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Organisational change and the computerisation of British and Spanish savings banks, circa 1950-1985[*]

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Abstract

In this article we explore organisational changes associated with the automation of non-bank financial intermediaries the UK while making a running comparison with developments in Spain. This international comparison helps to ascertain the evolution of the same organisational form in two distinct competitive environments. Changes in regulation and technological developments (particularly applications of information technology) are said to be responsible for enhancing competitiveness of retail finance. Archival research on the evolution of savings banks helps to ascertain how, prior to competitive changes taking place, participants in bank markets had to develop capabilities to compete. Moreover, assess the response of collaborative agreements to opportunities opened by technological change (in particular resolve apparent scale disadvantages to contest bank markets). Of particular interest are choices made between applications of computer technology to redefine the relation between head office and retail branches as well as between staff at retail branches and customers.

Keywords: comparative financial markets, United Kingdom, Spain, market structure, technological change, regulatory change, savings banks, banks, TSB, cajas de ahorro.

1   Introduction

This article reports on research into the role the mechanisation and automation of practices within retail financial intermediaries aiming to contest bank markets. The financial service organisations, which are the topic of this article, were originally established as independent providers but all were guided by a common principle. This unifying concept dates to 1810 when the first 'savings' bank was established in Ruthwell, Scotland (Horne, 1947: 34). Savings banks grew throughout the United Kingdom and continental Europe. A change in government policy in the UK, led to the amalgamation of independent savings banks into a single entity, which was floated in the stock exchange in 1986. It then merged with Lloyds Bank in 1995 to create the Lloyds TSB Group. Meanwhile, in Spain regulatory change during the 1980s positioned savings banks on the same footing as commercial banks while allowing individual savings banks remained independent and maintained unique features of their corporate governance (including its philanthropic orientation). By the end of the twentieth century, Spanish savings banks had captured half the market for retail deposits and successfully contested many other markets that had been dominated by commercial banks.

British savings banks were late adopters of mechanical accounting when compared with clearing banks and building societies, the other main participants in British retail finance (see further Bátiz-Lazo and Wardley, 2007). Technological evolution meant the use of mechanical and electromechanical devices was followed by automation in the form of mainframe computer technology. Initially, this evolution positioned savings banks in the UK spearheading technological change when compared with Spanish savings banks. But later on, Spanish savings banks seemed to have 'closed the gap'.

Research in this article shows how increasing use of computer applications in Spain and the UK helped to develop data processing capabilities, which often were seen as a key element to resolve scale disadvantages. However, while Spanish savings banks adopted computer technology on the back of a diversified business portfolio. Early computerisation in Britain primarily aimed to speed up transaction processing of low value, high volume deposits at retail branches. Spanish savings banks had developed organisational structures and created cradles of middle manager at head office by promoting from within as early as the inter-war period. At the same time,

the ultimate step of career development in Britain meant becoming retail bank branch manager while staffing of head office in the 1970s and 1980s most often involved attracting talent from clearing banks and building societies. As a result, while Spanish savings banks went from strength to strength, 'state of the art' computer systems were unable to make up for a lack of managerial capabilities when regulation allowed British savings banks to diversify across retail financial markets. This article thus shows how researching the uses and purposes of computer technology is every bit a business history (e.g. Yates, 1999; Haigh, 2001; Cortada, 2006).

Before proceeding five caveats must be considered. First, looking at organisational forms with similar roots in their corporate governance enables a degree of homogeneity in the analysis of technological change while articulating an international comparison. This premise enriches the understanding of financial organisations as users of technology while providing insights into the relative importance of aligning innovations of information and telecommunication technologies (ICT) with corporate strategy. However, in this article we focus on the evolution of mechanisation and impact of automation on the management of savings banks in Britain. We document a similar process for Spanish savings banks elsewhere (Bátiz-Lazo and Maixé-Altés, 2008). But relevant aspects of mechanisation and automation in Spain are introduced to highlight the international dimension of technological change as well as enhance the understanding of the breath of opportunities technological innovation opened for mutual financial organisations. As a result we are able to tell how automation and the introduction of computers emerged from collaborative strategies by savings banks. The continuity of these strategies in Spain and their evolution to competitive collaboration, helps to highlight some of the idiosyncratic aspects of similar moves in Britain.

A second central tenet of our international comparison evolves around competitive dynamics associated with first comer and late comer advantage, which could be attributed respectively to Britain and Spain. The UK characterises by a long industrial tradition and source of technological innovation while Spain industrialised well into the twentieth century and was typically a net importer of business applications of computer technology. When compared with other established providers of retail finance in their own milieu, neither British nor Spanish savings banks were early adopters of computers or applications of this technology. But while

the adoption of computers and computer applications helped to address important management issues for British savings banks; on balance, Spanish savings banks benefited from a lack of legacy systems and the adoption of cheaper, thoroughly tested and more powerful technology.

Without a doubt, the continuity in the evolution of ICT infrastructure noted by Chandler and Cortada (2000: 263) populates the competitive environments of North America and highly industrialised European nations like the UK. Indeed, there is evidence of networks of innovation spreading across the Atlantic dating to early modern capitalism (e.g. Meyer, 2006) while, more recently, there was intense exchange of ideas around the introduction of compute technology between US and British financial intermediaries (see further Bátiz-Lazo and Wardley, 2007). However, we cannot brush aside other competitive environments, although marginal to the construction of that continuity, where individual organisations were also successful in assimilating new technology to, first, speed up internal operations and, second, reconstruct the flow of information within and across organisations. Considering organisational characteristics and sources of competitive success of firms populating both inside and outside the construction of Chandler and Cortada's continuity, offers to enhance our understanding of the links between technological change and competitive advantage while avoiding the rationalisation of success often associated with a 'Whig' interpretation of history.

Moreover, Chandler (1990), Chandler and Cortada (2000) and others aiming to support (or not) the Chandlerian view of the business organisations in Europe (e.g. Whittington *et al.*, 1999; Kay, 2002; Whittington and Mayer, 2002 and references therein) move forward while focusing on large organisations. This is also the case of those exploring the cannons of the Chandelerian firm in financial intermediation (e.g. Channon, 1977; 1978; 1988; Nightingale and Poll, 2000). Research in this article contributes to this discussion by exploring similar ideas within non-bank intermediaries, of 'smaller' asset size, with a clear retail focus and distinctive governance structure. British savings banks lived in a milieu where others were active contributors to the technological continuity; while Spanish savings banks located outside of that continuity and were embedded in the 'Continental banking model' (i.e. one that promoted loans rather than stock market finance as well as close links between manufacturing and financial intermediaries, to the extent that the

Spanish savings banks even owned share capital of local firms). But in spite of that, Spanish savings banks seemed to have overcome the apparent disadvantage of being both late adopters as well as populating an environment outside of the technological continuity.

The evolution of British savings banks was quite different to that expected by the Chandelerian conception of the firm. Savings banks in Britain remained as a series of autonomous entities, many of them 'unit banks' (where the whole organisation was encapsulated within the premises of a single retail office) as late as 1970. Insipient collaboration accelerated to create a handful of small central service providers as larger banks wanted to take advantage of technological developments but, ultimately, political rather than business agents led to the integration into a single large organisation. Political considerations and regulatory change rather than effective implementation of corporate strategy were also to influence the speed of diversification in the product/service portfolio. On balance, therefore, British savings banks used mechanical aids, computer and other information and communication (ICT) applications to achieve economies of scale, that is, managing volume transactions with greater efficiency rather than redefining processes, procedures, transactions and operations. There is little evidence that computer applications were used to redefine performance measures or supply directors with new and interesting forms of information.

Applications of ICT were critical in maintaining a long-term commitment to servicing Spanish retail financial markets while articulating diversification in the savings banks customer and business product portfolio, that is, in achieving economies of scope while many individual banks maintained a small scale of operation. Active collaboration in technology oriented projects under the aegis of a central service organisation called the Confederation of Spanish Savings Banks (*Confederación Española de Cajas de Ahorro* or CECA), enabled individual banks assimilating ICT applications as collaboration mediated through CECA offered a high degree of flexibility when confronted with alternative technological solutions as well as means to solve scale disadvantages.

The role of collaboration and amalgamation which in this research we illustrate through cases in Britain and Spain, echoes similar to ideas within the work of Lemoreaux, Raff and Termin (2004) and Sabel and Zeitlin (2004). These authors

consider that inter-firm collaboration is one of the characteristics of the post-Chandelerian business organisation.[1]

A third caveat has to do with the nature of mechanisation and automation. The type of technology introduced to achieve 'modernity' and competitive advantage is a significant part of this article. Ours is not a tale of technological determinism. Rather we believe that savings banks in Spain and the UK attempted to assess the costs and benefits associated with the adoption of new technologies and act appropriately but, in so doing, were fully aware of the environment in which they undertook their business. Technology is seen as constructed primarily out of the interaction of policy decisions by senior bank staff and consumption decisions by banks' customers. Choice is therefore central to our tale of technological change (Malone *et al.*, 1987; Yates, 1999).

Fourth, along side the changing nature of competition and technological progress, philanthropy was another distinctive feature of savings banks in Britain and Spain when compared with other organisations populating retail financial markets. However, while in Spain savings banks looked for ways to balance social, regional and business dimensions; in Britain savings banks 'forget' their philanthropic principles to become ever more commercial and business like (and after being floated in the stock exchange, aimed to resemble clearing banks). Although the latter remained dedicated to servicing the personal consumer while essentially being a vehicle for personal savings to finance government debt, from the 1960s onwards British savings banks began to change in response to a drop in market share as well as new trends in the behaviour of their customers (see also Marshall, 1985). For the directors of British savings banks achieving competitive advantage replaced educating the poorest of the poor in the habit of thrift as the main operating priority. Although in Spain political considerations (and appointees) have played an important role in explaining the long-term survival of savings banks, their commitment to invest in the overall wellbeing of their host city or region is also undisputable. However, in this article economic rather than social considerations are the focus to explain the long-term performance of savings banks in Spain and the UK. A holistic analysis of Spanish 'cajas de ahorro' and trustees savings banks would be most desirable to do justice to their long history but space considerations override such analysis.

