010) and Gebhardt and Novotny-Farkas (2011) which utilised samples of European Union (EU) banks. The next section presents the empirical results for the pro-cyclicality hypothesis.

4.2   Pro-cyclicality analysis

The second hypothesis of this thesis is the adoption of IFRS leads to a more pro-cyclical behaviour for IFRS adopting banks than that of non-adopting banks. Section 4.2.1 presents the main analysis of the pro-cyclicality hypothesis while section 4.2.2 reports the robustness test.

4.2.1   Pro-cyclicality test

Similar to the earlier analysis on income smoothing, the pro-cyclicality hypothesis was also estimated using the 1-step system GMM estimator. Table 10 presents an analysis of pro-cyclicality hypothesis using the full sample that contains IFRS adopters and non-adopters. There are four columns in Table 10. Column 1 reports the results of the baseline regression in Equation (3). Column 2 reports the estimation that was controlled for bank size, column 3 reports the output that was controlled for country dummies, and column 4 reports the results that were controlled for year dummies.

Table 10: Test of pro-cyclicality - Full sample

Baseline model:

$$LLP_{it} = \alpha + \beta_1 LLP_{i,\ t-1} + \beta_2 GDP_{jt} + \beta_3 \Delta LOANS_{it} + \beta_4 BLLA_{it} + \beta_5 LOANTA_{it} + \beta_6 IFRSADOP_{it} + \beta_7 GDP_{jt} \times IFRSADOP_{it} + \varepsilon_{it}$$

$$(3)$$

Independent variables	Predicted sign	Dependent variable: Loan loss provisions			
		1	2	3	4
Constant	N/A	0.0022	-0.0241*	-0.0082	0.0029
		(1.02)	(-1.8)	(-0.9)	(1.4)
LLP_{t-1}	+	0.2520*	0.2587*	0.2147	0.2177*
		(1.93)	(1.93)	(1.29)	(1.68)
GDP	-	-0.0007**	-0.0006**	-0.0003	-0.0007**
		(-2.2)	(-2.14)	(-0.78)	(-2.24)
ΔLOANS	+	-0.0292***	-0.0278***	-0.0326***	-0.0254***
		(-3.31)	(-3.21)	(-2.92)	(-2.69)
BLLA	-	-0.0077	-0.0439	-0.2340***	0.0070
		(-0.17)	(-0.91)	(-3.05)	(0.16)
LOANTA	+	0.0106***	0.0110***	0.0380***	0.0094***
		(3.14)	(3.27)	(3.12)	(3.12)
IFRSADOP	N/A	-0.0072**	-0.0090**	-0.0099**	-0.0071*
		(-2.03)	(-2.42)	(-2.36)	(-1.95)
GDP*IFRSADOP	-	0.0007	0.0006	0.0007	0.0007
		(1.00)	(0.81)	(0.9)	(0.95)
SIZE			0.0011*		
			(1.91)		
AUS				-0.0080	
				(-0.43)	
NZ				-0.0236	
				(-1.19)	
HK				0.0020	
				(0.18)	
MY				-0.0016	
				(-0.13)	
TH				0.0055	
				(0.43)	
Year dummies		No	No	No	Yes
Hansen *p*-value		0.108	0.195	0.181	0.140
AR (1) test (*p*-value)		0.000***	0.000***	0.001***	0.000***
AR (2) test (*p*-value)		0.461	0.537	0.188	0.439
No. of observations		653	653	653	653
No. of banks		62	62	62	62
Instruments		$LLP_{t-1\ to\ t-3}$	$LLP_{t-1\ to\ t-3}$	$LLP_{t-1\ to\ t-3}$	$LLP_{t-1\ to\ t-3}$
		GDP_{t-2}	GDP_{t-2}	GDP_{t-2}	GDP_{t-2}
		$\Delta LOANS_{t-2}$	$\Delta LOANS_{t-2}$	$\Delta LOANS_{t-2}$	$\Delta LOANS_{t-2}$
		$BLLA_{t-2}$	$BLLA_{t-2}$	$BLLA_{t-2}$	$BLLA_{t-2}$
		$LOANTA_{t-2}$	$LOANTA_{t-2}$	$LOANTA_{t-2}$	$LOANTA_{t-2}$

The dependent variable is loan loss provisions divided by average total assets (LLP). Independent variables are lagged one period of LLP (LLP_{t-1}), Gross domestic product (GDP) growth (GDP), change in total loans outstanding scaled by average total assets (ΔLOANS), beginning loan loss allowance over average total assets (BLLA), and total loans to total assets (LOANTA). IFRSADOP is dummy variable for IFRS adopters who adopt IFRS (1 for 2006-2009, 0 otherwise), GDP x IFRSADOP is the interaction term to capture the evidence of pro-cyclical behaviour for adopters, SIZE is the bank size, measured by the natural logarithm of total assets, AUS is dummy variable for Australia, NZ is dummy variable for New Zealand, HK is dummy variable for Hong Kong, MY is dummy variable for Malaysia, and TH is dummy variable for Thailand. The evidence of pro-cyclical behaviour is shown by the negative coefficient between GDP and LLP while the evidence of more pro-cyclical behaviour after IFRS adoption is shown by the negative coefficient between LLP and GDP x IFRSADOP. Regressions were estimated using the Blundell-Bond 1-step system GMM estimator for the period 1995 to 2009. Robust *t*-statistics are given in parentheses. Hansen test refers to the test of overidentifying restrictions. AR (1) and AR (2) test refer to the test for the null of no first-order and second-order autocorrelation in the first-differenced residuals. ***, **, and * represent significance at 1%, 5%, and 10% level, respectively.

