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**The Role of Implicit Costs and
Product Quality in
Determining the Customer
Costs of Using Personal
Current Accounts**

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Abstract

This study examines the influence of offering an overdraft facility on the customer costs of using a personal current account (also termed checking accounts). This assessment informs the wider debate as to whether overdraft use is a significant factor in paying for current account use within ‘free banking’ systems. A UK data set of 222 current accounts, recorded monthly between 1995 and 2011 is used in combination with interest rates from 1,200 instant access deposit accounts offered contemporaneously by the same firms. We use a panel framework to undertake the econometric analysis encapsulating contemporaneous correlation amongst UK current accounts. Our results do not support predictions that cross-subsidies flow from overdraft users to other current account customers. Both the quality of current accounts and the implicit costs of current account use arising from low current account deposit interest rates are significant features of pricing within this market and influential in the determination of customer costs. It is proposed future policy work needs to acknowledge the significant role of product quality and depositor inattention in the customer costs of current account use, as much as concerns with overdraft use.

1. Introduction

Does offering an overdraft affect the pricing of other personal current account (also termed checking accounts) services? This study examines this question by determining whether offering an overdraft in a personal current account affects the pricing of payment and deposit current account services within a ‘free banking’ system. This question is important as there have been repeated accusations that overdraft users subsidise other personal current account customers in such markets. For example Armstrong and Vickers (2012) report “*financially constrained customers pay contingent fees which help fund the free service offered to those in credit - (this) might appear to some as a kind of ‘reverse Robin Hood exercise’*” (p.479). Criticism has also been made by legislators. In the UK, the House of Commons Treasury Committee (2011) reported “... *so-called free banking has important distributional consequences. A minority of consumers, often those on lower incomes, pay explicit charges associated with overdrafts. This results in high prices and poor outcomes for a sub-set of consumers. Meanwhile, other consumers, often on higher-incomes do not pay explicitly for their current account provision.*” (para.80). Similarly the Australian Senate report on competition in retail banking (2011) reported contingent bank fees from overdraft use may fall disproportionately on the poor and “*poorer customer who do pay fees subsidise their wealthier counterparts on a per transaction basis*” (paragraph 4.69).

An assumption underlying these emotive debates is that personal current accounts in ‘free banking’ systems are financed by customers using overdraft services disproportionately. This view has arisen as both overdraft lending had reached high levels in many nations and such credit is inadvertently incurred by the inattentive and vulnerable (Financial Conduct Authority 2014). If the assumption that overdraft lending is cross-subsiding other current account services is reliable we would expect the customer costs of using payment and deposit services (hereafter termed base services) within current accounts which offer an overdraft facility to be lower relative to using base services within current accounts which do not offer an overdraft facility. In this study we test this assumption using UK pricing and product information on 222 personal current accounts offered between 1995 and 2011 and 1,200 deposit accounts offered contemporaneously by the same firms. From a descriptive assessment and a regression model, we report that offering an overdraft facility is significantly associated with the customer costs of using base services in current accounts.

The direction of this relationship is not, as a widely predicted, negative from overdraft services to other current account users; the presence of an overdraft facility has a positive influence on the costs of customers using current account base services. This assessment incorporating the implicit costs of current account and aspects of product quality indicates inattentive customers which opt to accumulate large current account deposits, as well as overdraft users, are an important element when considering whom pays for ‘free banking’ current accounts. The difference between this empirical finding and policy and theoretical contributions indicates this topic requires further empirical analysis and policy makers should not assume a redistributive cross-subsidy operates in this significant retail banking market.

Examining this question is timely as while a diversity of approaches are used to price personal current accounts internationally, the ‘free banking’ pricing model is observed to be dominant in the UK, it is used increasingly in Ireland, Australia and the USA. In this payment model, payment for current account base services is undertaken indirectly and arises from customers using overdrafts, customers depositing funds in current accounts and receiving relatively low levels of interest and through the payment of merchants or interchange fees by retailers (see Schmiedel et al. 2012). Regulators and legislators in Australia (Australian Senate 2011), the European Union (Commission of the European Communities 2009; European Commission Directorate-General for Competition 2006), Ireland (Central Bank of Ireland 2012), the United Kingdom (Competition Commission 2008; House of Commons Treasury Committee 2011; Office of Fair Trading 2008, 2010a, 2010b, 2011, 2013 [hereafter OFT]) and the USA (Federal Deposit Insurance Corporation 2008) have all reported concerns with the provision and the pricing of personal current accounts and associated overdraft services within a ‘free banking’ context. While, this international policy discussion has been accompanied by notable theoretical (Armstrong and Vickers 2012), legal (Whittaker 2011) and US empirical contributions (e.g. Fusaro 2008; Fusaro and Ericson 2010; Stango and Zinmann 2009a,b), there is a paucity of empirical evidence examining how current accounts services are priced in nations where free banking is the dominant pricing model.

The study is divided into five sections. After this introduction, the academic and regulatory literature considering the pricing of personal current accounts and overdrafts are examined. In section 3, the data and empirical design are introduced and in section 4 the results are discussed. The conclusions and implications of the study are provided in section 5.