Fifth, during the twentieth century Britain and Spain changed in significant ways. Financial intermediaries played their part in fostering and responding to these changes, be they economic, legal, social, or political. Consequently, there are parts in this story for a number of factors additional to the onward march of technological progress; among these can be included: increased professionalism, and the development of the managerial class; changing perceptions of gender; the impact of war; and the role of the state. Although new technology underpins these developments, these are the themes which also enlighten our story.

The reminder of this article proceeds as follows. The second section details the emergence and growth of savings banks in the UK. The third section tells of the late adoption of mechanical accounting when compared with other participants in British retail financial markets. Section four considers the adoption of computer technology. Of particular importance is the creation of data processing capabilities. This by looking at how a loose alliances of small and geographically dispersed intermediaries invest in computer technology and in turn, achieve critical scale in retail bank markets. The fifth and final section summarises and puts forward some tentative conclusions.

2   Takes two to tango: origins and growth of the Trustee Savings Banks (accentuated by a running comparison with the 'cajas de ahorro').

From the outset savings banks were retail finance institutions operated through democratic and philanthropic guidelines. There was no share capital traded on the stock market and all profits were reinvested (or in the case of Spanish banks, returned to the community through social spending). Unlike mutually held banks and building societies, depositors had no voting rights nor the ability to direct the financial and managerial goals of the organization. Savings banks sought to create thrifty habits amongst small and medium-sized savers like craftsmen, house servants or the growing proletariat, that is, outside the banks' target market (Horne, 1947; Lawton, 1950; Fishlow, 1961; Payne, 1967; Ross, 2002a). There were other forms of savings banks in the UK (including the National Security Savings Bank system and the Post Office Savings Bank later called National Savings Bank) but our research only deals with trustees savings banks or TSBs.

In the first half of the 19th century, bank-runs or bank collapses were common, so savings banks had no safe outlet for deposits. To create trust among potential depositors, the Savings Bank (England) Act 1817 (also called George Rose Act) was passed, which as a matter of policy required funds to be invested in government bonds or deposited at the Bank of England. This regulation was extended to Scottish savings banks in 1835 and resulted in the essential feature of a trustee savings bank in the UK, namely that depositors had a full guarantee of the nominal value of their savings so that these could be withdrawn at their full value plus interest, no matter how long the deposit had been with the bank (Horne, 1947).

The guarantee introduced by the Act of 1817 was reinstated in subsequent legislation (enacted in 1833, 1863 and 1891). It effectively limited the potential diversification of the savings banks' investment portfolio and foreclose opportunities for direct lending to retail customers while their business remained in collecting low volume deposits. Funds and operation of the savings banks would be under control of voluntary managers or trustees (hence the roots of the TSB acronym), none of whom was to derive any benefit from that office. Savings banks paying interest on deposits (at a rate ranging from three to five per cent per annum) proliferated until the number of successful institutions in the UK grew to its peak of 645 in 1861 (Horne, 1947: 388).

The Savings Bank Act of 1891 envisioned the creation of the Trustees Savings Bank Inspection Committee. This statutory body was to remain independent of government throughout its history.[2] The Inspection Committee quickly established itself as the internal audit force within the TSB 'movement', forcing nominal trustees out of office, drafting model rules and procedures, introducing guidelines and regulations to deal with everyday transactions, and proposing standard methods of book-keeping and audit (Moss and Slaven, 1992: 158; Maixé-Altés, 2006).

All these features of a rather restrictive central control made it possible for local trustees to work autonomously and were to dominate the management of the TSB's until the 1970s. At the same time, they provide idiosyncratic differences when compared with Spanish savings banks. The latter had greater flexibility in lending decision until the 1930s, when the first steps ware taken to reform their governance (separating the administrative functions of governing board and staff) and introduce administrative reforms (by attracting professional staff to management roles) (Bátiz-

Lazo and Maixé-Altés, 2008); while it was until late 1950s when the Spanish started to consider the standardisation of accounting processes and the simplification of administrative routines (Maixé-Altés *et al.*, 2003: 222-3).

Growing recognition as to the commonality in their social orientation (and evangelical nature as portrayed by the self referring label of 'movement') led 26 of the 389 trustee savings banks to come together and establish the Association of Savings Banks in Manchester in 1887 (Moss and Slaven, 1992: 67). This initiative anticipated by about half a century the establishment of the CECA in 1928.

As was the case in Spain, where CECA had a very small staff (four or five full time members of staff) until the 1950s, the British association was run 'on a shoe string'. The work of the British association was to be directed by a Council of Management comprising representatives from not fewer than 14 of the larger banks; the day to day affairs were to be guided by a trio of honorary secretaries made up of the actuaries of the Glasgow, Manchester and Liverpool savings banks. The new Association was a modest but important step in self-regulation although it remained ineffective in persuading hundreds of small savings banks to speak and act as a single body at least until 1914 (Horne, 1947: 324). Spencer (later Sir Spencer) Portal was credited with introducing the idea of appointing a permanent secretary and a large Council in 1914 with the aim of deciding a common policy as well as a single voice to conduct negotiations with the government and promote legislation (Horne, 1947: 325). Portal became deputy chairman of the Association in 1919, chairman in 1923 and president when relinquishing his chair in 1935. By the 1930s the Association under Spencer Portal was already successful in putting forward a common view to Parliamentary Committees and the Treasury to support the progress of the savings banks (Horne, 1947: 326). This was important given the detailed regulatory framework surrounding the operation of the savings banks.

Another important development for trustees savings during the inter-war years was their potential to grow within retail deposit markets becoming ever more evident (Saville, 1996: 532,583,663). By 1919 the sum of cash and assets held in deposit for all the TSB reached their first £100 million, which rapidly rose to £162 million in 1929 and £292 million in 1939 (Horne, 1947: 324). Thus, in twenty years TSB assets doubled the amount accumulated in the century since the passing of the first Savings Bank Act (1817).

Together, the trustees savings banks would rank in size with any of the four main London clearing banks. In practice, however, there was little competition between clearing banks and savings banks or even amongst the savings banks. This as each individual TSB served a separate geographic area and competition for retail deposits becoming more acute until after the end of the Second World War. A similar development took place in Spain, where individual savings banks limited their activities to specific geographies. Initially because of lack of organisational capabilities and later, because of administrative restrains and legislation passed on during the Franco regime - until these restrains were effectively dissolved in 1977 as part of the so called the 'Fuentes Quintana' economic reform (Grifell-Tatjé and Lovell, 1996; Bátiz-Lazo, 2004).

In 1955, inter-savings-bank clearing was extended to the whole of the UK (Moss and Slaven, 1992: 142). The system had been in operation in the south of England (i.e. Surrey) for a short time and it had proven successful in facilitating the settlement of transactions between different savings banks and in improving the service to clients (particularly when on holidays within the UK). Here it is interesting to note the 'late' development of inter-savings-bank clearing in the UK when compared with other European countries. For instance, in Spain the Savings Banks Credit Institute (*Instituto de Crédito de las Cajas de Ahorro* or ICCA) was established in 1933 as a wholesaler of retail finance with clearing functions. A similar kind of institution had been developed in countries such as Finland (1908), Norway (1919) and Italy (1921) (Revell, 1991).

Also in 1955, increased competition for retail deposits (and most notably the growing popularity of hire-purchase) led to calls for the Association of Savings Banks to revive a proposal originally made in 1926 by W.A. Barlcay of the Perth Savings Bank, that the TSB should seek permission from the Treasury and the National Debt Commissioners to allow withdrawals by cheque (Moss and Slaven, 1992: 142). But it was until a review of payment systems which lead to the passing of The Trustee Savings Bank Act 1964 when individual banks were able to open current accounts (upon which individual customers could make withdrawals by cheque from deposits but not to give credit in the form of overdraft facilities). In 1965, the TSB were allowed by the National Debt Office to offer 'direct transfers' or the payment of household bills (mainly utilities) on behalf of individual customers by debiting

payments directly to the account, and were also authorised to offer services for the safeguard securities and valuables.[3,4]

Although regulatory changes altered the internal (i.e. operational) management and investment opportunities that had characterised TSB regulation introduced throughout the nineteenth century while, at the same time, threatened to erode the deposit base of the clearing banks (Saville, 1996: 663), in practice individual retail branch managers were slow to capitalise on these opportunities:

> '[because of first direct transfers and then paying payrolls through accounts rather than in cash] we had thousands upon thousands of factory workers having their money paid into the accounts…. we were then allowed to set up current accounts. But these were moving quite slowly because, quite frankly, the branch manager of the day was not used to them and didn't promote them very actively. We had huge queues of people standing outside the branch from customers wanting cash, particularly on Friday. Any one customer coming into the branch had to have its passbook updated and then decide how much to withdraw. The time to deal with each of these transactions just increased the size of the queue… I suggested to the manager for us to open current accounts for all the customers so that people could come in with a cheque already made and withdraw however much cash they wanted, without us having to look at anything else. We could then deal with the exceptions in less time that was taking us to deal with the queue AND the exceptions. So the boss and I agreed to open current accounts for every wage coming in from the Watkins Factory. Because this had been done without customers' permission, we then went through an exercise, that lasted about two to three weeks, in which customers were told what they had to do and why it would benefit them… After that there wasn't a queue but we had the same number of people coming through the door. Later on we convince the same people to get a card to use the autotellers down in the city centre (as we didn't have one at the time) and would only cash cheques for large amounts. At the same time, other branches were just happy living with their queues.' (McQuade, 06/Mar/2008).