From Table 10, as expected, lagged one period of loan loss provisions over total assets- ($LLP_{i, t-1}$) exhibits a positive and significant coefficient with the dependent variable (LLP) in all columns (except Column 3). The variable of interest, GDP growth, is negatively significant in all columns (except Column 3 although the sign is negative), indicating that there is evidence of pro-cyclical behaviour in the sample. Therefore, holding all other factors constant, on average, banks tend to increase their loan loss provisions during economic downturns.

Similar to the income smoothing analysis, the variable for loan growth (ΔLOAN) is negatively significant in all columns, affirming that the average banks in the sample lower loan loss provisions during periods when loan growth is on the rise. As for the beginning loan loss allowance (BLLA) variable, only Column 3 shows a negative and statistically significant coefficient while the rest are insignificant. The significant coefficient of BLLA in Column 3 may suggest that country specific effects, such as the regulatory framework or economic background, may influence the way banks build up their provisions. The proxy for credit risk of a bank's loan portfolio, total loans to total assets (LOANTA), is positively significant in all columns, implying that average banks in the sample increase the LLP when the total loans increase.

Contrary to the income smoothing analysis, the variable for IFRS adopters (IFRSADOP) is negatively significant in all columns, indicating that the adoption of IFRS has forced average banks in IFRS adopting countries to lower their loan loss provisions amount. This contradicts the findings in the income smoothing analysis where the earlier results in Tables 8 and 9 demonstrate that the adoption of IFRS has

caused IFRS adopting banks to increase their provision for loan losses. This could be because there are other factors influencing pro-cyclicality and income smoothing, other than just loan loss provisions.

The main variable of interest, the interaction term of GDP x IFRSADOP, is not statistically significant in all columns. This suggests that the findings in this study do not support the evidence of more pro-cyclical behaviour after IFRS adoption. As for the control variable, the positive and significant coefficient of bank size in Column 2 implies that holding all other variables constant, on average, larger banks in the adopters' sample establish their loan loss provisions higher than that of smaller banks. The findings in Table 10 also demonstrate that after controlling for bank size (Column 11), country dummies (Column 12), and year dummies (Column 13), the results of the main variables of interest (GDP, IFRSADOP, and GDP x IFRSADOP) remain constant.

For the model specification, as shown in Table 10, the Hansen test for over-identifying restrictions fails to reject the null hypothesis in all columns, indicating that the instruments used in the pro-cyclical analysis are valid. In addition, the p-value for AR(2) in all columns fails to reject the null hypothesis of the absence of second-order serial autocorrelation. This means that the GMM estimator used to analyse the pro-cyclical hypothesis in this study is consistent. For further analysis to confirm the main findings, a robustness test was conducted and the empirical results are reported in Section 4.2.2.

4.2.2 Robustness test

For further analysis to capture the effects of IFRS adoption on pro-cyclical behaviour of IFRS-adopting banks, a static version of Equation (3) was re-estimated using the subsample of IFRS adopting banks. Column 1 in Table 11 reports the results of the baseline regression using Equation (4). Column 2 reports the results that were controlled for bank size, column 3 for country dummies, while column 4 and 5 report the results that were controlled for time fixed effects and bank fixed effects, respectively. Similar to the robustness test in the income smoothing analysis, the equation in this section was re-estimated using panel least squares.

As shown in Table 11, the variable to assess pro-cyclical behaviour in the sample, GDP growth, is negatively significant in all columns. This indicates that, on average, there is evidence of pro-cyclical behaviour in the IFRS-adopting banks sample in the period studied. Holding all other factors constant, banks tend to provision more during economic slumps. Similar with the findings in Table 10, the variable for loan growth (ΔLOAN) is negatively significant in all columns, affirming that, on average, banks in the adopter sample lower the loan loss provisions during periods when loan growth is on the rise. Alternatively, the positive and significant coefficient of beginning loan loss allowance (BLLA) in all columns suggests that holding all other factors constant, an increase in BLLA will require banks to increase loan loss provisions by 11.45% (refer Column 1).

Table 11: Test of pro-cyclicality - Robustness test

Baseline model:

$$LLP_{it} = \alpha + \beta_1 GDP_{jt} + \beta_3 \Delta LOANS_{it} + \beta_4 BLLA_{it} + \beta_5 LOANTA_{it} + \beta_6 IFRSADOP_{it} + \beta_7 GDP_{jt} \times IFRSADOP_{it} + \varepsilon_{it}$$

(4)

