Synchronisation and Staggering of Deposit Account Interest Rate Changes

by

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Abstract: This study examines the frequency and form of deposit account interest rate change. Specifically, the question of whether deposit interest rate change is synchronised with other banks or staggered at periodic intervals is addressed. Overall, evidence consistent with individual banks changing deposit interest rates in a staggered manner is recorded. Further, larger banks are seen to change interest rates in a more synchronised manner than smaller banks. Lastly, when banks offer multiple deposit accounts, these products' interest rates are generally changed simultaneously by individual banks. These findings extend the current understanding of deposit interest rate change, and indicate that UK deposit interest rate setting is relatively rigid.

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1. Introduction

As systems of monetary policy have increasingly focused on controlling money supply through interest rate targets (Biefang-Frisancho and Howells 2002) understanding how banks set their market interest rates has developed a critical policy importance. Despite this significance, comprehending the frequency and format of market interest rate setting for bank products has long been a 'black box' (Dale and Haldane 1998). This examination, employing the wider population of longer term UK deposit products between 1988 and 2006 enables deposit interest rate change to be scrutinised at a level of detail yet to be provided. From this assessment it is reported that deposit interest rates move with a consistent regularity or change in a staggered form. Further, different types of bank alter deposit interest rates in a manner which differs significantly. Lastly, banks shift interest rates of their own often multiple deposit products in a distinct synchronised manner.

Understanding the interest rate setting behaviour of banks is of central importance to a system of macro-economic management. Specifically within the Bank of England macroeconomic model, '… interest rates have gradually been incorporated into all of the various model equations explaining the main component of aggregate demand' (Easton, 1990, p.200). Further, an implicit assumption within this macroeconomic model is that '… banks and building societies pass on any changes in the base (rate) to their customers immediately' (Heffernan 1997 p.221). As previous academic investigation (e.g. Hannan and Berger 1991) has viewed adjustment of retail deposit rates to external shocks as 'sluggish', 'sticky', or lagged, this notion requires further consideration.

Beyond understanding the degree of pass-through from official interest rates, cognisance of how banks change market interest rates has a wider policy importance. Comprehending the frequency and form of deposit and loan interest rate change enables relative interest rate movements to be assessed (Biefang-Frisancho and Howells 2002). Discerning how relative interest rates differ is critical as these spreads between market rates for different assets have a substantial influence on

wealth effects, the cost of credit, and the desire to trade existing for future consumption (Biefang-Frisancho and Howells 2002). Subsequently assessing whether deposits or loans change interest rates swiftly or sluggishly is important when comprehending the impact of official interest rate movements of the wider economy.

Interest rate setting can also differ between distinct financial systems (Dale and Haldane 1998) and different types of bank (Küppers 2001). Financial systems are increasingly populated by a diversity of institutional types which offer banking services that can differ in their behaviours. Küppers (2001) reports that smaller German savings banks tend to respond less swiftly to official interest rate changes than larger Grossbanken. Similarly, Dale and Haldane (1995) indicate differences exist in the transmission of official UK interest rates to the corporate and retail sectors. Subsequently, assessing how certain types of bank alter market interest rates can illuminate how relative interest rates change.

To achieve these aims, the study is divided into six sections. After this brief introduction, the forms of interest rate change addressed in this study are forwarded. Section three describes characteristics congruent with synchronised and staggered interest rate change. In section four, the data used in the study is described, with interest rate characteristics quantified in section five. Concluding remarks are included in section six.

2. Price and Interest Rate Change

Past international assessments of deposit interest rate change have indicated infrequent and sluggish interest movement is common. This slow adjustment of retail interest rates has been attributed to a number of possible factors, including the competitiveness of retail financial services markets (Heffernan 1997, 1993, Calem and Mester 1995, and Paisley 1994); reasons of interest rate asymmetry (De Haan and Sterken 2004, Lim 2001 and Scholnick 1999); and the structure of the banking

industry, both in the US and Europe (Corvoisier and Groop 2001, Jackson 1997, Hannan and Berger 1991, and Calem and Carlino 1991).

