

The Depositor behind the Discipline: A Micro-level Case Study of Hamilton Bank

by

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ABSTRACT

Though uninsured depositors are recognized as a source of market discipline, the possible disciplinary effect of decisions made by fully insured depositors have gone largely unexamined. Using proprietary administrative deposit data at the account level, this paper analyzes depositor behavior at a recently failed institution. The results suggest that although uninsured deposits exited at a greater rate than insured deposits, the vast majority of deposits withdrawn were fully insured. Among types of deposit accounts, the rates of withdrawal for fully insured individual, joint, and trust accounts were relatively high. Uninsured business account owners were highly sensitive to the bank's deteriorating condition. In contrast, owners of uninsured individual retirement accounts effectively exerted no market discipline.

Key Words: depositor discipline, account types, uninsured, insured

| *JEL Classification:* G20, G21, G28

CFR Research Programs: deposit insurance, policy and regulation

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Recent policy initiatives have promoted market discipline as a mechanism with which to reinforce sound banking practices. Pillar 3 of the Basel II Accord (Basel Committee on Bank Supervision, 2003) views market discipline as a complement to minimum capital requirements and the supervisory process.¹ The literature on market discipline focuses on uninsured depositors and subordinated debt holders as the principal sources of market discipline. Insured depositors have not been widely recognized as a source of discipline presumably because the associated government guarantee attenuates the insured depositors' incentives to monitor their bank's health, adjust their balances in response to the bank's condition, or require a risk premium. For the most part the literature treats insured depositors as a low-cost, readily available alternative source of additional funds for deteriorating banks that face higher costs for uninsured deposits. While the monitoring incentives of fully insured account holders may be tempered relative to the incentives faced by the uninsured, the predominance of insured deposits typically observed in banks' funding structure implies that even relatively minimal responsiveness by these deposits to a bank's condition could have substantial implications for the bank's cost and supply of funding.

¹ In 1983 the Federal Deposit Insurance Corporation (FDIC) argued that mandatory subordinated debt issuance by banks merits serious consideration as a source of market discipline. Since then, other studies have further investigated the efficacy of mandating subordinated debt issuance. Additional proposals and studies include Benston, Eisenbeis, Horvitz, Kane, and Kaufman (1986), Avery, Belton, and Goldberg (1988), Gorton and Santomero (1990), Calomiris (1999), Bliss (2001), Evanoff and Wall (2000) and Lang and Robertson (2002) among others.

Using several months of depositor data for a recently failed institution, this paper analyzes the discipline exerted by different types of depositor accounts. First, we explore the relative sensitivity of various account types to the bank's condition across uninsured and insured depositors. We investigate the extent to which changes in deposit balances are determined by fully insured or partially insured depositors, and the degree to which loans that offset the exposure of uninsured deposits help to explain these depositors' behavior across account types. To complement this analysis, we also analyze the behavior of risk premia on uninsured and insured certificates of deposits (CDs).

Our results provide evidence that insured depositors are a source of market discipline. The results also provide insight into the type of customer accounts that exert this discipline. While uninsured deposits declined at a substantial rate throughout the bank's final months, the total balance of insured deposits withdrawn from the bank far exceeded withdrawn uninsured deposits. Furthermore the majority of depositors who withdrew their funds did not have uninsured deposits in this bank. These findings demonstrate that fully insured depositors are sensitive to the bank's condition. The premia on uninsured and insured certificates of deposits relative to local rates are also consistent with the hypothesis that uninsured and fully insured depositors are sources of market discipline.

An analysis of the account-level data reveals that the degree of depositor discipline varied significantly by account type. Uninsured depositors owning business accounts were highly sensitive to the bank's condition, withdrawing 86 percent of their unprotected dollars. Among individual accounts, uninsured deposits declined substantially relative to insured deposits. Uninsured individual retirement accounts exhibited no strong tendency to exit from the bank, whereas fully insured individual retirement accounts experienced some run-off.

Differences in the behavior of depositors of different account types are an important consideration for deposit insurance policy. For example, recently proposed deposit insurance legislation before Congress contains variations in insurance coverage across different account types; these variations reflect legislators' differing preferences for protecting certain account types while also preserving the role of market discipline.² It is important to note, however, that the presumed relationship between market discipline and deposit insurance by account type has largely remained unconfirmed. Evidence that certain account types exit institutions before failure would suggest these account types are sensitive to bank conditions and actively discipline the bank.³ Thus, increasing deposit insurance to provide additional protection for these accounts could compromise the effectiveness of market discipline. However, increasing insurance coverage on account types where both insured and uninsured depositors are insensitive to bank conditions would have a minimal effect on the market discipline experienced by banks.