2. Literature review

In light of the preceding discussion, any literature review of personal current account and overdraft pricing could consider a diversity of concerns and for compactness we only examine two pertinent areas. Initially we examine the developing theoretical literatures pertaining to contingent charges and how these have been applied in personal current account markets. Secondly, the empirical work undertaken on the provision of, demands for and the pricing of personal current account services are reviewed.

2.1 Theoretical literature on contingent charges and current account pricing

Contingent costs, such as overdrafts charges, are frequently applied to goods and services purchased in addition to and after, a primary or base good or service. While contingent charges provide pricing efficiencies for firms allocating costs to those customers using additional services, they also present challenges; particularly when firms can exercise market power over an aftermarket.

Shapiro (1995) reports four circumstances when market power within aftermarkets develops. Initially, customers may be surprised by firms unexpectedly raising prices in aftermarkets; an outcome leading customers to switch provider when possible. Secondly, if customers are poorly informed and fail to account for the costs of using aftermarkets due to optimism or the costs of comprehending charges, firms can maximise profits from an aftermarket. Firms may then intensify competition within the primary market to obtain additional aftermarket customers (Bennett 2011). Third, when firms have limited ability to make credible or binding price and quality commitments at the time of the primary product/service purchase, there will be incentives for firms to maximise profits in aftermarkets. Lastly, if the firm is able to exclude rivals from aftermarkets, the ability to price discriminate is enhanced. Customers using such an aftermarket are then tied to a single supplier and vulnerable to profit maximising firms.

More recently concerns have developed that firms exaggerate customers' decision making biases through contingent charging. This is undertaken by making information on contingent charges hard to find, difficult to assess and using a challenging pricing format. This softens

competition in aftermarkets making product comparison more challenging, relaxing the degree of product substitution and raising switching costs.

These assumptions and outcomes are central to an expanding theoretical literature assessing the market interaction between profit maximising firms and ‘boundedly rational’ consumers. This work considers the firms’ strategic use of confusing pricing schemes to enhance consumers’ decision errors. For example Gabaix and Laibson (2006) indicated circumstances where exploitation of customers’ weakness in comprehension and decision making by firms may persist under competitive conditions in the joint pricing of base and add-on goods. Subsequently persistent forms of cross subsidy may flow from profits achieved on add-on goods purchased by less informed customers, to subsidise base goods, purchased by all customers. As financial services markets are characterised by limited consumer comprehension and financial literacy (Agarwal *et al* 2008, FSA 2006) and personal current accounts markets are associated with high switching costs and employ a diversity of pricing formats these concerns appear pertinent.

Despite the appositeness of personal current accounts to the preceding discussion theoretical links between this specific market and theory have been piecemeal, with the notable exception of Armstrong and Vickers (2012). These authors examined the pricing of overdrafts viewing these services as a tied aftermarket complimentary yet distinct from primary personal current account services. It is assumed diligent customers can take inefficient actions to avoid high charges, small print or confusing pricing formats aimed at naïve customers. Naïve customers are predicted to choose the lowest costs of primary personal current account services (deposit and payment services) whilst diligent customers’ chose the lowest overall costs (deposit, payment services and overdrafts) leading to two potential outcomes. If the aftermarket prices are high and there is a large proportion of naïve customers then the contingent charge should subsidise the primary service. Firms will then compete relatively more for the primary market and the aftermarket profits will be passed back to the customer in the form of subsidised and lower cost primary services. This outcome raises concerns as to inefficient patterns of pricing being created, redistributing costs from customers’ using overdrafts to those customers not employing these services. Alternatively, if there are enough diligent customers or low enough contingent charges then efficient contract terms will develop.

2.2 Empirical literature on pricing current accounts

To date there is a scarcity of non-US academic work examining current account and overdraft pricing. In the UK past examinations of pricing in the current account market have generally addressed concerns other than the costs of current account use. These studies have used current account pricing to contribute to topics including the transmission of monetary policy (e.g. Heffernan 2002), the switching of current accounts (e.g. Gondat-Larralde and Nier 2006; Morgans 2010) and financial exclusion (e.g. Devlin 2005). A limited number of studies have also examined current account pricing in Canada (Seldon and Solmer 1996), the Netherlands (Cunha et al. 2011) and Scandinavia considering topics including the pricing of transactional and deposit services (Klee 2008; Merrigan and Nomandin 1996; Tin 2008) and the costs of payment services used within current accounts (Guibourg and Segendorff 2007; Humphrey et al. 2003)¹.

In the USA the academic literature is more extensive, examining pricing under systems where payments are made for payment service use such as the number of cheques written (e.g. Ederington and Skogstad 1977; Mingo 1980; Osborne and Wendel 1981) assessing credit service demands (Bar-Ilan 1990; Boyd 1976), customer switching (Kiser 2002) and convert pricing (McGovern and Moon 2007). More recently overdraft pricing and use has been examined using transaction data from individual customers' current accounts. Stango and Zinman (2011a,b) and Fusaro (2008) employed a large proprietary data sets of US customer current account records for a limited time period and smaller data set over a ten year period, respectively. Both studies support the conjecture that overdraft use is primarily accidental. Stango and Zinman (2011) further report that while only 31% of current accounts have had at least 1 overdraft fee, a further 72% of the current accounts had been very close to overdrafting behaviours and displayed financial fragility. Similarly, Fusaro (2008) reports that on average 1 in 5 customers incur an overdraft each year and over a 10 year period 46.2% of customers incur overdrafts.