A long established and growing literature has also examined low frequency or rigid price change. While price change rigidity is often linked to the influence of menu costs, alternative explanations have arisen. Through examination of situations where menu costs are not substantial, such as internet book sales (Chakrabarti and Scholnick 2005), electronic markets, (Oh and Lucas 2006) and apartment rents (Genesove 2003), price rigidities have been increasingly attributed to grid pricing[1] and frequent, small and random price changes intended to confuse customers. Recent evidence has also linked the frequency of price change to the type of price setter, where firms with a greater sensitivity to costs (MacDonald and Aaronson 2006), a history of frequent price changes (Campbell and Eden 2005) and high firm liquidity (De Graeve *et al* 2004) have been associated with more responsive pricing. Further numerous contributions to the price change literature have been provided in the ongoing European Central Bank assessment of inflation persistence. These studies (e.g. Gautier 2006, Hoffman and Kurz-Kim 2006, Kurri 2007) have involved the examination of often substantial micro data sets used to form price indices in euro-area states. In most of these cases price rigidity is viewed to be substantial.

Distinctly this study addresses whether interest rate rigidity exists and how this rigidity occurs by assessing if interest rates change in a staggered or synchronised fashion. Staggering is assumed to occur when product interest rates are changed at different points in time, whilst synchronisation assumes interest rates change simultaneously at one point in time. This form of assessment has importance as staggered price setting is a central explanation of the presence and duration of time lags in the transmission of monetary shocks to the real economy. For example Sheshinski and Weiss (1992) state '… If individual price paths are staggered, then temporary shocks may be propagated over long periods. Synchronised price policies, on the other hand, may accelerate the adjustment process' (p.331-332). A review of

[1] Grid pricing refer to the practice of setting prices with strong preference for certain digits, such as just below a integer (e.g. 99 or 49) or around certain reference numbers (e.g. 100).

the theoretical importance of price staggering for the underlying economy is provided by Ascari (2003).

Other literature which has considered price staggering or synchronisation has employed survey methods to ask economic agents about their pricing behaviour. For example Hall *et al* (2000) and Blinder *et al* (1998) report survey evidence which indicates price staggering may be a dominant form of price change for UK and US firms. Most of the prevailing empirical price change literature has considered the case, where an individual firm only offers a single product to market (e.g. Cecchetti 1986). While considering single product firms has the advantage of simplifying the empirical problem at hand, such analysis does not accommodate increasingly common multi-product companies. To date, only a limited number of studies have addressed the issue of multi-product price change for synchronised and staggered price change (e.g. Lach and Tssidon 1996, Fisher and Konieczny 2000). These studies indicate price staggering may exist between firms, and that price changes are synchronised within firms.

Staggering or synchronisation in interest rate change can also be illustrated with reference to the transmission mechanism literature. Prices can change in response to particular events or are state dependent, or change with a particular frequency over time, or are time dependent. The presence of state dependent pricing is assumed within signal extraction models (Lucas 1973), where an exogenous shock affects all suppliers at the same time and prompts a synchronised response. Conversely, if time dependent price change exists, prices movement at discrete time intervals will be expected. The interval between price changes is assumed to alter with exogenous economic phenomena such as inflation or base rate shifts (Fisher 1977). These state or time dependent forms of price change are broadly concurrent with the concepts of price synchronisation and staggering employed in this study.

This examination of interest rate change is distinct from previous studies (Biefang-Frisancho and Howells 2002, Dale and Haldane 1995, Hoffmann and Mizen 2004)

which have used econometric time series techniques to quantify the speed of interest rate changes. Such statistical techniques are not employed, as product-specific retail interest rate data displays a substantial degree of clustering around certain digits and factions (see Kahn *et al* 1999). The non-random and discrete data characteristics associated with data clustering are inconsistent with econometric time series methods, which depend on random and continuous data for non-biased estimation. To overcome this problem a methodology drawn from the price change literature (see Carlton 1986, 1989, and Lach and Tsiddon 1996) is employed.