In the mid 1960s, while regulatory innovations opened possibilities for diversification in the business portfolio of the TSBs, in Spain the economic reform introduced by Franco in 1959 had begun to take effect. The nationwide payment system had still to develop as retail transactions were cash-based and debt of manufacturing organisations was predominantly sourced through loans and investments in share capital by local commercial banks. Yet Spanish savings banks already had a well diversified business portfolio. This as they had successfully rolled out current accounts and term deposits as well as new services (such as mortgages, industrial and commercial loans for house construction and facilitated access to government credit schemes) including cash withdrawals at retail branches other than the customer's own branch (*operaciones de intercambio*).[5] So while the TSB financial

assets remain solely deposited in government bonds, Spanish savings banks had successfully begun to diversify their retail portfolio. This had brought them in head to head competition with commercial banks but also required the development of internal capabilities for lending, risk assessment and risk management (Maixé-Altés *et al.*, 2003: 228,248,251).

In 1970 there were 75 savings banks in the UK loosely tied up in an association with £2,806 million in total assets (Revell, 1973: 355). Size was unevenly distributed. Five of the banks had over £100m in assets (together accounting for 25 per cent of the total), 14 had between £50 and £100m (35 per cent), 39 between £10 and £50m (38 per cent) and 17 under £10m (2 per cent) (Revell, 1973: 355). In spite of the largest trustees savings banks being based in London, Glasgow, Edinburgh and Belfast, those based in the north of England accounted for 50 per cent of total funds, those in the south of England and Wales for 27 per cent, those in Scotland for 19 per cent and those in Northern Ireland for less than 5 per cent (Revell, 1973: 356). Geographical location of the 1,655 trustee savings bank branches was also unevenly distributed with branch density higher in Scotland and the North of England. Hence, in 1978, there was one savings bank branch per 18,000 persons in Scotland, but only one per 75,000 persons in the otherwise high density area of London (Price Commission, 1978: 44). A similar pattern existed in respect of individual accounts, with two out of five persons in Scotland having a savings bank account, one out of five in the north of England but only one out of twenty in London and the home counties (Revell, 1973: 356).

3   Mechanization of the trustee savings banks

3.1   Manual rather than mechanical accounting

For most of the first five decades of the twentieth century, savings banks in Britain and Spain relied on manual processes to conduct their business. Slowly but steadily new devices were adopted to help transaction processing in the busiest retail branches. For instance, in the 1948 a new system of mechanised accounting was announced in Belfast. See Figure 1. While it was until the 1950s when large and medium-sized Spanish banks (as measured in terms of assets) begun to introduce mechanical accounting machines (Bátiz-Lazo and Maixé-Altés, 2008).

Figure 1: The New System of Machine Posting at the Belfast Saving Bank, 1948

Source: *TSB Gazette* vol. XVIII (1948) no. 4 (Oct), p. 28

As had been the case for clearing banks, the image shows how performing these operations was made away from the counter (i.e. the 'back office'). The image above also shows that the introduction of mechanical devices in trustee savings banks built on (cheap) female labour to perform repetitive tasks (Booth, 2004; Wardley, 2006; Booth, 2007). Nevertheless other savings banks were to follow the example of Belfast. Mechanisation, therefore, proceeded at the TSB in spite of currency controls, rationings and other things that characterised the adverse economic climate in the British isles during the years that followed the war in Europe. See Figure 2.

Figure 2 shows how only a small portion of retail premises were dedicated to service customers (and this primarily through the mediation of human tellers or cashiers). Most of the dwelling housed the 'back office' or the area to perform administrative functions. In this area Figure 2 suggest how savings banks retail branches had adopted a number of labour saving devices including typewriters, steel feeling cabinets, mechanical adding machines and as the case of the Guernsey, electromechanical ledger posting machines. In some cases, the introduction of electromechanical devices mirrored an increased flow of deposits by customers at the teller. In other instances, the number of transactions had been reduced at the teller but not at the branch. This had been the case in Sheffield following the introduction of

'direct transfer schemes' (that is, a fixed deduction from the payroll paid directly into the savings account). A 'pilot scheme' dated to 1938 and after 1944 both the number of customers using direct transfers and the number of banks offering the scheme 'increased at a very fast rate.'[6] By 1948 the success of direct transfer was causing serious congestion in some retail branches. In 1949 both Sheffield and York County requested and were granted to halt taking on new direct transfer members by the National Savings office.[7] But by 1954, 'only 39 of the 84 savings employed the deposit slip system on their counters…'.[8] As had been the case for mechanical accounting machines, direct transfers diffused amongst the TSB based on decisions made by local managers and, most likely, reflecting local conditions.

Figure 2: Reconstructed Head Office the Guernsey Saving Bank, 1952

Source: *TSB Gazette* vol. XXII (1952) no. 3 (Jul), p. 25

Another symptom of increase flow of paper-based transactions at the teller took place in Spain, with the migration of inter-bank clearing from ICCA to be centralised at CECA. Although processing information in still relied in manual processes, during the 1950s CECA introduced Swedish made accounting machines to help with calculations and processing of ledgers. Meanwhile, the response to increasing volumes of paper-based transaction in the UK was the creation of a 'clearing house' for London-based savings banks in May 1953.[9] This was a simple system of settlement between a small group of banks, which kept customers' stationary unchanged and was built around the Surrey office.[10] The 'clearing house' centralised settlement of travel credit payments, using a TSB Draft instead of cheque and (straight forward) transfers. The introduction of batching through summary

ledgers helped increase efficiency by keeping labour costs under control. Specifically, the settlement of one week of transactions (i.e. some 4,000 items) could be dealt in one 'man-hour'. Reflecting on these results, participants speculated that new services (such as selling Traveller Cheques)[11] could be easily introduced on the top of established administrative systems. Interesting the creation of a 'clearing house' in the South East mirrored better economic conditions in London and its immediate area. This as opposed to a declining industry base in the North West of England where, at the time, Lancashire was the county with the greater number of savings bank offices. Continued growth around the Surrey 'clearing bank' meant that the South East hub would be one of the early adopters of computer technology.

In 1959 some head offices and one or two of the very big branches started the mechanisation of accounts using Burroughs P600 equipment.[12] These were primarily adding machines to process the capital sums in the account and solely process for accounts based in the branch in which they were housed. Interest had to be calculated through a manual process. In 1964 the Burroughs were replaced by NCR Class 31, as the latter could add the capital and calculate the accrued interest. But although it was the first machine that had been used by the TSB for multiplication, these operations were in fact additions, that is, the multiplication resulted from the operator providing an interest factor and then the machine adding a certain amount as many times as indicated by the factor.

By the mid-1960s transactions at retail counters were increasing around 5 percent p.a. in the TSB while some savings banks and saving bank branches still worked with leather-bound ledgers. Hand-written record cards piled up in the thousands while even the most elemental source of managerial information (such as the annual balance sheet) was a huge task and in some banks it involved substantial amounts of over-time pay:

> 'When customers entered in a [savings bank retail] branch, their passbooks were handed in to clerks who recorded their transaction in the [pass]book itself, in the ledger and on the clerk's sheet before passing on the passbook to a teller who also recorded the transaction before calling out the customer's name to bring them forward to the counter. Once the initial transaction was completed, part of the back-office control system involved recording it in further check-sheet, which was then cross-referenced with teller and clerk-sheets, and the ledger-cards. To eliminate any possible errors a further cross-checking of the day's transactions was done at close of business so it was a system of high-security but appallingly labour intensive. A first change came

in the mid-1960s with the introduction of deposit slips – which at least eliminated the clerical work – but even that was only a slight improvement and did nothing to dent the time needed to update the huge number of record cards.' (Moss and Slaven, 1992: 159).

Ten years later, by the mid 1970s, branch staff was still being primarily recruited by individual branches from school leavers.[13] They would be placed for a month or so in training at the local head office and from there assigned to the hiring retail branch. The branch manager would sit in the 'better room' (sometimes using the whole the floor above the retail branch) while the sub-manager or chief cashier had a smaller office next to the tellers. This also provided a space for private conversations while doors to the retail space and to the teller area mediated flow of people between the two. Recording of transactions remain based on manual annotations in the passbook (by the cashier) and ledger (by back office staff). Each transaction would accrue a running interest (to be credited or debited according to the nature of the transaction). Staff rotated their roles between cashiers and back office and were all prepared to help throughout 'one whole weekend around November 20th' to calculate the running interest for the year to be credited to each account and to balance all the ledgers (to the penny).

Organizational methods at some savings banks remained not only antiquated but time consuming. They were clearly in badly need of modernization and streamlining. The early computerisation of the TSB then resulted in a platform that supported real time, on line accounting while, at the same time, some branches operated fully automated, others remaining completely manual and yet others had a mixture of both (according to he volume of transactions handled at the branch). This was possible as long as processing of the transaction were largely the same (whether recorded directly in the computer or relying on asynchronous methods), operations remained relatively simple (i.e. deposit taking), and the TSB's remained a passbook-based bank. Things were to change with amalgamation in the 1970s and diversification in the 1980s. But before looking at the structuring of these platforms, which primarily aimed to speed up transactions, lets considers alternative methods to the retail branch that were explored by the TSB.

