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Why Do Firms Go Public? Evidence from the Banking Industry

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Abstract: The lack of data on private firms has made it difficult to empirically examine theories of why firms go public. However, both public and private banks must disclose financial information to regulators. We exploit this requirement to explore the going-public decision. Our results indicate that banks that convert to public ownership are more likely to become targets than control banks that remain private. Banks that go public are also more likely to become acquirers than control banks. IPO banks grow faster than control banks after going public, although there is some evidence that their performance deteriorates.

JEL classifications: G32, G21, G34

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Why Do Firms Go Public? Evidence from the Banking Industry

1. Introduction

Why some firms go public and others remain private remains something of a mystery. Though textbooks describe the conversion from private to public ownership as an inevitable consequence of (or necessity for) growth, IPO firms display substantial cross-sectional variation in terms of size, age, profitability, and numerous other characteristics.[1] Though private firms are undoubtedly smaller on average than their public counterparts, examples of very large private companies abound. The family-owned SC Johnson, for example, estimates 2004 sales in excess of $5.5 billion. SC Johnson competes with public rivals such as Procter & Gamble and Unilever in more than 110 countries.[2]

In the last ten years, a flurry of theoretical papers explore the IPO decision and produce many interesting hypotheses, however few of these predictions have been tested. The paucity of empirical evidence, especially for IPOs in the U.S., is primarily due to the difficulty of obtaining data on private firms. Without data on the *ex ante* and *ex post* characteristics of both public and private firms, drawing conclusions about the factors that influence the going-public decision is treacherous. In this paper, we take advantage of the requirement that both public and private depository institutions must disclose financial data to regulators to learn about the causes and consequences of going public.

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[1] Ritter and Welch (2002) describe the primary motivation for most IPOs as, "the desire to raise equity capital for the firm and to create a public market in which the founders and other shareholders can convert some of their wealth into cash at a future date." Kim and Weisbach (2005) study almost 17,000 IPOs from 38 countries and find that 79% of IPO firms raise capital by selling primary shares.

[2] www.scjohnson.com

We use a sample of banking organizations to examine the decision to go public. With this sample, we are able to compare firms that did IPOs to otherwise similar firms that did not. Because all banks must file financial reports, the available data on private banks is not skewed toward large private banks, unusually profitable banks, distressed banks, or any other attribute. The recent history of banking industry also makes it an attractive laboratory to examine IPOs. The active corporate control market in banking makes it possible for us to test theories of IPOs that view control issues as central to the decision to go public. Related to this, many smaller banks – such as the ones that typically do an IPO – believe they must grow to survive, given the consolidation and the economies of scale in the industry.[3]

We use the data on private and public banks to create a matched sample of banks that go public and otherwise similar banks that stay private. We match on asset size, geographic location, and organizational structure since these are all factors that can affect strategy and returns. Using this sample we are able to provide support for several theories of why firms go public.

First, banks choosing to go public differ from matched institutions that remain private on several dimensions. Prior to the IPO, banks that ultimately go public grow faster, earn higher profits, employ more leverage, and invest more of their assets in loans. Together, the results suggest that banks going public are riskier than those that remain private. These findings do not appear to be driven by banks going public to meet minimum regulatory capital standards.

[3] See Gorton, Kahl, and Rosen (2005) on the need to grow to survive and Saunders and Cornett (2003) on economies of scale in banking.

Second, we find that banks that have recently gone public are more likely to be acquired than otherwise similar private banks. This finding emerges from a multivariate logit model with controls for bank size, profitability, and leverage, and the result is robust to changes in our control sample. These results are consistent with the models in Zingales (1995) and Mello and Parsons (1998) which view the IPO as the first stage in a subsequent sale of the firm.

Third, banks going public are also more likely to become acquirers than their peers who remain private, again controlling for factors such as the size, age, and profitability of the bank. This suggests that the motivation for going public may vary dramatically across institutions, with some banks viewing the IPO as the first step in an exit strategy and others using the capital raised to acquire additional assets.

Fourth, IPO banks exhibit weakly deteriorating performance after going public as measured by either return on equity, return on assets, or the ratio of chargeoffs to total loans. This is consistent with Hogue and Loughran's (1999) growth fixation hypothesis. However, we find no evidence that, after going public, IPO banks differ from their privately held counterparts in terms of asset growth.

Fifth, we find some evidence that banks go public following a period of high stock market returns (broadly and for bank stocks particularly), though this result is sensitive to the index used to measure market returns and the pre-IPO event window over which returns are calculated.

In the next section we provide some context for these results by reviewing the theoretical and empirical literature on the decision to convert to public ownership. In the

following section, we describe our data sources and the matching process we use to pair public and private banks. The last two sections of the paper present our results and conclusions.

2. Why Do Firms Go Public?

In this section, we discuss the theoretical and empirical IPO literature with a focus on whether we can use bank IPOs to shed any additional light on the theories of the decision to take a firm public.[4]

2.1. Theory

Any theory of the decision to go public must describe the costs and benefits of public versus private ownership that confront private firms. A simple observation that conducting an IPO involves significant fixed costs, as documented in Ritter (1987), leads to the prediction that bigger firms or firms seeking larger capital infusions will go public. A recent and growing body of literature models a wide range of costs and benefits that influence the IPO decision. One of the earliest papers to examine this question is Zingales (1995). In Zingales' model, an original owner sells shares in a competitive market to dispersed shareholders, thereby capturing the surplus associated with an increase in the value of cash flow rights associated with a future change in control. The owner retains enough shares to retain voting control which subsequently allows the

[4] Some studies in corporate finance drop banks from their samples. This is appropriate if the technique involves looking across industries, since banks have different capital structures than other firms. However, the theories that we test do not put restrictions on the capital structure of a firm. Moreover, regulation does not play much of a role in the day-to-day operations of most adequately-capitalized banks. Bank regulators are primarily concerned with the safety and soundness of banks, and focus much of their attention on

owner to extract some of the eventual buyer's private benefits. Thus, the IPO serves as a precursor to the firm being acquired.