Independent variables	Predicted sign	Dependent variable: Loan loss provisions				
		1	2	3	4	5
Constant	N/A	0.0033***	0.0030	-0.0027**	0.0021***	-0.0013
		(5.03)	(1.16)	(-2.38)	(2.64)	(-0.61)
GDP	-	-0.0004***	-0.0004***	-0.0004***	-0.0004***	-0.0004***
		(-7.43)	(-7.42)	(-7.4)	(-6.38)	(-7.97)
ΔLOANS	+	-0.0033**	-0.0033**	-0.0045***	-0.0022	-0.0039***
		(-2.44)	(-2.43)	(-3.43)	(-1.63)	(-3.00)
BLLA	-	0.1145***	0.1142***	0.0982***	0.1042***	0.0998***
		(5.79)	(5.74)	(5.16)	(5.33)	(4.83)
LOANTA	+	-0.0006	-0.0005	0.0060***	-0.0005	0.0046*
		(-0.64)	(-0.57)	(4.25)	(-0.59)	(1.85)
IFRSADOP	N/A	-0.0004	-0.0004	-0.0002	-0.0012	-0.0003
		(-0.86)	(-0.87)	(-0.57)	(-0.49)	(-0.73)
GDP*IFRSADOP	-	0.0002	0.0002	0.0001	0.0006***	0.0001
		(1.53)	(1.53)	(1.11)	(4.07)	(1.22)
SIZE			1.37E-05			
			(0.14)			
AUS				0.0013***		
				(3.44)		
HK				0.0033***		
				(6.48)		
Bank fixed effects		No	No	No	No	Yes
Time fixed effects		No	No	No	Yes	No
Adjusted R-squared		0.2256	0.2237	0.2960	0.3125	0.3666
F-statistic		20.71***	17.71***	22.34***	10.23***	8.12***
No. of observations		407	407	407	407	407

The dependent variable is loan loss provisions divided by average total assets (LLP). Independent variables are lagged one period of LLP (LLP_{t-1}), Gross domestic product (GDP) growth (GDP), change in total loans outstanding scaled by average total assets (ΔLOANS), beginning loan loss allowance over average total assets (BLLA), and total loans to total assets (LOANTA). IFRSADOP is dummy variable for IFRS adopters who adopt IFRS (1 for 2006-2009, 0 otherwise), GDP x IFRSADOP is the interaction term to capture the evidence of pro-cyclical behaviour for adopters, SIZE is the bank size, measured by the natural logarithm of total assets, AUS is dummy variable for Australia, HK is dummy variable for Hong Kong. The evidence of pro-cyclical behaviour is shown by the negative coefficient between GDP and LLP while the evidence of more pro-cyclical behavior after IFRS adoption is shown by the negative coefficient between LLP and GDP x IFRSADOP. Regressions were estimated using using panel least squares for the period 1995 to 2009. White's heteroscedasticity-adjusted *t*-statistics are given in parentheses. ***, **, and * represent significance at 1%, 5%, and 10% level, respectively. The highly significant of *F*-statistic means that all explanatory variables have joint effect on loan loss provisions.

The results for the credit risk of a bank's loan portfolio, total loans to total assets (LOANTA), are mixed. Only Column 3 and Column 5 are statistically significant, and the signs are as expected. The rest are insignificant with the opposite sign. This suggests that credit risk in the pro-cyclical model is sensitive to country dummies and bank dummies.

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Contrary to the findings in Table 10, the coefficient of IFRSADOP is statistically insignificant in all columns, although the signs are all negative. This might be due to the different estimation techniques employed in Table 10 and Table 11 that alter the results. Finally, the main variable of interest, GDP x IFRSADOP, is insignificant in all models, supporting the earlier findings in Table 10 that no clear evidence to support the idea that IFRS adoption amplifies the pro-cyclicality of loan loss provisioning among IFRS adopters.

The control variable, bank size, is not significant in Column 2. This means that, on average, the size of a bank does not play an important role for banks in the adopter sample to make their provisions. The positive and statistical significance of the Australia and Hong Kong dummies suggests that the loan loss provisions of banks in both countries are higher than that of New Zealand. The results significantly change after controlling for time fixed effects. The coefficient of the interaction term of GDP x IFRSADOP becomes positively and statistically significant. This implies that after removing the time-invariant effects, there is clear evidence that the adoption of IFRS does not amplify pro-cyclical behavior among the adopters. As for the rest, the inclusion of the control variable, country dummies, and bank fixed effects in regression models does not alter the main findings of this analysis, where the results of GDP, IFRSADOP, and GDP x IFRSADOP remain constant.

Overall, Hypothesis 2 of this thesis is not supported. The main analysis and the robustness test of the pro-cyclical hypothesis have confirmed that there is insufficient evidence to state that IFRS-adopting banks exhibit more pro-cyclical behavior after IFRS adoption. These findings complement the finding of Handorf and Zhu (2006)[67], whose empirical testing using US banks does not support the claim that loan loss provisioning of average-sized banks is pro-cyclical. The next section presents the empirical results of the earnings volatility test.

4.3   Further robustness test for income smoothing and pro-cyclical analysis

4.3.1   Inclusion of Singapore in the IFRS adopter category

Some might argue that Singapore is IFRS adopter as previous studies claim that Singapore starts using IFRS since 2005. To test for this, Singapore is treated as IFRS adopter for both income smoothing and pro-cyclical analysis. The regression results remain consistent.

4.3.2   Exclusion of New Zealand sample

There is also an argument that New Zealand banks sample are included twice, (1) as banks in the New Zealand sample and (2) a segment consolidated within the Australian banks in the Australian sample as four New Zealand banks are subsidiaries of Australian banks. To test for this, New Zealand sample are excluded and the regressions were estimated for both income smoothing and pro-cyclical hypothesis. The results confirm that, the inclusion or exclusion of New Zealand sample does not affect the main findings.

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[67] Their approach is to see the effects of regulatory capital requirements on pro-cyclicality through loan loss provisioning.