3.2   Alternative modes of delivery to the retail branch

Alert to developments in France, The Netherlands and specially Sweden and the USA, trustee savings banks began to consider alternative ways to engage with customers

other than through the retail branch. The 'Savings Banks by Mail' was perhaps one of the earliest proposals.[14] Put forward in 1948 based in experiences in the USA between 1944 and 1946, it was far sighted in as much as considering ways to address congestion at the counter and the potential of the postal service for articulating a new delivery system as well as reaching households that 'from the Savings Banks point of view, have never been 'tapped.'[15] Considering that 'the postman on his rounds becomes the Bank messenger for withdrawals'[16] it implied the use of cheques rather than cash for deposits and withdrawals (a facility which at the time the savings banks were unable to provide and, therefore, might have been a way to attract deposits from middle and higher income individuals). The idea clearly pointed to early thinking of new ways of increasing the inflow of deposits, reducing the number of reasons for closing accounts by increasing convenience to customers, exploring non-traditional market segments, using asynchronous delivery as a way to keeping greater 'smoothness in the internal work' of the retail branch and that 'progress can only come from meeting the needs of depositors.'[17]

Another such proposal came from the Netherlands. The 'motor-car branch' of the Rotterdam Savings Bank was brought into use in March 1949 and involved the transformation of a small van into a 'mobile savings bank'.[18] A 'motorised branch' had been in use in the 1930s Britain by clearing banks to service agricultural markets. They did so again from the late 1940s because loans to agriculture were typically outside lending controls. In the mid-1960s, Martins Bank considered taking its mobile branches to housing estates. But in any event, it was until 1983 when, according to available records, the trustee savings banks first invested in a motorised branch.

Along side the discussion of alternative ways to engage with customers and the use of publicity to attract more deposits, some trustee savings banks began to open retail branches and sub-branches. Some of these came from converting premises of 'savings centres' into actual branches, tried for the first time in Gloucester in 1948.[19] But by and large most of the branches came from organic developments in close geographical proximity to 'head office' – thus responding to changes in local economic conditions while avoiding the sphere of action of another savings bank.[20] The emergence of a retail branch network was timid in number of outlets (reaching 1,500 in September 1970 for the whole movement and 30 for the Preston bank).[21]

New and refitted branches would always be inaugurated with a 'social bang', as the opening accompanied with 'an impressive civic opening ceremony.'[22]

Other alternatives to the retail branch included the introduction of cash dispenser. This when the West Midland made operational a Chubb MD2 at the Shrewsbury branch in June 1970.[23] Some other banks also installed Chubb machines but when the TSB wanted to embrace this technology in full, it found that Chubb was unable to supply the machines and in spite of thinking it was not the better technology, went with Burroughs cash dispensers.[24]

Later on and four years after installing its Burroughs mainframe, in 1974 the first two 'on-line' cash dispensers (Burroughs RT 2000) were made operational in Belfast.[25] Here 'on-line' meant that the central computer was informed of withdrawals after the cash had been dispensed as otherwise the transaction would have been too time consuming for the customer. There were no opportunities to confirm availability of funds prior to dispensing the cash. As late as 1978, only few retail branches were equipped with a currency dispensing apparatus. However, their day to day operation was not a challenge for human tellers.[26] This as the cash machine had a big tally roll within them, in which details of each transaction were recorded. Each morning the dispenser was refilled (always using new notes as otherwise they would get stuck or cause the machine to malfunction) and the printed record balanced. This latter procedure was exactly the same as that used to balance tills serviced by human tellers. So after a brief explanation, any of the cashiers was able to service the cash dispenser for the purpose of routine transactions.

Moreover, currency dispensing seems to have worked well provided that individual customers overcame their fear of the card not being return or had a dislike for interacting with a machine rather than human teller. There were of course instances where the cash card would slip through the wrong slot or the machine failed to dispense the right amount (something easily solved if the customer returned at the end of the working day and the balance in the machine equal the amount he/she claimed had not been dispensed.) But largely, the Burroughs cash dispensers seem to have been free of associating with specific errors or malfunctions – illustrating how the TSB benefited from adopting a tried and tested technology after clearing banks had to endure 'teething problems' with early currency dispensing technology.

Savings banks, therefore, explored cost efficient ways of using readily available technology that could sit on top of scarce resources to attract the inflow of deposits from geographically remote customers. This included opening of retail branches by the largest banks. But tight regulation limited possibilities but for a handful of individual organisations in this constellation reaching critical scale to compete.

4   Computerisation

4.1   Early computing at the trustee savings banks

In the late 1950s savings banks became interested in the business applications of computer technology, among other things thanks to the marketing efforts of Ferranti's Pegasus. [27] In 1960 representations were made for the mechanisation of depositors' accounts at a central point but this proposal was turned down by the Inspectors Committee - whose mandate included overseeing capital expenditure at individual banks.[28] At the same time, Inspectors were happy to allow for the mechanisation of ledgers at the banks' head offices and the introduction of ledger posting machines in some branches.[29] For instance, a system of centralised posting in the London TSB started in February 1962 when the first punched card was prepared.[30] Information on the card included the account number of the depositor (made out of three digits for the branch, five for the account and two for control), the value of the transaction and type of transaction (credit transfer or standing order). A 'Posting Unit' was created which centralised information from all branches and was responsible for a 'master file' of customer data.

Increasing demands to replace manual systems for mechanised accounting of ledgers and to modernise obsolete accounting machines, combined with the impending decimalisation of sterling, the extension of administrative systems for the centralisation of customer information (at head offices of individual banks), and the increase in the numbers of transactions at the teller, resulted in the Trustee Savings Bank Act (1968) making provisions for financial assistance to be given to groups of savings banks for the acquisition of mechanical and electronic processing equipment.[31] The banks also noted the increase salary costs, scarcity of staff and the introduction of the Current Account Service as reasons for mechanisation in an extended scale.[32] At the time, the London bank gained approval to explore the suitability and eventually installed an IBM 1401 mainframe computer while the

Inspectors Committee recognised its limitations (and that of its staff) in being able to provide adequate support for the purchase of capital equipment (in the form of computer technology) and thus called for the use of professional consultants to advise in the introduction of mechanical accounting in individual savings banks or groups of banks.[33]

The attitude of the Inspectors Committee was in sharp contrast with the practice in Spain, where in 1962 the general manager of CECA, Luis Coronel de Palma, had taken the initiative to automate administrative and accounting processes inside of CECA. During the 1960s administrative processes changed to adopt batch-processing of information and these same processes were those aimed to speed up when mainframe computers were adopted in the 1970s. The later benefited from the availability of data transmission protocols over telephone lines developed elsewhere in Europe (primarily the Swedish savings banks) enabling Spanish savings banks interconnection and real time, on line processing before their European counterparts[34] - a claim to fame which the TSB also like to make.[35]

A group of computer experts where hired as full time members of staff at CECA and this group would eventually grow to become the Computerisation Department. On the one hand, this group helped creating within CECA a shared technological platform that would speed up inter-savings bank clearing. This through the adoption of NCR 390 machines. On the other hand, this group interacted with developments at large savings banks and particularly the *Caja de Ahorros y Pensiones de Barcelona* ('La Caixa') and other Catalan savings banks. These had taken steps to create the first on-line data interconnection network through telephone line (while building on the telephone infrastructure provided by the national telephone company) with the aim of enabling the 'hub and spoke' model, that is, speedy communication between main retail branch offices and their subsidiary sub-branches in urban areas (Ballarín, 1985; Channon, 1988; Canals, 1994).[36] For this purpose the 'la Caixa' adopted an IBM 360-40 mainframe, while other savings banks (such as the one in Granada) preferred NCR computers.[37]

The influence of 'la Caixa' over CECA is key to understand the structuring of automation at the Spanish savings banks. At the time Enrique Luño Peña was both the general manager of 'la Caixa' and CECA's president. A second figure of interest was Jesús Ruiz Kaixer, one of the pioneers of electronic data interchange in Spain. He was

also a full time member of staff a 'la Caixa' and often in secondment at CECA. In their dual roles these two persons will then influence key decision at CECA (primarily aiming to assure inter-bank compatibility in terms of technology already in place at 'la Caixa'). This influence articulated once a project for developing a common technological platform for all savings banks was launched in 1969 with the establishment of CECA's Organisation, Automation and Services Commission (*Comisión de Organización, Automatización y Servicios* or COAS). The COAS provided the professional and organisational space for representatives of savings banks sharing and co-ordinating their activities for specific projects such as Interlex (April 1970) and continued in October 1971 through the Savings Banks Electronic Clearing System (*Sistema de interconexion de las cajas de ahorro* or SICA). Through these savings banks endeavoured to achieve interoperability in transactions and electronic clearing through a network of mainframe computers (hosted at individual banks, jointly owned and shared by groups of banks or computer bureau services supplied by CECA for the benefit of the smallest intermediaries) while CECA's central computer housed the main clearing function for all.[38]

About this time the TSB also formally joined the computer age. This when a mainframe computer was used to produce a demographic analysis of customers taking up the TSB's first unit trust offer in 1968.[39] Shortly after, consent was given by the Inspectors Committee for the installation of a mainframe computer in the South East of England and for a group of Scottish banks to employ an independent consultant for a feasibility study leading to the introduction of a mainframe computer.