An outline of the paper follows. Section 1 reviews the literature on market discipline. Section 2 provides background on the subject of the case study—Hamilton Bank, N.A. (henceforth “Hamilton”). Section 3 gives details on the data available for Hamilton. Section 4 describes the empirical analysis and presents the results. Section 5 concludes the paper.

1. Literature Review

“Market discipline” is a general term that covers several conceptual mechanisms by which stakeholders (i.e., stockholders, depositors, and other creditors) can induce the management of the bank to follow a risk/return strategy that maximizes their risk-adjusted

² In May 2005 the House of Representatives passed a deposit insurance reform bill that increased the general coverage limit to \$130,000 while providing additional coverage to other types of accounts. For example, retirement accounts are insured to twice the general coverage limit.

³ The classic model of Diamond and Dybvig (1983) suggests that a shift in expectations based on faulty information could nonetheless cause depositor runs and failure, without any underlying weakness in a bank's portfolio.

returns. The literature studying the effectiveness of discipline exerted by uninsured depositors is extensive. For example, banks may be reluctant to engage in imprudent strategies for fear of suffering a resulting decline in uninsured deposits.⁴ Bliss and Flannery (2002) note that market discipline encompasses two activities: the market's ability to monitor the behavior of the bank's management, and the market's ability to "cause subsequent managerial actions to reflect those assessments" or to influence management's actions.⁵ Given the difficulty of observing market influence, the literature focuses on evidence of monitoring rather than evidence of influencing. Similarly, this paper focuses on evidence of market monitoring, although we do find some evidence of bank management responding to losses of deposits.

The depositor discipline literature has focused on the responsiveness of uninsured depositors to bank health. Beginning with Baer and Brewer (1986), the literature has concluded that rates paid on uninsured deposits reflect the bank's underlying condition.⁶ Additionally, most studies have found that uninsured deposits generally decline with bank health. Goldberg and Hudgins (1996, 2002), for example, conclude that the share of uninsured deposits of total deposits declined for U.S. thrifts as the institutions approached failure. Maechler and McDill (2003) find that uninsured depositors penalize banks for poor performance. In an earlier study, McDill and Maechler (2003) find uninsured depositors of U.S. banks to be more responsive to bank conditions when banks have low equity.⁷

Very few studies, however, have expanded the sources of market discipline to include insured depositors. To empirically investigate the hypothesis that banks face market discipline

⁴ Calomiris and Kahn (1991); Flannery (1994).

⁵ Bliss and Flannery (2002), p. 361.

⁶ For example, see Hannan and Hanweck (1988); James (1988, 1990); Cargill (1989); and Keeley (1990).

⁷ One recent exception to this general finding is the research by Hall, King, Meyer, and Vaughan (2003) that compared jumbo CD rates both before and after the passage of Federal Deposit Insurance Corporation Improvement Act of 1991. They find that jumbo CD run-offs were indeed sensitive, though the magnitudes were economically insignificant. They reached the same conclusion in their examination of jumbo CD rates.

from insured depositors, Cook and Spellman (1994) relate rates on Federal Savings and Loan Insurance Corporation (FSLIC) insured deposits to measures of bank health, such as the leverage ratio and return on assets. In their model insured depositors require a premium to compensate for restitution-related transaction costs incurred upon failure that include the costs of recovering the insured funds, interest lost until restitution occurs, and illiquidity costs. The model also recognizes that insured depositors may incur losses due to guarantor insolvency. The low likelihood but high cost event of repudiation of deposit insurance, creates an incentive for insured depositors to respond to their bank's condition. They find that the market priced both guarantor insolvency risk and the insolvency risk of the institutions between January 1987 and August 1988, a period of FSLIC instability.⁸ Park and Peristiani (1998) investigate the sensitivity of insured deposits balances to bank conditions, using a large panel of thrifts between 1987 and 1991. They find that the probability of failure was unrelated to the pricing of interest-bearing transaction accounts. Insured CD rates, however, were positively affected by the probability of failure, indicating that among insured entities, insured CD holders are sensitive to thrift financial conditions. From his study of failing New England banks in the early 1990s, Jordan (2000) found that banks with the highest share of uninsured funds shifted most aggressively towards insured deposits.

Absent from the literature are explorations into the behavioral dynamics of insured and uninsured depositors across account types, as most of the information is unavailable in public filings. Most studies have relied on Call Report and Thrift Financial Report filings, which have very limited information on types of account holders.