4.4 Earnings volatility analysis

The third hypothesis of this thesis is that banks that have adopted IFRS will have earnings that are more volatile after IFRS adoption. The fourth hypothesis is that banks that have adopted IFRS will have more volatile earnings than non-adopting banks. To answer these, this section adopts a different approach by conducting univariate tests. Section 4.3.1 provides the results of the Paired-samples t-test and Wilcoxon signed-rank test to compare the pre- and post-adoption earnings volatility for the adopters' sample. Section 4.3.2 compares the earnings volatility for IFRS adopters and non-adopters before and after IFRS adoption by running an Independent-samples t-test and Independent-samples median test.

4.4.1 Paired-samples t-test and Wilcoxon signed ranks test

As discussed in Chapter 3, the earnings volatility for the period before IFRS adoption was determined by calculating the standard deviation of earnings before taxes and provisions scaled by average total assets (σEAR_{before}) from 2001 to 2004. For the period after IFRS adoption, the earnings volatility was estimated by calculating the standard deviation of earnings before taxes and provisions scaled by average total assets (σEAR_{after}) from 2006 to 2009. This section compares the earnings volatility for IFRS-adopting banks before and after IFRS adoption. Table 12 presents the results.

Table 12: Paired-samples *t*-test and Wilcoxon signed rank test

Panel A Paired-samples *t*-test		Ho: Mean$_{after}$ = Mean$_{before}$ H$_A$: Mean$_{after}$ > Mean$_{before}$			
Variable	N	Mean before	Mean after	Mean change	*t*-statistic for difference in means
σEAR	25	0.0019	0.0036	0.0017	-2.024***

Panel B Wilcoxon Signed Rank test		Ho: Median$_{after}$ = Median$_{before}$ H$_A$: Median$_{after}$ > Median$_{before}$			
Variable	N	Median before	Median after	Median change	*p*-value for difference in medians
σEAR	25	0.0015	0.0028	0.0013	0.000***

σEAR = standard deviation of earnings before taxes and provisions scaled by average total assets.
*** represent significance at 1%, by one-tailed tests.

The results in Table 12 Panel A show that mean differences of standard deviations of earnings (σEAR) are statistically significant, affirming the evidence of higher earnings volatility for IFRS adopters following IFRS adoption. A non-parametric test (Wilcoxon signed rank test) was then conducted to assume the non-normality[68] of the data as well as to ensure that the results are not driven by outliers. The outputs in Panel B confirm the results of the Paired-samples *t*-test where there is evidence of more earnings volatility after IFRS adoption for IFRS adopters as the *p*-value is significant. Careful interpretation, however, must be exercised in interpreting these results as the mean and median differences may be affected by the global financial crisis in the years 2008 to 2009. Excluding years 2008 and 2009 to estimate the earnings volatility after IFRS adoption will add noise to the tests because calculating standard deviations by using only two years of data (2006 to 2007) may contain more

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[68] Non-parametric tests make few or no assumptions about the distributions and are called distribution-free.

measurement error than standard deviations measured over a longer period[69]. For further analysis, the next section compares the earnings volatility for IFRS adopters and non-adopters prior to and after the IFRS adoption.

4.4.2 Independent-samples *t*-test and Independent-samples median test

Under this test, the mean and median differences of earnings volatility for IFRS adopters and non-adopters are compared for the period before and after the IFRS regime to see if there are any significant differences in earnings volatility following IFRS adoption by the adopters. The mean difference of earnings volatility was tested using the Independent-samples *t*-test, while the median difference of earnings volatility was estimated using a non-parametric test, the Independent-samples median test. Both of these tests assume that both samples are independent of each other. The measurement for earnings volatility is similar to the discussion in Section 4.3.1. Table 13 presents the results.

Table 13: Independent-samples *t*-test and Independent-samples median test

Panel A Independent-samples *t*-test				H_0: Mean$_{adopter}$ = Mean$_{non-adopter}$ H_1: Mean$_{adopter}$ > Mean$_{non-adopter}$		
Variable	Period	Group	N	Mean	Mean difference	*t*-test
σEAR_{before}	Before IFRS adoption	Adopter	25	0.0019	-0.0027	-2.079***
		Non-adopter	35	0.0046		
σEAR_{after}	After IFRS adoption	Adopter	25	0.0036	-0.0001	-0.0675
		Non-adopter	33	0.0037		

σEAR = standard deviation of earnings before taxes and provisions scaled average total assets.
*** represent significance at 1%, by one-tailed tests.

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[69] This limitation is similar to the work done by Hodder, Hopkin, and Wahlen (2006), where the volatility of full-fair-value income for a short period is studied over a five-year measurement period.

Panel B Independent-samples median test				H_0: Median$_{adopter}$ = Median$_{non-adopter}$ H_1: Median$_{adopter}$ > Median$_{non-adopter}$		
Variable	Period	Group	N	Median	Median difference	p-value
σEAR_{before}	Before IFRS adoption	Adopter	25	0.0015	-0.0020	0.001***
		Non-adopter	35	0.0035		
σEAR_{after}	After IFRS adoption	Adopter	25	0.0028	0.0003	0.213
		Non-adopter	33	0.0025		

σEAR = standard deviation of earnings before taxes and provisions scaled by average total assets.
*** represent significance at 1% and the results of significance tests are one-tailed.

