The Dynamics of Product and Process Innovation in UK Banking

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ABSTRACT

Sustained competitive advantage depends heavily on the ability of organisations to internalise the benefits of innovative activities. While the vital importance of innovation in today's competitive climate has been widely proclaimed, our understanding of innovative behaviour in service organisations is not yet fully developed. This article documents an interpretative approach (based on archival research and semi-structured interviews) of the main drivers of change in organisational function (process) and access to financial markets (service or product) in UK commercial banking. As a result, research in this article contributes the understanding of innovation in service organisations by exploring past and present perceptions of banks' senior managers and management consultants on the importance and factors stimulating and constraining the adoption of new technology in financial intermediaries.

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Abstract
Sustained competitive advantage depends heavily on the ability of organisations to internalise the benefits of innovative activities. While the vital importance of innovation in today's competitive climate has been widely proclaimed, our understanding of innovative behaviour in service organisations is not yet fully developed. This article documents an interpretative approach (based on archival research and semi-structured interviews) of the main drivers of change in organisational function (process) and access to financial markets (service or product) in UK commercial banking. As a result, research in this article contributes the understanding of innovation in service organisations by exploring past and present perceptions of banks' senior managers and management consultants on the importance and factors stimulating and constraining the adoption of new technology in financial intermediaries.

1. Introduction

The dynamics of innovation in service firms is of particular interest for the overall discussion around the adoption of new technology. This as there are few opportunities to enforce property rights whereas the analysis of manufacturing organisations often centres on reaping benefits to patent protection.

Innovation is widely proclaimed as being of vital importance to achieve and maintain competitive advantage. At the same time, successfully internalising new technology is seen as essential for maintaining competitive positioning and adapting to changes in the external environment. However, documented evidence suggests that the successful adoption of new technology poises extreme challenges to managers [1-5]. Key issues hindering successful adoption of technological innovations include: resistance to change organisational structure, cultural inertia, internal politics, fear of cannibalizing existing products, fear of destroying existing competencies, satisfaction with the *status quo*, and in general, a lack of incentives to abandon the certainty of the current way of doing things to embrace the uncertainty of future rewards. Moreover, a widening gap between a) managers' discourse and their ability (or lack of ability) to implement innovations and b) between normative and prescriptive contributions by academics and what managers actually do [6, 7].

Research in this article aims to reconcile theory and praxis around the adoption of new technology in service firms by looking at the drivers for the adoption of innovations in banking. Changes in banks' internal and external markets were selected because in the last quarter of the 20th Century this sector suffered the impact of regulatory changes, developments in information and telecommunications technologies (IT), changes in customer needs and new ways to price risk.

The changes as those described above forced bank managers to make much needed investments to modernise facilities, provide innovative products, and improve operational efficiencies [8-10]. However and but for a handful of exceptions [11-15], systematic studies of innovation in financial mediation considered changes in organised markets in isolation to the development of new organisational capabilities within banks. As a result this article addresses the need of examining common drivers for the adoption of new services (i.e. product innovations) and innovations in organisational function (i.e. process innovations) in financial services.

The article proceeds as follows. Section two offers a frame of reference to the analysis of the adoption of product and process innovation in banking organisations. The research methods employed during semi-structured interviews and archival research is then outlined in section three. Section four encompasses the qualitative analysis of archival sources and interviews. Section five offers a discussion of results in the context of other contributions to the topic. The final section presents a summary and tentative conclusions.

2. Analysis Framework

Broadly defined innovation is the process that brings about technological change in organisations and societies. However, there is little consensus as to what this process entails [16, 17]. Definitions of innovation range from "treating innovation and invention synonymously, to regarding any idea, practice, or product that is new to the user organization as innovation" [18]. In spite of this disagreement established frameworks that study patterns of how organisations internalise innovations [19-21], moved forward under the assumption that process and product innovations are intrinsically separate and occur at different times. Empirical support to this line of argument focused on developments in the manufacturing sector [22-25]. At the same time, similar studies on the service sector focusing on financial services [12, 20, 21], were rather prescriptive and disregarded possibilities that findings documented mostly within manufacturing sectors transferred unaltered to financial services. Moreover, studies emanating from experiences in

manufacturing ignored possibilities which were specific to service firms. For instance, banking organisations have used IT applications to implement innovations that would simultaneously achieve greater process efficiency and enhance service quality [15].