Lastly, this study differs from previous contributions in that in any assessment of price, it would be expected that prices would continually change with the underlying rate of inflation and other economic factors. An assessment of the change in interest rates over time is distinct as the prevailing rate of interest is itself a measure of change and linked to the underlying economy.

3. Features of Synchronisation and Staggering in Interest Rate change

A central issue for the analysis is the dimensions over which interest rate change can occur. Initially, interest rates change between banks, where every bank can change an interest rate of any of its deposit products in a particular month. Thus interest rate change at a bank level can be investigated relative to other banks, termed a "between banks" interest rate change. Secondly, a bank may change one, all, or an intermediate proportion, of the interest rates of deposit products it provides. This level of assessment, at a product level, can provide information on how interest rates change within banks – termed a "within bank" interest rate change.

To add clarity to the description of these interest rate change characteristics the analysis will be subdivided into three sections. Following Lach and Tsiddon (1996) three price adjustment characteristics associated with price staggering and synchronisation are quantified. These characteristics include the proportion of products where prices are changed in a time period, both within and between firms;

the frequency and duration of consecutive price changes; and the associated degree of cyclicality observed in interest rate change. The assessment will then be subdivided into interest rate change, at the bank level, and then at the product level.

First, the proportion of interest rate changes in a single time period will be calculated. In the between banks case, the proportion of all banks where any deposit product which has changed interest rate in a particular month is recorded. For the within banks case, the proportion of deposit products offered by an individual bank which alter interest rates in a particular month is reported. Synchronisation in interest rate change implies that interest rates move together or simultaneously. Subsequently the observed proportions of interest rate movement in a particular month would be close to 1 or 0. Conversely, when interest rates change in staggered fashion or with a lack of synchronisation, we might expect an intermediate proportion of interest rate movements in a particular month. In this case the observed proportions of interest rate change in a particular month would be intermediate values between 1 or 0. The results of this assessment, for both between and within banks, are reported in Table 2.

Second, the incidence of consecutive interest rate changes for deposit account products is assessed. Following Lach and Tsiddon (1996), consecutive price changes are recorded as 'non-overlapping spells of consecutive price changes'. For example, consecutive interest changes of four months are recorded as one consecutive interest rate movement of four months; not as two consecutive interest changes of two months. When interest rates alter in a staggered form or with a particular frequency, consecutive interest rate change will be minimal. In the between banks case, the number of consecutive interest rate changes of any deposit product held by a bank is recorded. Similarly, for the within banks case, the number of consecutive interest rate movements in individual deposits offered by banks is recorded. The results of this assessment are included in Table 3.

Third, the characteristic of cyclical interest rate change assesses whether interest rate change is congruent with regular cyclicality. Interest rate staggering assumes that interest rate movements are initiated at regular intervals with a consistent and predictable time lag after an external shock. Under these circumstances regular cyclicality should be displayed. Cyclicality is quantified by recording interest rate movement in consecutive months and by examining the distribution of interest rate change in any month T, compared to shifts in the interest rate in a month T+1. Following Lach and Tsiddon (1996) this information is provided within 2 × 2 contingency tables. These contingency tables include the number of observations and percentages, which provide an estimate of the probability of an event occurring, assuming the presence of a previous action, i.e. if interest rate change is observed or not in month T, or the probability of interest rate movement or not, in month T+1. If interest rate staggering is dominant, it is expected that an interest rate change is recorded in month T, and is not followed by another movement in interest rates in month T+1. The results of this assessment of cyclicality in interest rate change are presented in Table 4.

