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DETERMINANTS OF PRICE DISCOUNTS IN BANKING ASP SYSTEMS

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ABSTRACT

In September, 2011, there were 7,436 financial institutions insured by the FDIC. Of these, 6769 (90%) were small with assets less than $1 billion. These small banks and savings institutions are critical components of their local economy, but to survive and succeed, they have to be able to compete with the large financial institutions. Critical to competing is both the ability to deliver set of services expected by their customers and to manage their costs effectively. In both delivering their service and in managing costs, banks rely on their information systems.

Many small banks outsource their IT to an Application Service Provider (ASP). An ASP provides its banks with access to a set of applications ranging from core financial systems to electronic banking. The ASP vendor tracks usage and may charge based on that usage, based on the number of users, or it can charge a single, monthly fixed fee. The fee structure and prices charged are negotiated between the ASP and the bank. For the ASP, how to price the services is a critical issue in winning the business, effectively delivering the service and remaining profitable. Typically, the price is bounded below by the cost of the service and above by the expected maximum the bank will pay. Determining that maximum and then negotiation a deal to extract the maximum gains is an art based on knowledge of the environment and the bank.

The art of pricing at ASPs, however, is highly variable and not well understood. In this study of 255 contracts from an ASP, price discounts, measured as a discount from the vendor's standard price lists, range from 99.5% to 0% (full price is charged). This range of price discounting appears to be unique to IT services, and, to date, has not been examined in the IT field. Although some work has been done on contract structure (e.g., Ma and Seidmann, 2008; Gopal, L, Sivaramakrishnan, K. Krishnan, M. and T. Mukhopadhyay (2003).) and the relationship between prices and service quality contract terms (Domberger, Fernandez and Fiebig, 2000), ASP contracting and the determinants of price discounts has not been addressed.

It is crucial to understand how to set prices and how the contract structure (contract length, pricing structure, and other key terms) and buyer characteristics affect the pricing. For vendors, profitability depends on effective pricing. For banks, outsourcing success depends, at least in part, on controlling costs.

CONTRACTING PROCESS FOR ASP SERVICES

In general, the contracting process follows a common format, but also has significant variation in interaction between the banks and ASP that are omitted from the following outline. A firm decides to possibly contract out a service and selects a set of vendors to whom it sends a

request for proposal (RFP). The set of vendors receiving the RFP is typically a small subset of the potential vendors. The vendors respond with their proposal for services and price. The firm reviews the proposals, selects a vendor and then negotiates a contract. This contract negotiation is a bilateral bargaining process where the expected gains from trade are split.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Bank incumbency is a key factor affecting prices; although explanations for its impact differ based on the focus of the model. For incumbency to lead to higher prices, a firm must be able to segment its market between existing and new banks.

If there are switching costs – something believed to exist and affect pricing in IT [Varian, 2001) – existing banks will be charged a higher price than new banks (Farrell and Klemperer, 2006). In fact, new banks are given a discount to entice them to make an initial purchase and the expected discount increases with switching costs (Chen, 1997). After the initial purchase, the vendor raises prices in subsequent periods.

In the ASP market, vendors can identify existing banks. Additionally, there are switching costs. Switching from one vendor to another entails two possible costs. First, switching vendors requires converting the data from one vendor's systems to the other vendor's systems. Secondly, the users must be trained to use the new system, which leads to:

H1: Existing banks will have higher prices (smaller discounts) than new banks

If incumbents pay more, does the length of their incumbency affect the prices they pay? The length of incumbency is not typically a feature of economic models; so there is no theory to guide the discussion. There is, however, significant variation in the length of the incumbency among the banks, with the length of the association varying from zero (new bank) to 28 years. Without theoretical guidance, we use:

H2: The longer a firm has been a bank, the higher the prices it will pay.