The results in Table 13 do not show significant differences between the earnings volatility of IFRS adopters and non-adopters after the IFRS regime. As shown by the significant t-statistic for the period before IFRS adoption, the earnings for non-IFRS adopters is more volatile than that of adopters in the period before IFRS adoption, but not in the period after IFRS adoption (the t-statistic fails to reject the null hypothesis). This suggests that the adoption of IFRS (via IAS 39) does not completely drive the observed differences between the two groups in the aspect of earnings volatility in the post IFRS regime. This is somewhat plausible as, according to Barth, *et al.*, (2008), one potential problem with comparing adopters and non-adopters in the post-adoption period is that the two observed groups could exhibit different characteristics in the post-adoption period because of the differences in their economic background.

Overall, hypothesis 3 that suggests that there is evidence of more earnings volatility for the IFRS adopters after they have adopted IFRS is supported. However, it is important to interpret this information carefully as the global economic recession in 2008 may have influenced the results. Hypothesis 4 proposes that banks that have adopted IFRS will have more volatile earnings than those of non-adopting banks is not supported in this thesis, as the findings do not conclude that the earnings of

IFRS-adopting banks are more volatile than those of non-adopting banks for the period after IFRS adoption.

4.5   Results discussion

The empirical analyses in Sections 4.1, 4.2, and 4.3 have provided the answers for Hypotheses 1, 2, 3, and 4 of this thesis. Table 14 summarises the findings:

Table 14: Summary of hypothesis and findings

No.	Objective	Hypothesis	Findings
1.	To investigate the income smoothing activities of IFRS adopting banks in the Asia Pacific region.	Banks that have adopted IFRS engage less in income smoothing through loan loss provisions than non-adopting banks.	Supported
2.	To examine the pro-cyclical behaviour of IFRS adopting banks in the Asia Pacific region.	Banks that have adopted IFRS exhibit more pro-cyclical behaviour in loan loss provisions than non-adopting banks.	Not supported
3.	To investigate the earnings volatility of IFRS adopting banks before and after IFRS adoption	Banks that have adopted IFRS will have earnings that are more volatile after IFRS adoption.	Supported
4.	To compare the earnings volatility of IFRS adopting banks and non-IFRS adopting banks	Banks that have adopted IFRS will have more volatile earnings than non-adopting banks	Not supported

The first hypothesis proposes that banks that have adopted IFRS engage less in income smoothing through loan loss provisions than non-adopting banks. The empirical tests in Section 4.1 show that IFRS adopting banks engage in income smoothing activities in the period studied, but the income smoothing activities diminish after IFRS adoption. The finding related to Hypothesis 1 is generally consistent with the findings of Leventis, *et.al.,* (2010) and Gebhardt and Novotny-Farkas (2011) who utilise a sample of listed banks in the European Union

jurisdiction. Both of the studies found that the incurred loss approach under IAS 39 lessened the income smoothing through loan loss provisions of banks in the EU.

From the finding of hypothesis 1, this thesis concludes that IFRS objective to reduce manipulation activities has achieved as the requirement for the 'objective evidence' to determine loan losses has restricted banks in the sample to manipulate loan loss expenses in the period studied. This finding also supports the suggestions by Barth, *et al*., (2008) and Ewert and Wagenhofer (2005) that the efforts put in by standards-setters to remove accounting options in the international accounting standards could improve accounting quality and mitigate earnings management. In addition, the finding of hypothesis 1 in this thesis supplements the finding of Shen and Chih (2005) whose empirical results show that stringent accounting disclosure requirements are effective in reducing earnings management in the banking industry. In relation to this, this thesis suggests that the International Accounting Standards Board (IASB) should cooperate with the bank regulators around the world to enforce the use of IFRS to improve the accounting quality of local firms and banks.

The second hypothesis of this thesis is banks that have adopted IFRS exhibit more pro-cyclical behaviour in loan loss provisions than that of non-adopting banks. The empirical analyses in Section 4.2, however, do not find enough evidence to conclude that IFRS adoption amplifies more pro-cyclical behaviour of IFRS adopting banks. Most of the previous literature that looks at the potential impact of IFRS adoption (via IAS 39) on pro-cyclicality provides only analytical arguments rather than

empirical analysis. The closest study is Handorf and Zhu (2006), whose approach is to see the effects of regulatory capital requirements on pro-cyclicality through loan loss provisioning for the period 1990 to 1999. Their results are similar to the pro-cyclical test in this thesis as their empirical testing using US banks does not support the claim that loan loss provisioning of average-sized banks is pro-cyclical.

There are two possible explanations for the lack of pro-cyclical behaviour evidence in the sample analysis of this thesis after IFRS adoption. Firstly, IAS 39 may cause a more forward-looking approach to loan loss provisions and the Financial Stability Forum (2009) highlights that the proper application of the incurred loss model may mitigate the pro-cyclicality of loan loss provisioning. Secondly, the IFRS may not influence the pro-cyclical behaviour of loan loss provisioning as the decision to establish loan losses may be highly dependent on the economic conditions rather than on the stringent disclosure requirements imposed by the accounting standards.

The third hypothesis of this thesis is that banks that have adopted the IFRS will have earnings that are more volatile after doing so. The univariate test in Section 4.3.1 proposes that the earnings volatility of IFRS adopters is somewhat higher after IFRS adoption. However, this may be due to the global economic recession in 2008. The finding in Hypothesis 3 is consistent with the findings of Iatridis (2010) and Iatridis and Rouvolis (2010) whose empirical results show that IFRS has caused volatility of reported profits due to the application of fair value. Both of the studies have examined European companies.