4. Data

The study considers monthly observations from the UK market for deposit accounts over the sample period, November 1988 to December 2006. This market is supplied by a wide range of financial services firms, which employ branch, postal, telephone and internet channels to distribute and service deposit accounts. As previous work on the UK deposit market indicates that no significant differences exist between interest rate setting policies for any of these distribution channels (Ashton 2002), deposits even when distributed differently are considered. The population of deposit account interest rates was constructed from data issued by the Moneyfacts magazine, which provides a comprehensive selection of financial services details on a monthly basis. In total, 1618 deposit accounts which have operated for at least 24 months and issued by 152 institutions are included in the study. This database of 77,379 observations recorded over 218 monthly intervals represents the effective population

of all longer-term deposit accounts issued in the UK between 1988 and 2006. Of these accounts 49.5% are instant access accounts, and the remainder are time deposits. The data is contiguous, yet unbalanced, as both deposit savings accounts which are introduced and withdrawn and financial institutions have entered and exited this market between 1988 and 2006.

The definition of a deposit savings account used here is “a widely available savings product with broadly homogenous characteristics of high liquidity and a higher return than current accounts”. This definition is also employed by Cruickshank (2000) and the Moneyfacts Magazine and provides a degree of continuity and comparability within the literature. For further discussion of issues of market definition in retail banking markets see Ashton (2001). This market is also supplied by a number of firm types (hereafter termed banks) which may conduct interest rate setting in a separate or distinct manner. Such bank groups include high street retail banks, building societies, which have both converted to proprietary status or remained mutually owned, and other banks which do not have a strong retail orientation. Other proprietary firms which offer deposit accounts are also included as a distinct group, including insurance companies and supermarket retailers. The division of the market into institutionally defined groups has been previously undertaken in price change studies (e.g. Loy and Weiss 2004) and is consistent with approaches adopted for examining UK banking markets (e.g. Ashton and Letza 2003, Cruickshank 2000, Heffernan 2002, 2005). When appropriate, F tests from an ANOVA procedure will be recorded to ascertain if statistically significant differences exist between the different bank groups.

Table 1: Summary statistics for population characteristics and interest rate (IR) change within and between banks operating the UK deposit market

	Characteristic	Retail banks	Other banks	Building societies	Converted building societies	Other Providers	Total
A Sample Characteristics	Average number of firms operating in the deposit market	13.776	16.34	53.04	8.977	10.616	99.750
	Total number of products held by the firm	6.778	3.585	7.365	15.778	2.650	6.228
	Average number of products held by the firm	2.596	2.252	3.699	5.471	1.621	3.116
	Average duration of a product (months)	84.44	63.81	85.60	75.88	70.01	77.61
B Interest Rate (IR) change Characteristics	Number of firms changing IR in any month	4.597	5.097	17.620	3.889	3.519	33.46
	Proportion of firms changing an IR of any product	0.3345	0.3192	0.3343	0.433	0.329	0.340
	Proportion of products within firms which changed IR	0.268	0.273	0.273	0.298	0.270	0.276
	Average frequency of IR changes (per month) at the product level	0.268	0.260	0.257	0.286	0.252	0.263

In Table 1 descriptive statistics are presented in two panels: panel a) which considers population characteristics, and panel b), which outlines some aggregate attributes of interest rate change. In panel A, the average number of banks operating in the UK deposit market (99.75) is recorded; this value is far below the total number of banks included in the sample (152), illustrating the degree of bank entry and exit. Secondly, the total (6.228) and average number (3.116) of deposit products provided by individual banks is provided. These values clearly illustrate the high level of product turnover in this market; a point further clarified through consideration of the average duration of individual deposit products (77.71 months).

In panel B, the average frequency of interest rate change at both the firm (0.340) and the product level (0.276) are outlined. By examining the proportion of banks changing interest rates of any of their deposit products it is observed that approximately one third of banks change their interest rates every month. Similarly, the proportion of all

deposit products held by an individual firm which are changed in any month is approximately one quarter. Lastly, the frequency of interest rate change at the product level (0.263) remains broadly similar across all firm groups, indicating that an interest rate change occurs approximately once every four months, a possible frequency for a staggered interest rate change 'cycle'.