Mello and Parsons (1998) reach a similar conclusion with a different setup. Their model argues that a firm's owner receives valuable information from dispersed investors in the IPO, and that this information increases the value that the owner can obtain from the subsequent sale of a controlling block. Whereas in Zingales the optimality of an initial IPO is conditional on a subsequent buyer's ability to increase the firm's cash flows, the IPO is always best in Mello and Parsons because going public reveals information that determines whether a sale to a new owner increases firm value and that allows the original owner to extract a larger fraction of the surplus.[5]

Banking provides a good opportunity to test theories that center on acquisition activity. Our sample period, 1981-2002, is a period of rapid consolidation in banking. Over the period, the number of banks fell by almost half, largely via bank mergers. This means that merger strategy is likely to be an important factor when considering other strategic opportunities such as an IPO. Note that there is an extra step in the merger approval process in banking relative to unregulated industries. Bank mergers must be approved by bank regulators and the antitrust regulators at the US Justice Department. For all but the weakest institutions, bank regulators focus on the same antitrust guidelines as the Justice Department. The extra hurdle, however, may be one reason that hostile takeovers are rare in banking. To the extent that this affects the decision to go public, it

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under-capitalized banks. Most banks that go public are adequately capitalized, and our results are robust to the exclusion of under-capitalized banks.

[5] Stoughton and Zechner (1998) argue that selling to a large blockholder before the IPO maximizes firm value because of the externality that a large blockholder provides through monitoring. Brennan and Franks

gives bank managers less cause to avoid an IPO since they would have more control over their private benefits than managers of other firms. Thus, it should be easier to pick up IPOs intended to pave the way for a bank to be acquired.

Two papers that emphasize other informational effects on IPO decisions are Chemmanur and Fulghiere (1999) and Subrahmanyam and Titman (1999). A significant cost of public ownership in Chemmanur and Fulghiere's model arises from small investors' (duplicative) costs of learning about a firm, which the firm bears in the form of a lower offer price if it goes public. Their model predicts that a firm goes public when information gathering costs are low or when enough information about the firm has accumulated in the public domain (e.g., as the firm ages).[6] Subrahmanyam and Titman also investigate how information gathering by dispersed investors influences the IPO decision. Their model allows investors to acquire information about the firm that insiders lack and this information improves the firm's investment decisions. When insiders can uncover this "serendipitous information" at low cost, firms go public otherwise they remain private.[7]

Pastor and Veronesi (2005) model the optimal IPO timing decisions of private firms. Firms in their model decide when to exercise a real option to go public, invest proceeds, and begin production. The value of this option rises when expected market returns fall, when aggregate profitability is high, and when uncertainty about future

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(1997) predict that insiders who value control and want to limit monitoring by outside investors will underprice IPOs to create excess demand which permits discrimination against large bidders.

[6] Welch and Ritter (2002) report that with the exception of the Internet bubble period, there is little time series variation in the average age of IPO firms.

[7] Benveniste, Busaba, and Wilhelm (2002) argue that there is an informational externality associated with IPOs because private firms learn from first movers in the IPO market. Investment bankers resolve this

aggregate profitability rises. Among the predictions of their model are that IPO waves caused by declining expected market returns are preceded by high market returns (which are not a function of mispricing, but rather depend on falling expected returns), and similarly, IPO waves driven by increased aggregate profitability follow periods of high market returns. During our sample period, banking went through some very strong and very weak periods of profitability, making it a good industry to test theories of IPO timing based on option value.

There are several theories that we are unable to test using our sample of banks. Boot, Gopalan, and Thakor (2005) envision entrepreneurs trading off the benefits of greater "elbow room" when running a private firm against the higher cost of capital associated with greater managerial autonomy. Most of the empirical predictions of this model are tied to variations in the restrictiveness of corporate governance regimes (making this a good model to test with international data) or to a parameter ρ, a measure of agreement between the entrepreneur and investors about whether a particular investment should or should not be undertaken. Lacking a good empirical proxy for ρ which we could apply to a cross section of banks, we fail to provide any evidence to support or refute this model. Similarly, because banks must disclose a great deal of information whether or not they go public, the banking industry seems an unlikely fit for the model of Yosha (1995), which envisions a small, innovative private firm facing a cost

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externality by using their access to investors to influence going-public firms to share information gathering costs.

of going public in the form of an existing competitor who learns from IPO-related disclosures.[8]

2.2. Empirical Evidence

Lack of data on private firms creates a significant obstacle for researchers attempting to test predictions of the models described above. European scholars have had more success in overcoming this hurdle than their US counterparts. The only published study with a broad sample of public and private firms is Pagano, Panetta, and Zingales (1998; henceforth PPZ). Tracking a sample of almost 20,000 private Italian firms from 1982-1992, they find that the most important driver of the IPO decision is the market-to-book ratio of existing public firms in an industry. Private firms in a particular industry go public when public valuations in that industry are high. High market-to-book ratios can indicate an increase in growth opportunities, or they might simply reflect temporarily high valuations. Supporting the latter view, Italian IPO firms go public after a period of rapid growth and high investment, but not before such a period. Not surprisingly, firm size is the second most important factor in determining which Italian firms go public, with larger firms being more likely to conduct an IPO. PPZ also find evidence that Italian IPOs lead to subsequent control changes. Because institutional features of markets as well as the relative importance of the stock market to the overall economy differ considerably between Italy and the United States, it is not clear whether the results from PPZ extend to the US. For example, the typical IPO firm in Italy is eight

[8] Black and Gilson (1998) view the IPO primarily as an exit strategy for venture capitalists. Our paper is silent on the predictions of their model because very few banks in our sample receive venture backing.

times as large and six times as old as the average IPO in the United States, despite no compelling evidence that listing costs are significantly higher in Italy.

Two working papers examine IPO decisions using German data. Fischer (2000) examines a sample of private German firms, some of which ultimately listed on the short-lived *Neuer Market*. The data on private firms used in this study come from *Hoppenstedt*, a German financial data provider. Fischer does not specify exactly how *Hoppenstedt* gains access to private firm data, but he does acknowledge a very large size bias in their figures. The control group of private firms is, on average, seven times larger than the IPO group. In addition, firms in this sample use a mix of accounting standards, with the private companies using the German Company Code and the IPO firms using a mix of that as well as IAS and GAAP. Factors that appear to prompt private firms to go public in this study are high capital expenditures, high intangible assets, and growth in sales. Fischer finds that the holdings of corporate insiders, relative to the holdings of other blockholders prior to the IPO, actually increases after the IPO, and he finds no evidence that IPO firms are more likely to be acquired than private firms.[9] Thus, he concludes that the IPO is not a mechanism that facilitates a later sale.

