The Goods and Services Tax and Mortgage Costs of Australian Building Societies

Benjamin Liu  
Department of Accounting, Finance and Economics, Griffith Business School  
Griffith University, Queensland 4111, Australia  
E-mail: b.liu@griffith.edu.au  
Tel: +61-7- 3735 3549

Allen Huang  
Department of Accounting, Finance and Economics, Griffith Business School  
Griffith University, Queensland 4111, Australia  
E-mail: a.huang@griffith.edu.au  
Tel: +61-7- 3735 7278

Abstract  
Australia has experienced significant rises in mortgage costs and sharp declines in housing affordability since it implemented a new tax system of Goods and Services Tax (GST) in July 2000. Prior research has attempted to examine the influence of the GST on general price levels, but little research effort has been directed to investigate the impact of the GST on mortgage costs. Using proprietary data of major building societies in Australia for 36 months, this paper examines the changes of mortgage yield spreads in the pre- and post-GST periods for building societies. Results suggest that the lenders significantly increased their mortgage charges in the post-GST periods. For example, the increase is found to be, on average, 45.4 basis points. The paper also documents that the rise in mortgage yield spreads is not a one-off impact. The findings are consistent with Huang and Liu (2009) on Australian banks.

Keywords: Australian GST, Mortgage Costs of Building Societies, Housing Affordability, Lender Pricing Behavior

JEL Classification Codes: G21; G12; H25; G14

1. Introduction
Australia has seen significant rises in mortgage costs and sharp declines in housing affordability in the past decade, which causes alarming concerns in the society. This period corresponds with the practice of the Goods and Services Tax (GST) introduced in July 2000. How to contain and reduce mortgage costs has become an important issue for relevant parties in the country.¹ Mortgage cost plays an important role in improving the nation’s economy, quality of living and, in particular, housing affordability. According to the Reserve Bank of Australia (RBA), the housing mortgage loans outstanding by June 2010 reached A$ 1.117 trillion. Based on the amount, every 10 basis point rise in mortgage interest would lead to an increase of over A$1 billion per annum in the borrowers’ cost. An

¹ For instance, in a recent recommendation the Reserve Bank of Australia suggested Australia should consider halving the GST to reduce business and household burdens to help them recover from the global financial crisis.
understanding of how the GST has contributed to the rise in mortgage costs is, therefore, a significant issue and a prerequisite for the banking regulators and policymakers to reach appropriate policy decisions. This paper examines the changes of mortgage yield spreads of Australian building societies\(^2\) in the pre- and post-GST periods in an attempt to answer the research question. The findings of this research provide insights into mortgage costs and should have significant policy implications and wider economic relevance.

Moreover, the Federal Treasury Secretary, Ken Henry\(^3\), is currently reviewing the Australian taxation system and will report to the Federal Government about his findings. Soon after the Australian Labour Party won the right to form the government in the August 2010 election, the business and industry groups started lobbying the Federal Government to review and debate about Australian GST in the next tax summit to be held in June 2011, in an attempt to lift the GST to 12.5% from the current 10%. In addition, New Zealand has increased its GST to 15%, effective on 1 October 2010. This research, therefore, is timely prepared and would be a useful reference to the tax review and the tax summit. In the wake of the recent global financial crisis, the mortgage cost issue has attracted a widespread attention. Thus, the findings of this paper may also have international implications and significance.