¹ While discussion of the wider functions of the payments system is beyond the scope of this study, reviews are provided for the UK and Nordic nations by Milne (2006) and for the USA by Gerdes (2008).

3. Data and Methodology

To address the research question, that whether a current account offers an overdraft facility or not influences the customers' costs of using base current account services, we undertake a descriptive assessment and employ a regression model. The descriptive assessment examines the relationships between the cost of current account use, services received and the availability of overdraft provision. The regression model is used to examine statistical significance of the presence or otherwise of an overdraft service on the costs of personal current account 'base' services in the presence of other variables used to denote differential quality of current accounts and payments services provided.

3.1 Assumptions and Concepts

In order to undertake the assessment three assumptions require explanation. Initially the costs of using deposit and payment services within personal current accounts are defined as base costs. For reasons outlined in the data section (3.2), overdraft costs are not directly quantified and the presence or otherwise of an overdraft service are used to reflect the cost or benefit of providing this service.

Second, to accommodate the opacity of charging on free banking current accounts, we measure of the implicit cost of current account use. Implicit costs are those costs of using current accounts which are not clearly linked to a form of action and include relatively low yields received on current account deposits relative the yield received on funds deposited or invested in different financial services. Implicit costs are commonly recognised to be major cost to current account users (e.g. Central Bank of Ireland 2011; Independent Commission on Banking 2012; Stango and Zinman 2009a) these costs have either been overlooked or quantified relative to the market rate of funds in past assessments. In this study we adopt a distinct approach by calculating the actual costs and benefits of using current account base services (including the interest provided on current account deposits and the costs of any packaged fees) relative to the average interest receivable by depositing the credit balance in an average instant access deposit account offered by the same firm offering the current account. This enables comparison of the costs of a customer opting to accumulate deposits within their current account or choosing to deposit or sweep funds into an average instant access deposit account offered by the same bank.

A third assumption underlying the analysis is that the costs of using base services are determined by the how the current account is used by a customer. Optimally customer use is defined using current account transactions data which enables a robust definition of how individual customers use current account services (see Stango and Zinmann 2009a,b). As current account transaction data is not publically available in the UK we consider three representative customers; an approach previously used by regulators (e.g. Central Bank of Ireland 2011; Competition Commission 2008; Independent Commission on Banking 2011; OFT 2008). In total the three representative customer definitions which use both the base and overdraft service are outlined.

Table 1: Representative customers and use of current accounts

Label	Group	Description	Credit balance	Credit days	AOD Balance	AOD Days	UOD Balance	UOD Days
A	Typical customer with unauthorised overdraft	A typical average credit balance and an unauthorised overdraft	£830	345	0	0	£40	20
B	High credit customer with overdraft use	A high credit customer for all except 3 weeks a year when an authorised overdraft is used	£2,000	344	£500	21	0	0
C	Marginal customer with overdraft use	In credit for all except 3 weeks a year when an authorised overdraft is used	£400	344	£800	21	0	0

Notes AOD = authorised overdraft; UOD = unauthorised overdraft

To reduce subjectivity in defining customer use of current accounts we adopt one OFT (2008) classification of unauthorised overdraft use derived from an assessment of current account transaction data. We also follow the Competition Commission (2008) by interviewing senior bankers with a remit for current account provision to develop further representative customers. Interviews were undertaken with four senior representatives from a very large and a small provider of UK personal current account services and led to two more representative customer definitions which incorporate overdraft use. These definitions are outlined in Table 1.

3.2 Data

The empirical analysis employs data from Moneyfacts PLC for the retail personal current account market and the instant access deposit market. This data is comprehensive and includes current accounts with and without usage or packaged fees, basic bank accounts and accounts offering payment and deposit services both with and without an overdraft facility. These accounts are provided to market primarily by high street banks, yet also by building societies, small banks, foreign banks and other firms including insurers and retailers. For current account deposit services we record four different tiers or levels of interest payable for a range of sums deposited including:

- i) Equal to and greater than £1 deposited and less than £500,
- ii) Greater than or equal to £500 deposited and less than £1,000,
- iii) Greater than or equal to £1,000 and less than £2,500, and,
- iv) Greater than or equal to £2,500 and less than £5,000.

While some current accounts offer higher rates of interest for sums greater than £5,000 deposited, these are not available. The frequency of interest rate payment is also recorded and is used to ensure the calculations undertaken match the frequency used within the current accounts (i.e. monthly, quarterly and annually). Where a current account requires an access fee (termed packaged fees) their scale and frequency of payment are recorded. Data is also recorded as to how current accounts are distributed and what specific payment services are included in this product. These product characteristics are not comprehensive due to the availability of data, yet can assist in indicating the differential quality of current accounts offered to market. We acknowledge that other forms of distribution, payment services and a host of add-on services such as travel insurance are not included in this assessment.