Boehmer and Ljundqvist (2004) study a sample of private German firms that announced an intention to go public between 1984 and 1995. They use a hazard model to measure the effects of various factors on IPO timing, conditional on the announcement of intent. Increasing the likelihood of an IPO are increases in profitability, sales, earnings growth, or stock market returns. Family-run companies are less likely to complete IPOs.

[9] The incidence of M&A activity in Germany is far less than in the U.S., so this finding may be driven by characteristics of the larger market environment.

Comparing their sample firms to a broad sample of public and private German firms covered by Worldscope, Boehmer and Ljundqvist find that firms announcing their intent to do an IPO grow faster than other firms both before and after the announcement, though growth does slow a little after the announcement. The median age of IPO firms in their sample is 38 years, a little more than 5 times the age of IPO firms in the US. As with PPZ, it is unclear how these results would transfer to the very different market environment in the US. In addition, because Boehmer and Ljundqvist lack data on private firms that did not announce their intent to go public, they cannot address why some private firms make these announcements while others do not. Boehmer and Ljundqvist exploit their time series to determine which factors raise or lower the likelihood of completing an IPO conditional upon an initial announcement, but the thrust of our paper is on the more primitive initial decision.

Interesting evidence on the motives for going public in the U.S. is provided in a working paper by Chemmanur, He, and Nandy (2005), who use plant level data from the U.S. Bureau of Census to study public and private manufacturing concerns. They study the performance of firms that go public, both in absolute level and compared to the performance of private firms over the same period. The performance measure they choose to emphasize is total factor productivity. They find that larger and more rapidly growing firms are more likely to go public, as are firms with greater productivity and higher market share. However, Chemmanur, He, and Nandy do not examine whether IPO firms are more likely to be acquired or to become acquirers themselves relative to private firms, which is a central focus of this paper.

Helwege and Packer (2004) exploit the SEC's requirement that private firms with either public debt or a large number of shareholders must file public disclosures. The sample described in their working paper contains very large firms with high leverage. They track 27 firms that complete an IPO after 1996 and another 15 firms that express an interest in doing an IPO but did not complete one. Like PPZ, Helwege and Packer find that industry market-to-book ratios are important drivers of firms' IPO decisions, and they interpret this as being consistent with the windows of opportunity hypothesis. They also find that the presence of an outside equity block raises the odds of a successful IPO as predicted by Black and Gilson (1998). They find no difference in merger activity between the firms that remain private and those that go public, so in their data it does not appear that the IPO is an initial step in the ultimate sale of the firm.

It is natural to worry that sample selection biases could drive some of Helwege and Packer's findings. For example, in their sample of large, highly levered firms, they find that firm age is inversely related to the probability of an IPO, which is at odds with conventional wisdom and the results in PPZ. Similarly, their proxies for growth opportunities do not have explanatory power, perhaps because there is little variation in growth opportunities among mature firms.

Several papers examine *ex post* characteristics of formerly private firms in an attempt to test some of the theories mentioned above. Hogue and Loughran (1999) examine the post-IPO stock returns (as well as some accounting performance measures) of banks and thrifts that go public from 1983-1991. Comparing these firms to existing public financial institutions (and in some cases to the aggregate banking sector which is dominated by public firms), Hogue and Loughran find unusually poor performance after

the IPO. They argue that investors fixate on these firms' pre-IPO growth figures, which are above average before the IPO.

The insights gained from Hogue and Loughran into the IPO decision are limited not only because they do not draw on a sample of private firms, but also because their sample of IPOs includes a large fraction of thrift institutions. For these firms, an IPO is a joint event in which the thrifts convert from a mutual to a stock form of organization while simultaneously switching from private to public ownership. Therefore, it is difficult to disentangle the factors related to each of these organizational changes. Moreover, Esty (1997) documents that during the 1980s, regulators actively encouraged thrifts to convert from mutual to stock ownership because they believed that stock-based thrifts would take fewer risk than mutual thrifts. Esty argues that the stock organizational structure provides managers of thrifts with greater risk-taking incentives because of the call-option characteristics of levered equity. Consistent with this view, Esty finds that after a conversion from mutual to stock ownership, thrifts invest more in risky assets and exhibit greater profit variability. Therefore, to the extent that Hogue and Loughran's post-IPO performance results are influenced by the large number of thrifts in their sample, the simultaneous shift from mutual to stock ownership encouraged by regulators and from private to public ownership clouds the interpretation of their findings. Clearly most private firms that do IPOs do not begin as mutual organizations.

Two other studies that examine *ex post* characteristics of IPO firms are Brau, Francis, and Kohers (2003, henceforth BFK) and Ciccotello, Field, and Bennett (2001, henceforth CFB). BFK gather data on two types of private firms – those that go public via an IPO and those that are acquired by a public company. The sample construction

allows them to examine, conditional on a desire to sell stock, the factors that influence one method of selling versus another. Focusing on broad external influences rather than firm-specific factors, BFK find that firms are more likely to conduct an IPO when the private firm's industry is more concentrated, when the private firm is high tech, when the IPO market is "hotter" than the takeover market, and when the cost of debt is high. With respect to deal characteristics, they show that post-deal insider ownership is higher and liquidity is lower in firms that choose the IPO route. Though the choice of IPO versus takeover is quite interesting, BFK's research design does not allow them to assess whether a firm's decision to undertake an IPO might be part of a larger plan to sell the firm to an acquirer later.

CFB examine 36 thrifts that go public from 1988-1992, some of which are subsequently acquired and some of which remain independent. They also construct a sample of 73 thrifts that convert from mutual to stock ownership and subsequently sell out to an acquirer without doing an IPO first. CFB investigate how thrifts that conduct IPOs and subsequently sell out differ from those that remain independent, and they ask why some firms that sell out to an acquirer go through an IPO first when a private sale is possible. They find that acquired thrifts that do not go public first are smaller, perhaps because fixed IPO costs are prohibitive for small firms. In addition, prior to the IPO, thrifts that ultimately sell to acquirers are less risky than those that stay independent. As with many of the studies cited above, CFB do not begin with a random sample of private firms. The problem of interpreting the joint "IPO and mutual-to-stock" event and the regulatory "push" that thrifts received as financial conditions in the industry deteriorated

in the late 1980s and early 1990s makes it difficult to know the extent to which these results provide support for theories such as Mello and Parsons (1998).