In a milestone in tax reform since World War II, Australia introduced a new tax system that abolished a range of indirect taxes, such as the Wholesale Sales Tax, and replaced them with a GST of 10% of the selling price (Maclntyre, 2001)\(^4\). The new tax system, which came into effect on 1 July 2000, led to a substantial structural change in the Australian economy. Broadly speaking, the Australian GST is similar to the value added tax (VAT) operating in the UK, several other European countries, and New Zealand. It applies to most forms of economic activities, such as, supplies of goods, services and other things, with exemptions for some goods and services (Bolton and Dollery, 2005). The essential policy concept of GST, like VAT, is that of value adding. This requires each business to pay GST on the value it adds to a particular product and the end cost of GST is passed on to the end-consumer. For financial institutions, however, the financial products (e.g., mortgage loans) they provide are treated differently from the goods and services of other types of organizations. While financial institutions pay GST on the operational supplies they acquire (input GST), no output GST is charged on the financial products they provide. Hence, the input GST is not recoverable as input tax credits and financial institutions are effectively treated as the end-consumer. This GST cost will need to be absorbed by financial institutions first and then be allocated to supplies (e.g., mortgages) they provide by the way of increasing the overall charges to their customers. For example, a lender may increase the margins or fees it charges to its customers to cover the GST costs (Maclntyre, 2001). In addition, lenders may pass any compliance costs of implementing the GST on to their customers.

Since the introduction of the GST in Australia, studies have been conducted to examine various issues pertinent to the GST. Those studies can be broadly classified into two categories. The first category of studies attempts to determine the effects of the GST on the price level of goods and services (e.g. Commonwealth Treasury, 2000; Australian Competition and Consumer Commission, 2000 and 2003; Johnson et al., 1999; Warren et al., 1999; Valadkhani and Layton, 2004; and Valadkhani, 2005). The second category estimates compliance costs of the GST (e.g. Commonwealth Treasury, 1998; Ernst and Young, 1999; Tran-Nam, 1999, 2000 and 2001). In addition, only recently did Huang and Liu (2009) start investigating the impact of the GST on banks’ mortgage costs. While the research on price levels only provides general information with limited usefulness, the estimated

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\(^2\) In Australia, building societies are authorised depository institutions, usually operating on a mutual cooperative basis, where the depositors are also members of the society. Building societies accept deposits from member households to provide loans and residential mortgage financing to other members, and are regulated by Australian Prudential Regulation Authority in the same way as are banks. Building societies differ from banks in that they are not publicly-listed companies and so do not have the pressure to maximise profits to pay external shareholders.

\(^3\) More information about the review can be found at http://taxreview.treasury.gov.au/Content/Content.aspx?doc=html/home.html

\(^4\) Maclntyre (2001) provides a comprehensive discussion on the GST, in particular GST for financial institutions in Australia.
compliance costs of the GST are based on different assumptions, using different survey techniques with varying sample sizes and lumping the GST-related and normal upgrading computer and system costs together. Consequently, Tran-Nam (2000) concludes that those estimates are either baseless or difficult to justify.

To date, we are not aware of any research that has investigated the impact of GST on mortgage yield spreads of building societies. To fill this research gap, we collected the monthly mortgage data of Australian building societies over 36 consecutive months from January 1999 to December 2001: 18 months before and 18 months after the implementation of the GST on 1 July 2000. We then employ t-tests to analyze the data of both nominal and effective mortgage yield spreads, the latter of which considers all origination and ongoing service fees of the lenders.

The key finding of this study is that the introduction of the GST in July 2000 has contributed to significant rises in mortgage costs charged by building societies in the post-GST periods. Furthermore, contrary to common understanding, the GST impact on mortgage costs was not just a one-off surge taking place in the third quarter of 2000 when GST was implemented. In the 6 post-GST quarters investigated, mortgage costs were on the rise in most quarters, clearly indicating that the GST impact on mortgage costs of building societies persisted.

The rest of this paper is structured as follows. Section 2 reviews the most relevant literature. Section 3 discusses data while Section 4 presents and discusses the results. Conclusions are drawn in Section 5.

2. Literature Review

A number of studies have been conducted to examine various issues pertinent to the introduction of the GST. The studies can be broadly classified into two categories: those investigating the effects of the GST on the price level of goods and services (i.e., the inflationary effect) and those estimating the compliance costs of the GST. Although the GST effects on price levels and the tax compliance costs are different issues, they are related in the sense that most GST-related costs are eventually and ultimately borne by the consumers.