⁸ Dahl, Biswas, and O'Keefe (1997) find evidence that the spread of insured brokered deposit rates over Treasuries increased before passage of the Financial Institutions Reform, Recovery, and Enforcement Act of 1989 (FIRREA), which abolished the FSLIC and created the FDIC-managed Savings Association Insurance Fund (SAIF).

2. Background of Hamilton Bank

Originally chartered as Alliance National Bank in 1983, Hamilton was headquartered in Miami, Florida, with eight branches in Florida and one in San Juan, Puerto Rico.⁹ In the mid-1990s, Hamilton's management decided to pursue an aggressive growth strategy. Coincident with the Hamilton Bancorp IPO in March 1997, Hamilton began to increase its asset concentration in developing countries such as Ecuador, Panama, El Salvador, Guatemala, and Russia. Along with expanding its customer base, Hamilton also pursued riskier ventures such as commercial lending to highly-leveraged firms. With this shift in strategy, Hamilton increased its size from \$755 million to \$1.7 billion between 1996 and 1998.

Hamilton's rapid expansion into new markets and activities led to a series of adverse events and ultimately to the institution's failure. The Russian financial crisis in August 1998 had a significant effect on the institution. In 1999, Hamilton reported a loss of \$15 million largely attributable to its Ecuadorian exposure. Between 1998 and 2000, the bank's deteriorating asset quality, declining capital, concentration of assets in risky markets, inadequate risk controls, and regulatory violations led the Office of the Comptroller of the Currency (OCC) to downgrade Hamilton's composite CAMELS rating from 1 to 4.¹⁰ In December 1998 the OCC issued a Safety and Soundness Notice. In September 2000 a Consent Order was reached.¹¹

In response to Hamilton's announcement that it was restating its 1998 and 1999 earnings, shareholders filed lawsuits in early 2001 against Hamilton Bancorp for improper financial statements. During 2001 Hamilton restated earnings to reflect millions of dollars in losses, and

⁹ This section borrows from the December 2002 U. S. Department of the Treasury Office of Inspector General's *Material Loss Review of Hamilton Bank, N.A.*

¹⁰ CAMELS represents a rating based on Capital adequacy, Asset quality, Management, Equity, Liquidity, and Sensitivity to market risk.

¹¹ The long-running dispute between the OCC and Hamilton stemmed from \$40 million dollars in Ecuadorian loans and lines of credit for which the OCC claimed Hamilton underreserved. An on-site examination of Hamilton following the onset of a financial crisis in Ecuador led the OCC to require Hamilton to reserve for their Ecuadorian loans at 90 percent. Hamilton appealed and lost.

was at risk of being delisted from the NASDAQ because of delayed filings. In June 2001, the composite CAMELS rating for Hamilton was downgraded to 5 and the bank was considered “undercapitalized” under Prompt Corrective Action guidelines. On January 11, 2002, shortly after the OCC determined that the Capital Restoration Plan filed by Hamilton was insufficient, the OCC appointed the FDIC as receiver of the bank.

In some respects this background makes Hamilton ideal for a case study of market discipline. The numerous public assessments, events, and confrontations with the OCC imply that conditions were favorable for satisfying the prerequisite of market discipline that depositors be sufficiently informed.¹² Market discipline also requires sufficient time for depositors to analyze and respond to developments in the bank’s health. In the case of Hamilton, the myriad revelations occurred over a long time horizon, beginning in 1998 and continuing until the bank’s failure in 2002—a period long enough to give depositors an opportunity to exert market discipline.

Hamilton’s unique features also highlight the importance of recognizing this analysis as a case-study of a single institution. Hamilton’s combination of size, specialization, international presence, and experience makes it unique. Consequently, the results may not generalize and should be interpreted within the context of the specific Hamilton experience.

3. Data

In advance of a bank’s failure, the FDIC often acquires depositor-level data to facilitate the resolution process. Hamilton’s weakened condition prompted the FDIC to collect Hamilton’s depositor data beginning in March 2001. The FDIC periodically updated its data as Hamilton continued to survive. In tracking Hamilton’s condition, the FDIC obtained depositor

¹² Llewellyn (2002) outlines the prerequisites for market discipline. See also Bliss (2001) and Flannery (2001).

data tapes drawn after the close of business for August 31, 2001, September 30, 2001, November 15, 2001, and December 1, 2001. The final panel of depositor data was acquired during the closing of Hamilton on January 11, 2002.¹³

Each of the six panels of data contains detailed characteristics of Hamilton's deposits at the account level. Balances are available for each account, all of which are uniquely identified. Information on the owners, beneficiaries, or agents is associated with each account. The accounts are classified into one of the following insurance categories: individual accounts, joint accounts, business accounts, brokered accounts, municipal or government accounts, revocable or irrevocable trust accounts, individual retirement accounts, and business pension plan accounts.¹⁴ Accounts can also be identified as one of the following types: a demand deposit, a savings account, a money market account, a negotiable order of withdrawal (NOW) account, or a CD. The account types have no bearing on insurance coverage. For the panels from August 31, 2001, through closing, we are able to calculate the CD rates offered at Hamilton.