Lastly, Brau, Ryan, and DeGraw (2005) attempt to uncover the motivations driving firms' decisions to go public by conducting surveys of 380 Chief Financial Officers of firms that went public during 1996-2002. The study concludes that CFO opinions support two motivations for going public: (1) the desire to increase the firm's visibility and reputation and (2) market timing. The answers to survey questions designed to explore control-related motivations for the IPO are not consistent with firms going public to enable subsequent control changes. CFOs also report that a significant concern about going public is disclosure of confidential information. Presumably disclosure related concerns play a smaller role in the banking industry given the significant disclosure requirements imposed on private and public institutions.

In addition to all of the standard concerns that one might raise about drawing conclusions from survey evidence, Brau, Ryan, and DeGraw do not examine why some firms chose not to go public. Rather, only CFOs of firms that had already gone public received surveys to complete. As with many of the other papers reviewed here, it is not clear how the firms going public compare to their private counterparts. It is the ability to study an unbiased sample of private firms and compare those that go public to those that remain private that constitutes the primary advantage of our bank-focused approach.

3. Data

Our ability to observe both public and private firms derives from the requirement that financial institutions disclose balance sheet and income statement figures to regulators. To build our sample, we begin with the Thomson Financial Securities Data, SDC Platinum new issues database. From SDC we extract all firm-commitment IPOs from 1981-2002 by banks and bank holding companies. This yields a sample of 59 bank IPOs and 181 bank holding company IPOs.[10] For reasons mentioned above, we do not include in our sample the 168 thrift IPOs that took place during this period.

Data on banking organizations come from the Call Reports of Income and Conditions that banks and bank holding companies (BHCs) are required to submit. We are able to match the SDC data to the Call Report data for 140 IPOs, of which 25 are banks and 115 are BHCs. This constitutes our base sample, although in the tables below the sample may shrink due to missing data required for some of our tests. Missing data is often an issue for the BHCs because frequently the holding company structure did not exist prior to the IPO. We address this problem by constructing an artificial holding company structure to backfill the data for BHCs that own a single bank.[11]

To construct a control sample of private institutions, we match based on size, location, and organizational structure. We match on size because large banks may compete in different ways and in different markets than small banks.[12] In addition, many of the costs of going public are fixed, making it less likely that very small banks will find

[10] In most of what follows, we will use the term bank to refer to both banks and bank holding companies.
[11] We use the Call Report data on the bank to backfill.
[12] See, for example, Berger, Rosen, and Udell (2005) which discusses how bank size affects competition for small business lending.

an IPO feasible. We match on location because competition in banking, especially for the smaller banks that do an IPO, is largely local in nature. Both the level of competition and the economic conditions of bank customers are likely to vary significantly across the country. Finally, we match on organizational structure to capture the differences in investments available to stand-alone institutions and banks with a holding company structure.

For each banking organization that goes public, we select up to five matching firms. We require that matching firms be in the same state as the IPO firm and have the same corporate organization (bank or BHC). For stand-alone institutions and BHCs with only a single bank, we also require matching firms to be in a rural area if the IPO firm is in a rural area or in an urban area if the IPO firm is in an urban area.[13] If a firm is less than five years old, we also require all matching banks to be within five years of the IPO firm's age (since there is evidence that de novo banks are different than established banks). Once this is done, we choose up to five matching firms based on size (total assets). We choose the firm that is closest in size plus up to four other matching firms conditional on those firms being within 50% of the size of the IPO firm. (Henceforth, unless otherwise noted, 'banks' refers to both stand-alone institutions and BHCs.)

In our empirical analysis below, we compare the IPO banks to both the entire control group and to a control group that includes only the single closest match for each IPO bank. This bank, which we refer to as the best control, is the one with total assets closest to that of its matching IPO bank in the year prior to the IPO.

[13] We do not do this for BHCs that own multiple banks since the BHC may be have banks and branches in both rural and urban areas.

4. Results

Table 1 lists descriptive statistics for both our IPO banks and the private control institutions. By design, the IPO banks and controls are similar in size (assets). In the year prior to the IPO, banks that go public grew faster than those that remained private, reminiscent of the result for Italian firms obtained by Pagano, Panetta, and Zingales (1998; henceforth PPZ). In terms of profitability and leverage, IPO banks and their control banks appear quite similar, while the IPO banks' asset portfolios tilt more heavily toward loans than their peers' portfolios. IPO banks also are younger than private banks and have more branches.

4.1. Which Banks Go Public and Which Remain Private?

In this section, we examine how the probability of going public is affected by bank characteristics. In Table 2, we report results from a logistic regression on the characteristics that are associated with a firm going public. We include one observation for each IPO firm for the year prior to when it goes public and one for each control firm for the year prior to the one in which its matched IPO firm goes public. The basic model is

IPO bank = f(*log total assets, asset growth rate, return on assets (ROA), equity-to-assets ratio, loans-to-assets ratio, bank age, young bank dummy, bank dummy, branches, branches per market, deposits per branch*)

where *IPO bank* is a dummy variable that equals one for IPO banks and zero for control banks. The independent variables in the regressions include bank size and growth rate;

measures of profitability and risk; age of the bank; and bank branch and deposit characteristics.

The first thing to note is that with the full sample, we find larger banks are more likely to go public. This may seem surprising, since we match based on size, but it reflects the fact that some of the controls differ significantly in size from the IPO bank. This is one reason why we run all of our tests on the sample that includes only the best controls. For the best control sample, the coefficient on bank size is insignificant. In addition to the role of size, we find that faster growing firms are more likely to go public, consistent with prior work.

Banks with higher profits and more leverage are more likely to go public. The coefficients on *ROA* and *equity-to-assets ratio* in Table 2 are positive and significant. A bank may be more likely to go public after a period of strong profitability since it may allow the bank to get a better price. More levered banks have less equity available to expand, so it also not surprising that they are more likely to go public. IPO banks also have asset portfolios more heavily tilted towards loans.