2.1. The GST Effects on Price Levels

The inflationary effect of the GST has been a concern to the Governments and other organizations. The Commonwealth Treasury and various State Treasuries have been involved in estimating the inflationary effect through the use of survey methods. The consensus of the government surveys is that the GST’s effect on the goods and services included in the consumer price index (CPI) is a one-off price-perturbation in the quarter of the introduction of the GST and the magnitude of the effect varies within a small range. For example, the Commonwealth Treasury estimated that the GST could increase the overall CPI by 2.75 per cent in July 2000 (Commonwealth Treasury, 2000, p. 11). The Queensland Treasury (2001, p. 1) and New South Wales Treasury (2001, p. 14) also believed that the GST impact would be one-off event, and estimated the numerical effect to be 2.75 percent and within 2.50−3.00 per cent, respectively.

The Australian Competition and Consumer Commission (ACCC) conducted eight general surveys (December 1999−January 2000; March, May, August and October 2000; and February and May 2001), in which prices for various goods and services were collected from approximately 10,000 retail outlets in 115 geographical locations (i.e., major capital cities, regional cities and towns across Australia). According to the ACCC (2001, p. 2), the inflationary impact of the GST during the third and fourth quarters of 2000 was estimated to be approximately 4 percent, with 3.7 per cent occurring in the third quarter.

Individual researchers have also endeavored to study the effect of GST on the price level. Before the GST, Johnson et al. (1999) and Warren et al. (1999) thoroughly evaluated the revenue, efficiency and equity effects of the government’s tax package. Warren et al. (1999) also predict the
possible effect of the GST on inflation and estimate, under different assumptions, that this effect was likely to be between 0.8 and 3.6 per cent in July 2000.

Valadkhani and Layton (2004) examine the magnitude and duration of the GST effect on the overall rate of inflation. Using intervention analysis (an autoregressive integrated moving average model with dummy variables), Valadkhani and Layton (2004) find that the GST effect on inflation was only temporary (i.e., in third quarter of 2000) and the size of the effect was 2.8 per cent. In another study, Valadkhani (2005), using the same methodology, investigates the price changes of goods and services in the four quarters before and four quarters after the third quarter of 2000. Valadkhani finds that the overall effect was a one-off lift in inflation of approximately 3 per cent in the third quarter of 2000 and prices did not increase significantly before or after the third quarter of 2000.

2.2. The Tax Compliance Costs

Other studies have focused on estimating the compliance costs of the GST. According to Tran-Nam (1999 and 2000) and others (e.g., Sandford et al., 1989), the introduction of a new tax (such as the GST) gives rise to two new types of costs: the implementation compliance costs and the recurrent compliance costs. The implementation compliance costs (hereafter, the implementation costs) are the costs incurred in complying with the GST when it was implemented and include mainly the administrative costs and the compliance costs of the implementation of the GST. The administrative costs refer to the start-up costs incurred by the Australian Taxation Office (ATO) and other regulatory bodies.

The compliance costs of implementing the GST refer to the resources expended by the economy in its preparation to comply with the GST. A broad-based tax such as the GST affects all sectors of the economy including households, firms and the budget sector (government departments, universities etc.). Most of these costs would eventually be passed on to consumers. As the compliance costs of implementing the GST are far greater than the administrative costs, research interest has been focused on the implementation costs. Around the time when the GST was introduced, there was much public interest in and concerns for the implementation costs of the GST. A wide range of estimates were made and reported. For example, the Federal Government stated in its original Regulation Impact Statement (RIS) that “start-up costs are likely to be one-off expenses and to be lower than the full year compliance costs of the GST” (Commonwealth Treasury, 1998, p. 5). In the revised RIS the Government is more explicit in stating that it expects the estimated implementation compliance costs would not exceed A$ 2.2 billion (Joint Government Advocate, 2000, p. 9).