As with the length of the incumbency, contract length may affect prices. Using a long-term contract will reduce the average transaction costs associated with finding a vendor and negotiating a deal. Harris and Holmstrom (Harris and Holmstrom, 1987) show that a non-contingent upper bound to the length of a contract is optimal, but do not address the contract length's interaction with price. Fundenberg and Tirole (Fundenberg and Tirole, 2000) show that long-term contracts can affect the impact of incumbency. A firm (e.g., ASP) could prevent poaching by using a long-term contract, but it will always be better off using short-term contracts. Without theoretical guidance, we use:

H3: Longer contracts will be associated with higher prices

Banks have a choice between bundled, fixed-price contracts and per-unit contracts. With a fixed-fee contract, the firm is able to plan their expenditures, but not necessarily control them. Alternatively, if there is a per-unit contract, the monthly service cost will vary with usage, which does not necessarily correlate with the bank's revenue. A risk averse bank may prefer a fixed price contract and an ASP will offer one if it can charge a premium (this assumes the ASP is risk neutral), but this assumes some banks are risk averse. Thus:

H4: The pricing structure (fixed-fee or per unit pricing) does not affect price.

Bank size, salesperson and firm efficiency may affect bargaining power. In the ASP market, the bank may provide the service itself, internally. The ability to backward integrate limits the amount the ASP can charge. Since larger firms are more likely to have the resources to backward integrate, they have more bargaining power and should receive a lower price.

At the ASP studied, the sales person had significant leeway in pricing the deal. Research in marketing (Woodside and Davenport, 1976) show that the sales person can affect price and price elasticity. This does not address, however, how or if different sales people will consistently differ in their pricing decisions with some "giving away the farm" and others squeezing their bank for their last nickel. It also does not address the bank's ability to negotiate.

Since the final price is the result of a bilateral negotiation, if a sales person is a superior negotiator, it should show up consistently in the prices – especially since the sales person's compensation depends on the value of the deal. Alternatively, a firm that is "better managed" should also have better negotiating skills.

H5: Larger banks will pay lower prices

H6: Sales person will affect price

H7: Better managed firms will pay lower prices

EMPIRICAL MODEL

Multiple regression allows one to compare a large number of contracts while controlling for relevant information that may rationally affect price. It has been used in previous studies to examine the existence of price discrimination (Ladd, 1998) and to identify the factors affecting bargaining power and therefore price discounts (Sorensen, 2003). To test these hypotheses, we use a regression model where the discount provided is a function of the firm, vendor and contract characteristics. Specifically:

$$P = \alpha + \beta_1 I + \beta_2 IL + \beta_3 CL + \beta_4 CT + \beta_5 S + \beta_6 SP + \beta_7 E + \varepsilon \qquad (1)$$

Where: *P* is the percent of list prices paid by the bank. It is calculated as the amount charged divided by the expected charges at full price. *I* represents incumbency and is a binary variable

indicating whether the contract is a renewal or a new bank. *IL* is a measure, in days, of how long the bank has been serviced by the vendor. *CL* measures the contract length in months. *CT* is a binary variable for contract type and indicates whether the contract is fee for service or fixed fee. *S* measures the size of bank as number of accounts in a key master file. *SP* is a set of binary variables for each sales person, and *E* is bank efficiency measured as operating cost/employee. We use this model to test the hypotheses. A significant parameter coefficient with the appropriate sign indicates support for the hypothesis.

DATA

Most of the data in this data set is unique and proprietary. It includes information from 260 contracts and invoices tied to those contracts. The contract data includes the services provided, key pricing terms, length of contract, and how long the purchasing firm had been a bank of the service provider. The invoices include the quantities of these services used, the list price and actual price charged. Some contracts bundled these services together and charged a fixed fee for the services. That data is also included (Because of the sensitive nature of the data, the firm that provided the data asked that anything that could be used to identify it or their banks be disguised. This has been done where it would not affect the results of the analysis). The data included the name of the sales person as well as information on the banks, including a copy of their financial statements.

The key dependent variable is the percent of list price paid by the bank. This is calculated by dividing the actual invoice amount charged the bank by the value of the services used at list prices. Since the vendor provided both a price list and an invoice that specifies actual usage as well as amount charged, calculating the discount was simple. The invoices cover one month of service. The value of services at list prices ranged from $500 to $380,000 and averaged $44,270. Total cost paid as a percentage of list ranged from .5% to 100% and averaged 71%.