Chemmanur and Fulghiere (1999) predict that firms go public when more information about them has accumulated in the public domain or when the costs that investors bear to gather information declines. Of course information gathering costs are difficult to observe. In the logistic regression we include several variables intended to proxy for costs of information gathering. The first is *bank age* (as well as *young bank dummy*). Presumably investors have more knowledge about a firm the longer is its operating history. However, we find that newer banks, whether measured by the age of the bank or the young bank dummy, are more likely to go public. We also conjecture that

investors have more information about banks with more branches or more branches per market. The coefficients on these variables do not tell a consistent story, however. Banks with more total branches are more likely to go public, but banks with more branches per market are less likely to go public.

4.2. Do Banks Go Public to Sell Out to an Acquirer?

Several theories of the going public decision postulate that firms conduct IPOs to facilitate a subsequent sale to an acquirer. These predictions run contrary to the more conventional wisdom that firms go public to raise equity to finance growth. The banking industry may be uniquely well suited to test these theories due to the rapid pace of bank mergers and acquisitions during our sample period. With the number of banks shrinking rapidly, it seems plausible to assume that an owner of a private bank would recognize the significant probability that the bank might be purchased by another institution and would consider how going public might affect the chances of being acquired and the price offered in any acquisition attempt.

In Table 3, we report estimates from logistic regressions in which the dependent variable equals one if a bank (either the IPO bank or its controls) is acquired within four years of the IPO date. The main variable of interest is *IPO bank*, a dummy that is one if the bank did an IPO and is zero if the bank is part of the matched sample. The logistic model includes controls for bank size, profitability, leverage, and bank age. We include a salary measure as a proxy for private control benefits and an indicator variable equal to one if a bank itself had made an acquisition in recent years. Finally, for those banks that conducted IPOs we include measures of the fraction of shares sold and the amount of proceeds raised in the IPO. It turns out that, as shown in Table 3, none of these variables

help to distinguish banks that become takeover targets from those that remain independent. The only variable with a significant link to the probability of being acquired is the IPO dummy. Banks that went public are much more likely to become takeover targets themselves than are the privately-held control institutions. This is true when we include all the controls or when we restrict attention to only the best controls, and whether or not we include year dummies.

Banks may also decide to go public in order to may future acquisitions easier. There are several ways that an IPO can make it easier for a bank to make an acquisition. The bank can use the capital it raises in the IPO to finance all or part of an acquisition. In addition, going public may give the bank a more acceptable currency for a stock-financed acquisition. The owners of the target bank may prefer the relatively liquid stock of a publicly-traded bank to the less liquid stock of a private bank. To test whether the IPO is used to facilitate acquisitions, Table 4 reports estimates from logistic regressions estimating the probability that a bank becomes an acquirer. The logistic models reported in Table 4 use the same set of covariates as the model for becoming a target. We find that IPO banks are more likely to be acquirers than are banks in the control samples. This is true when we include all the controls or when we restrict attention to the best control banks, and whether or not we include year dummies.

There are several other factors that affect the probability of making an acquisition. Consistent with conventional wisdom, larger banks are more likely to be acquirers. Note that the coefficient on the log of total assets is at best marginally significant when we drop all but the best control banks. This is not surprising, since in these regressions we match banks most closely on size. There is also evidence that banks

paying lower salaries are more likely to be acquirers. One explanation for this is that these banks are more efficient than their rivals. Finally, among the IPO banks, those that raise more capital in the offering are more likely to make acquisitions in subsequent years. This is consistent with banks using capital raised in the IPO process to finance their acquisition strategy.

The results in Tables 3 and 4 suggest that IPOs can be a part of a larger merger strategy for a firm, regardless of the role they will play in the merger. The result in Table 3 that IPO banks are more likely to be acquired is consistent with the hypothesis that firms go public with a subsequent sale in mind (e.g., Zingales, 1995, and Mello and Parsons, 1998). The results in Table 4 support the intuition that an IPO bank raises money to finance growth, albeit growth through acquisition.

4.3. Do Banks Go Public in Hot Markets?

Loughran and Ritter (1995), Ritter and Welch (2002), and others argue that firms may choose to go public when the market places a particularly high value on their shares. PPZ find that Italian firms go public when the market-to-book ratios of existing public firms in the same industry are high. Though our data do not allow us to make cross-industry comparisons in market valuations, we can look at the time series to see if banks go public when the market is hot. In Table 5 we test the market timing hypothesis by comparing returns on various stock indexes for the periods preceding bank IPOs to

average returns across the entire sample period. If banks go public to time the market, then we expect above-normal market returns leading up to the IPO.[14]

Table 5 presents results for four market indices over several horizons. The four indices we include are a value-weighted portfolio of all banks listed on CRSP, a portfolio of small banks, and the value-weighted and equally weighted CRSP indexes. Table 5 reports gross returns calculated by taking the average daily return over the given pre-IPO horizon. We calculate pre-IPO returns for each IPO bank and then take averages across all IPO firms. Given the lead time required to execute an IPO, we examine index returns over several pre-IPO event windows and compare them to the average (annualized) daily return over our entire sample period. The t-tests in Table 5 assess whether the average daily return in the event period differs from the average daily return for the entire sample.

There is some evidence of a hot market effect, but the results are sensitive to the stock market index and event horizon chosen. For example, the top panel shows that the annualized daily return in the year leading up to IPOs is 21.6 percent for the CRSP value-weighted index, whereas the annualized daily return on the same index for the entire sample period is just 14.3 percent. That difference is highly significant, but differences for the other three market indexes are insignificant in the year leading up to an IPO.

Other event windows in Table 5 show mixed results. Our strongest evidence for a hot market effect emerges when we measure average daily returns from nine months to three months prior to the IPO. Over that pre-event horizon, the average daily returns are

[14] In a sense, this test is biased against finding that IPOs occur in hot markets because the average returns for the benchmark indexes include some hot and cold periods. An alternative test could compare benchmark returns prior to periods of high IPO volume to returns during low IPO volume periods.

above normal for three of our four market indexes. However as was the case in the 1-year pre-event horizon, only the CRSP value-weighted index return shows any sign of a market timing effect in the horizon covering the six months leading up to the IPO.

4.4. How Does the Financial Performance of IPO Banks Differ from Private Banks

If firms go public to raise capital which enables them to pursue profitable growth opportunities, then we might expect IPO banks to grow faster and to improve profitability after going public. A somewhat surprising result from PPZ is that firms in Italy appear to go public after a period of rapid growth, not before one. In this section, we examine various financial performance measures for public and private banks, before and after the IPO, to see how financial performance varies across institutions before and after the IPO.