In contrast, in this article we adopt a rather loose framework to conceptualised innovation as an idea, product, process, service, hardware or software application that is perceived as new by an adopting organisation or unit. In addition, we focus on two most frequently employed innovation typologies: service or product versus changes in organisational functions (i.e. process) and radical versus incremental.

A product innovation could be defined as "new products or services introduced to meet external user or market need whereas process innovation is defined as new elements introduced into the organisation's service operations to render a service" [25, 26]. Product innovations have a market focus and are primarily customer driven. Process innovations have an internal focus, seek to develop new capabilities, competencies or routines and are primarily efficiency driven [11, 25].

An innovation is either radical or incremental by determining the degree of change associated with it [27]. Radical innovations produce fundamental changes in the activities of an organisation, industry or society and represent clear departures from existing practices. Highly radical, competence-destroying innovations, also significantly increase environmental uncertainty and result in the transformation of firms or industries [28]. Incremental innovations, on the other hand, merely call for marginal departures from existing practices as they mainly reinforce the existing capabilities of organisations [27, 29, 30]. Incremental innovations emphasise the importance of the economies of scale and economies of scope in production and development of mass markets. Incremental improvements to existing products, services and organisational routines can enhance performance, quality, and usefulness and are vital to making more competitively advanced products [14].

Changes in banks' internal and external markets were selected because in the last quarter of the 20th Century this sector characterised by:

(1) The regulatory changes such as the "Big Bang" (1986), the Financial Services Act (1986), the Building Society Act (1986), to mention some, have all modified the intensity of competition in financial markets by allowing financial and non-financial institutions to diversify into one another's traditional business areas through provision of new products and services [9, 10].

(2) Prominent amongst the theoretical explanations offered for the occurrence of financial innovation is the attempt by financial institutions to circumvent controls imposed upon their profitable activities by the monetary authorities [31, 32]. It is not obvious, however, that the distinction is as sharp as it is at first appear to be, for implementing changes to circumventing regulatory barriers are not resource-free.

(3) Developments in information and telecommunication technologies (IT) lowered barriers to enter bank markets and helped achieve greater scale and scope of operation within banks [11, 33-36]. Technological innovation also facilitated rapid adoption, in the absence of widespread use of patents, by making copying easier [8, 37-39].

(4) Developments in the theory of finance helped price through open markets risk (i.e. bank disintermediation), practices which were exclusive domain of banks' internal markets. Applications of information and telecommunication technologies could be employed to design and implement more sophisticated and complex forms to price and manage risk [32] .

(5) Changes in customer needs modifying competitive intensity.

(6) The emergence of documented evidence suggesting that banks were more likely to adopt innovations as a response to competitive and institutional challenges rather adopting innovations which *certeris paribus* represented new business opportunities[9, 10, 40].

In summary, in this article we consider that a number of environmental factors (such as changes in regulation, IT applications, competition and customer needs) could influence the dynamics of adoption of product and process innovations in banking organisations. The survey suggested there was an impending a need to articulate the details of the conditions leading to the adoption of innovations in banking. With that purpose in mind the research followed a rather loose framework to conceptualised innovation as an idea, product, process, service, hardware or software application that is perceived as new by an adopting organisation or unit. In addition, we focused on two most frequently employed innovation typologies: service or product versus changes in organisational functions (i.e. process) and radical versus incremental.

3. Research Methods

Literature on innovation in banking was examined but, as explained above, relied on frameworks developed for manufacturing firms while, at the same time, and sought to establish factual and discrete knowledge disregarding the complexity and intricacies of the innovation process in service organisations. In particular, such an approach disregarded possibilities to consider that in

the financial services sector the introduction of products and services responds to "defensive strategies" [41]. Moreover, that new products and services must deal with multiple distribution channels and often result from improved versions (i.e. incremental innovations) of the existing products and services [33, 41].

Our survey of systematic studies around innovation in banking also suggested that an overwhelming number of empirical support emerged from US bank markets disregarding possibilities in other competitive environments. Thus, in exploring the pattern of adoption and organisational innovativeness UK financial markets were used as benchmark because this country always had a large and highly competitive wholesale banking markets, and preceded other countries in regulatory change. The UK was also an early adopter of the dual process of increasing competitive pressures and imposing supervisory control, investor protection and conduct of business rules in bank markets. Moreover, during the 1980s and 1990s participants in UK bank markets seemed to have anticipated other European and North American markets in the adoption of key technology innovations [9-11].