While considerable data on overdraft interest rates, buffers, arrangement and usage fees has been obtained for authorised and unauthorised overdrafts, we have been unable to collect to full set of data relating to additional special fees for customers using unauthorised overdrafts, such as letter costs, rejected direct debit and cheque costs. As the omission of all unauthorised overdraft charges will understate the level of unauthorised overdraft use costs and we do not wish to interpolate data, these values are not included in this assessment.

Table 2. The expected relationships between current account base rates and factors.

Bank or Product Factor	Influence on Personal Current Account Base Costs
Current account offered with an overdraft	The direction of the relationship depends on whether offering an overdraft positively or negatively influences the customer' costs of using current accounts.
Average Wholesale cost of funds	The average base or policy rate issued by the Bank of England for the month considered. If the market is linked to the cost of funds then a significant positive influence is expected.
Account sweeping	If customers has a facility to automatically sweep excess current account funds to another financial account (such as a deposit or mortgage account), the size of current deposits will be curtailed. This will therefore be costly for the bank and have an expected positive influence on the base costs.
Cheque book	The ability to use cheques is additional convenience for customers, yet costly to provide. Therefore a positive relationship is expected.
Unlimited Direct Debit	This indicates if when there are no restrictions on the use of the direct debit system through the UK BACS payment system. This is expected to exert a positive influence on base costs.
Distribution of PCA Branches, Internet and Telephone	The use of one or a combination of these forms of distribution are expected to have differing influences on base costs depending on their costs to provide. Branches are widely viewed to be the highest cost and internet provision the lowest cost forms of distribution.
Minimum Credit Balance.	If the current account requires that the customer pay income into this account – i.e. use this as their main account is specified in many accounts. This requirement is expected to have a negative influence on base costs as, it will be associated with a higher use of the deposit function, yet also may add to the costs of payment services.

Using the approach specified above, ‘representative customers are used to calculate base costs of current account use. The Moneyfacts data set is provided monthly over a 17 year period, for 345 current accounts offered by 71 firms, which are owed by 61 parent companies. This data is truncated to only include those current account services which have been offered for two years or more removing current accounts offered briefly for marketing purposes such as obfuscation (Carlin and Manso 2010) or bait and switch activities (Lazear 1995) and when insufficient data on current accounts or instant access deposits exists. This provides a contiguous data set of 222 products offered by 42 firm and 34 parent firms; in total 16,667 observations. The data on instant access deposits contains 56,909 monthly observations of 1,200 instant access deposit accounts. This data is used to estimate implicit cost of using base services of the selected current account accounts. Descriptive statistics of prices, fees and interest rates used to calculate base costs of current account use and used in the construction of the implicit cost of current account use are presented in Table 3.

The analysis is undertaken at the product rather than the firm level. This decision is informed by the relatively frequent merger and acquisition of current account providers over the sample period (see DeYoung et al. 2010). This has resulted in many current account products changing ownership yet continuing to operate with the same brand name and product features. The parent firms (ultimate owners) marketing these current accounts are listed in Appendix 1.

Table 3 outlines both descriptive statistics of the variables employed and indicates why the approach to quantify implicit prices is followed. In the upper panel of the table we report the mean and dispersion of current account pricing, product features, forms of distribution and the average interest rates of the instant access deposit accounts offered the same firms providing current accounts. In total, 160 current accounts or 71% of the current account observations have an overdraft facility and 62 current accounts do not have an overdraft facility. Three of the current account products altered the availability of overdraft facilities throughout the sample period. The average duration of a current account in the sample is 75 months with a standard deviation of 44 months. We may observe the level of interest provided for current accounts is far lower than the average rates provided on the associated instant access deposits. Packaged fees are levied on 76 current accounts (67% of observations). The average fee overall is £5 and £18.31 per month for current accounts requiring fees. The availability of payments services vary across the sample. Overall 24% of observations have account sweeping, 78% have a cheque book and 98% have unlimited direct debits. Forms of distribution also vary with 89% of current account observations available through branches, 83% over the telephone and 67% via the internet.

The lower panel reports the different average benefits or costs of holding deposits for the three representative customers. These costs or benefits can be recorded relative to three sets of interest rate: a) the interest rate of the current account deposit service, b) the average interest rate of an instant access deposit account and c) the prevailing base or policy rate. The yield from depositing three levels of funds (£830, £2000 and £400 for customers A, B and C) are calculated annually. These yields vary from very low returns on current account deposits to higher returns from average instant access deposits, and the highest returns from assumed depositing at the base rate returns. The implicit customer costs of using a current account deposit relative to sweeping these funds into an instant access deposit account or depositing these funds at the base rate are then recorded. It is observed that these costs are far higher when we consider the use of base rates. As this measure of implicit cost may overestimate the

implicit costs of customer use of current accounts and access to deposits offering the base rate is unusual, the level of implicit cost employed is the average instant access deposit rate for each individual parent firm offering current accounts.