The clearing centre near London was to consider the exchange of information (i.e. credit slips) with clearing banks.[40] This move required the embossing of optical characters in magnetic ink at the bottom of credit transfer slips. The move was necessary as transaction volumes were getting to high. Decimalisation of sterling was a second driver for computerisation to take place two years later. In 1970, a consortium of 13 trustee savings banks signing an agreement to use the Leeds centre of the National Data Processing Service (NDPS), an independent subsidiary of the Post Office.[41] Servicing branches from NDPS (while the link with clearing banks was housed in the London clearing centre) was necessarily as otherwise there was no capacity at the branch level to cope with increased volume of paper-based transactions:

'[By 1968-9] we simply could not manage the volume at the branch. To give you an indication, the branch in St Martin's at Gray Friars [Leicester] had 250,000 accounts in the one branch and all of these were passbook accounts. On the 20th of November customers knew their annual interest was to be credited. But to copy over the interest to the accounts and rebalance the ledgers had to be done manually. It took us five days and five nights to do this manually. No transactions were posted to accounts during that week as the branch closed for the duration. We definitely needed computers to speed up processing.' (McQuade, 06/Mar/2008).

As was the case for some banks and many building societies, computer technology offered an attractive way to update individual accounts while sorting out the decimalisation of sterling:

'The TSB had large numbers of accounts and transforming them by calculating the shillings and pence into decimal was seen as a formidable task. This was seen as the true spur to see if we could do it through computerised means. Initially, when computers were coming on the horizon, I was of the view that they were fine for complicated operations but not adequate for a series of small repetitive tasks. Memory was also very expensive. But cost came down while the possible use of computers also increase. So that made it for us worth exploring. We at the Nottingham Bank had done a bit on the computer of the Coal Board. But things got serious when we decided to take a huge load off the branches and get things ready by February 15th 1971 through computerisation.' (Neal, 16 March 2008).

Vendors of accounting equipment also took a hold of the opportunity. NCR, for one, then launched a dual currency model of the Class 31 – one that could deal indistinctively with schillings and pence or decimal annotations. It also contracted the conversion of older machines to the new system as NCR accounting machines now populated all retail branches of the TSB (a process of conversion that took a good many years).[42]

NDPS was used to process the standing order book and enabled the first step in digitalisation across all TSBs (which was later on to build in regional computer centres).[43] This included renumbering all accounts to a 'modular 11' sequence, that is, a sequence through which an algorithm the account number resulted in a whole number if divided by 11 (and where the last digit assured that the result was a whole number).[44] By October 1970 the NDPS centre in Leeds was servicing 23 TSB banks and was said to be in the process of incorporating into the computer system 450,000 accounts and 45,000 standing orders. The aim was for the NDPS computers to service 40 percent of saving banks operations, that is, a total of 400 branches, five million customers and processing 43 million transactions a year.[45]

Rather than developing computer related capabilities organically, the TSB wanted to take advantage of the NDPS's 12 year experience in computing and in servicing the National Savings Bank.[46] Press reports pointed to the NDPS using an ICL System 470 at the centre in Leeds.[47] At retail branches, dedicated staff (called 'processors' and usually females) were hired to digitalise standing order transactions.[48] This by transferring information onto punched tape. The tape was carried daily by dedicated courier to Leeds and processed overnight. The next morning large branches received a slip for each transaction (which would be sorted and filed manually by client to update passbooks) and a new tape. The processing of standing orders in smaller retail branches meant that on Monday each would receive a computer generated printout with instructions. These would then have to be transferred manually to the branch ledger and updated in the customer's passbook. Whether the retail branch was large or small, the passbook would be updated until customer next visited the branch.

It is interesting to note that differences in legal environments resulted in Scottish savings banks taking a slightly different route.[49] By the late 1960s savings banks in general were alert to the need of reform and as a response the Savings Banks of Glasgow, Edinburgh, Aberdeen, Dundee and Paisley jointly commissioned James Allen – a Chartered Accountant turned computer salesman – a study of their accounting records to see what improvements could be achieved by automation (Moss and Slaven, 1992: 159). The National Debt Commissioners granted permission for the research to be conducted, on the understanding that the findings of the report would be shared with all other savings banks. The resulting report recommended the purchase of Burroughs equipment. The savings banks then played a 'Scottish card' (since Burroughs manufactured computers in Scotland) and overcame the Treasury's and the National Debt Office's reluctance to depart from the government's 'Buy British' campaign (Moss and Slaven, 1992: 160).[50] Within two years four of the Scottish group jointly contracted to install a computer and create a computer centre in Anderston in Glasgow. The centre opened in 1969, and within two years it was serving eight Scottish banks and processing 89 per cent of savings account transactions in Scotland (Moss and Slaven, 1992: 160). By 1971, therefore, had brought the main Scottish banks into a regional computer network.[51]

Following developments around automation in both sides of the border, one observer then commented: 'the savings banks is moving aggressively onwards to

expand their clientele. Computerization is in progress throughout the [TSB] movement.' (English, 1972). However, as had been the case for clearing banks a decade before and more recently for the building societies (Bátiz-Lazo and Boyns, 2003; Bátiz-Lazo and Wardley, 2007), the introduction of computers aimed to speed up established manual processes rather than redefine them for first principles. For many staff at branches the evidence as to the introduction and use of computer technology limited to the weekly printout. A take on team would then move branch by branch and decide, according to the volume of transactions, to convert the ledgers to on-line or off-line systems, that is, large branched would be fully automated (on line real time) and small branches in mixed system of manual and automated (off-line).[52] But even when computer terminals made their appearance in the retail branch and position slips gave way to manual ledgers, for many a teller things changed little:

> 'It was all manual processing (including calculating the running credit and debit interest) and in a way it was good. We knew all of the processes so that when we were computerised we knew exactly what the computer was doing, because we could work it all out.' (Whitmore, 08-February-2008).

Passbooks were handwritten up to the mid to late 1980s. The passbook had to be updated by hand (even though the account had been digitalised) because the transactions stored in the computer were being recorded in daily position slips, each giving the value of the transaction and an updated balance.[53] Behind the teller, one would find trays of cards with the daily position slips, with a separator card stating the name of the customer and his/her essential details. There would always be one position slip, the latest, and more than one meant those transactions had to be updated in the customer's passbook. So if the customer had a transaction in another branch, a position slip would be posted to his/her branch. If it was a deposit transaction, this would be shown in the passbook after being updated by the other branch. If it was a cash withdrawal transaction, the other branch would keep the passbook and send it internally to the customer's branch for updating (where it would be made to record that and any other pending transaction slip and then posted to the customer).

Reconciling the passbook was then relatively simple as the brought forward balance in the first transaction slip had to be shown on the passbook and from then on, any slip showed the value of the transaction and the balance forward. Exceptions could be dealt by using the weekly microfiche, which listed all the transactions for the branch. But exceptions happened rarely, no more than one passbook a week that had

problems to be reconciled. Even then it was a question of finding a balance in the passbook that matched the slips or microfiche and work forwards from there. There were also clues to reconciling as more often, differences matched regular transactions albeit one that had not been recorded properly as the slip had gone missing.

However, if the customer had a current account then they could make the system (or lack of it) work in their favour:

> 'When online your account was debited straight away. What customers used to do (even in the 1980s), say two days before payday and didn't have any money, was to go to a branch that was still operated manually and cash a cheque there. Because by the time the cheque came through to their branch the money had arrived in the account. There was a lot of that going on as customers were savvy as to which branches were on line and which weren't.' (Shipley 11/Mar/08).

But during the 1970s, the computerisation of the TSB was somewhat different to experiences in other financial intermediaries and certainly from those in the UK and Spain. Organisations equipped with LEO aside, other participants in UK retail bank markets and indeed British manufacturing typically started to adopt computers to enhance the efficiency of established procedures and usually around the accounting function (Bátiz-Lazo and Boyns, 2003; Bátiz-Lazo and Wardley, 2007; Booth, 2007). However, computers at the savings banks were adopted in tandem with a major process of organisational change.

4.2   The Page Committee to Review National Savings

In 1973 at the time of the report by the Page Committee, there were still 73 savings banks with 1,549 branch offices (Marshall, 1985: 39). Eight years had passed since regulatory change had been allowed for the first time the introduction of cheque accounts. The trustee savings banks community sensed the need 'to change in response to changing customer needs.' (Marshall, 1985: 39). However, there had been mixed developments in the growth of assets at individual banks. On the one hand, the assets of the Scottish trustee savings banks, traditionally the strongest members of the TSB movement, had been growing more slowly than those of their southern counterparts (Revell, 1973: 356). On the other hand, trustees savings banks in Lancashire, Yorkshire, Midlands, Welsh countries and West Country had 'built up enviable reserves and [were] anxious to protect their territories.'[54] London and southern England still remain the areas where the savings banks had little presence.

There was frustration amongst directors of the savings banks as their organisations had been unable to capture growth opportunities opened by changes in regulation, attract new clients nor capitalise on the loyalties of existing depositors.

Amongst directors of the individual banks there were differing views about reconciling strong regional character with centralising services, including the creation of a 'central' trustee savings bank, and about the need for further amalgamation (Moss and Slaven, 1992: 160). Board members of individual trustee savings banks were non the wiser. Directors and board members of banks and building societies had long experience in financial intermediation and therefore, a wealth of banking experience was to be found in the running of these organisations. As non-profit organisations, board members of individual TSB (i.e. the trustees) were drawn from public-spirited businessmen and members of the professions within the local area of individual banks. Experience in banking was then to be found only within the handful of paid professionals running central offices of the largest individual banks.