The sample consists of depositors that have demonstrated themselves to be heretofore insensitive to changes in the bank's health. Since the available data do not begin until March 2001, any evidence of market discipline from this analysis can be observed only within a period of less than one year. Moreover, by March 2001 significant disclosures about Hamilton's condition had already been well publicized. With a flow of unfavorable news beginning years before Hamilton's failure, conceivably depositors who remained in March 2001 represented

¹³ By using these administrative data, we avoid the potential measurement issues that arise when self-reported data as contained in public filings are used.

¹⁴ This represents an incomplete list of FDIC insurance categories, though nearly all accounts fall into one of the categories listed. It should also be noted that brokered accounts denote pass-through coverage rather than their own insurance category. For more information on insurance categories, see FDIC (2004).

those with higher risk tolerance.¹⁵ They may also simply be those who were less well informed about the changes to the bank's risk profile.

4. Empirical Results

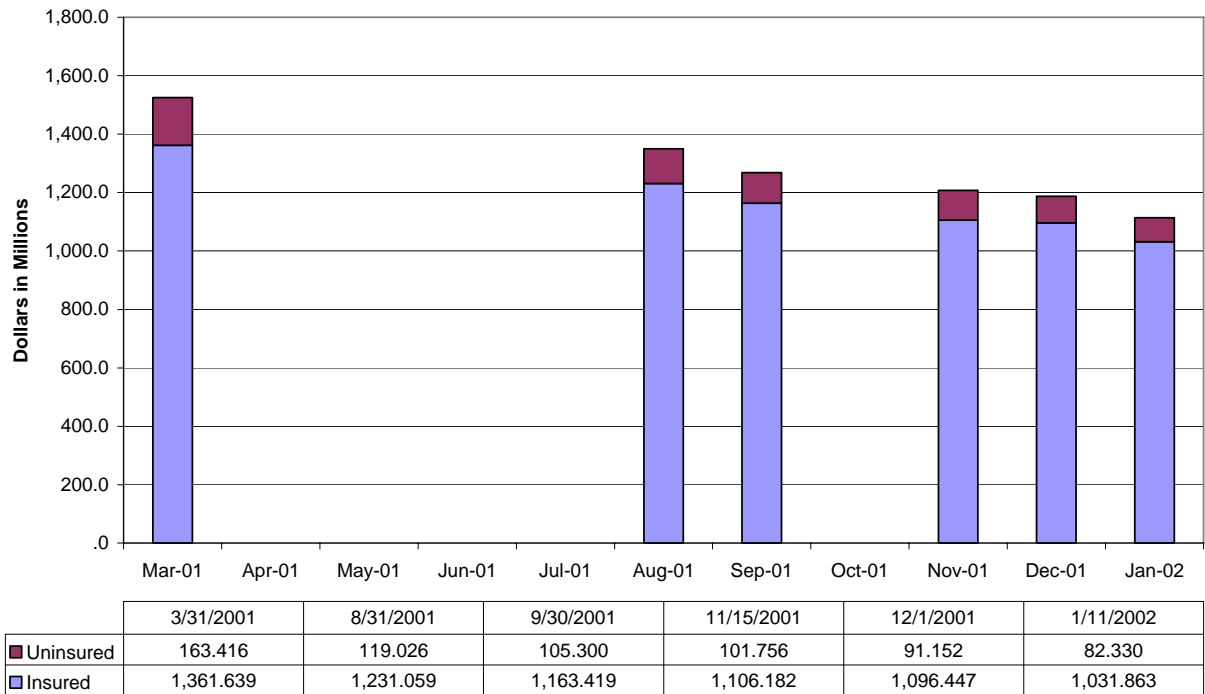
4.1. Depositor Discipline in Aggregate

Between March 2001 and January 2002, total deposits at Hamilton fell from \$1.5 billion to \$1.1 billion, or 27 percent (Figure 1). Total uninsured deposits declined 50 percent over the same period, from \$163.4 million to \$82.3 million. Of the accounts with a positive uninsured component in the first period, 39 percent closed, another 38 percent decreased their exposure, and the remaining increased their exposure before failure. New accounts (one third of the increase) and accounts with increasing exposure (two thirds) combined to keep net declines in uninsured accounts to 37 percent.¹⁶