Table 6 shows regression results for five different performance measures: return on assets (ROA), return on equity (ROE), leverage (the equity-to-assets ratio), ratio of chargeoffs to loans, and asset growth. To estimate these regression models, we pool the data for IPO banks and their controls across years (the best control only results are in the lower panel). We gather data from up to 3 years prior to the IPO for up to 5 years afterwards. By requiring banks to have at least one year of pre-IPO data, we eliminate banks that are created at the time of the IPO. We also require two years of post-IPO data.[15]

As above, our key variable is *IPO bank*, a dummy variable equal to 1 in all years for banks that conduct IPOs and zero in all years for control banks. Since we are examining performance over time we have to control for changes in economic conditions.

We do this in two ways. The first is to create dummy variables for before and after the bank IPO. *Pre-IPO* is a dummy that takes the value 1 for IPO banks in the years prior to their IPO and for the control banks in the years before their matched IPO banks go public. In the IPO year and subsequently, the dummy is zero. *Post-IPO* is defined similarly for the years following the IPO (so the IPO year is the omitted date). We also include year dummies to control for macro effects.

To determine whether the performance of IPO banks changes relative to the matched sample in period following the IPO, we use the interaction term *IPO bank * post-IPO*, the product of the IPO dummy and the post-IPO dummy. Since performance might be affected by the amount of cash raised in the IPO (since we know this affects acquisition activity), we include *percent sold * post-IPO* and *new cash-to-equity * post-IPO*, which allow us to determine whether banks that give up more control or raise a larger share of new equity perform differently than other IPO banks.

The results reported in Table 6 suggest that the profitability of IPO banks may decline relative to their peers after the IPO. When we include all control banks, the coefficients on *IPO bank * post-IPO* are significantly negative for both ROA and ROE. When we tighten the focus to the best controls only, the magnitudes of the coefficients change very little, but the statistical significance is weaker. The drop in significance is likely due to the loss of two-thirds of our observations.

We find a little evidence that IPO banks differ in profitability from control banks prior to the IPO, consistent with the univariate results in Table 1. The coefficients on the

[15] Control banks are only in the sample for the years where their matched IPO bank has data. Also, for the best control results, we use the control bank with at least one year of pre-IPO data and two years of post-

IPO bank dummy are weakly significant when focusing on ROE and including all control banks. In addition, the coefficients are smaller in magnitude than those on *IPO bank * post-IPO*.

Not surprisingly, going public reduces leverage for IPO banks. Raising new equity capital increases the equity-to-assets ratio unless the bank immediately uses the capital for something such as an acquisition. One question is whether a bank does an IPO because regulators pressure it to add equity. To address the concerns that IPO banks might be going public to meet minimum regulatory capital standards, in unreported regressions we exclude banks that are close to or below minimum capital thresholds. Leaving these firms out of our sample does little to change our results.

We find at most weak evidence that loan losses rise after an IPO. The coefficient on *IPO bank * post-IPO* is weakly significant when we include all controls, but it is not significantly different from zero for the best control sample. Consistent with the results in PPZ, we find no evidence that IPO banks experience faster asset growth after going public.

The coefficient on *new cash-to-equity* indicates how performance measures are correlated with the amount of money raised in the IPO for those banks that went public. The interaction term on this variable indicates whether the performance measures changed after the IPO. A robust result is that more profitable institutions raise more money in their IPOs, but there was no correlation between money raised and subsequent changes in performance. The amount of money raised in the offering does not appear to

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IPO data that is closest in size to the IPO bank.

be strongly correlated with leverage, loan charge offs, or asset growth rates before or after the IPO.

Our results in this section provide some evidence against the hypothesis that banks go public to undertake profitable investment opportunities. Banks do not grow faster after going public, and there is some evidence that their profitability deteriorates.

5. Summary

In this paper we propose that a sample of private banks and bank holding companies can shed light on the going public decision. Obtaining empirical results in this area is a challenge because most private firms do not disclose much information. Regulators require that all banks, both public and private, disclose their financial results, and this requirement enables us to compare banks that go public to those that remain private, an essential comparison in any test of a theoretical model of the IPO decision.

One interesting finding is that banks that choose to go public face a higher probability of being acquired in subsequent years than do firms that remain private. This result, which is predicted by several theoretical models, is in contrast to findings of other empirical papers such as Fischer (2000), Helwege and Packer (2004), Brau, Ryan, and DeGraw (2005), and Brau, Francis, and Kohers (2003).

But going public also raises the probability that the IPO bank will subsequently acquire other banks. This supports the more conventional view of IPOs as capital raising events designed to finance future growth. However, our analysis of financial performance metrics before and after the IPO indicates that IPO firms on average do not grow faster after going public, and their profitability deteriorates. This may be because

banks choose when to go public based on how well they have performed recently. We find evidence of rapid growth and high profitability leading up to the IPO, however since we use accounting measures of profitability, it possible that we are capturing the effects of banks manipulating their accounting data to inflate pre-IPO profit at the expense of future profitability.

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Table 1
Descriptive statistics for IPO bank vs. control banks

This table presents descriptive statistics for IPO banks and the matched sample of control banks in the year of the IPO. Asset growth rate is the current year's total assets divided by the prior year's total assets. ROA (return on assets) is net income divided by total assets. ROE (return on equity) is net income divided by shareholders' equity. The equity-to-assets ratio is shareholders' equity divided by total assets. The loans-to-assets ratio is total loans divided by total assets. The chargeoffs-to-loans ratio is loan chargeoffs divided by total loans. Bank age is the age of the bank in years at the time of the bank IPO date. The young bank dummy is equal to 1 for banks that are less than 3 years old at the bank IPO date. The bank dummy is equal to 1 for stand-alone banks and 0 for bank holding companies. Branches is the number of branches for a bank. Branches per market is the average number of branches per local market for a bank. Deposits per branch is the average amount of deposits per branch for a bank. Target is equal to 1 for banks that are acquired within four years and 0 otherwise. Salary per employee is the total salaries divided by the total number of employees. Prior acquirer is equal to 1 for banks that have completed an acquisition within the prior four years and 0 otherwise. Percent sold is equal to the IPO primary shares sold divided by the post IPO total shares outstanding for IPO banks and 0 otherwise. New cash raised is IPO proceeds divided by shareholder's equity prior to the IPO. New cash-to-equity is total IPO proceeds divided by the post IPO shareholder's equity for IPO banks and 0 otherwise. With respect to t-tests of equal means between control banks and IPO banks, ***, **, and * indicate significance at the 1, 5, and 10 percent level respectively.

