

**Evaluating Investments in Electronic Distribution:
The Case of PC Banking**

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Extended Abstract for WISE '98

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1. Introduction

In many industries, the ability to make the right IT investments and manage them effectively is a key driver of performance. However, as more and more IT investment is directed at improving customer value (e.g. improving quality, convenience, or service) rather than simple cost reduction, it is increasingly difficult to evaluate these investments using traditional (e.g. discounted cash flow) and even non-traditional investment evaluation approaches (e.g. real options). In practice, these methodologies tend to overweight measurable and easily quantifiable factors (cost savings, technology costs) leading to systematic underinvestment in projects with hard-to-quantify benefits (Brynjolfsson and Hitt, 1997). Alternatively, uncertainty regarding the magnitude of potential benefits enables overoptimistic assessments of revenue enhancement opportunities to survive scrutiny.

Recently, it has been recognized that the customer data generated as a by product of service interactions is useful for designing new strategies and identifying profitable and unprofitable customers (Clemons and Weber, 1997; Clemons and Thatcher, 1997). While these data can't be used to build a business case for a new project directly (since they are not observable until after the investment is made), they may be able to inform the IT investment decision in at least two ways: 1) they may enable an assessment of the relative magnitude of different types of costs and benefits for similar projects, enabling attention to be focused on quantifying factors that are likely to be key drivers of profitability; 2) they can help define a measurement framework for ongoing assessment of incremental investments in a project by identifying what characteristics need to be tracked over time.

In this study, we examine the evaluating of a specific type of IT investment: the investment by retail banks in electronic banking (which at the current time is PC banking). This type of investment is interesting to study because it is has or will be undertaken by almost all retail banks and is likely to provide insight into the next major investment in electronic delivery of retail bank products: internet-based banking. Moreover, by evaluating PC banking and internet banking we may be able to draw some general conclusions about other transaction oriented

electronic commerce investments in highly competitive, commodity-product environments such as on-line shopping and retail brokerage.

Using a combination of field interviews, surveys and actual customer data from a group retail banks (currently 8 in the study) we can obtain comprehensive measures of the potential and realized cost and benefits from PC banking products. These data will be used to answer three interrelated research questions:

- 1) What are the potential sources of value from PC banking?
- 2) What is the relative magnitude of the various sources of value?
- 3) To what extent does an understanding of the value of PC banking inform future investments in related electronic commerce ventures?

At the time of writing, we have completed interviews with four institutions and have obtained a large sample of customer data from one. While data collection is ongoing, our initial results suggest that while there are numerous potential benefits of PC banking (cost savings, cost avoidance and revenue enhancement) and the average PC banking customer is more profitable, there is little evidence that PC banking is associated with incremental profitability. Almost all the differences in customer characteristics existed before the customers adopted PC banking and the majority of the customers using PC banking are drawn from the banks' existing customer bases. This suggests that banks should proceed cautiously in their investments in on-line banking; it may be more of a competitive necessity (Clemons, 1991) to retain good accounts than a source of incremental profit.

2. Initial Results

1) What are the potential sources of value for PC Banking?

From our interviews, participants and a search of existing banking and related economic literature, we identified a number of possible motivations for investing in PC banking. These break down into several general categories: operational cost savings, revenue enhancement (new

accounts/account deepening/account consolidation), customer retention, product differentiation, and enabling price discrimination.

Our initial results suggest that collectively the banks in our study are expecting almost all of the benefits we have described although each bank has a distinct set of expectations. Two examples drawn from the banks in our study are tabulated below (Y means that the bank expects this sort of benefit):

	Bank A	Bank B
<i>Revenue Enhancement</i>		
New customers (in footprint)	Y	Y
New customers (outside)	Y	
Cross-sell	Y	Y
Consolidate relationship	Y	Y
Deepen relationship		Y
Select high value customers		
<i>Cost Avoidance</i>		
Operational cost reduction	Y	
Reduction of branch expense		Y
Reduce acquisition cost		
<i>Customer Retention</i>		Y
<i>Other Strategies</i>		
Price discrimination	Y	Y
Horiz. (taste) differentiation		
Vertical (quality) differentiation		

Altogether, we see a wide variety of potential sources of value being described by the respondents. While the lack of consistency is striking, it suggests that there are a wide variety of approaches to investing in PC banking. In the next section, we explore the profit impact of PC banking of the various components (to the extent they can be measured)

2) *What is the magnitude of the various sources of value?*

Cost Savings. Our initial analysis suggests that cost savings is not a major component of the value of PC banking. This is primarily due to the relatively low customer penetration rate (1-5% for the banks in our study) combined with high fixed costs if the product is developed in house or high variable costs if a third party service is employed (e.g. Intuit Service Corporation).