¹⁵ In fact, historical changes in Hamilton's uninsured and insured deposits, as reported by Hamilton in its quarterly Call Report, indicate that Hamilton had experienced a substantial drop in total deposits and uninsured deposits between December 1999 and March 2000, well before our first observation. Over the course of the year 2000, uninsured deposits fell from \$378 million to \$285 million, and the proportion that was uninsured steadily declined as the bank moved toward failure.

¹⁶ The rate of decline in deposits changed over time, though to some extent in a manner unrelated to the proximity to failure. Among insured deposits, the highest daily rates of decline were in September (\$2.25 million) and the period between December 15, 2001 and January 11, 2002 (\$1.58 million). The two weeks preceding December saw the largest daily decline in uninsured deposits (\$663 thousand), followed by the period between April and August, 2001 (\$458 thousand)

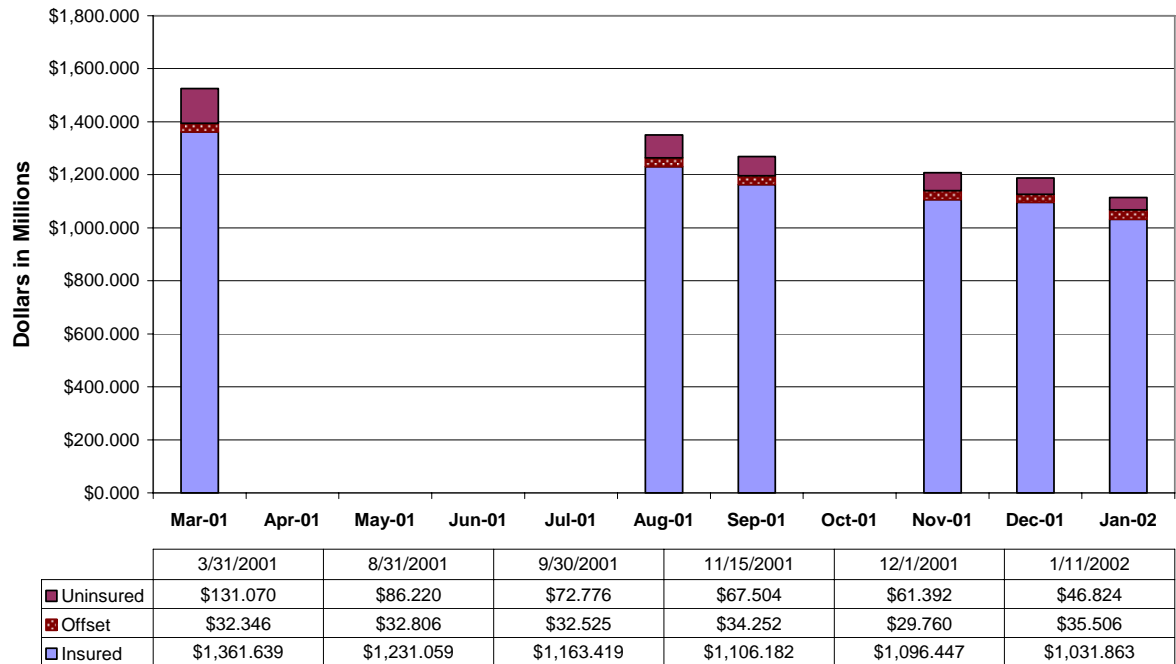
**Figure 1: Hamilton Bank Uninsured and Insured Deposits
March 2001 - January 2002
All Accounts**



The response of uninsured depositors at Hamilton is even more significant when we recognize the change in these depositors' exposures due to offsets. Upon failure, uninsured depositors can apply the full balance of outstanding loans to reduce their losses. Thus, these offsets protect deposits that are technically uninsured beyond the deposit insurance limit. Ignoring offsets serves to bias downward the observed responsiveness of uninsured depositors to the condition of the bank. As figure 2 shows, of the \$163.4 million in uninsured deposits as of March 2001, 20 percent were protected by offsets. Although in the aggregate uninsured deposits fell by 50 percent, unprotected uninsured deposits declined nearly two-thirds. This greater decline in unprotected uninsured deposits suggests that netting out the uninsured depositors with

offsets reveals considerable sensitivity to bank conditions on the part of the remaining depositors at Hamilton.¹⁷

**Figure 2: Hamilton Bank Uninsured and Insured Deposits, Including Offsets
March 2001- January 2002
All Account Types**



The dramatic declines in uninsured and insured deposits indicate that Hamilton was unable to effectively substitute insured funds for lost uninsured funds and that depositor discipline did affect Hamilton.¹⁸ Insured deposits represented 89 percent of total deposits in March 2001. Of the \$411 million in deposits that left Hamilton, the vast majority (80 percent) were insured. \$330 million in insured funds left Hamilton, yielding a run-off rate among insured deposits of 24 percent.