	Means		
	IPO Banks	All Control Banks	Best Control Banks
Log total assets	8.358	8.200 ***	8.260 *
Asset growth rate	0.555	0.127 ***	0.160 ***
ROA (percent)	1.057	1.106	1.265
ROE (percent)	11.203	9.489	10.179
Equity-to-assets ratio (percent)	9.038	8.868	9.027
Loans-to-assets ratio (percent)	62.021	56.058 ***	55.690 ***
Chargeoffs-to-loans ratio (percent)	0.375	0.543 **	0.440
Bank age	5.941	8.268 ***	7.866 ***
Young bank dummy	0.361	0.256 **	0.294
Bank dummy	0.126	0.114	0.126
Branches	7.269	5.522 **	6.849
Branches per market	4.348	3.827	4.539
Deposits per branch in millions	0.056	0.048	0.059
Salary per employee in thousands	32.217	32.065	33.781
Prior acquirer	0.09	0.09	0.08
Percent sold	0.288	-	-
New cash raised in thousands	10606.640	-	-
New cash-to-equity	0.727	-	-

Table 2
What factors make a bank go public?

This table presents logistic regressions of the incidence of going public for the IPO banks and the matched sample of control banks. The dependent variable is equal to 1 for IPO banks and 0 for control banks. Asset growth rate is the current year's total assets divided by the prior year's total assets. ROA is net income divided by total assets. The equity-to-assets ratio is shareholders' equity divided by total assets. The loans-to-assets ratio is total loans divided by total assets. Bank age is the age of the bank in years at the time of the bank IPO date. The young bank dummy is equal to 1 for banks that are less than 3 years old at the bank IPO date. The bank dummy is equal to 1 for stand-alone banks and 0 for bank holding companies. Branches is the number of branches for a bank. Branches per market is the average number of branches per local market for a bank. Deposits per branch is the average amount of deposits per branch for a bank. The regressions are estimated using robust standard errors. With respect to t-tests of parameter estimates equal to zero, ***, **, and * indicate significance at the 1, 5, and 10 percent level respectively.

	All controls	Best controls	All controls	Best controls
Log total assets	1.314**	0.519	1.210*	0.444
Asset growth rate	0.733***	0.546***	0.733***	0.611***
ROA	0.572**	0.676**	0.648**	0.783**
Equity-to-assets ratio	-0.424***	-0.494***	-0.445***	-0.563***
Loans-to-assets ratio	0.043***	0.039***	0.042***	0.038***
Bank age	-0.040*	-0.028	-0.039*	-0.025
Young bank dummy	0.854**	1.036*	0.935**	1.141**
Bank dummy	0.823	0.436	0.769	0.433
Branches	0.060*	0.036	0.070**	0.057
Branches per market	-0.153*	-0.107	-0.176**	-0.152
Deposits per branch	-0.595	-1.283	-0.339	-0.972
Number of observations	374	159	369	158
Pseudo R-square	20.7%	18.3%	21.4%	19.4%
Year dummies included	NO	NO	YES	YES

Table 3

Is a bank that goes public more likely to be acquired than a bank that stays private?

This table presents logistic regressions of the likelihood that a bank is acquired in the next four years. The sample includes IPO banks plus the matched controls as of the year of the IPO. The dependent variable is equal to 1 for banks that are acquired in the following four years and 0 otherwise. ROA is net income divided by total assets. The equity-to-assets ratio is shareholders' equity divided by total assets. Bank age is the age of the bank in years at the time of the bank IPO date. The young bank dummy is equal to 1 for banks that are less than 3 years old at the bank IPO date. The bank dummy is equal to 1 for stand-alone banks and 0 for bank holding companies. Salary per employee is the total salaries divided by the total number of employees. Prior acquirer is equal to 1 for banks that have completed an acquisition within the prior four years and 0 otherwise. Percent sold is equal to the IPO primary shares sold divided by the post IPO total shares outstanding for IPO banks and 0 otherwise. New cash raised is IPO proceeds divided by shareholder's equity prior to the IPO. The regressions are estimated using robust standard errors. With respect to t-tests of parameter estimates equal to zero, ***, **, and * indicate significance at the 1, 5, and 10 percent level respectively.

	All controls	Best controls	All controls	Best controls
IPO bank	1.519***	1.814***	1.540***	2.082***
Log total assets	-0.582	-0.478	-0.355	-0.638
ROA	-0.059	-0.380	-0.095	-0.297
Equity-to-assets ratio	-0.094	-0.007	-0.067	-0.049
Bank age	-0.011	-0.005	-0.008	-0.033
Young bank dummy	-0.289	-0.504	0.045	-0.365
Bank dummy	0.119	0.034	-0.018	0.273
Salary per employee	-0.003	-0.014	0.000	-0.032
Prior acquirer	0.181	0.421	-0.122	0.101
Percent sold	-0.289	-0.716	-0.294	-0.548
New cash raised	-0.691	-0.617	-0.741	-1.193
Number of observations	547	233	499	207
Pseudo R-square	5.3%	9.8%	9.9%	16.6%
Year dummies included	No	No	Yes	Yes

Table 4

Is a bank that goes public more likely to acquire another bank than a bank that stays private?

This table presents logistic regressions of the likelihood that a bank makes an acquisition in the next four years. The sample includes IPO banks plus the matched controls as of the year of the IPO. The dependent variable is equal to 1 for banks that acquire another bank in the following four years and 0 otherwise. ROA is net income divided by total assets. The equity-to-assets ratio is shareholders' equity divided by total assets. Bank age is the age of the bank in years at the time of the bank IPO date. The young bank dummy is equal to 1 for banks that are less than 3 years old at the bank IPO date. The bank dummy is equal to 1 for stand-alone banks and 0 for bank holding companies. Salary per employee is the total salaries divided by the total number of employees. Prior acquirer is equal to 1 for banks that have completed an acquisition within the prior four years and 0 otherwise. Percent sold is equal to the IPO primary shares sold divided by the post IPO total shares outstanding for IPO banks and 0 otherwise. New cash raised is IPO proceeds divided by shareholder's equity prior to the IPO. New cash to equity is total IPO proceeds divided by the post IPO shareholder's equity for IPO banks and 0 otherwise. The regressions are estimated using robust standard errors. With respect to t-tests of parameter estimates equal to zero, ***, **, and * indicate significance at the 1, 5, and 10 percent level respectively.