As discussed in Chapter 2, the volatility of earnings after IFRS adoption in the sample studied is possibly due to the use of fair value accounting for the recognition of financial assets and liabilities. This is due to the complicated nature of IAS 39 itself, as the determination of fair value might involve managerial judgment because not all financial assets have market value. However, once again, it is difficult to make definitive conclusions from the findings of Hypothesis 3 of this thesis, as the univariate test does not take into account other factors such as bank specific variables and macroeconomic variables that may influence the earnings volatility.

Finally, hypothesis 4 proposes that banks that have adopted IFRS will have more volatile earnings than non-adopting banks. However, both the parametric and non-parametric tests in Section 4.3.2 do not find adequate evidence to conclude that IFRS adopting banks have more earnings volatility than non-adopting banks. As emphasised by Barth, *et al.*, (2008), one potential problem with comparing adopters and non-adopters in the post-adoption period is that the two observed groups could exhibit different characteristics because of the differences in their economic background.

One possible reason for the opposite findings in hypothesis 4 is the time frame used. Measuring earnings volatility in this thesis is relatively short, being only four years before and four years after IFRS adoption. As emphasised by Hodder, Hopkin, and Wahlen (2006), using a short period to calculate standard deviations to measure volatility may contain more measurement error than standard deviations measured over a longer period. Furthermore, it is arguable that the comparison made in

hypothesis 4, between adopter and non-adopter, does not base on the same analogy which might explain the inconsistent finding that is found for hypothesis 4.

4.6   Chapter summary and conclusion

This chapter has reported the results and provided a discussion of the findings. Three types of empirical analyses have been conducted: income-smoothing analysis, pro-cyclicality analysis, and earnings volatility analysis. The 1-step system GMM estimator proposed by Blundell and Bond (1998) has been employed to run the main analysis for the income smoothing hypothesis (Hypothesis 1) and pro-cyclicality hypothesis (Hypothesis 2). For the robustness tests, panel least squares have been employed to further affirm the consistency in the main analysis. To assess the earnings volatility hypothesis, univariate tests were utilised to test hypothesis 3 and hypothesis 4.

The results of hypothesis 1 confirm that IFRS adoption leads to a reduction in income smoothing activities through loan loss provisions for IFRS adopters in the Asia Pacific region. This is consistent with the previous findings of Gebhardt and Novotny-Farkas (2011) and Leventis, *et al.*, (2010) that utilise samples of European Union (EU) banks. The argument in hypothesis 2 that IFRS adoption would cause more pro-cyclical behaviour of loan loss provisions has not been verified by the findings from this thesis.

Hypothesis 3 suggests that IFRS (via IAS 39) may cause more volatility of earnings of IFRS adopting banks after IFRS adoption due to the use of fair value accounting. The findings show that IFRS adoption leads to higher earnings volatility for IFRS adopting banks in the Asia Pacific region. This is parallel with findings from Iatridis (2010) and Iatridis and Rouvolis (2010) that used a sample of European countries. However, caution has to be exercised in interpreting the findings as the volatility of earnings might be driven by the global financial crisis in 2008. Finally, hypothesis 4 is not supported, as the results of the univariate test in Section 4.3.2 do not find enough evidence to conclude that IFRS adopting banks have more earnings volatility than that of non-adopting banks. Chapter 5 provides a summary of the thesis and discusses the policy implication, limitations, and suggestions for future research.

5   Summary and conclusion

5.1   Thesis summary

This thesis investigates the impact of the International Financial Reporting Standards (IFRS) on bank loan loss provisioning behaviour and bank earnings. Specifically, it explores the controversial issue of IAS 39 *Financial Instruments: Recognition and Measurement* that governs loan loss accounting by examining the effects of IAS 39 on income smoothing activities through loan loss provisions, pro-cyclical behaviour, and earnings volatility of the IFRS adopting banks in the Asia Pacific region.

Briefly, loan loss provisions are a non-cash expense recorded on the income statement, where understating or overstating the amount may significantly affect bank net income and capital. Loan loss provisions are subject to managerial discretion and are commonly associated with the issues of income smoothing, capital management, pro-cyclicality, and signalling. Beaver and Engel (1996) and Hasan and Wall (2004) highlight this as a weakness in accounting standards (particularly GAAP) that allows too much discretion for bank managers with regard to loan loss recognition.

In the banking industry, inaccurate information on bank income statements due to earnings management activity might prevent bank regulators from assessing a bank's true performance. It is essential, therefore, to have high quality accounting standards to enhance the transparency of financial reporting in order for bank managers to report the true condition of their performance.

The International Financial Reporting Standards (IFRS) came into effect in 2005 with the main objectives of harmonising accounting standards and improving the financial information quality of firms across the globe. Despite their potential to replace GAAP and national accounting standards, the IFRS have, nevertheless, triggered intense debate among academics, regulators, standard-setters, and industry players, as well as users of financial statements. This is due to their complexity and the difficulty in understanding them, particularly with regard to the standard that governs loan loss accounting - *IAS 39 Financial Instruments: Recognition and Measurement*.