It was considered that established frameworks and documented evidence on innovation provided some guidance only but not enough detail with which to develop a list of successful attributes of innovation in banking. Neither were these contributions deemed to provide sufficient detail on common drivers to explain changes in organisational structure (i.e. process innovation) and service offering (i.e. product and service innovation). It was also considered that an overwhelming number of research studies on innovations in financial markets focussed on changes in banks' external markets (e.g. monetary aggregates, price differentials, etc.) and changes in banks' cost structures. These contributions often disregarded other influences on profit variations and over-simplified what is often a complex organisational change process.

Instead, research in this article adopted an interpretative approach to access unobservable, contextually rich and subjective managers' attitudes, perceptions, belief and mental models that lie behind their understanding, decisions and actions [17, 42-44]. Data collection methods combined a survey of archival sources with in-depth interviews with managers who had direct and indirect responsibilities in bank markets. Data collection thus attempted to understand phenomena through the meanings that people assign to them [45-47]. The adopted approach would thus centre on the complexity of human sense making rather than in identifying simple causal relations [48]. Moreover, this approach was considered to be valuable in accessing "sticky, practice-based problems where the experiences of the actors involved and the context of action are critical" [49]. This approach was also deemed as being helpful to validate the relative importance of innovation constructs emerging from context other than UK bank markets.

An interpretative methodological approach does not require the validation of constructs as the positivist approach would suggest. Instead, the main question was whether the study would gain access to the experiences and in-depth knowledge of participants in UK banking. As a result the following steps were followed to facilitate the validation of constructs emerging from the survey of archival sources and interview questionnaire. First, an archival search was conducted including popular banking and academic journals. Archival search included the Financial Times, The Banker, Financial World, Oxford Bulletin of Economics and Statistics, relevant publications of the Bank of England and Bank for International Settlements (Basel), industry reports from Reuters and Euromonitor as well as banks' websites. This search generated a list of 51 innovations introduced in the banking industry between 1960 and 2003 (more below). The archival survey also proved helpful in the design an interview schedule that would ascertain the following areas of research:

- What do managers understand for "innovation" in banking.
- Whether innovation in banking is, on balance, externally or internally driven.
- Whether it was possible for the list of 51 innovations to be sorted into product/service innovation and organisational function (i.e. process) innovation.

Although the list of 51 alleged innovations was used as the focus of interviews with managers, the interviewees were ultimately responsible to validate identified constructs as innovations in UK banking and sorted them into the proposed categories of product and process. The discussion around the handouts was then taped, transcribed compared and contrasted to ascertain any further categories and meanings around process and product innovation. This approach thus allowed developing an understanding of the perspectives of those being studied question by question, and then noting down the similarities and dissimilarities [50].

A first group of participants in the survey had all least five years work experience in bank markets, either working in the retail operations of a major UK commercial bank (36%) or as stock analysts in an investment bank (36%). A second group of participants had direct experience with the banking sector but no current responsibilities. In particular, management consultants were Partners or Project Managers (in all but one case, from a “Top 6” firm), with again a minimum of two years experience in servicing commercial banks (28%). A total of 11 interviewees (seven men and four women, 64% and 36% respectively) with rich, diverse and long experience in banking and management consulting for banks took part in the research. Their composition by organisational sector is summarised in Table 1 below.

Table 1: Sector Distribution of Participants in Survey, 2003

Sector	No. of participants	Current role/position	Code
Retail/commercial banks (RB)	4 (36%)	Senior managers	RB1 to RB4
Investment/ corporate banks (IB)	4 (36%)	Senior managers & managers	IB1 to IB4
Consulting firms (MC)	3 (28%)	Partner/Senior consultant	MC1 to MC4
Sum	11 (100%)		

The data was also collected through semi-structured interview and handouts were offered which portrayed the proposed list of banking innovation constructs (instruments which are available from the corresponding author upon request). The validity, reliability and clarity of the research instrument were improved by conducting pilot study considering six long established UK academics. Semi-structured interviews were carried out in face-to-face encounters with managers and management consultants in the months of July and August 2003. The interviews lasted on average 90 minutes, were taped and transcribed. Prior to the analysis, copies of the transcribed interviews were sent to individual respondents for their review, approval and if appropriate, clarification as to avoid any possible misinterpretation of their responses.