Table 3: Descriptive Statistics for Personal Current Accounts (PCA).

		Mean	Std. Dev.	Min.	Max.
Sample features	PCA Offered with Overdraft Services (%)	71.0	45.4	0	1
	PCA Product Tenure (months)	101.23	50.90	24.00	204.00
Personal current account (PCA) pricing	Interest rate £1 deposited (%)	0.66	1.31	0.00	9.57
	Interest rate £500 deposited (%)	0.68	1.33	0.00	9.57
	Interest rate £1000 deposited (%)	0.77	1.39	0.00	9.57
	Interest rate frequency (p.a.)	6.82	5.07	1.00	12.00
	Fee (£)	5.01	17.17	0.00	195.00
	Fee frequency (p.a.)	2.98	5.14	0.00	12.00
Product features	Account sweeping (%)	24.5	43.0	0.00	1.00
	Cheque book (%)	78.4	41.2	0.00	1.00
	Unlimited direct debits (%)	95.0	22.8	0.00	1.00
	Minimum credit balance (£)	101.17	547.92	0.00	5000.0
Distribution (%)	Branch	89.0	31.3	0.00	1.00
	Telephone	83.4	37.2	0.00	1.00
	Internet	67.1	47.0	0.00	1.00
Instant Access Deposit Interest Rates (%)	£500 deposited	2.22	1.23	0.03	5.75
	£1000 deposited	2.30	1.26	0.03	5.75
	£2500 deposited	2.47	1.27	0.03	5.75

Customer	Annual Yields	Mean	Std. Dev.	Annual measures of implicit cost (without fees)	Mean	Std. Dev.
A	PCA deposit rate (£)	5.44	10.65	PCA deposit cost relative to instant access deposit (£)	12.24	12.94
B		14.80	26.81		29.1	31.5
C		2.50	5.06		5.12	6.06
A	Instant access deposit rate (£)	17.68	9.88	PCA deposit cost relative to base rate (£)	27.8	19.18
B		43.90	24.20			
C		7.62	4.90			
A	Base rate (£)	33.24	17.05		65.05	46.26
B		79.86	40.96			
C		15.97	8.19			

3.3 Methods

The descriptive assessment examines the link between whether the current account offers an overdraft facility or otherwise and i) the costs of using base services for the three representative customers and ii) the ‘quality’ of current account services.

The first part of this assessment is undertaken overall and for three time periods (1995-99, 2000-04 and 2005-11). We then use quartiles to examine current accounts which do and do not offer an overdraft facility. If overdrafts are influential in cross-subsidising base current account services, it is expected more current account observations with an overdraft facility will be recorded in the lowest cost quartile. Similarly, a higher percentage of observations for current accounts without an overdraft facility would be expected in the highest cost quartile. This assessment is reported in Table 4

High costs of using base current account services may also reflect differences in the quality of current accounts. Therefore we examine if there are links between the variables denoting 'quality' of current accounts and the base cost of using the current account. This is undertaken overall and using quartiles. In the quartile analysis we discriminate between higher and lower quality by counting the number of forms of distribution and total number of current account payment services offered on each current account observation. When a current account is available through all forms of distribution assessed and offers all the possible payment services it is denoted as having the highest quality. Where a current account is offered through a limited number of distribution channels and provides few payment services, such a current account is judged to be of a lower quality. This examination of whether offering an overdraft facility or otherwise is associated with current account quality is reported in Table 5.

The regression 'test' follows the descriptive assessment and is used to determine if the availability of an overdraft facility on the account has an influence on the costs of using current account base services. If overdrafts are used to cross-subsidise base services then a dummy variable indicating whether the current account observation has or does not have an overdraft facility would be expected to be significant. If the presence of an overdraft facility provides a cross-subsidy to the cost of using base services, then there is a reduction in usage costs and the expected coefficient sign will be negative. If the presence of an overdraft facility is costly for a bank and cross-subsidy flows from base services to overdrafts then the expected direction of the coefficient would be positive.

The costs of using current account base services for the three representative customers are also assumed to be determined by a range of other factors including the wholesale cost of funds, the services offered within the current account, product restrictions and how the current account is distributed. The panel data model to be estimated is written as:

$$Y_{it} = \alpha_i + X_{it}\beta + f_t + u_{it} \quad (1)$$

where i ($i = 1, 2, \dots, n$) denotes current account products, t ($t = 1, 2, \dots, T$) denotes months, Y_{it} is the it^{th} observation of the dependant variable (current account base costs) and X_{it} is the it^{th} observation of the explanatory variables outlined in Table 2. β represents the coefficient of the explanatory variables, f_t represents the time effects in the model and the error term u_{it} may be written as $u_{it} = \mu_i + v_{it}$ where μ_i represents the time invariant individual specific effects and v_{it} denotes the remaining error.