5. Results and Findings

In this section three sets of results, reported in Tables 2, 3 and 4 respectively, are discussed, considering: one, the proportions of interest rate change; two, the frequency and duration of consecutive interest rate changes; and three, the cyclicality of interest rate change.

Table 2: Frequency tables illustrating the proportion of interest rate changes within and between banks

		Retail banks	Other banks	Building societies	Converted building societies	Other Providers	Total
Panel A Between Banks Interest Rate Change	**Between Banks Interest Rate Change: Proportion of Banks' Which Have One or More Deposit Accounts Changing Interest Rates in a Given Month m.**						
	0	0.1861	0.1174	0.0448	0.0648	0.2230	0.0046
	>0 to ≤0.2	0.3420	0.4261	0.4350	0.1250	0.3094	0.6713
	>0.2 to ≤0.4	0.1515	0.1783	0.1883	0.3519	0.1367	0.2083
	>0.4 to ≤0.6	0.0649	0.0522	0.1211	0.1898	0.0935	0.1111
	>0.6 to ≤0.8	0.0866	0.1000	0.0807	0.0926	0.0863	0.0046
	>0.8 to ≤1	0.1688	0.1261	0.1300	0.1759	0.1511	0.0000
	Total	100	100	100	100	100	100
	F test for differences between strategic group means = 15.628*						
Panel B Within Banks Interest Rate Change	**Proportion of All Products Within The Bank Which Changed Interest Rate in a Given Month m**						
	0	0.6692	0.6950	0.6514	0.5667	0.7057	0.6729
	>0 to ≤0.2	0.0121	0.0090	0.0210	0.0567	0.0197	0.0151
	>0.2 to ≤0.4	0.0348	0.0146	0.0357	0.0577	0.0212	0.0263
	>0.4 to ≤0.6	0.0323	0.0350	0.0250	0.0469	0.0222	0.0304
	>0.6 to ≤0.8	0.0395	0.0126	0.0329	0.0665	0.0130	0.0248
	>0.8 to ≤1	0.2122	0.2340	0.2340	0.2038	0.2182	0.2305
	Total	100	100	100	100	100	100
	F test for differences between bank group means = 7.649*						

* = significant at 0.05 significance

Panel A Between Banks Interest Rate Change - considers the proportion of banks either overall or at a group level which change an interest rate of any of their deposit products in a certain month.
Panel B Within Banks Interest Rate Change – considers the proportion of all of the products held by an individual bank which change an interest rate in a specific month

The statistics presented in Table 2 relate to the proportion of bank and deposit products which undertake changes in their interest rates simultaneously. This information is presented in two frequency tables which outline: one, the proportion of all banks which change the interest rates of one or more of their deposit products in a particular month; and two, the proportion of deposit products issued by individual banks where interest rates change in a particular month. This information is presented in six classes (0, >0 to ≤0.2, >0.2 to ≤0.4, >0.4 to ≤0.6, >0.6 to ≤0.8, and >0.8 to ≤1), which indicate the proportion of all banks or products within the individual banks which have changed interest rates in a particular month.

Within the first frequency table only a small percentage of banks change none of the interest rates of any of their deposit products in a particular month. This table also displays that a substantial percentage of all observations exist within the intermediate classes, which represent different proportions of all banks that change their interest rates in the same month. This distribution indicates that staggering in interest rate change is present between banks. Additionally, some differences exist between the bank groups. For example, 16.80 and 17.59% of all banks observations for retail banks and converted building societies respectively occur in the >0.8 to ≤1 group, where 80 to 100% of banks in a group change their interest rates simultaneously. Such values are greater than those observed for other bank groups, implying a marginally higher degree of synchronisation for retail banks and converted building societies. These differences are statistically significant as indicated by the appropriate F test.

In the second frequency table presented in panel B, within bank interest rate change is reported. A very different distribution of interest rate change from the between banks case is observed with around 90% of observations occurring when none or all of a bank's deposits change interest rates. Further, only a limited number of observations are recorded in the intermediate classes. This apparent polarisation of within banks' interest rate change is representative of synchronised interest rate setting.