Topics during the interview questionnaires included clarifying the participant's background and experience in banking. Secondly, discussing the significance they attributed to the concept of "innovation" and how this conceptualisation of "innovation" applied in the context of UK banking. Thirdly, why they thought innovation was potentially important to banks and where banks found incentives to adopt innovations. Fourthly, whether they saw the existence of any adoption patterns of product and process innovations in UK banking. And finally, they were invited to discuss what they considered to be the main constraints to the adoption of innovations in banking. The following section offers results of this process.

4. Product and Process Innovation in UK Banking

4.1 Technological Change and Its Relative Importance in UK Banking

During the course of the interview participants were required to describe the importance of technological change in financial mediation. In particular, they were prompted to define “innovation” and how this modified the internal environment of banks. During the analysis of the interview transcripts, it became apparent that most respondents offered more than one meaning

of innovation in banks. Responses were then synthesised into seven constructs as described in Table 2.

Table 2: Impact of Technological Change on Banks' Internal Performance, 2003

Description	Interviewee code	Sum	%
Radical Process of Change			
New methods of doing business	MC2, MC3, IB2, RB1, RB4	5	23%
New products introduced to the market	MC3, IB2, RB1, RB3, RB4	5	23%
New ways of providing existing products	IB2, RB3, RB3, RB4	4	18%
Something new that brings potential benefit	MC1, MC3, RB4	3	14%
Incremental Process of Change			
Minor changes in products and processes	MC2, IB1, IB4	3	14%
New business strategy, control system	MC3	1	5%
Broadly defined process of change	IB4	1	5%
Sum		22	100%

As summarised in Table 2, consensus emerged around technological development bringing about radical change in banks' internal environment (77% of responses). For example, one senior manager with over 38 years work experience in banking viewed innovation as “new ways of providing existing products, new ways of doing existing business and introduction of new products to the new markets” (IB2). Hence, 23% of the responses (5 participants) described "innovation" as representing new products and new process. Other 23% of the responses (5 participants) defined "innovation" as involving new ways of providing products or creating new delivery channels. Other 14% of responses (3 participants)perceived that "innovation" as bringing about changes that benefited banks.

In contrast, 33% of the responses described technological change as an incremental in banking. For instance, one participant described innovation in banking "as involving development of new business strategy, process and control (risk management) systems and these apply to all banking types" (MC4). Hence, 14% of responses (3 participants) specifically told of innovation in banking taking the form of incremental changes, repackaging and refining of existing products and processes, and that radical innovation was rare.

Participants were then prompt to describe whether, on balance, technological developments in banking organisation resulted from internal or external change. As suggested in Table 3,

participants' perceptions and understanding of the importance of innovation for the management banking organisations was quite varied, diverse and contextually rich.

Table 3: Drivers of Innovation in UK Banking, 2003

Description	Interviewee code	Sum	%
Externally Driven			
Keeping up with changes in information technology, society, economic cycle or regulation	MC1, MC3, IB4, IB1, IB3, IB4, RB1, RB2, RB4	9	31%
Managing new forms of risk	MC3, RB1, RB4, IB4	4	14%
Matching new products or services offered by competitors	IB1, IB3, RB1, RB4	4	14%
Stay in business	MC1, MC3, IB2	3	10%
Internally Driven			
Greater profitability (i.e. gain competitive advantage)	MC2, MC3, IB2, RB3	4	14%
Improve efficiency	MC3, RC1, RB3	3	10%
Retain or capture tacit knowledge	MC1, RB1	2	7%
Sum		29	100%

Results in Table 3 show how interview responses were summarised into seven constructs. These constructs emerged after a minority of participants failed to elaborate on their reasoning simply stating that innovation took place to meet banks' need to stay in business (3 participants, 10% of responses). Results in Table 3 suggested that participants were almost evenly split between technological change being internally or externally driven in UK banking:

On the one hand, participants who overwhelmingly described innovation as responding to developments outside managers' control (69%). Participants specifically said that banks innovate in order to cope with the changes in their external environment (9 participants, 31% of responses). Managing new forms of risk exposure was also important (4 participants, 14% of responses) while 4 participants (14% of responses) perceived innovation as resulting from the need to match new products or new services offered by competitors. A contribution by one senior management consultant may summarise the core perceptions of this type of respondents:

> "What springs to my mind is a basic stakeholder diagram of the banking industry. Banks have a lot of people to answer to and to interact with: government pressure to improve the banking industry; shareholders looking for a kind of profit history; and customers wanting more. So they are under pressure from the outside to innovate as well as within the industry in terms of competition." (MC1)

When the interviewer probed further to discuss the sources of external change, participants overwhelmingly described applications in information and communication technologies and the actions of competitors as specific sources of technological change in banking. Changes in regulation, changes in customer needs and the globalisation of financial services were deem worthy of mention but of lesser importance.