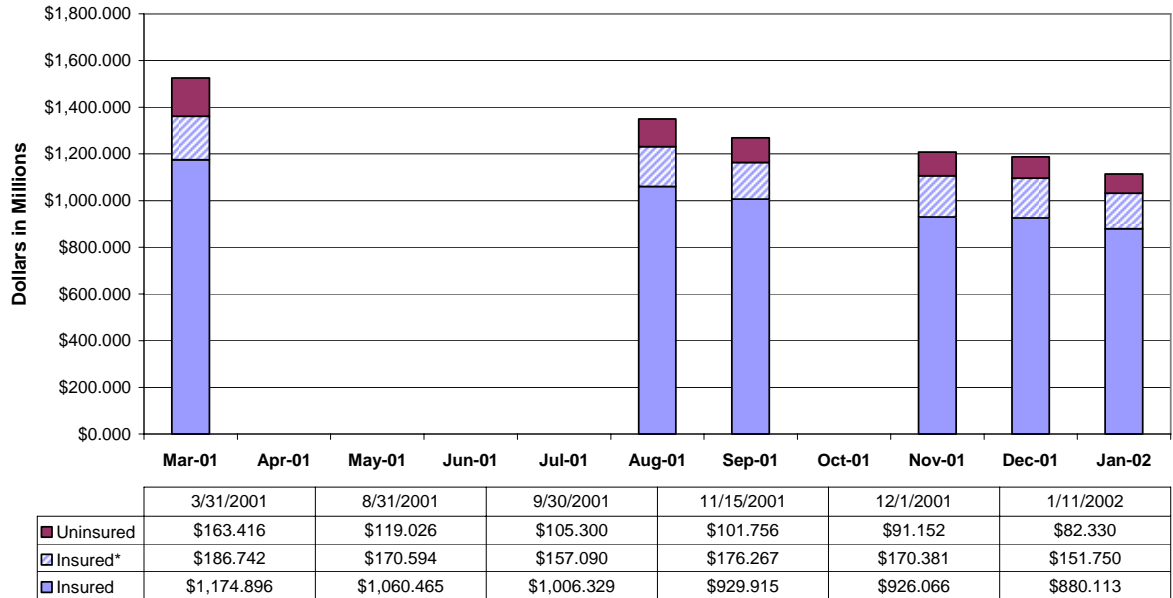
¹⁷ The offsets are observed only at closing and are applied throughout the six periods.

¹⁸ This inability to easily shift to insured deposits contradicts the finding of Jordan (2000) that banks with a substantial share of total deposits represented by jumbo CDs substitute into insured deposits most aggressively as the bank approaches failure. In Hamilton, jumbo CD deposits as a share of total deposits exceeded 30 percent in March 2001.

Evidence of market discipline by insured depositors requires that the decline in insured deposits can be largely attributed to the behavior of insured depositors. Changes in insured deposits could be due to uninsured depositors reducing their uninsured portion, and withdrawing insured funds as well, e.g. removing an entire \$110,000 account. Thus, uninsured depositors withdrawing funds beyond just their uninsured deposits could result in fewer insured deposits as well. However, declines in insured deposits may also be the result of the decisions of fully insured depositors to remove funds from the bank.

FDIC proprietary data allow us to confirm that the primary source of insured funds withdrawn was from fully insured accounts rather than the insured portion of uninsured depositors' balances. Figure 3 addresses the extent to which changes in total insured deposits are attributable to the behavior of fully insured depositors. Figure 3 identifies the insured portion of account balances with uninsured deposits. Of the \$330 million that left Hamilton during the period March 2001 through January 2002, only \$34 million were attached to uninsured deposits. While 50 percent of uninsured deposit balances left Hamilton, the insured deposits that were attached to accounts with uninsured balances declined by only 19 percent. In contrast, 25 percent of fully insured deposits were withdrawn over the same period.