The estimated implementation costs of the GST reviewed above are based on different assumptions, using different survey techniques with varying sample sizes and lumping the GST-related and normal upgrading computer and system costs together. According to Tran-Nam (2000), these estimates are either baseless or difficult to justify.

In summary, the existing research all suggests that the GST effect on prices and the GST compliance costs are substantial, which inevitably increases costs to both businesses and consumers (see Huang and Liu, 2009). However, the research that has been conducted to date, except for Huang and Liu’s (2009) on bank mortgage costs, remains at the level of estimating either the general price effect or the overall compliance costs in the society. It is clearly justified that this study analyzes the impact of the GST on mortgage costs in Australia.

3. Data

The data is mainly collected from the Cannex’s monthly survey of Australian lenders, which publishes monthly information on mortgage interest rates, mortgage fees and charges, credit criteria and other data of building societies operating in Australia, and from the Statistics of the Reserve Bank of Australia (RBA). The time periods selected for the analysis cover 36 consecutive months from January 1999 to December 2001 (that is, 18 months before and 18 months after the GST came into effect on 1
The selection of the time periods is mainly determined by the research question this study addresses, that is, the impact of the introduction of the GST on mortgage costs. Hence, inclusion of the even pre- and post-GST periods in the analysis would allow comparisons to be made on the mortgage costs before and after the implementation of the GST. In addition, during the research period there was no significant market-wide event that could have caused abrupt alterations in the Australian mortgage market, which would lead to a more reliable research outcome.

The data selection results in a total of 611 monthly observations. To make the comparisons between the pre- and post-GST periods more valid, only the standard products of residential mortgages, that is, the owner-occupied home loans with adjustable interest rates (with which about 80 per cent of Australian home loans are originated), are examined. Loans for other purposes are not used. We use both the nominal interest rate and the annualized average percentage rate (AAPR); the latter includes the nominal interest rate and all other fees and charges levied on mortgages, that is, the effective rate. The AAPR adopted in this study is computed using the standard calculations required under the Australian Uniform Consumer Credit Code (UCCC) and is considered to be a benchmark for comparing mortgage products in Australia. When analyzing and comparing mortgage costs, however, we use mortgage yield spreads, rather than the interest rates (either the nominal rate or the effective rate). Two types of mortgage yield spreads are derived from the nominal and effective rates: the nominal mortgage yield spreads and the effective mortgage yield spreads. The nominal yield spreads are the differences between the standard ARMs' nominal rates and the 90-day bank bill rates and the effective yield spreads are the differences between the AAPR rates and the 90-day bank bill rates. The 90-day bank bill rates are often used as the benchmark in the banking industry that measures relative or margin costs and the data is collected from the RBA’s Statistics. The use of yield spreads is a standard approach in measuring mortgage costs as it helps overcome the impact of inflation and adjustments of monetary policy over time on the interest rates. This approach is, therefore, often used by the RBA, the banking industry, and most mortgage pricing research (e.g., Black et al, 1981; Kumar and Ralston, 1999; Ambrose et al, 2004; Liu and Skully, 2005, 2008).

4. Empirical Results
Quarterly means of both nominal and effective yield spreads of building societies are used to conduct the $t$-tests. Later quarters are compared to earlier quarters and a matrix of $t$-tests is developed for each of the two sets of the tests, that is, building societies nominal and effective yield spread differentials. Tables 1 and 2 present the matrixes of $t$-tests over the 12 quarters on building societies nominal and effective yield spreads, respectively. Later quarter average yield spreads are each compared with (deduct) earlier quarter average yield spreads using the nominal data and the effective data. The comparisons result in the nominal/effective yield spread differentials that are expressed in percentage points, comparable to annualized interest rates. As shown in Tables 1 and 2, a positive figure means an increase in the yield spreads while a negative figure (figures in parentheses) represents a decrease in the yield spreads.