	All controls	Best controls	All controls	Best controls
IPO bank	0.910**	1.298***	0.895**	1.316***
Log total assets	1.620***	0.929*	1.599***	0.717
ROA	0.043	0.134	-0.027	0.162
Equity-to-assets ratio	-0.040	-0.008	-0.055	-0.027
Bank age	-0.030	0.022	-0.051	-0.012
Young bank dummy	-0.206	-0.455	-0.218	-0.492
Bank dummy	-0.292	-0.203	-0.250	0.110
Salary per employee	-0.031**	-0.031*	-0.035*	-0.049*
Prior acquirer	0.029	0.013	-0.022	0.431
Percent sold	-1.366	-1.490*	-1.451*	-1.829**
New cash raised	0.720***	0.648***	0.742***	0.737***
Number of observations	547	233	525	225
Pseudo R-square	12.4%	13.7%	13.7%	17.3%
Year dummies included	No	No	Yes	Yes

Table 5
Returns prior to IPOs compared to average daily returns

This table presents gross average daily returns prior to IPOs compared to average daily returns in the entire sample period. The table shows gross annualized average daily returns. The t-tests refer to the difference in the mean return during pre-IPO event windows compared to the mean return throughout the sample period.

Index	Time period	Mean	t-test	Std Dev
Bank	IPO - 1 year --> IPO-1 day	1.281	1.561	0.195
Small bank		1.267	-0.276	0.241
CRSP EW		1.266	-0.914	0.201
CRSP VW		1.216	7.831	0.133
Bank	IPO - 9 mns --> IPO - 3 mns	1.327	3.083	0.317
Small bank		1.324	2.019	0.37
CRSP EW		1.311	1.291	0.359
CRSP VW		1.239	5.857	0.238
Bank	IPO - 6 mns --> IPO - 1 day	1.262	0.077	0.292
Small bank		1.252	-0.808	0.352
CRSP EW		1.266	-0.583	0.328
CRSP VW		1.211	4.428	0.224

Overall averages	Time period	Mean	Std Dev
Bank	Average 1 year return	1.26	0.217
Small bank		1.272	0.286
CRSP EW		1.279	0.245
CRSP VW		1.143	0.168

Table 6

OLS panel regressions of pre- and post-IPO performance for IPO banks vs. control banks

This table presents ordinary least squares panel regressions of pre- and post-IPO performance (3 years prior through 5 years post, with at least one year prior and two years post of data) for IPO banks and the matched sample of control banks. The dependent variables are ROA, ROE, equity-to-assets, chargeoffs-to-loans, and asset growth rate. ROA is net income divided by total assets. ROE is net income divided by shareholders' equity. Equity-to-assets is shareholders' equity divided by total assets. Chargeoffs-to-loans is loan chargeoffs divided by total loans. IPO bank is equal to 1 for sample IPO banks and 0 for control banks. IPO bank*post is an interaction term that is equal to 1 for IPO banks for observations subsequent the bank IPO date and 0 otherwise. Pre-IPO is equal to 1 for observations prior to the IPO date of the bank or its matched partner and 0 otherwise. Post-IPO is equal to 1 for observations subsequent to the bank IPO date of the bank or its matched partner and 0 otherwise. Percent sold is equal to the IPO primary shares sold divided by the post IPO total shares outstanding for IPO banks and 0 otherwise. New cash-to-equity is total IPO proceeds divided by the post IPO shareholder's equity for IPO banks and 0 otherwise. The bank dummy is equal to 1 for stand-alone banks and 0 for bank holding companies. The regressions are estimated using robust standard errors. With respect to t-tests of equal means between control banks and IPO banks, ***, **, and * indicate significance at the 1, 5, and 10 percent level respectively.

All Controls

	ROA	ROE	Equity-to-assets ratio	Chargeoffs-to-loans ratio	Asset growth rate
IPO bank	0.088	1.029*	-0.770	-0.032	0.008
*IPO bank*post-IPO*	-0.135**	-2.350***	2.140***	0.183*	0.063
Pre-IPO	-0.030	0.085	0.395	-0.055	0.020
Post-IPO	0.065**	0.323	0.073	-0.053	-0.037
Percent sold	-0.461***	-2.013	2.219	-0.307	0.804
*Percent sold*post-IPO*	-0.008	0.371	-7.227**	0.039	-0.683
New cash-to-equity	0.045***	0.337***	-0.104	0.001	-0.031
*New cash-to-equity*post-IPO*	0.019	-0.599	1.437	0.004	0.010
Log total assets	0.261***	4.294***	-3.141***	-0.115	0.059**
Bank dummy	-0.130	-2.139***	0.718	0.133	0.119***
Number of observations	3,465	3,465	3,465	3,461	3,432
Adjusted R-square	6.2%	10.7%	13.5%	4.3%	6.1%

Best Controls

	ROA	ROE	Equity-to-assets ratio	Chargeoffs-to-loans ratio	Asset growth rate
IPO bank	0.079	1.068	-1.135**	-0.035	-0.021
*IPO bank*post-IPO*	-0.115	-1.861*	2.179***	0.088	0.122
Pre-IPO	-0.036	0.499	-0.206	-0.034	-0.047
Post-IPO	0.084	0.405	-0.161	0.006	-0.119*
Percent sold	-0.553***	-2.084	2.288	-0.175	0.815
*Percent sold*post-IPO*	0.022	0.380	-7.557**	-0.017	-0.711
New cash-to-equity	0.043***	0.314**	-0.125	0.011	-0.034*
*New cash-to-equity*post-IPO*	0.008	-0.595	1.423	0.026	0.007
Log total assets	0.230*	4.245***	-3.441***	0.045	-0.011
Bank dummy	-0.156	-2.857*	1.128	0.268*	0.174*
Number of observations	1,443	1,443	1,443	1,441	1,430
Adjusted R-square	5.5%	13.0%	15.3%	10.4%	7.1%

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