To determine the appropriate estimator for the regression we undertake a number of steps. First, as financial institutions and their subsequent product decisions are exposed to similar kinds of systematic shocks, we test whether cross-company residuals are contemporaneously correlated. By computing the Breusch and Pagan (1980) Lagrange Multiplier (LM) statistic, λ_{LM} we test for contemporaneous error correlations using:

$$\lambda_{LM} = T \sum_{i=2}^n \sum_{j=1}^{i-1} r_{ij}^2, \quad (2)$$

where r_{ij}^2 is the squared ij^{th} correlation coefficient of cross-company residuals. Under the null of no contemporaneous error correlations across the companies, the test statistic is asymptotically χ^2 distributed with $N(N-1)/2$ degrees of freedom, where N denotes the number of companies in the panel. The p-value of the LM test statistic is zero, which rejects the null hypothesis, suggesting that the error series are contemporaneously correlated across all the products for each of the representative customers.

Secondly, the fixed effects panel estimator is not applicable to our econometric analysis because it does not encapsulate the contemporaneous correlation across the products in our sample. Also, panel estimators that capture endogeneity and joint determination of variables such as the Generalized Method of Moments estimator derived by Blundell and Bond (1998) are not relevant to our dataset. This is because a vast majority of our explanatory variables are dummies, which are by definition exogenous explanatory variables. We therefore adopt the Seemingly Unrelated Regression (SUR) econometric methodology in our empirical analysis.

4. Results.

4.1 The descriptive assessment

The descriptive assessment is reported in two tables. Table 4 considers the influence of offering an overdraft on costs of using base current account services (upper panel) and differences in usage costs in quartiles (lower panel). The differences between the ‘quality’ of current account services and whether a current account provides an overdraft facility are provided in Table 5. In the upper panel of the table, the differences between these costs of using base services are indicated for accounts with and without overdraft facilities. In the lower panel the distribution of higher and lower ‘quality’ current accounts are recorded relative to whether the current account offers an overdraft facility or otherwise.

In Table 4 we observe in all cases when a current account is offered with an overdraft, the costs of using base current account services are higher. These differences are significant using T Tests. There is also a higher dispersion of customer costs when current accounts have an overdraft rather than when not. The assessment of the costs of using base services using quartiles supports this general finding. For the majority (75%) of cells, there are relatively more observations from accounts with no overdrafts rather than otherwise in the lowest cost quartile. For highest cost quartile there are relatively more observations for current accounts offering an overdraft facility in all cases. We also test if these distributions of observations are random or independent using a χ^2 test; in all cases independence is rejected.

In Table 5 we examine the differences between the ‘quality’ of current accounts with whether an account offers an overdraft facility or otherwise. It is reported in all cases that more current account payment services are more frequently observed when an account offers an overdraft than otherwise. Current accounts providing an overdraft facility may also be accessed through a greater number of distribution channels be these branch, telephone or over the internet, relative to current accounts not offering overdrafts. In all cases the differences between the occurrence of these product features and the whether the account is offered with and without a current account are significant. The quartile assessment of distribution of higher and lower ‘quality’ current accounts bears out this observation and we see the highest quality quartile is overwhelmingly populated by current account observations offering overdraft facilities. The hypothesis that this distribution is independent is rejected in all cases using a χ^2 test.

Table 4: The influence of offering an overdraft facility on the base costs of using current accounts.

Annual usage costs of base current account services							
		Customer	Mean	Std. Dev.	Min.	Max.	
All current accounts		A	£46.406	£69.246	-£54.58	£720.39	
		B	£63.265	£72.158	-£125.52	£720.94	
		C	£39.286	£69.597	-£25.63	£720.19	
Current accounts offering overdrafts		A	£57.577	£71.938	-£41.77	£343.71	
		B	£74.103	£75.010	-£100.35	£405.01	
		C	£50.871	£72.235	-£19.92	£321.00	
Current accounts not offering overdrafts		A	£22.64	£58.15	-£54.58	£720.39	
		B	£40.59	£62.71	-£125.52	£720.94	
		C	£14.84	£57.99	-£25.63	£720.19	
Differences between accounts offering and not offering overdrafts			Customer A	Customer B	Customer C		
T Tests			25.87** (0.00)	22.88** (0.00)	26.35** (0.00)		
		Customer A		Customer B		Customer C	
Quartiles of base costs		With Overdraft Facility	No Overdraft	With Overdraft Facility	No Overdraft	With Overdraft Facility	No Overdraft
Highest	4	27.06	18.58	28.86	12.77	27.02	18.71
Overall	3	26.09	21.49	26.16	21.24	24.87	25.41
	2	25.77	22.50	26.44	20.35	23.62	29.46
Lowest	1	21.08	37.42	18.54	45.64	24.48	26.42
	χ^2	89.70**	(0.00)	255.15**	(0.00)	25.87**	(0.00)
Highest	4	13.03	0.32	29.94	11.23	34.09	6.88
1995-99	3	33.22	43.35	14.24	35.13	13.60	42.25
	2	22.45	37.34	26.44	33.54	20.26	35.92
Lowest	1	31.30	18.99	29.38	20.09	32.05	14.95
	χ^2	296.33**	(0.00)	346.53**	(0.00)	735.39**	(0.00)
Highest	4	34.52	2.50	34.12	3.41	34.34	34.34
2000-04	3	22.82	30.18	22.96	29.82	22.91	22.91
	2	12.20	16.24	20.15	36.52	20.18	20.18
Lowest	1	30.46	51.08	22.77	30.25	22.57	22.57
	χ^2	1005.9**	(0.00)	945.02	(0.00)	981.36	(0.00)
Highest	4	33.52	4.19	32.71	6.18	33.57	4.09
2005-11	3	21.00	34.77	21.81	32.81	19.72	37.91
	2	22.47	31.16	23.47	28.74	22.63	30.81
Lowest	1	23.00	29.88	22.01	32.27	24.09	27.19
	χ^2	1610.7**	(0.00)	1316.47	(0.00)	1753.33	(0.00)