Tables 1 and 2 show the following results. Comparing the third quarter (Q hereafter) of 2000 (the GST was implemented at the beginning of this quarter) to Qs 1 and 2 of 2000, there were only moderate, but significant, increases in the yield spreads (18.2 and 18.3 basis points for the nominal spreads and 18.8 and 18.3 basis points for the effective spreads). However, when comparing the other five post-GST Qs to Qs 1 and 2 of 2000, we find that all the yield spread differentials are much increased and significant at $p<0.01$ (see Tables 1 and 2). For example, the effective yield spreads for Q1 of 2001, in comparison to Qs 1 and 2 of 2000, are 103.0 and 102.5 basis point higher.

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5 More information is available on CANNEX website www.cannex.com.au. The calculations of the AAPR consider various upfront fees (e.g., documentation, valuation and application fees) and ongoing service fees. Other parameters in the AAPR incorporate loan amount and maturity into its calculations.

6 More detailed information about the UCCC can be found at an Australian government website: www.creditcode.gov.au.
In fact, as shown in Tables 1 and 2, all four Qs of 2001, as compared to the eight previous Qs, recorded much higher yield spreads, all significant at $p<0.01$. Furthermore, the majority of the quarters since the base quarter recorded increases in the yield spreads, indicating continued rises in mortgage costs. The findings that suggest the mortgage cost increase is not a one-off impact, are consistent with Huang and Liu (2009), but inconsistent with Valadkhani (2005).

A closer examination of Tables 1 and 2 reveals that the yield spreads started to increase in Q4 of 1999, three Qs before the GST came into effect. If using Q4 1999 as the base quarter, we find much larger increases in both the nominal and effective yield spreads (all significant at $p<0.01$), peaking in Q1 of 2001 (121.92 points for the nominal and 114.5 points for the effective yield spreads, respectively). Finally, a comparison on the two grand means (the average yield spreads of 6 Qs before and 6 Qs after the GST) shows the nominal (effective) yield spreads rose 51.6 (45.4) basis points, which are even higher than those of banks (41.4 and 35.7 basis points for the nominal and effective spreads, respectively) as reported in Huang and Liu (2009).

This table reports the results of pair-wise comparison matrix of building societies nominal yield spreads (NYSP) for 12 quarters from 1999 to 2001. In July 2000, Australia implemented the Goods and Services Tax (GST). The $t$-test results are presented to specially demonstrate the quarterly average yield spread differentials in the pre- and post-GST periods, which is the central issue addressed in this paper. The figures indicate increases or decreases (in parentheses) in the nominal yield spreads (i.e., mortgage costs) from one quarter to the next and the two grand means of the pre- and post-GST periods.

### Table 1: Building Societies Nominal Yield Spread Differentials: Matrix of $t$-tests Using Quarterly Means*

<table>
<thead>
<tr>
<th></th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>Pre GST</th>
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</thead>
<tbody>
<tr>
<td>Q1</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.516</td>
</tr>
<tr>
<td>Q2</td>
<td>(0.075)</td>
<td>(0.066)</td>
<td>(0.435)</td>
<td></td>
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<tr>
<td>Q3</td>
<td>(0.589)</td>
<td>(0.137)</td>
<td>(0.086)</td>
<td></td>
</tr>
<tr>
<td>Q4</td>
<td>(0.516)</td>
<td>(0.319)</td>
<td>(0.516)</td>
<td></td>
</tr>
<tr>
<td>Q1</td>
<td>0.116</td>
<td>0.000</td>
<td>0.115</td>
<td></td>
</tr>
<tr>
<td>Q2</td>
<td>0.297</td>
<td>0.143</td>
<td>0.182</td>
<td></td>
</tr>
<tr>
<td>Q3</td>
<td>0.143</td>
<td>0.179</td>
<td>0.183</td>
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<tr>
<td>Q4</td>
<td>0.000</td>
<td>0.579</td>
<td>0.464</td>
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<tr>
<td>Pre GST</td>
<td></td>
<td></td>
<td>0.218</td>
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</tbody>
</table>

* A quarter to quarter comparison is made from the left to the top, as the arrow signs indicate. a, b denote the 1% and 5% levels of significance, respectively.