Revenue Enhancement. To understand the effects of PC banking on various outcome measures such as number of products (Nprod), account profitability (π) and account balances (Balance), we estimate various regression models of the form:

$$(Nprod, \mathbf{p}, Balance) = \mathbf{a}_0 + \mathbf{a}_{PC}(PCBanking) + \mathbf{a}_{BP}(BillPay) + \sum_{i=age\ groups} \mathbf{g}_{i,age} A_i + \sum_{j=inc.\ groups} \mathbf{g}_{j,income} I_j + \mathbf{g}_{oh} OwnHome + \mathbf{g}_{Mar} Married + \mathbf{e}$$

We thus relate the outcome metrics to the use of PC Banking (PCBanking), the use of extended functionality PC banking that includes bill payment (BillPay), and dummy variables capturing demographic characteristics: age (A), income (I), home ownership (OwnHome), and marital status of primary account holder (Married). In some analyses, we also control for other relevant factors unique to specific analyses.

Our initial results indicate that PC banking customers on average use more products and maintain larger balances than the average customer. For one bank in our study, the average household has 1.4 products while the average PC banking household has 2.5. A small portion of this differences is due to differences in demographics; PC banking customers do tend to represent attractive customer segments (both in terms of age and income), however, demographics per se have little explanatory power and the coefficients on PC banking are only slightly lower when demographic controls are removed. Overall this suggests that while PC banking does indeed appeal to a better demographic segment, demographic difference appear to contribute little to bottom line differences in the value of PC banking.

The baseline regression model also suggests that PC banking customers are on average yield \$50 more revenue contribution based on the banks profitability model. There is almost no apparent incremental value for customers using only baseline PC banking; almost all the value is the

customers who utilize a bill payment option (the majority of the user base). The increase in product usage directly affects relationship profitability. When an additional control for number of products is included (or alternatively controls for asset and liability balances), the explanatory power of the regressions rises substantially. Moreover, the coefficients on PC banking fall to almost zero suggesting that most of the effect is due to increase product usage.

While it appears that PC banking customers are more profitable, it is difficult to know whether they were more profitable before they adopted the product or the incremental account value came after the product was adopted. To capture the distinction between PC banking increasing account value and PC banking appealing to high profit accounts, we examined differences between customers who adopted the PC banking product within a month¹ of opening the account (new PC banking customers) versus those that already had a banking relationship prior to adopting PC banking. Overall, we find that customers who adopt PC banking are in general, less attractive than the customer population, and much less attractive than the existing customers who adopt PC banking. Most of this effect is probably due to the fact that they are new to the bank and new customers tend to have fewer products and lower balances. When time of relationship is included as a control, the differences lessen somewhat. At present, we are obtaining additional data so that new customers and new PC banking customers can be compared directly rather than comparing new PC banking customers to the existing population.

Another analysis to separate the causal relationship between PC banking and profitability is to examine differences in products and account before and after PC banking was adopted. Overall, our results suggest that the amount of account upgrading is relatively small. We are currently awaiting additional data that will allow the separate of the effects between baseline account growth versus differential account growth for PC banking customers.

Overall, initial customer analysis suggests that cross-sell plays some, but not a large role in making PC banking customers more profitable. However, to the extent that high profitability

¹ The one month widow was included for data concerns. The customer information file does not record the PC banking account as being active until the software is actually installed on the customers' PC and a dialup session has been initiated to setup the account. Thus, we allow 1 month following account opening to capture customers who do not immediately install the software.

customers are adopting PC banking it may suggest a role in retention: the product is disproportionately adopted by the bank's best customers.

We are currently investigating further the possibilities for cost savings and cost avoidance and have found that aside from the product being a source of differentiation, little evidence of a deliberate attempt to differentiate the product or engage in price discrimination.

To what extent does an understanding of the value of PC banking inform future investments in related electronic commerce ventures?

Overall, if our initial results are correct, it suggests that investments in PC banking should be made as if they were a competitive necessity – a requirement for retaining accounts but not a tool for increasing customer profitability substantially or in extending the customer base outside the branch area (with the exception of banks where this is their entire strategy).

This should sound a cautionary note for existing businesses considering electronic product distribution. While it may appear to be a highly profitable investment, much of this profitability is potentially an accounting illusion as profitable customers shift from traditional to on-line channels or perhaps more likely, include on-line interaction in their portfolio of interactions with the firm. Careful analysis of customer profitability before and after the adoption of on-line distribution is essential to understanding whether to treat e-distribution as a major growth area or simply a requirement to stay in business.

References (partial list)

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