Information on consecutive interest rate change is displayed in Table 3. In this table, the frequency and duration of runs of consecutive interest rate changes are recorded. Between and within banks interest rate change is displayed overall and for different groups of banks, in panels A and B respectively.

Table 3: The frequency, duration and percentage of consecutive interest rate change both at the product and at the bank level

		Consecutive Interest Rate Changes by Bank: Frequency of Observations and Duration (percentage of all observations in brackets)					
	Duration	**Retail banks**	**Other banks**	**Building societies**	**Converted building societies**	**Other Providers**	**Total**
Panel A Firm Level Observations	0	1995 (77.423)	2449 (78.797)	7689 (75.836)	1107 (70.871)	1146 (79.473)	14386 (76.407)
	1	400 (15.523)	464 (14.929)	1746 (17.221)	274 (17.542)	203 (14.078)	3087 (16.396)
	2	97 (3.745)	106 (3.411)	420 (4.142)	106 (6.786)	55 (3.814)	784 (4.164)
	3	34 (1.319)	35 (1.126)	153 (1.509)	31 (1.985)	12 (0.832)	265 (1.407)
	4	18 (0.698)	21 (0.676)	62 (0.612)	16 (1.024)	17 (1.179)	134 (0.712)
	5	14 (0.543)	16 (0.515)	37 (0.365)	14 (0.896)	3 (0.208)	84 (0.446)
	6	11 (0.427)	6 (0.193)	15 (0.148)	5 (0.320)	1 (0.069)	38 (0.202)
	7	1 (0.039)	3 (0.097)	6 (0.059)	1 (0.064)	0 (0.000)	11 (0.058)
	≥ 8	7 (0.272)	8 (0.257)	11 (0.108)	8 (0.512)	5 (0.347)	39 (0.207)
	Total	2577 (100)	3108 (100)	10139 (100)	1562 (100)	1442 (100)	18828 (100)
	F test for differences between bank group means = 25.558* for observations where interest rate change is present						
		Consecutive Interest Rate Changes by Product: Frequency of Observations and Duration (percentage of all observations in brackets)					
	Duration	**Retail banks**	**Other banks**	**Building societies**	**Converted building societies**	**Other Providers**	**Total**
Panel B Product Level Observations	0	7308 (79.478)	6201 (80.627)	33994 (79.379)	7357 (78.668)	2065 (81.588)	56925 (79.511)
	1	1395 (15.171)	1109 (14.419)	6744 (15.748)	1419 (15.173)	332 (13.117)	10999 (15.363)
	2	297 (3.230)	241 (3.134)	1570 (3.666)	427 (4.566)	90 (3.556)	2625 (3.667)
	3	70 (0.761)	66 (0.858)	322 (0.752)	71 (0.759)	11 (0.435)	540 (0.754)
	4	61 (0.663)	39 (0.507)	132 (0.308)	45 (0.481)	24 (0.948)	301 (0.420)
	5	45 (0.489)	22 (0.286)	42 (0.098)	22 (0.235)	3 (0.119)	134 (0.187)
	6	12 (0.131)	3 (0.039)	6 (0.014)	4 (0.043)	1 (0.040)	26 (0.036)
	7	4 (0.044)	1 (0.013)	3 (0.007)	2 (0.021)	0 (0.000)	10 (0.014)
	≥ 8	3 (0.033)	9 (0.117)	12 (0.028)	5 (0.053)	5 (0.198)	34 (0.047)
	Total	9195 (100)	7691 (100)	42825 (100)	9352 (100)	2531 (100)	71594 (100)
	F test for differences between bank group means = 58.378* for observations where interest rate change is present						

*= significant at 0.05 significance

Panel A records the duration in months of consecutive interest rate changes for any of the deposit products issued by the bank. Panel B records the duration of consecutive interest rate changes for individual deposit products.