This table reports the results of pair-wise comparison matrix of building societies effective yield spreads (EYSP) for 12 quarters from 1999 to 2001. In July 2000, Australia implemented the Goods and Services Tax (GST). The $t$-test results are presented to specially demonstrate the quarterly average yield spread differentials in the pre- and post-GST periods, which is the central issue addressed in this paper. The figures indicate increases or decreases (in parentheses) in the effective yield spreads (i.e., mortgage costs) from one quarter to the next and the two grand means of the pre- and post-GST periods.

### Table 2: Building Societies Effective Yield Spread Differentials: Matrix of $t$-tests Using Quarterly Means*

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<thead>
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<th>2000</th>
<th>2001</th>
<th>Pre GST</th>
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</thead>
<tbody>
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<td>Q1</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.516</td>
</tr>
<tr>
<td>Q2</td>
<td>(0.063)</td>
<td>(0.081)</td>
<td>(0.439)</td>
<td></td>
</tr>
<tr>
<td>Q3</td>
<td>(0.160)</td>
<td>(0.520)</td>
<td>(0.439)</td>
<td></td>
</tr>
<tr>
<td>Q4</td>
<td>(0.588)</td>
<td>(0.232)</td>
<td>(0.439)</td>
<td></td>
</tr>
<tr>
<td>Q1</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
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<tr>
<td>Q2</td>
<td>(0.081)</td>
<td>(0.520)</td>
<td>(0.439)</td>
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<td>Q3</td>
<td>(0.160)</td>
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<td>Pre GST</td>
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* A quarter to quarter comparison is made from the left to the top, as the arrow signs indicate. a, b denote the 1% and 5% levels of significance, respectively.
5. Conclusions

Using the mortgage data of building societies in Australia covering 36 months from January 1999 to December 2001, this study analyzes the quarterly changes of mortgage yield spreads for the research period. The results of this study show that the introduction of the GST in July 2000 has had a significant impact on mortgage yield spreads and has contributed to the substantial rise in mortgage costs charged by building societies in the post-GST periods. This finding is consistent with that of Huang and Liu (1999) for bank lenders.

Unlike prior studies which conclude that the GST effect was only a one-off price perturbation in the third quarter of 2000 when the GST was introduced and prices did not increase significantly before or after that quarter (e.g., Valadkhani, 2005), this study finds that all the six post-GST quarters, as compared to the pre-GST quarters, recorded significant increases in both yield spreads. The largest increase occurred in the first quarter of 2001. In fact, the increases in the yield spreads in all four quarters of 2001 were much larger than those of quarters 3 and 4 of 2000. Furthermore, the yield spreads started to rise in 4th quarter of 1999, three quarters prior to the GST implementation. Overall, Australian building societies raised their nominal and effective yield spreads by 51.6 and 45.4 basis points respectively in the post-GST periods examined.

As in the new tax system no output GST is charged on mortgage loan interest, financial institutions need to recover the input GST they pay through increasing the overall charges to their loan customers. It is possible that financial institutions may take the opportunity of implementing the GST to increase the mortgage yield spreads beyond their GST costs. This study also provides the evidence of such pricing behavior of Australian building societies.

The mortgage burdens on Australian borrowers have risen substantially and the housing affordability has declined sharply in the past decade. The findings of this study should have important financial, economic and policy implications for regulators and policymakers in the banking industry in their contemplation of the proper regulations and policies to control and curb mortgage costs. For the borrowers, the evidence suggests that lenders have passed the GST costs of multi billion dollars on to them each year. For example, for 2001 alone, based on the mortgage balance of A$353 billion at the end of June 2001, the mortgage cost could be increased by A$1.6 billion (A$353b*0.45%). For policymakers, in the wake of the current global financial crisis and in consideration of Australian housing affordability problem, and to help reduce the cost for the lender and borrower, the GST input credit for lenders should be reconsidered.

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