While savings banks and government were engaged in deliberations about the future organisational structure and functioning of the movement as well as of individual trustees savings banks (Moss and Russell, 1994: 275), the trustee savings banks remained restricted in what services they could offer. The banks could not give loans to their customers and regulation still limited the way funds could be invested. It was at this critical stage that the report of the Page Committee recommended that the trustee savings banks were freed from government control, allowed to develop its service range and as a result, become the 'third force in banking'. But the pace of change was to be slow:

> 'The paper by officials covers a 'blue print' agreed without commitment with the [Trustee Savings Banks Association]. This sets out a phased programme – perhaps lasting some ten years – under which the TSB would move to the Page objective of establishing the TSB as the third banking force, standing mid-way between the National Savings Bank and the clearing banks. Given the structural re-organisation that would be necessary – including the establishment of a strong central authority to assume many of the control powers at present vested in the Government – and the need to build up adequate reserves virtually from scratch, it is doubtful whether the transition would be achieved over much shorter period. And from the Government's point of view, there is an advantage in a gradual staging of the period during which the TSBs investment powers are widened and they cease to invest solely in public sector debt.' (Confidential communication of Edmund Dell, Paymaster General, to Denis Healey, Chancellor of the Exchequer, 'Future of the TSB', 7 June 1974, Bank of England 5A44/7).

The communication of Edmund Dell to Denis Healey quoted above is revealing in a number of ways. First, it suggests that dealing with recommendations of the Page committee was high up in the agenda of the newly elected Wilson government. Second, Dell was writing after private consultations with officials at the Bank of England, other civil servants and Sir Athelstan Caröe, chairman of the Trustee Savings Banks Association, as well as informal meetings with heads of individual savings banks at their annual conference in Eastbourne. There was thus widespread consensus on the organisational reform of the TSB (which was not the case of other key recommendations from the Page committee, notably the indexation of savings). Third, recommending a sluggish transition that allowed the creation of organizational capabilities (including management and risk management skills), accumulation of capital reserves and achieved portfolio diversification (by both the TSB and the government). This recommendation clearly illustrates that the TSB were not except from the policy of balancing prudential supervision and innovation in financial intermediation.

Trustee savings banks then developed computer infrastructure 'organically' as part of a long effort to articulate organisational change. Two companies were set up in 1972 in preparation for future change. One was TSB Computer Services Ltd., to co-ordinate all computer systems and related developments; the other being the incorporation of the Central Trustee Savings Bank Ltd., to deal with volume transactions (Moss and Russell, 1994: 275). It was expected that the Central Trustee Savings Bank Ltd. would become operative as the 'central bank' for all trustee savings banks.[55] The aim of the Central Trustee Savings Bank was to amalgamate clearing operations in England and Scotland and co-ordinate money transmission between all savings banks. At the same time, Scottish banks effectively resisted the idea of greater centralisation (in London) by rejecting plans for the Central Bank to take responsibilities in the management of a single investment portfolio (Moss and Slaven, 1992: 163).

The creation of TSB Computer Services Ltd. effectively brought home computing to the savings banks as it migrated applications away from bureau services at the NDPS centre in Bootle. NDPS had accustomed the TSB at regional offices and branches to operate a remote computer system.[56] The savings banks then decided to go on their own by grouping into five consortia of between five and nine banks to

move into computer-based accountancy and banking services (English, 1972). Each consortia built around a centre reflecting the geographical strength of the TSB movement (Lancashire, Yorkshire, the Midlands, Wales and South West England).

Regional centres immediately took control of the processing of standing orders (previously run at NDPS) while each was equipped with an ICL System 4 computer to power a network of 1,400 Olivetti TC 349 BI terminals. System applications grew beyond the standing order book run at NDPS to consider all other processes at the TSB. The aim of this extensive network was to forego batch processing of paper-based transactions and introduce 'on line' processing. That is, computer terminals sitting near (or on) each teller to allow all deposits, payments and savings transactions at the counter in savings bank branches to be fed ('spooled') directly into magnetic disks or tapes.

By the end of 1972 computer applications rather than clerks aimed to become the main source of data input and file maintenance. This would create the largest computer system of its kind in Europe.[57] However, change was slow to come. By 1974 individual banks still expected the Central Trustee Savings Bank to become fully operational. Incorporating retail saving bank branches to the computer consortia managed by TSB Computer Services Ltd. was also progressing but not expected to be fully operational before 1975.[58] Retail branches in the head offices of regional centres, however, did go on line in 1975 while 'senior' staff at these branches attended a week long course in Manchester[59] to learn on-line banking.[60] Then for some 18 months, branch by branch, all the TSB was taken onto the computer system. A team of experts visited each location to convert larger branches to on line (i.e. with computer terminals at the teller) and smaller branched onto a mixed system (off line).[61]

4.3   Scale through a central provider in the UK

Efforts within the trustee savings banks and within government gave rise to the publication of the Trustees Savings Banks Act in 1975. This Bill granted savings banks the right to offer equivalent services to those of the clearing banks. But it also required that, in the space of one year, their number was reduced from 73 (of varying sizes) to 19 independent banks, under the central co-ordinating authority of the TSB Central Board. This organisational framework for savings banks was in place between 1976 and 1984, a period during which TSB management undertook a series of

fundamental changes while pursuing to create an independent and profitable financial services group (Marshall, 1985: 40; Moss and Russell, 1994: 283).

Tom Bryans, general manager of the Northern Ireland Trustee Savings Bank, was appointed the first new chief executive of the Trustee Savings Banks.[62] At the time in his mid fifties, he had spent all his working life at the TSB movement, achieving 'manager status in 1956 and then became an expert in computerized banking.'[63] Bryans took the helm with a mandate to turn the savings banks from a quasi-government body into successful independent providers – although his salary of £17,000 p.a. was well below those paid at similar posts at clearing banks. Perhaps as recognition of the success in representing the TSB interests since 1915, the president and secretary-general of the Trustee Savings Banks Association in 1975, Freddie Miller, was co-opted to become deputy chief executive of the newly created TSB Central Board, working under Tom Bryans.[64]

In sharp contrast to the development of CECA in Spain (Bátiz-Lazo, 2004) (Bátiz-Lazo and Maixé-Altés, 2008), throughout its history the Trustee Savings Banks Association failed to act as central provider of administrative functions to small independent savings banks. Not surprisingly a great number of the 73 banks in existence in 1975 did not have the critical scale to compete in British banking. The amalgamation of individual banks into purposely created regional banks and the establishment of a central board in 1975, then brought about the use of own resources to support the introduction of personal lending in 1977 (CLCB, 1978: 230). However, by 1979, the attempts to diversify across retail bank markets by the trustees savings banks had failed. Together with the Giro Bank and the Co-operative Bank the efforts of the trustees savings banks to penetrate retail finance, from scratch in 1971, resulted in only £200m in direct consumer loans in 1979 and this accounted for less than 3 per cent of total consumer lending that year.[13]

At the end of the 1970s, retail branches still characterised by a close knit and collegial atmosphere.[65] At the time, the expectation was for most member of staff at branches to remain employed in the same branch for the duration of their career. Although the Savings Banks Institute targeted female employees to facilitate their training,[66] females would not really be encouraged to and actually sit examinations (unless they had remained single or childless and a career within a retail branch was their only option).[67] Instead, women were expected to and most of the time would,

leave the organisation upon marriage (quite a number of them meeting their partner at the bank):

> 'When I was working full time, I got to be Chief Cashier. I did feel there was a career for me at the TSB. But to be fair it was going to be hard for a woman to get on because, basically, to get to a managerial position was going to be a man's job.' (Shipley, 11/Mar/08).

Men who decided to sit the banking examinations could expect to develop into assistant manager and then perhaps have a branch of their own. Those deciding not to sit the exams usually sought a career elsewhere (meaning, outside of banking).

As was the case for the customer, staff (including branch managers) were local people: attracted from and resident in the immediate neighbourhood of the branch's premises. Familiarity between staff and customers was to be expected:

> 'You knew everybody in the area. As soon as they came in [to the branch] and you saw their face, you knew it was so and so; and you would recall their account number. Because you worked at the branch for such a long time, people would sometimes line up on your queue because they wanted to see and speak with you, particularly the older customers. They wanted to see somebody who knew them.' (Whitmore, 08-February-2008).

The milieu within the branch could be very social and even fraternal. Managers often adopted a rather patronising attitude, being 'quite protective' and 'looking after their staff'. This approach was further reinforced by a number of social events and clubs promoted by the bank itself where staff socialised after hours. But it was not long after that when things would change with the introduction of new computer applications, new services and products and changes in the organisational structure which required the closing of some retail branches.