Table 5: Relationship between offering an overdraft facility and current account ‘quality’.

		All accounts		Accounts offering overdrafts		Accounts offering no overdrafts		T Tests Difference between with and without O/D	
		Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.		
Average Wholesale cost of funds (%)		4.13	2.11	4.14	2.09	4.01	2.10	n/a	
Account sweeping (%)		24.5	0.430	29.9	45.8	15.6	36.2	14.004**	(0.00)
Cheque book (%)		78.3	0.412	88.4	32.1	50.5	50.0	45.538**	(0.00)
Unlimited Direct Debit (%)		95.0	0.218	98.4	12.4	86.7	34.0	10.324**	(0.00)
Distribution of PCA through Branches (%)		89.0	0.313	90.7	29.1	84.6	36.2	4.289**	(0.00)
Distribution of PCA through Internet (%)		67.1	0.470	71.9	45.0	66.4	47.2	24.293**	(0.00)
Distribution of PCA through Telephone (%)		83.4	0.372	92.7	26.1	60.9	48.8	24.864**	(0.00)
Minimum Credit Balance (£)		£101.17	£547.92	£7,568	£56,754	£244.20	£793.31	-18.244**	(0.00)

Quartiles of current account quality		Overall		1995-99		2000-04		2005-11	
		With Overdraft Facility	No Overdraft	With Overdraft Facility	No Overdraft	With Overdraft Facility	No Overdraft	With Overdraft Facility	No Overdraft
Highest	4	22.63	6.51	0	0	24.62	3.48	31.11	10.29
	3	32.69	20.27	0	0	42.76	16.93	41.13	28.49
	2	34.24	31.28	66.99	4.80	24.06	35.94	25.83	36.75
Lowest	1	10.44	41.94	33.01	95.20	8.56	43.64	1.93	24.46
	χ^2	2428.80**	(0.00)	936.53**	(0.00)	1140.34**	(0.00)	1523.39**	(0.00)

Table 6: Regression Results – Effect of offering an overdraft services on the cost of using current account base services

Variable	SUR Estimates Customer A		SUR Estimates Customer B		SUR Estimates Customer C	
Constant	30.77	(12.16)**	15.53	(5.53)**	33.32	(13.48)**
Overdraft Facility	45.22	(32.84)**	41.62	(28.68)**	46.68	(34.00)**
Base Rate	-4.62	(-11.72)**	-0.07	(-0.17)	-6.50	(-16.52)**
Account Sweeping	3.09	(2.35)**	4.15	(3.00)**	3.48	(2.65)**
Cheque Book	-23.16	(-14.07)**	-25.49	(-14.80)**	-23.30	(-14.20)**
Direct Debit	-11.44	(-8.60)**	-5.50	(-3.55)**	-11.44	(-8.83)**
PCA Branch	20.45	(15.00)**	27.64	(16.63)**	17.63	(13.80)**
PCA Internet	0.57	(0.45)	2.61	(1.87)*	1.21	(0.97)
PCA Telephone	15.55	(11.17)**	20.97	(14.07)**	14.11	(10.19)**
Credit Balance	0.018	(8.81)**	0.018	(9.05)**	0.018	(8.79)**
a _i	(0.00)		(0.00)		(0.00)	
b _t	(0.00)		(0.00)		(0.00)	
SE	64.48		68.15		63.94	
R ²	0.13		0.11		0.16	
Observations	16676		16676		16676	

Notes: SE represents the standard error of the panel estimator. a_i and b_t are the fixed and time effects. The (.) are p values, (.) are t statistics, ** and * indicates significant at the 5 and 10% level respectively.

Within Table 6 we see that the fixed and time effects are significant, suggesting that the company and time-specific shocks differ significantly across the companies in our sample, justifying the use of the panel. The coefficient for a personal account offered with overdraft services is statistically significant at the 5% level for all representative customers. The direction of the relationship is positive in all cases indicating providing overdraft facilities adds rather than distracts from the costs of using base services. The regression model also indicates other factors have a statistically significant influence on the costs of using current account base services. The method distributing current accounts positively influences the costs of using base services, with statistically significant and positive coefficient values all branch and telephone variables, yet not for internet distribution. The provision of payment services such as account sweeping, cheque books and unlimited direct debits also has a positive and significant influence on cost of using base services in all cases. Lastly, the influence of the base rate on the cost of using base current account services is statistically significant in two of the three representative customers and negative in all cases. This result may reflect experiences of recent years where both the historically low base rates are

observed and the average customer cost of using base services within current accounts have arisen with the increasing use of packaged fees for example.