The vendor's contract documentation includes when the bank first started using the vendor as well as when the most recent contract was signed. If the original contract date was earlier than the most recent contract date, the bank was coded as an incumbent. The length of time the bank had been a customer was measured in days and equaled the current contract date minus the original contract date. The contract length was coded in months and ranged from 12 to 120.

Different measures of bank's size were evaluated including: assets, revenues, and number of employees. These variables are highly correlated (0.9582 between assets and revenues), so only one was included in the model at a time. A somewhat different measure of size is the number of accounts in a key master file. While measuring size, it also measures the amount of business being done between the bank and the vendor and was taken from the ASP's records.

Different measures of bank efficiency were evaluated. The measures included operating costs in dollars/assets in dollars (asset efficiency), operating costs/number of full-time employee equivalents (employee efficiency) and operating costs/revenue (revenue efficiency).

RESULTS

The model was highly significant (F(7,252)=71.62) with an R^2 of .40. The model was constructed to minimize multicollinearity. The largest correlation between the remaining variables was .586 between renewal and days with vendor, but the variance inflation factor (VIF) was only 1.69, and the average VIF was 1.27. The Ramsey reset test indicated that non-linear transformations of the variables have not been omitted (F(3, 249)= 0.79). The Breusch-Pagan/Cook-Weisberg test showed heteroskedasticity is present (Chi(1)=16.81), so heteroskedastic robust error terms were used to test for parameter coefficient significance.

Five of the model's seven parameters were significant at the .05 level of significance or better . The coefficient for the incumbency variable is positive and significant (0.091; p-value=.009). Bank size measured by the number of accounts provided the best model. Larger banks pay a smaller percentage of list prices. The coefficient for the lnaccount parameter is negative and significant (-0.0356; p-value=.008). The payment structure – fixed fee versus per unit prices – also significantly affected the percent of list paid. The coefficient for fixed fee contracts was positive (0.2415; p-value = 0.0). Finally, the positive and significant coefficients for both the sales person and the employee efficiency parameters imply that bargaining ability matter. The employee efficiency parameter (0.0001, p-value = 0.0) is positive, so operational efficiency (lower operating costs per employee) does translate into better bargaining. The impact, however, is small, with the difference in percent of list prices between the average employee efficiency and the best (lowest) employee efficiency being only .004.

Finally, the length of the incumbency (.000006; p-value = .38) and the length of the contract (.00023;p-value=.736) had no effect on price, so both hypotheses *H2* and *H3* are not supported.

SUMMARY AND CONCLUSIONS

This research examined data associated with 255 contracts between and ASP and its banks to assess the factors affecting the price discount given to the banks. Following economic theory, incumbency, bank size and risk aversion all affect the price discount. The economic theory, however, does not address the relative importance of these factors. In this study, the contract type had more than twice as large an impact on the price discount than did incumbency (0.24 vs 0.09). This greater impact of contract type implies that bank identification – targeting those potential banks that are will want a fixed fee contract – is more important to profitability than signing banks and exploiting the incumbency at contract renewal time.

The largest banks pay 11% of list price less than the average bank, and about 45% less than the smallest banks. Size, thus confers a significant price advantage. Two other factors, not typically addressed by economic theory, that affect the prices are the sales person and the bank's efficiency. Only one of the eighteen salespeople consistently affected the price charged. That sales person consistently extracted higher prices from his or her banks than did the other sales people. There is not data on lost banks and potential banks not signed to determine whether that

sales person drove away business and should be replaced or extracted additional rents and should be emulated.

Firms with lower operating cost per employee – those that are in one sense more efficient – also pay a lower percentage of list prices. It is possible that there is a tautology. The lower price lowers operating costs, which lowers operating cost per employee. Alternatively, firms concerned about operating costs bargain harder and get a better deal.

For companies considering outsourcing or continuing to outsource to an ASP, the existence of price discrimination has implications for management outsourcing to an ASP. The price they pay will depend on how well they negotiation their contract. Since they can expect to pay more when they renew their contract, they may want to negotiate a longer deal. They also need to carefully consider whether having a fixed, predictable monthly fee is worth the increased price that accompanies it. It may be less expensive to spend time forecasting usage and negotiating a per-unit contract. Finally, larger banks need to leverage their size to obtain significant discounts.

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