In the other hand, 41% of responded believed that, on balance, innovation in financial mediation was driven by internal developments at banking organisations. This type of responses were less diverse and included elements which alluded to innovation being primarily driven by a desire for greater profitability, achieve competitive advantage (4 participants, 14% of responses) or improving efficiency and quality of service (3 participants, 10% of responses).

Retaining tacit knowledge within the organisation was also mentioned as an additional reason for banks to engage in innovation (2 participants, 7% of responses). Interestingly these respondents were also very wary of associating innovation with the development of a competitive advantage: "Even though innovation is vital to the very survival of banks, it does not affect or impact uniformly across all the banks" (MC4).

When the interviewer probed further to discuss the sources of internal change, interviewees failed to elaborate a significantly different response to the one already offered.

In summary, interview results suggest that "innovation" as a concept is associated with radical process of change. Results suggested there was a predominant view that such process associated with external factors and in particular, IT related applications and actions of competitors. Thus, the view portrayed by the popular press of banks as "traditional" (i.e. risk averse and unwilling to engage in radical changes that may upset erstwhile virtues and routines) was in a minority.

4.2 Identifying Innovations in Banking

This section reports on the validation of banking innovation constructs and their categorisation into product and process innovations in the UK context. Table 4 summarised the results of the the survey of archival sources. This survey identified 51 developments as potential innovations in banking. It was noted some of these developments initially took place in US bank markets but were reported as having been some sort of effort to implement them in UK markets. From the

total of 51 developments identified from archival sources (details of which are available from the corresponding author), 24 (48%) were initially considered as enhancements of service delivery or facilitating the access to financial markets (i.e. product or service innovation). There were 16 (31%) constructs identifying only changes in organisational function (i.e. process innovation). There were 11 constructs (21%) which were identified as requiring both product and process innovation for implementation (i.e. radical innovations).

Of the 51 developments identified in the archival survey, 44 (86%) were selected by interviewees as being new ideas or practices that had been adopted in UK bank markets. Widespread consensus between archival search and interviews suggested these 44 constructs captured innovations widely adopted across UK banking. However, 7 (14%) constructs (encompassing personal banker, lockbox system, treasury work station, loyalty schemes, on-line financial management systems and lobby automation) were dropped for further analysis. Respondents considered that these constructs duplicated the meaning of others and thus could be easily accommodated in other constructs within the list. Respondents also felt they were typical of the retailer sector (e.g. loyalty schemes), were too specific to the US banking sector and thus, not widely diffused in the UK.

Managers categorised the validated innovation constructs into product or process innovations based on definitions provided by Haaroff [26] and Drew [25]. However, two managers (18%) found difficulty in categorizing innovation constructs neatly into suggested definitions for product and process innovation. Those in disagreement claimed that technological change in banking is often intangible (but for changes in accounting records or marketing literature), complementary to the bank's existing portfolio and could have embedded service attributes. These findings were consistent with previous studies which warned of the prescriptive orientation in academic research [51-53] and challenged the wisdom of boxing innovation into mutually exclusively categories [12]. The other nine participants (81%) had no problem accepting the proposed definitions as well as their suitability to characterise technological change in banking organisations.

Table 4: Outstanding New Developments in US and UK Commercial Banking, 1960-2003
(Validation and Categorisation of Innovation Constructs in Alphabetical Order)