It has been argued that the mixed measurement model under IFRS in recognising financial instruments (some are measured at fair value while some are measured at amortised cost) could potentially cause more volatility of bank earnings. This is because the changes in fair value will be reported in the profit and loss account, and the determination of fair value involves subjective judgment because not all financial assets have market value (Ball, 2006; Gray, 2003). On the other hand, Ernst and Young (2006) and Krishnakumar and Kulkarni (2007) suggest that the complexity in determining loan loss provisions under IAS 39 will also affect the earnings because loan loss provisions have a direct effect on net income.

IAS 39 also emphasises an incurred loss approach to determine loan loss provisions whereby provisions are only raised for losses that have already been incurred for exposures that are known to be impaired. This has been debated as one of the contributing factors to the pro-cyclical behaviour of bank loan provisioning. The probable reason for the incurred loss approach is to reduce the activities of

manipulating financial information. In summary, the positive side of IFRS is that it may reduce the manipulation activities of financial information, while the negative sides are it might encourage more pro-cyclical behaviour of loan loss provisions and cause more volatility of earnings.

The objective of this thesis is to examine the impact of IFRS adoption on bank income smoothing activities, bank pro-cyclical behaviour, and the volatility of bank earnings among the adopters in the Asia Pacific region. Non-adopters were also included in the sample as a control group. For that reason, this thesis can study the actual effects of IFRS adoption by distinguishing the adopters and non-adopters group in the sample.

The first hypothesis of this thesis is that banks that have adopted the IFRS engage less in income smoothing through loan loss provisions than non-adopting banks. The results confirm that the IFRS adoption leads to a reduction in income smoothing activities through loan loss provisions for IFRS adopters in the Asia Pacific region. With reference to the argument that IFRS adoption would cause more pro-cyclical behaviour of loan loss provisions in the hypothesis 2, the findings from this thesis have not found any evidence to support the theory of more pro-cyclical behaviour of IFRS-adopting banks after IFRS regime. The use of fair value accounting in IAS 39 may cause more volatility of earnings for IFRS adopting banks after IFRS adoption. The finding of the hypothesis 3 is supported, but this might also be influenced by the global economic crisis in 2008. Finally, hypothesis 4 is not supported, where there is

insufficient evidence to conclude that IFRS adopting banks have more earnings volatility than that of non-adopting banks.

5.2   Policy implications

The IFRS are relatively new, and accounting standards-setters are continually finding ways to improve the new standards. Compliance with IAS 39 should improve the quality of the financial reporting of a bank's balance sheet due to the enhancement in financial information transparency that reduces scope for manipulation. In view of this, this thesis suggests that the accounting standards-setters should refine IAS 39, specifically the guidelines on how banks determine their provision for loan losses. This is because the current standards are quite complicated due to the 'objective evidence' of impairment losses being quite subjective. In addition, different banks may have various ways to interpret this 'objective evidence'. As suggested by Ernst and Young (2005), the standard should prescribe the appropriate time the provisions are charged off against impaired loans.

With regard to the pro-cyclicality issue, this thesis supports Huizinga and Laeven (2009) whereby bank regulators should take pro-active action in addressing the issue of pro-cyclical behaviour of loan loss provisions. This is in accordance with the outline under *Principle 18: Problem assets, provisions and reserves (Criteria No. 4)*[70] where bank supervisors are responsible for determining whether banks have appropriate policies and processes to ensure that provisions and write-offs are timely

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[70] Core Principles for Effective Banking Supervision (Consultative Document) produced by the Basel Committee in December 2011. For further explanation, refer to http://www.bis.org/list/bcbs/index.htm.

and reflect realistic repayment and recovery expectations, taking into account market and macroeconomic conditions. However, the decision to adopt the IFRS is generally left to the regulatory bodies of individual countries or regions. More importantly, the IFRS is more focussed on improving the financial information quality, while pro-cyclicality is highly dependent on the economic cycles.

The dynamic provisioning[71] approach is another way to deal with counter-cyclical loan provisioning. This approach was practised by the Spanish banking system and proved to be very useful for Spanish banks in the 2008 global financial crisis (Saurina, 2009, p. 23). In addition, Bouvatier and Lepetit (2008) and Laeven and Majnoni (2003) also support the implementation of dynamic provisioning to improve the provisioning system in the banking industry to counter pro-cyclicality. The regulators also take this issue as a serious matter as, in March 2009, the Financial Stability Forum report, the Joint Financial Stability Forum (FSF), and the Basel Committee on Banking Supervision (BCBS) Working Group were assessing approaches to address the issue of pro-cyclicality of bank provisioning, including the implementation of dynamic provisioning. The Financial Stability Forum also urged bank regulators (Basel Committee) and accounting standard setters (IASB) to cooperate to deal with the pro-cyclicality issue.

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[71] The main concept of the dynamic provisioning approach is to counter-cyclical loan loss provisioning by encouraging banks to build up provisions during the good years to be drawn on in bad years to preserve banks' soundness.

Historically, dynamic provisioning was introduced in the Westpac Bank Australia in 1995, and was heavily promoted in 2000 by the Bank of Spain to address the cyclical nature of loan loss provisions, particularly in the period of aggressive lending policy during the boom times. Briefly, the system works by using an estimation of expected losses based on historical experience over the business cycle to counter-cyclical specific provisions. The aim of the counter-cyclical policies is to increase the resilience of the system by building buffers to withstand shocks during downturns. A more ambitious objective would be to ensure stable credit supply through the cycle – through booms and busts (Sinha, 2011, p. 1411). However, dynamic provisioning might be difficult to put into practice, particularly in developing countries, due to the lack of required data on historical losses (Ren, 2011). In addition, the system is still new and not widely used[72]; therefore, it is hard to draw conclusive agreement on its applicability to other countries as well as its effectiveness to mitigate the pro-cyclicality of loan loss provisions.