**Figure 3: Hamilton Bank Uninsured, Fully Insured and Attached Insured Deposits
March 2001- January 2002
All Account Types**



* Insured deposits attached to uninsured deposits.

There are potential explanations for declines in deposits that are unrelated to depositor discipline, but we do not find evidence that these are factors in this analysis. For example, deposit withdrawals could represent a general decline in deposits or uninsured deposits at other banks over the period. However, both nationally and locally total deposits and the uninsured proportion of deposits trended upward in this period. Alternatively, banks can comply with capital adequacy requirements by allowing their assets and liabilities to shrink to match the amount of capital available. Supervisory discipline, rather than market discipline, would explain a finding of a declining depositor base along with uncompetitive rates. However, observing declines in deposits despite above market rates would indicate that Hamilton was attempting to retain its deposits, or at least manage the decline in deposits as the bank became smaller.

The evidence suggests that relative to regional competitors Hamilton Bank offered substantially better returns on its one-year CDs, as both its insured and uninsured deposits were falling. The interest rate that Hamilton offered for small (\$10,000 or less) one-year CDs¹⁹ compared to the national and Miami average interest rates on one-year CDs as shown in figure 4 suggest that Hamilton was shrinking in response to market forces rather than supervisory discipline.²⁰ Interest rates declined considerably over the period for which we have interest-rate data (September 6, 2000 to January 9, 2002), with national rates for one-year CDs declining from 5.53 percent on average in September 2000 to 2.12 percent in January 2002. In comparison, the average interest rate on small CDs at Hamilton dropped from a high of 6.67 percent on September 27, 2000, to a low of 2.20 percent shortly before the bank closed. The premium on Hamilton's small CDs began to decline in early 2001, dropping to less than 0.50 percent in February 2001 and averaging 0.36 percent above the national average thereafter until failure. Hamilton generally offered about 14 percent above both the average national interest rate and the Miami average. In the last few weeks before failure, the premia Hamilton offered relative to the national average varied substantially, with rates exceeding national rates by 39 percent in the first week of December 2001.

¹⁹ One year was the most common maturity for CDs at Hamilton. The data for other maturities are less complete but generally consistent with the one-year CD results.

²⁰ The Miami and national rates obtained from the Bankrate, Inc.'s *Bank Rate Monitor* (various issues) are those corresponding to interest rates for the minimum required to open a CD and earn interest. So that the Hamilton rates would be as comparable as possible to the average data, we based the Hamilton rates on an average of rates across all the CDs whose denominations were less than \$10,000.