Description	Estimated Adoption Date	Description	Estimated Adoption Date
Panel A- Service delivery or access to financial markets (i.e. new service or product)			
Adjustable rate mortgage	1980s	Direct payroll deposit	1990s
All in one account	1990s	Eurobond	1963
Asset securitization	1970s	Junk Bond	1970s
Bond	1960s	Money market deposits	1970s
Cash management account	1978	Money market mutual funds	1970s
Certificate of deposit	1979	NOW account	1970s
Collateralised mortgage	1970s	Self directed IRA account	1980s
Convertible bonds	1970s	Structured products	1990s
Credit cards	1969	Sweep (asset management) account	1980s
Credit derivatives	1993	Trackers savings account	2000s
Debit cards	1987	Variable rate mortgage	1980s
Derivatives	1970s	Weather derivatives	2000s
Panel B - Organisational function (i.e. process)			
Automated cheque reconciliation systems	1980s	High speed image processing of cheque	1980s
Automated mortgage origination	1990s	High speed image processing of office documents	1980s
Automated voice response system	1980s	Loan tracking system	1990s
Centralised loan application process	1990s	Profitability analysis by customer	1990s
Computerised loan document generation	1980s	Risk management systems	1970s
Customer information file	1990s	Straight through process	2000s
Discount brokerage service	1980s	Telephone banking	1983
Electronic trading of shares	1990s	Truncation of cheque handling process	1980s
Panel C - Common to both organisational function and service delivery			
ATMs	1967	Home banking	1983
Electronic fund transfer (PoS)	1985	Internet banking	1997
Panel D - Constructs identified only in archival search			
Treasury work station	1990s	One-stop banking	1990s
Lobby automation (video-banking)	1990s	On-line financial management system	1990s
Lockbox System	1980s	Personal banker	1990s
Loyalty schemes	1990s		

Source:[8, 11, 12, 32, 34, 35, 37, 54-61] and own estimates.

In spite of this apparent disagreement, participants were invited to consider whether they had observed the existence of any pattern in the adoption of product and process innovations by UK banks. Their responses were then synthesised into four categories and results summarised in Table 5.

Table 5: Managers' Perception of Adoption Patterns in UK Banking, 2003

Description	Interviewee code	Sum	%
No clear adoption patterns	IC1, MC1, MC2, IC2, IC4	5	29%
First product then process pattern	RC1, MC3, IC4, RC4, RC2	5	29%
Product and process simultaneously (i.e. radical innovation)	RC1, MC3, IC4, RC4	4	24%
First process then product	MC3, IC4, RC1	3	18%
Sum		17	100%

The interview results on the likely patterns of adoption of product and process innovations in banking advanced no clear-cut explanation of the adoption process. A third of respondents (5 participants, 29% of responses) stated that there were no clear patterns of adoptions of product and process innovations in UK banking. For example, one senior partner in a management consulting firm considered that:

> "The prime driver of the process innovation is cost reduction and it doesn't particularly linked to products; ... I don't think that banks are really innovative and they have to change the processes in order to support the new products." (MC3)

Other group of responses considered that adoption of product innovations preceded process innovations (5 participants, 29% of responses). However, a group of almost equal size considered that both could be adopted simultaneously (4 participants, 24% of responses). This second group included as examples to illustrate their arguments banks' entry to the warrant market and the introduction of weather derivatives (which required new risk management systems and new mathematical pricing models.) Other examples included the introduction internet banking and ATMs. Yet a third type of examples suggested that a process to product adoption pattern could be a norm (e.g. first electronic connectivity, followed by mathematical models then trading in derivatives). To this regard an historical analysis of the dynamics of adoption pattern by a management consultant is worth mentioning. According to his account:

> "In 1980s – 1990 the adoption of product innovations was preceding the process; from 1990 to 2000 both product and process innovations were incrementally modified, and since the year 2000 onwards simultaneous adoption of both the product and process (technologies) becomes absolutely essential." (MC4)

Although in a minority, this account was consistent with analysis emerging from the archival survey of innovations in UK Banking. See Table 6.

Table 6: Estimated Rate of Adoption of Innovations by US and UK Banks, 1960-2003.

Period	Changes in Service delivery or access to financial markets (i.e. new service or product innovation)	Changes in organisational function (i.e. process innovation)	Both	*Sum*
1960-1979	14	0	1	15
1980-1989	5	9	2	16
1990-2003	7	10	3	20
Sum	26	19	6	51

Source: [8, 11, 12, 32, 34, 35, 37, 54-61] and own estimates.

As shown in Table 6, between 1960 and 1989 UK banks adopted 19 product innovations. This as compared to 9 process innovations and 3 innovations having attributes of both process and product innovations. However, between 1990 and 2003, the combination of archival research and interview responses identified UK banks as having adopted 10 process innovations, 7 products innovations and 3 having qualities of both types. Interestingly, results in Table 6 suggested that the adoption of innovations having attributes of both process and product had been increasing through time. This as participants considered that the most recent innovations (e.g. internet banking, straight through process, weather derivatives) had brought about radical internal and external change to banking organisations.