With regard to fair value accounting, it is clear that the banking industry and supervisors are opposed to the use of fair value to measure financial instruments in IAS 39 (Chisnall, 2001). In particular, the mixed-attribute measurement model that combines the components of fair value, historical cost, and hedge accounting under the new standards would cause confusion not only to the preparer of financial statements but to the users as well. Furthermore, the classification of financial assets, such as available-for-sale and held-to-maturity, allow more discretion to bank

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[72] According to Ren (2011), there are several countries applying the dynamic provisioning system: Spain, Uruguay, Bolivia, Colombia, and Peru.

managers that may hamper the objective of the IFRS to encourage banks to report the actual condition of their performance.

To this end, on 12 November 2009, the IASB issued the *IFRS 9 Financial Instruments* to replace IAS 39, to come into effect 1 January 2015 (early adoption is permitted) to add new requirements for impairment of financial assets measured at amortised cost and hedge accounting. IFRS 9 divides all financial assets that are currently in the scope of IAS 39 into two classifications – those measured at amortised cost and those measured at fair value. Classification is made at the time the financial asset is initially recognised, namely when the entity becomes a party to the contractual provisions of the instrument[73]. In addition, the available-for-sale and held-to-maturity categories currently in IAS 39 are not included in IFRS 9.

5.3   Research limitations

'There is no perfect job' is a good metaphor to discuss the limitations of this thesis. Although various robustness tests have been conducted and detailed econometric models have been justified, this thesis unquestionably suffers from some limitations. This section, therefore, outlines the limitations of this thesis, which supports the need for future research.

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[73] Source: http://www.iasplus.com/standard/ifrs09.htm

Coming into effect in 2005, the IFRS are relatively new. Therefore, this thesis suffers from a short time period for IFRS adoption years (2006-2009) so the results might not provide robust support of the actual effects of IFRS implementation. In addition, it is difficult to attribute the IFRS effects, particularly IAS 39, on bank provisioning alone, as the periods also experienced the global financial crisis beginning in late 2007 besides the implementation of Basel II in 2008. For that reason, this thesis cannot be sure that the empirical results were attributable to the IFRS implementation, global financial crisis, or Basel II implementation. It is worth noting that banks in Australia and New Zealand were affected by the global financial crisis in 2008, as revealed by the dramatic increase in loan loss provisions during that year.

The small range of countries to compare the impact of IFRS adoption on adopters and non-adopters is also one of the obvious limitations of this thesis. The findings, therefore, may not be generalised to other countries. Furthermore, all the sample countries are from the same legal origin, that is English origin and, therefore, the findings may not be applicable to other legal origins, such as code law countries. Using a small number of countries leads this thesis to another limitation — small numbers of observations. Having a small number of observations might reduce the accuracy of statistical analysis and, therefore, the findings may be driven by lack of powerful estimation.

This thesis did not use non-performing loans (NPLs) as an indicator for credit risk of a bank's loan portfolio in the regression model. However, Bouvatier and Lepetit (2008) emphasise that NPLs perform better as an indicator of risk. In addition, Gebhardt and Novotny-Farkas (2011) criticise that leaving out NPLs in the regression analysis could fail to control for a key determinant of loan loss provisions. Having said this, the number of NPLs is based on past due loans, in which the interpretation of 'past due' varies across countries. Some use 90 days past due while some others use 6-month past due. In this thesis's case, using total loans to total assets as a proxy for credit risk is appropriate because the sample is made up of six countries with different approaches on NPLs. Furthermore, the NPLs data are not consistently available on the Bankscope database; therefore, the use of loans to total assets as a measure for credit risk is well justified.

5.4   Suggestions for future research

There are two suggestions for future research. Firstly, it would be interesting to study the impact of the IFRS implementation using a longer period of time, as this would permit researchers to see the long term impact of IFRS adoption on provisioning behaviour. The findings may vary when using a longer period as, generally, it may take time to comprehensively evaluate the effectiveness of any new policy or standards. Currently, substantial phases are necessary to improve and revise new standards to ensure their steadiness and effectiveness. In addition, future research may control the double impact of the IFRS and Basel II on bank provisioning behaviour, and there has been discussion between the IASB and FASB to implement the expected loss model for provisioning of credit losses but not when to do so. As a

recent update, the IASB will issue an exposure draft during the second half of 2012.[74]

Secondly, expanding the sample by employing a wider range of countries would give greater advantages as further research could control the impact of institutional variables such as the tax system, legal system, enforcement system, regulatory and economic environments, and culture on the implementation of the IFRS. Controlling for institutional variables to some degree is important because the effectiveness of accounting standards is also influenced by the enforcement level (Ball, *et al.*, 2003; Burgstahler, Hail, and Leuz, 2006) and regulatory and litigation environment (Bradshaw and Miller, 2008). Furthermore, expanding the sample would increase the number of observations that would improve the results' accuracy and, thus, provide better findings.

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[74] A detailed report on the expected loss model can be accessed on
http://www.iasplus.com/insight/fiimpairment.pdf

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