In panel A, shorter runs of consecutive interest rate changes are more frequently observed and consecutive interest rate changes are recorded. The frequency distribution of consecutive interest rate change varies between different types of banks, with converted building societies particularly displaying a larger number of consecutive interest rate changes. In Panel B, a generally lower level of consecutive interest rate changes are observed for the within banks case relative to the between banks case. Little difference in the number of consecutive interest rates changes is observed for different types of bank.

Table 4: Tests of Cyclicality Between and Within Banks

Tests of Cyclicality Between Banks					
All Firms			Retail Banks		
T+1 / T	No change	Change	T+1 / T	No change	Change
No change	9861 (45.5)	11685 (53.9)	No change	1401 (47.1)	1575 (52.9)
Change	18761 (86.6)	2785 (12.9)	Change	2576 (86.4)	406 (13.6)
Other banks			Building Societies		
T+1 / T	No change	Change	T+1 / T	No change	Change
No change	1774 (50.1)	1766 (49.9)	No change	5199 (45.4)	6255 (54.6)
Change	3099 (87.5)	441 (12.5)	Change	1349 (88.2)	10105 (11.8)
Converted Building Societies			Other Proprietary Institutions		
T+1 / T	No change	Change	T+1 / T	No change	Change
No change	5199 (33.5)	6255 (66.5)	No change	838 (51.3)	797 (48.7)
Change	10105 (80.0)	1349 (20.0)	Change	1434 (87.7)	201 (12.3)
Tests of Cyclicality Within Banks					
All Firms			Retail Banks		
T+1 / T	No change	Change	T+1 / T	No change	Change
No change	42258 (54.6)	35121 (45.4)	No change	5422 (53.7)	4671 (46.3)
Change	71594 (92.5)	5785 (7.5)	Change	9194 (91.1)	899 (8.9)
Other banks			Building Societies		
T+1 / T	No change	Change	T+1 / T	No change	Change
No change	4712 (56.1)	3694 (43.9)	No change	25164 (54.9)	20660 (45.1)
Change	7692 (91.5)	714 (8.5)	Change	42824 (93.5)	3000 (6.5)
Converted Building Societies			Other Proprietary Institutions		
T+1 / T	No change	Change	T+1 / T	No change	Change
No change	5360 (52.1)	4923 (47.9)	No change	1600 (57.7)	1173 (42.3)

Change	9354 (91.0)	929 (9.0)	Change	2530 (91.2)	243 (8.8)

The values indicate when a change or no change occurs in month T and when a change or no change occurs in month T+1.

Table 4 presents contingency tables pertaining to interest rate change cyclicality, both between banks and within banks. In these tables the percentages are recorded for observations in month T and month T+1. For the between banks case, the probability of an interest rate change (or no change) in one month T conditional on no change in interest rates (or a change) in month T+1 is higher than the probability of an interest rate change occurring in both months. This finding is consistent with a relatively low level of consecutive interest rate changes and would indicate that interest rate change cyclicality and, by implication, staggering is present. Additionally, the magnitude of the percentages varies noticeably between types of institution considered. Further, for the within banks case interest rate change cyclicality cannot be rejected.

6. Conclusions

In this study, the form of interest rate change between and within banks supplying the UK deposit market has been examined. Evidence is presented that deposit interest rate change is staggered with a periodic frequency between banks. Distinctly, individual banks tend to change the interest rates of their own deposit accounts simultaneously. Both these findings are consistent with previous empirical evidence on price change (Lach and Tsiddon 1996, Fisher and Konieczny 2000). That said, within bank interest rate change also displays features of cyclicality. Thus, while within banks interest rate changes are relatively synchronised, these simultaneous interest rate changes occur only intermittently, as opposed to consecutively.

It is also reported that statistically significant differences exist in the way different types of banks change their deposit interest rates. Retail high street banks and particularly converted building societies – groups including the largest depository institutions in the sample – appear to synchronise interest rate changes more often. This finding indicates that retail banks and converted building societies are more reactive to movements in the underlying costs of deposits – a finding consistent with German evidence reported by Küppers (2001).