4.3 Contributions to Financial Performance

During the analysis of interview transcripts the research found conflicting accounts between those with direct responsibilities (i.e. managers in commercial, retail or investment banking) and those with indirect responsibilities (i.e. management consultants) regarding the contributions of product and process innovations to bank performance. Some of these contradictory accounts now follow:

One bank manager described the case of the introduction of new investment idea and the support systems needed to realise the profit opportunities guiding this investment idea. She considered that both product and process innovations contributed "in their own way to performance" (IB5): efficiency in the process reduces cost while investment idea as a product increases revenue thus the profit figure would be impacted on both ways.

Alternatively, one management consultant considered that "in the short term, process innovation contributes more positively to banks' financial health" (MC2). But this was challenged by an independent account of another management consultant who considered that the link between innovation and profitability "depends on cost of process technology, its amortization schedule and timing factor" (MC3). This because developing adequate and effective IT systems required substantial up-front expense for banks willing to match developments by competitors. This interviewee went on to say that the profitability link in terms of product and service innovation, was influenced by managers' expectations of financial margin or fee income associated with the introduction of the specific product or service.

In contrast, other interviewees took a rather different perspective considering that the profitability to innovation link "depends on market focus" (RC1 & IB3). According to these participants, retail and commercial banking characterised as having a "the mass market focus." Financial performance could be enhanced by adopting process innovations that improved efficiency and reduced cost structures. Alternatively, investment and corporate banking characterised by having a "selected (i.e. niche) market focus" and were more likely to enhance their profitability from new product offerings.

Managers were also asked to consider first mover advantage in the context of the link between profitability and innovation. There was no agreement as to whether banks could benefit from first mover advantage but the consensus was that being first to market was not seen as a key driver of innovation in banking.

In light of the apparent disagreement amongst participants regarding the link between innovation and profitability, the open nature of the interview allowed it to prompt participants to identify factors which could potentially constrain the adoption of innovations in banking. Participants perceived that innovation adoption difficulties could arise when:

(1) there was a need to change behaviours of staff and/or customers.

(2) innovation required negotiating access to established networks thus the participation of different stakeholders. Examples here included ATM network and straight thruogh process.

Also important was the creation of new networks (such as was the case of the rolling out of cards with "smart chips" in 2004 to replace autographs with electronic signatures amongst UK credit card users.)

(3) regulatory authorities who failed to give authorisation for the trading in new products or the failures to develop a secondary market for the new product (e.g. warrant market in London).

(4) the perception by the bank's senior management that potential benefits associated with the proposed innovation failed to cover the cost of implementation.

In summary, the adoption of innovations by UK banks seemed to have evolved since 1960. Managers told how innovation was increasingly associated with radical technological change. However, there was no consensus as to the effect of product and process innovation on banks' profitability levels.

5. Discussion

5.1 Managers' Conceptualisation of Innovation

The descriptions respondents offered to the term "innovation" were wide ranging. However this was not unique to sources in our survey as it is also the case amongst other systematic studies of innovation. For example, a definition of innovation such as: "the adoption of an idea or behaviour that is new to the organization (sic) adopting it"[62] lives side by side with "advances in the kind of products, production process, management system, organisational structures, and strategies developed by a company" [63]. Research in this article argued that the variations in the conceptualisation of innovation in banking reflected the contentious and problematic nature of technological change.

Results also suggested that, on balance, external forces were more important in explaining innovation in banking. This was consistent with empirical support documented elsewhere [31, 32, 35, 36, 59, 64]. A distinguishing feature of research in this article, however, was pointing out that some participants told of being wary that innovation does not impact uniformly across all banks (RB1, MC1 & MC4). Neither did participants felt that innovation in banking associated with high profitability as is the case of first to market in other sectors such as manufacturing.

Interestingly some participants emphasised that banks more frequently engaged in incremental and gradual changes and radical innovations were rare (IB1 & IB4). Others also questioned the innovative behaviours of banks (IB1, MC1 & MC4). So what might be hidden behind the discourse and analysis of managers and management consultants?

The banks age- size factors: There is no consensus amongst systematic studies as to the impact of asset size on the adoption of innovation in banking [18, 65, 66]. This as greater asset size has been associated with large pools of resources and these greater resources should, in turn, give organisations greater leeway to tolerate potential losses due to unsuccessful innovations and allow them to undertake many token adoptions for prestige reasons. However, a large repertoire of structures, organisational capabilities, routines, systems and other resources associated with greater asset size can also "discourage innovation while encouraging tinkering" [67, p. 596]. Hence, a result of "an internal focus", longer communication channels and slow information processing large banks could be slow in responding to changes in the competitive environment [68-70]. Moreover, by growing in size and establishing successful products and markets, UK banks might want to maintain their position in current products and markets mostly by retaining the *status-quo* and increasing efficiency of current operations, rather than by venturing into new products and uncharted markets. This view was consistent with research in this article which reported that since 1990 developments in banking characterised by the predominance of the adoption of process innovations over the adoption of product innovations. This view was also consistent with empirical evidence documented elsewhere [13, 71].