4.4   Common infrastructure of Spanish savings banks

Both the TSB and the Spanish savings banks focused on servicing private individuals and had a dominant market position amongst lower-income customers. But in Spain, greater freedom to diversify their business portfolio resulted in the savings banks making inroads to service small and medium sized firms as well as lending and deposit taking within the Spanish middle class. The retail focus thus engendered a strong competitive base at the end of the 1970s when the savings banks gained even greater operative freedom. Moreover, the period of growth coincided with a crisis amongst their main competitors, the commercial banks, from 1977 to 1985. During

this period savings banks' share of total loans grew 21.2 per cent in 1980 to 34.3 per cent in 1990.[68]

The cost-sharing network of CECA worked well through out the 1970s as it helped achieving control at individual banks while providing a low cost-base that enable them to deal with the long economic downturn associated with the energy crises and the end of Franco's regime (Fanjul and Maravall, 1985: 213; Caminal *et al.*, 1990: 279). The next phase began in 1979 when CECA and individual savings banks agreed on developing interconnectivity through SICA further. Specifically by establishing a network linking directly mainframe and mini-computers (as appropriate). A computer centre built by CECA in Sabadell (near Barcelona) in 1980 enabled CECA and the savings banks to continue articulating a clearly defined policy with regards to shared systems for payment methods, cash machines and point of sale terminals. By 1988 all the savings banks had an interface into the network systems run by CECA.[69] The transition came about based on transmission systems such as RJE, IFI, TAP and increasing participation for collaboration around joint projects (such as electronic clearing based on protocols to exchange magnetic tapes and procedures for electronic batch processing). [70]

Between 1975 and 1985 the 'big' savings banks actively engaged in CECA's activities as there were no major operational or strategy distinctions between them and the 'small' savings banks (Ash, 1987: 8). The association of 'big' savings banks continued while all the savings banks could benefit from the troubles of the commercial bank sector, which resulted in the growth of advantages and profits for the savings banks (Ash, 1987: 9). However, reduced rates of market penetration increasingly turned CECA into the defender of the smaller savings banks and this was accentuated when bigger savings banks pursued distinctive diversification moves such as their own international departments or the purchase of failed co-operative banks (*circa* 1987). The ominous trend for CECA changed in the mid-1990s and was associated with the savings banks having to update investments in information technology, a new general manager being named for CECA (Juan R. Quintás, a former management consultant), and renewed importance for CECA as the 'central' Spanish savings bank.

4.5   Becoming a 'leader' in the UK

Applications of computer technology continued to play a role in articulating the strategy of the trustee savings banks (Marshall, 1985: 41). In 1983 a new computer centre for TSB England and Wales was built in Wythenshawe, with the aim of providing a single integrated on-line real time facility throughout the retail saving bank network. In 1984 the government published a White Paper and a new TSB Bill in which the quasi-federal decentralised structure was abandoned in favour of a central organisation which was no-longer legally unique but incorporated under the Companies Act. The aim was to give the then called TSB Group 'a more effective operating structure and also establish clear guidelines for ownership and accountability, neither of which was clear under former legislation.' (Marshall, 1985: 41).

In terms of computer applications, the creation of Wythenshawe resulted in the closing down of regional computer centres.[71] For security purposes, operations at Wythenshawe were duplicated with a second (dedicated) centre at Milton Keynes. Perhaps as a legacy of the cold war, tapes, transaction logs and other back ups were taken daily to a third back up site, whose location was 'secret' (but suspected to be located in Rowntrees in York) which assured the TSB would be operational in spite of 'an attack'. At the time, system experts outside the TSB doubted whether the switchover in one go, of all of the accounts, to a single computer centre would work. But in the judgement of house experts prevailed and was proven right, as the TSB then became the first UK retail financial institution to have a full real time, on-line system. Through this process the TSB then created the largest network of computers and introduced leading edge software applications for fraud detection and management of cash machines (while replacing Burroughs R2000 with NCR 1780 equipment). Lack of substantial legacy systems plus the relatively simple product portfolio built upon the adoption of the latest available computer applications.[72] It would take years if not a decade before the larger clearing banks completely abandoned batch processing:

> 'It was really amazing what we could do at the TSB. I think we were the first bank to go fully on line. Balances were there immediately, you could print customer statements on the spot, order cheque books, cancel direct debits and standing orders right away. Many of these features were available in the new autotellers. I can't remember any of the clearing banks being able to do that. I

think we got so many accounts because we could give such a good service on the spot and it was fantastic. Others had forms to fill in for this or that and then posted to Leeds or Scotland or wherever.' (Shipley, 11/Mar/2008).

However, as the TSB increasingly adopted a multi-divisional structure, the relationship between branches and head office became ever more distant and some times tense. There was growing feeling at the branches that people at head office did not understand how things 'in the front line' worked:

'In those days after we were floated in the stock exchange [in 1986], we changed our name, logo, image, started to do our own clearing, etc. We wanted to be taken seriously and wanted to become more prominent as a bank. However, all the branches had Financial Times delivered everyday. It was expected for customers to read. But in fact, no-one was really interested. They just pilled up.' (Shipley, 11/Mar/2008).

For one the adoption of 'hub and spoke' distribution (Ballarín, 1985; Channon, 1988; Canals, 1994), meant processes were removed from branches and centralised either in city, regional or even head office locations:

'I did not want to particularly return to the bank. Although I was very happy there, things had changed [since I left to marry and raise my children to school age]. They had introduced secretarial pools and other stuff like that which make it look very much like the manufacturing type of job I didn't want to take when first employed.' (Whitmore, 08-February-2008).

The TSB like banks and building societies had done since the late 1960s, begun to attract university graduates rather than the traditional school leaver:

'The graduates were fine. They had a head to get around how things banking worked and were quick off the mark. These people were very intelligent and good at what they did. But the truth was that they were helpless when having to sit down and deal with a customer. At that time people were frighten to take loans, to borrow money and these graduates didn't know how to talk to the customers in a way the customers felt comfortable. They would also often move to jobs outside the bank. I was not surprised when they dropped that graduate training scheme.' (Shipley 11/Mar/2008).

Like others in retail finance, the TSB faced growing resistance for greater automation from organised labour.[73] Union representatives would tell staff at branches that: 'every time you push one of these [autoteller] cards, you put a nail in somebody's job'. A direct legacy of the success of the labour movement of the 1960s and 1970s, the philosophy of the banking unions was very much 'one person, one job'. There were not into flexible working practices. At the same time, the large clearing banks would not allow people to move between them and once out of one, people would not find employment in any of the others.[74] The TSB was a one union

bank (National Union of Bank Employees or Neube). When most of the other banks and building societies were two or three union banks and more often, encouraged employees to form staff associations to keep the unions out (as the staff associations tended to be management orientated). As a result the trade union movement was very slow moving in the other banks while the TSB was dominated in its dealings with Neube. So as a result of particularly strong union and in spite of a state of the art information systems platform, cash machines and other forms of automation arrived a the TSB, but perhaps not as fast as they could had.

Things were eventually to change and by 2008, part time workers (called 'key staff' a s they come in at 'key' moments) became common:

> 'Women can now work at sociable hours or be off when the children had school holidays, things which were not an option in the 1980s. But we did offer a service and cared about customers. Today all staff was asked to be more sales oriented, all is about selling, it's a selling environment. People are under so much pressure to perform and to do what the computer says. It used to be more laid back as we didn't have that many customers (because in those days people were paid in cash, in a wage packet every week and didn't need to have a bank account.) I understand we have to compete and all that. But it just got tougher. And that is why after 25 years on the job I've decided to go [by taking early retirement].' (Shipley, 11/Mar/2008).

5 Conclusions

The research in this article was conducted through an historical evaluation of the role of computer technology within two loose confederations of non-bank participants in retail financial markets. On the one hand, computerisation in Britain took place in tandem with the amalgamation of a into a single provider. Mechanisation and automation were primarily adopted to achieve greater economies of scale. On the other hand, Spanish savings banks remained independent and came together to exploit opportunities offered by computer technology to achieve diversification in the product portfolio (i.e. economies of scope). On balance, the development of managerial and risk management capabilities rather than the use of technology, seem to explain the relative success of Spanish savings banks in contesting bank markets. Although a large market share within lower income individuals together with low transaction processing costs made the TSB an attractive target for amalgamation in the mid-1990s.

Research results in this article support the idea that competitive collaboration can enable the creation of inter-organisational processes and procedures to distribute otherwise inaccessible information. The development and transformation of competitive capabilities of one or all of the partners, therefore, should be seen as the appropriate indicator for successful collaboration (Ross, 2002b: 56). However, the intensity of competition could remain unchanged unless opportunities opened by collaboration are implemented successfully (Bátiz-Lazo and Del Angel, 2003; Bátiz-Lazo, 2004).

In this article we have focused on the British savings banks while articulating a running comparison with developments of similar organisations in Spain. This meant we failed to address an important dimension of European savings banks: their active collaboration to present a common face to a number of issues (see Maixé-Altés, 2008). For instance, in 1984 and CECA had became involved in an international project led by the *Instituto per L'Automatizacione delle Casse di Risparmio Italiane* (IPACRI) of Italy and the TSB (Maixé-Altés, 2008). Spanish, Italian and British representatives presented a technical proposal to the European Savings Bank Group in 1985 that was developed in 1988. EUFISERV – an international partnership based in Belgium - was created in 1990 to start a pan-European project for the interoperability of cash dispensing machines. A company called SEINCA (1988-93) was created to articulate this collaboration by bringing together 68 savings banks in Spain, CECA, IPARCRI and two technology partners namely, Ibermatica (a company financed by the Spanish savings banks) and ERITEL (a joint venture between Ibermatica and the Spanish telephone company).[75] It is a task of future research to document this collaboration at pan-European level in greater detail.

6   References

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NOTES

[1] For an alternative view see Langlois, (2003; 2007).

[2] BPP, 1893-94: First Annual Report of the Proceedings of the Inspection Committee of TSB.

[3] TSB Inspectors Committee Report No. 73 (1965), paragraph 30.

[4] The TSB Trust Company was established in 1967 and a year later the first unit trust issue was offered (Pringle, 1973: 23 and 95).

[5] Customers of TSB could also withdraw from branches other than their own but then the passbook would be withheld and posted through internal mail to the customer's branch, where it was updated and return to the customer at his/her next visit (McQuade, 06/Mar/2008).

[6] Anonymous (1950) 'Direct Transfer Schemes at Sheffield', *TSB Gazette* vol. XX no. 2 (Apr), pp. 7.

[7] Idem.

[8] C.R. Stiles (1957) 'Mechanisation', *TSB Gazette* vol. XXVII no. 3 (Jun), pp. 99-105.