Overall, it can be concluded that due to the staggering of interest rate changes monetary shocks may be propagated over longer periods of time than may have been previously acknowledged. Such a finding would suggest the transmission of change from the base rate to the interest rates of retail deposit products used by the general public may be far slower than has been previously assumed. Such a finding has wider policy implications, as the existence of rigid deposit rates and relatively more responsive loan rates would enable relative interest rates spreads to develop in response to interest rate targeting by monetary authorities (see Biefang-Frisancho and Howells 2002 for further discussion). Further, the distinct forms of bank operating in the UK differ significantly in terms of their interest rate setting behaviours, with smaller banks displaying greater deposit interest rate rigidity.

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Appendix 1: Banks used in the analysis of the UK deposit market

AA	City and Metropolitan BS	Hanley Economic BS	Mansfield BS	Scottish BS
Abbey National	City of Derry/Londonderry Provident BS	Harpenden BS	Market Harborough BS	Scottish Widows Bank
AIB Bank (UK & NI)	Clay Cross BS	Heart of England BS	Marsden BS	Secure Trust Bank
Alliance and Leicester	CLF Municipal Mutual Bank	Heritable Bank	MBNA	Shepsted BS
Allied Trust Bank	Close Brothers	HFC Bank	Melton Mowbray BS	Singer and Friedlander
Bank of Cyprus	Clydesdale Bank	Hinckley and Rugby BS	Monmouthshire BS	Skipton BS
Bank of Ireland (GB & NI)	Co-operative Bank	Hoare and Co	N and P BS	SMILE
Bank of Scotland	Confederation Bank	Holmesdale BS	National Counties BS	Southdown/ Sussex County BS
Bank of Wales	Coutts and Co.	HSBC/Midland	National Savings/Giro Bank	Stafford Railway BS
Barclays	Coventry BS	ING Direct	Nationwide BS	Staffordshire BS
Barnsley BS	Cumberland BS	Intelligent Finance	Natwest	Standard Life Bank
Bath BS	Darlington BS	Investec Bank	Newbury BS	Stroud and Swindon BS
Beneficial Bank	Derbyshire BS	Ipswich BS	Newcastle BS	Sun Banking Corporation
Beverley BS	Direct Line	Irish Permanent	North of England BS	Teachers'
Birmingham Midshires	Dudley BS	Julian Hodge Bank	Northern Bank	Tesco
Bradford and Bingley	Dunfermline BS	Kent Reliance BS	Northern Rock	Tipton and Coseley BS
Bristol and West	Earl Shilton BS	Laiki Bank	Norwich and Peterborough BS	Town and Country BS
Britannia BS	Ecology BS	Lambeth BS	Norwich Union	Tridos Bank
Buckinghamshire BS	EGG	Lancastrian BS	Nottingham BS	TSB (UK & NI)
Butterfield Private Bank	Exeter Bank	Leamington Spa BS	Nottingham Imperial BS	Tyndall Bank
Cahoot	First Active	Leeds and Holbeck BS	Portman BS	Ulster Bank
Cambridge BS	First Direct	Leeds Permanent BS	Portsmouth BS	Universal BS
Capital One Bank	First National	Leek United BS	Principality BS	Vernon BS
Cater Allen Private Bank	First Trust Bank	Legal and General Bank	Progressive BS	Virgin Direct
Chelsea BS	Fleming Premier Bank	Leopold Joseph & Sons Ltd	Prudential	Wesleyan Savings Bank
Cheltenham and Gloucester	Friends Provident	Liverpool Victoria	Royal Bank of Scotland	West Bromwich BS
Chesham BS	Frizzells	Lloyds/TSB	Safeway	Woolwich
Cheshire BS	Furness BS	Lombard Direct	Saffron Walden Herts and Essex BS	Yorkshire Bank
Cheshunt BS	Gartmore	Lombard North Central	Saga	
Chorley and District BS	Greenwich BS	Loughborough BS	Sainsburys	
Citibank	Halifax	Manchester BS	Scarborough BS	

BS = Building Society