Weak appropriability regimes: In common with other service industries, is very costly to defend property rights through patents in financial services. There may well be legal reasons for this, but the most likely explanation is that widespread acceptance of new financial securities depends on their liquidity, which in turn requires the establishment of thriving secondary markets [32]. At the same time, copying (i.e. free access to proprietary knowledge) may actively be encouraged to ensure rapid adoption. In the literature, these external contingencies have been conceptualised in terms of "network externalities" and "critical mass" [72], to suggest that the value of innovation and, hence, its adoption probability, is determined by the number of other users such as close competitors [73]. Thus, the importance of changes introduced or adopted by competitors to influence the widespread adoption of an innovation in financial services [74]. However, radical innovation may be inhibited by the need to articulate successful cost- and network sharing agreements [11, 32]. The ineffectiveness of patent-related protection and secrecy and the instantaneous occurrence of moving down the learning curve in banks imply that lead-time and quick response in introducing new products may be the most effective way of appropriating the returns of innovation efforts [39].

5.2 Validation of Innovation Constructs

One of the main results of this paper was producing validated list of innovations the UK banking. These constructs emerged from archival research and a survey and were categorisied into product and process innovations. This synthesis suggested the existence of strong complementarities between product and process innovations in banks and that innovation in banking modifies both their internal and external environments in an inextricably intertwined and complex way [75, 76].

However, the distinction between product and process innovations could be potentially important for further research because the adoption of each type requires different organisational skills: product innovation requires that banks assimilate customer need, changes in demographic aspects and supply new ways to enter bank markets. Process innovations require banks to apply information and communication technology to improve efficiency of product development and commercialisation and service quality [12, 27]. This in turn requires banks to have necessary organisational capabilities and effective business strategies.

The fieldwork in this article also provided interesting insights into how innovation in banking had evolved since 1960. Results suggested there had been more product than process innovations between 1960 and 1989. Results also suggested there had been roughly and equal number of product and process innovations from 1990 to 2003. The latter period also witnessed adoptions of an increasing number of developments that had qualities of both product and process innovations. These findings supported the expectations of the so called "product life cycle model" [25] while, at the same time, underscored the dynamics unique to those operating in banking.

5.3 Patterns of Innovation Adoption

Contrary to the existing literature results documented in this article suggested that that multiple adoption patterns could be possible in banking. The analysis of interview results, although quite tentative, would suggest that possibilities around process-product or vice versa seemed contingent on the potential of finding new growth opportunities, specifically business strategy focus, market orientation and intensity of competition. Establishing the exact nature of those possibilities, however, was beyond the scope of this article.

The fieldwork in this article suggested a number of potential elements hindering the adoption of innovation in banking. These factors were to be found both within the internal functioning of banks as well as in the external environment. Internally, the most challenging constraints were organisational inertia and strategic orientation (or lack of orientation) as well as features of the management team (such as fear of uncertain outcomes and complacency with the *status-quo*),

managing attitudinal changes of staff during the innovation process. The discourses of managers on factors that are possibly inhibiting innovation adoption were consistent with empirical results around innovation in banking organisations documented elsewhere [1, 2, 6, 7, 28]. Interestingly, however, features of the external environment hindering innovation such as failure to develop secondary markets, regulatory controls or perceived high sunk (i.e. irrecoverable) investments have been seldom discussed as such within the academic literature. Exploring how when and how external change fosters or hinders innovation in bank markets thus offer potentially rich research opportunities.

6. Conclusion

Research in this article sought to explore the perception about innovation amongst archival sources and managers with direct and indirect responsibilities in bank markets was able to document some important managerial perspectives. A rather loose working framework was adopted to explore the interaction between internal and external environments. Results suggested "innovation" associated with dramatic changes inside and outside banking organisations (i.e. radical change). However, these were few and apart. Instead, it seems more common to depict innovation in banking as a process of incremental change. Interestingly, this process of change should be seen as a continuum that modifies both banks' internal and external environments.

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