5. Conclusions

Despite the theoretical and policy importance of contingent charges, empirical examination of the operation and level of such pricing techniques is limited. Perhaps reflecting this lack of empirical consideration, the distribution of customer costs arising from contingent charges has become an issue of public, political and policy concern in some markets, and particularly in the provision of current accounts and overdraft services. In this market, policy makers, parliamentarians, regulators and theorists have all predicted the provision of overdraft lending in a 'free banking' system can lead to a cross-subsidy of all current account users by those customers opting to use overdraft services. This study empirically examines this prediction by testing whether a current account offering an overdraft facility or otherwise is associated with higher or lower costs of using current accounts base services.

The descriptive assessment of this research question reports the customer costs of using current accounts with an overdraft facility are higher rather than lower. This relationship is complicated by the 'quality' of the current account. Current accounts of a higher 'quality' providing more payment services and offered through more distribution channels are more costly to use. We therefore undertake a regression assessment of what factors influence the base costs of customer use of current accounts. It is reported that having an overdraft is positively associated with the customer costs of using current accounts. Many other factors also have a positive influence on current account costs including variables used to represent product quality.

It is clear these results do not concur with the widely predicted cross-subsidy of current account base services by overdraft users. The customer costs of current account services appear to be financed by inattentive current account customers which allow large deposits to accumulate in their deposits. This relationship is also complicated by the differential quality of current accounts with current accounts offering overdrafts frequently offering more payment services through a wider range of distribution channels. The implications of this result are multifaceted.

Current account markets are used by 90% of the UK population and provide 31% of all retail banking income (OFT 2008); indeed across the European Union the ubiquity of these services is demonstrated by a customer base greater than that using telephone services, both mobile and fixed line, or a gas supply (Commission of the European Communities 2009). When a market is this economically and socially important as the current account market, clarity and comprehension as to how customer costs are incurred and the efficiency and transparency of pricing is essential. Despite the general importance of personal current accounts much of the policy discussion in this market reflects the substantial levels of overdraft borrowing observed in many nations, the less ‘visible’ nature of this borrowing to many inattentive and less affluent users than other forms of borrowing (see Financial Conduct Authority 2014) and the often complex and potentially confusing format of overdraft pricing. In light of the findings of this study we suggest that on-going policy efforts to address pricing complexity and enhance limited customer switching in this market are welcome as, to a degree, they address concerns with product quality and customer inattention. Distinctly, the widely predicted re-distributional cross-subsidies from overdraft users to other current account users appear to be hard to identify. Policy developed to address such cross-subsidy concerns requires reconsideration and future assessment of personal current accounts needs to more fully reflect the differential quality of these services and inattention of customers.

We therefore suggest further research is required both within the UK and other personal current account markets where ‘free banking’ occurs. Within future work improvements can be made with regards to the data used. Optimally the form of customer use would be defined relative to actual customer transaction data as observed in US studies (e.g. Stango and Zinman 2009; Fusaro and Ericson 2010); such data is currently not publically available in the UK. Public availability of data on the costs of actual overdraft use and particularly the costs of additional charges levied within unauthorised overdrafts is also limited and requires improvement. Lastly, data provision and access can also be improved with regards to the diversity and value of services offered within current accounts. Such developments to data availability are critical in developing the empirical assessment of this widely used and emotive area of banking provision.

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Appendix: The parent firms supplying personal current accounts used in the study.

Abbey National	Charterhouse Bank	Julian Hodge Bank	Santander
AIB	Chase	KBL	Schroder
Airdrie Savings Bank	Chelsea Building Society	Kleinwort Benson	State Bank of India
Alliance and Leicester	Citibank	Laiki Bank/Marfin Laiki Bank	Sun Life of Canada
American Express	Co-operative	Leeds and Holbeck Building Society	Tridos Bank
Arbuthnot Banking Group	Coventry Building Society	Leopold Joseph & Sons Ltd	TSB
Bank of China	Cumberland	Liverpool Victoria Friendly Society	Turkish Bank
Bank of Cyprus	Danske Bank	Lloyds	Weatherbys
Bank of Ireland	Dao Heng Bank	Manchester Building Society	Wesleyan Assurance Society
Bank of Scotland	Dresdner Benson	Metro Bank	Western Trust
Banque d'Escompte	Fleming Premier Banking	National Australia Bank	Whiteaway Laidlaw Bank
Barclays	Halifax	Nationwide Building Society	Woolwich
Bristol and West	HBOS	Natwest	Yorkshire Building Society
Britannia	HFC Finance (Household International)	Northern Rock	Zurich Financial Services Group
Butterfield Private bank	Hoare and Co	Norwich and Peterborough Building Society	
Caledonian Building Society	HSBC	Portman Building Society	
Cater Allen Private Bank	Investec bank	Royal Bank of Scotland	



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