[9] Unless otherwise stated this paragraph borrows freely from H.L. W. (1954) 'A clearing house for trustee savings banks', *TSB Gazette* vol. XXIV no. 1 (Jan), pp. 6-9.

[10] Participating banks included Wessex, Oxford, Surrey, Thames Valley, Portsmouth and South Eastern.

[11] Offering traveller cheques and foreign currency for depositors was offered from 1965 onwards along side other changes introduced by the Trustee Savings Bank Act 1964, namely the payment of periodical charges, household bills, travel draft, current account, inter-bank and credit transfer schemes. See TSB Inspectors Committee No. 73 (1965), paragraph 30.

[12] Unless otherwise stated this paragraph borrows freely from Neal (16 March 2008).

[13] Unless otherwise stated this paragraph borrows freely from Whitmore (08 February 2008).

[14] J.W. (1948) 'That Overcrowded Counter', *TSB Gazette* vol. XVIII no. 1 (Jan), pp. 4-9.

[15] Idem, p. 5.

[16] Ibid.

[17] Idem, p. 9.

[18] Anonymous (1949) 'Mobile Savings Banks', *TSB Gazette* vol. XIX no. 3 (Jul), pp. 29-32.

[19] Anonymous (1948) 'National Savings Centres and Trustees Savings Banks', *TSB Gazette* vol. XVIII no. 3 (Jul), pp. 12-13.

[20] At the end of 1949 there were still at least 30 urban districts and county boroughs with 40,000 or more inhabitants without a savings bank retail branch (*TSB Gazette* vol. XX no. 2 (Apr), pp. 1-5.)

[21] 'Opening of the 1500th Branch', *TSB Gazette* vol. XXXIV no. 4 (Oct), p. 159-60.

[22] H.R.J. (1948) 'The New Branch', *TSB Gazette* vol. XIX no. 3 (Jul), pp. 7-10.

[23] 'News from the Banks: West Midland', *TSB Gazette* vol. XXXIV no. 4 (Oct), p. 158.

[24] Neal (16 March 2008).

[25] B. R. Johnson 'First steps in self-serving banking ', *TSB Gazette* vol. XXXVII no. 3 (Jul), p. 74-80.

[26] Unless otherwise stated the reminder of this paragraph borrows freely from Whitmore (08 February 2008), which is consistent with those of McQuade (06 March 2008) and Shipley (11 March 2008).

[27] C.R. Stiles (1957) 'Mechanisation', *TSB Gazette* vol. XXVII no. 3 (Jun), pp. 99-105.

[28] TSB Inspectors Committee No. 69 (1962), paragraphs 4, 5,11 and 26. At the time the members of the Committee were A R. B. Haldane (Trustee of the Edinburgh Savings Bank – Chairman), Anthony E. Barber (formerly Deputy Chief Accountant of the Bank of England – Vice-Chairman), John Fox (OBE, formerly Chief Registrar of Friendly Societies), Lt.-Col. Oswald S. Francis (Deputy Chairman of Thames Valley TSB), W. Guy Densem (member of council and in representation of the Institute of Chartered Accountants of England and Wales), Sir W. Bernard Blatch (MBE, member of council and in representation of the Law Society).

[29] TSB Inspectors Committee No. 69 (1962), paragraph 26.

[30] R. Foster (1962) 'Electronic Data Processing', *TSB Gazette* vol. XXX no. 3 (Jun), pp. 151-2.

[31] TSB Inspectors Committee No. 73 (1969), paragraph 20 and TSB Inspectors Committee No. 80 (1971), Premises and Computers (paragraph 30).

[32] TSB Inspectors Committee No. 74 (1970), paragraph 20.

[33] TSB Inspectors Committee No. 73 (1969), paragraph 20.

[34] Esteve (12 December 2007).

[35] McQuade (06 March 2008) and Neal (16 March 2008).

[36] At the end of the 1960s, the cost of developing a data transmission network was out of reach for any one single private organisation. However, interest in sharing such network was made known to the national telephone company (Compañía Telefónica Nacional de España or CTNE). Commercial banks and most notably the 'Banco Español de Crédito' (Banesto) actively encouraged the CNTE to develop a telephone-based data interchange network (red telefónica conmutada or RTC) while looking for a technological solution to reduce their growing exposure to cheque-based fraud and a lack of an appropriate regulation on the use of cheque-based payments.

[37] In 1968, 'la Caixa' had placed terminals linked to its mainframe in all of its 212 retail branch outlets, while servicing 1,658,051 customers and 5,267,425 transactions p.a. Some 44 per cent of retail branches were located within the city of Barcelona and its immediate province, while the rest were distributed throughout Catalonia and the Balealic Islands. The electronic data interchange built upon an IBM 2970 terminals with a speed of 134.5 bytes per second (bps) and while running through nodes with the mainframe able to manage up to 1,200 bps.

[38] Started in 1968, Intertelex was launched in 1970 by CECA in partnership with the Spanish telephone company (CTNE). On-line connection was established in 1974 linking the computers of four of the biggest savings banks – Barcelona, Pensiones de Barcelona, Zaragoza and Bilbao. The remaining savings banks linked up through terminals. Here is also worth emphasizing that COAS's aims and objectives went beyond plain and simple interoperability and interconnectivity. The establishing COAS aimed to create a forum for debate and further understanding of technological issues by savings banks. Specific actions started to emanate the discussions. These projects were financed on a voluntary basis (by savings banks interested in taking part). Interoperability through SICA was one of the first of such projects (and a rather successful one).

[39] *The Times*, 02 May 1968.

[40] Unless otherwise stated this paragraph borrows freely from McQuade (06/Mar/2008).

[41] *The Times*, 12 January 1970, 19 January 1970 and 15 Oct 1970. By October 1970 the NDPS centre in Leeds was servicing 23 TSB banks and was said to be in the process of incorporating into the computer system 450,000 accounts and 45,000 standing orders.

[42] Ormerod (16 March 2008).

[43] McQuade (06 March 2008).

[44] Neal (16 March 2008).

[45] Ferry (2001: 110) claims that in 1965 Nick Smith, head of the Organisation and Methods Department at the Post Office, purchased two LEO III and five LEO 326 to "equip the National Data Processing Service centres, manage the accounts in the National Savings Bank … and carry out work for outside

users." (p.185). "By 1969, the Post Office had installed thirteen LEO III and 326s at centres around the country." (p. 186). The TSB certainly benefited from experience at NDPC. This even though there was no evidence to suggest that applications for the trustee savings banks actually were carried out within LEO mainframes nor that they were the same as those originally developed to service the 22 million account holders at the National Savings Bank.

[46] According to Agar (2003; 2007) the Post Office got involved in computer technology as early as 1943 while designing and building ten high speed, valve-based, single purpose machines individually called 'Colossus' (of which one of them was used at Bletchley Park to assist Alan Turing in his decoding work).

[47] *The Times*, 15 Oct 1970.

[48] Shipley (11 March 2008), also mentioned that in 1972 staff at large branches were fully trained in all back office procedures (i.e. 'the background of banking') before they were moved to face customers at the counter. Moreover, back office activities were seen as 'junior' where as those at the counter as more 'senior'.

[49] Scottish computer systems had to remain separate from English and Welsh operations as in Scotland it is a criminal offence to write a check without funds. To the present day, in England and Wales it is legal to write a cheque in excess of the account balance (McQuade, 06 March 2008).

[50] Details as to the British policy with regards to information technology see Coopey (2003: 185) for a general discussion and international comparison while Booth (2004) provides details of its impact on clearing banks.

[51] The one exception was the Savings Bank of Aberdeen whose chairman, Richard Ellis, was resolute not "to keep up with the computer Jones'." (2007).

[52] McQuade (06 March 2008) and Willars (07 March 2008).

[53] Unless otherwise stated, this paragraph borrows freely from McQuade (06 March 2008).

[54] *The Times*, 25 April 1972.

[55] *The Times*, 22 January 1974, p. 19.

[56] McQuade (06 March 2008).

[57] *The Times*, 25 Apr 1972. Advertising on page IV.

[58] *The Times*, 22 Jan 1974, p. 19.

[59] Sources and more often interviewees use Manchester, Altrincham and Wythenshawe interchangeably. They are all referring to the same location of the large computer centre but with different degrees of exactitude as to the actual address.

[60] Shipley (11/Mar/08).

[61] McQuade (06 March 2008) and Willars (07 March 2008).

[62] *The Times*, 29 May 1975, p. 17.

[63] *The Times*, 29 May 1975, p. 17.

[64] *The Times*, 29 May 1975, p. 17.

[65] Unless otherwise stated this paragraph borrows freely from Whitmore (08 February 2008), which concurs with other versions of the life at the retail branch such as Shipley (11/Mar/08).

[66] 'The Associate Examinations' (p. 3) and 'What is it for the future housewife' (p.5), Savings Banks Institute (circa 1973).

[67] For details of gender policies in clearing banks see Booth (2004).

[68] In 1980 commercial banks had 75.8 per cent of loans while credit co-operatives 2.9 percent. In 1990, banks share had dropped to 62.7 per cent while credit co-operatives remained stable at 3.0 per cent (Boletín Estadístico del Banco España, 1980-1990).

[69] While SICA is renamed *Unión de Ordenadores*.

[70] CECA, COAS Reports.

[71] Unless otherwise stated this paragraph borrows freely from McQuade (06/Mar/2008).

[72] McQuade (18 February 2008).

[73] Unless otherwise stated this paragraph borrows freely from McQuade (06/Mar/2008).

[74] Shipley (11/Mar/08).

[75] CECA, Secretariat of COAS, Papers and Reports.