**Figure 4: One-Year Small-CD Interest Rates
September 2000 - January 2002
National, Miami, and Hamilton Bank**

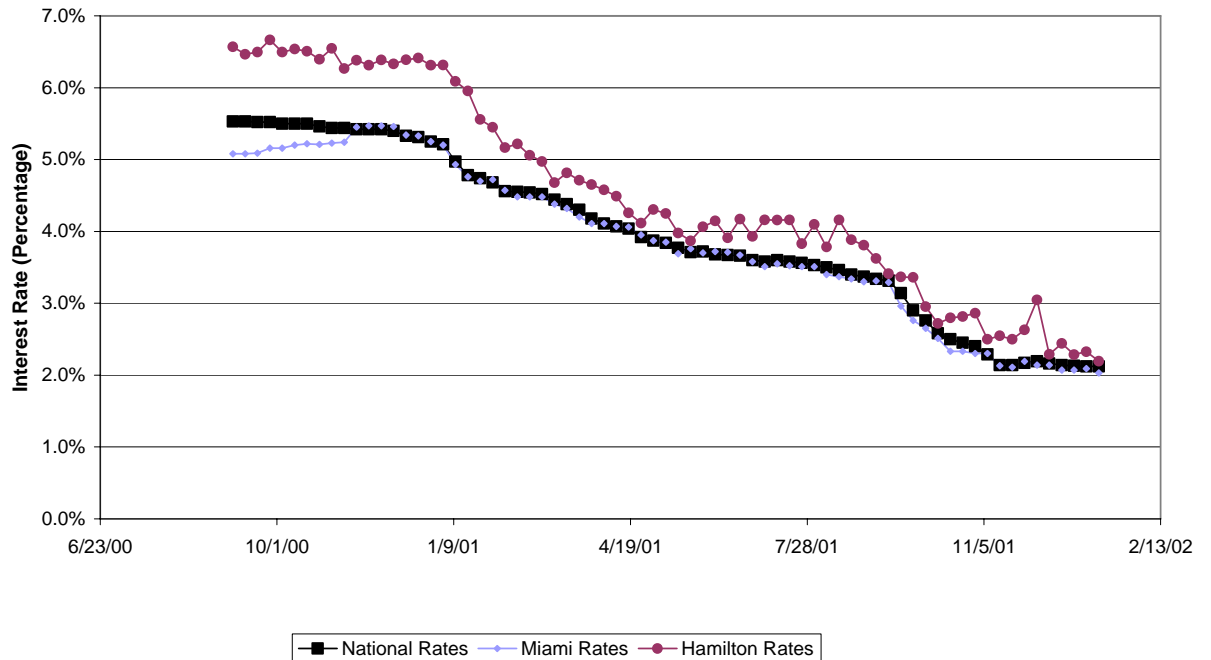
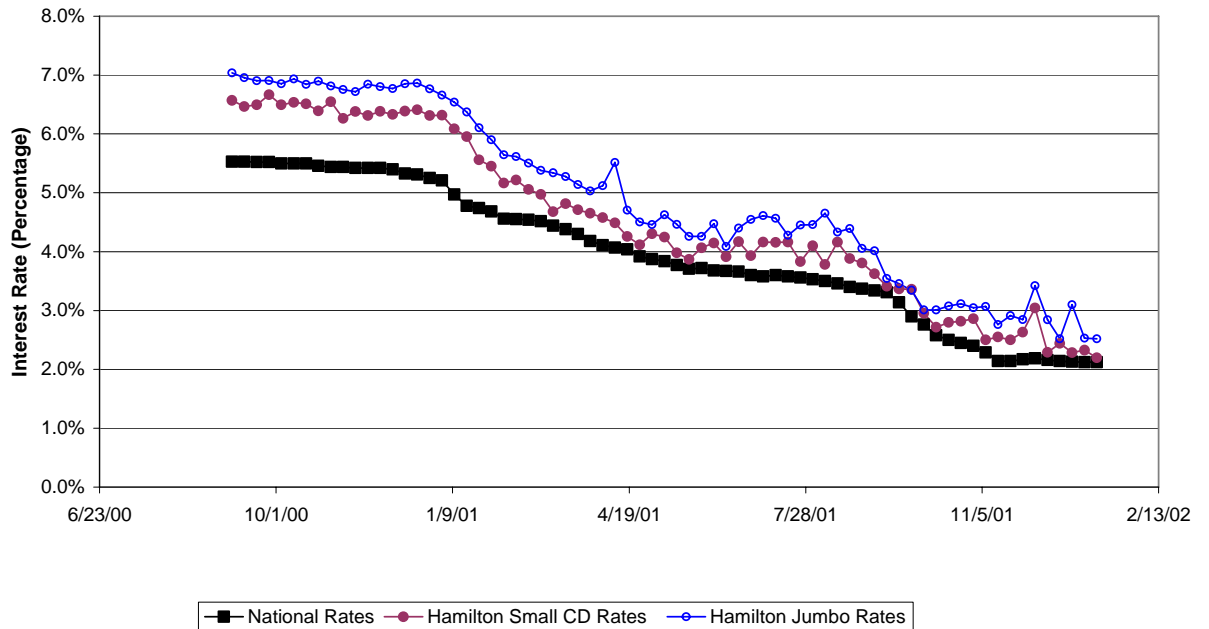


Figure 5 compares the Hamilton jumbo CD (those with balances greater than \$100,000) rates to the rates they offered on small CDs and national small CD rates shown in the preceding figure. National average interest rate for jumbo CDs is unavailable, so a direct comparison of the risk premia for jumbo CDs is not possible. Nevertheless, it is fairly clear that Hamilton paid a premium on jumbo CDs above its premium small CDs throughout the period, with the average interest rate Hamilton offered on jumbo CDs 0.39 percent above the interest rate it offered on small CDs. The difference in Hamilton’s CD rates between jumbo and small CDs started out at nearly half a percentage point and, although fairly variable, generally declined along with overall interest rates, then ticked up again in the final few months before Hamilton failed.²¹

²¹ It should be noted that these premia can be translated into a marginal cost of funding. Such a translation highlights the importance of incorporating the denominations associated with the premia in understanding fund pricing and the costs of funding. For example, consider two groups of depositors with one-year CDs established in the last week of March 2001, one group with balances in March 2001 between \$80 thousand and \$100 thousand and

**Figure 5: One-Year CD Interest Rates
September 2000 - January 2002
National (Small CDs) and Hamilton Bank (Small and Jumbo CDs)**

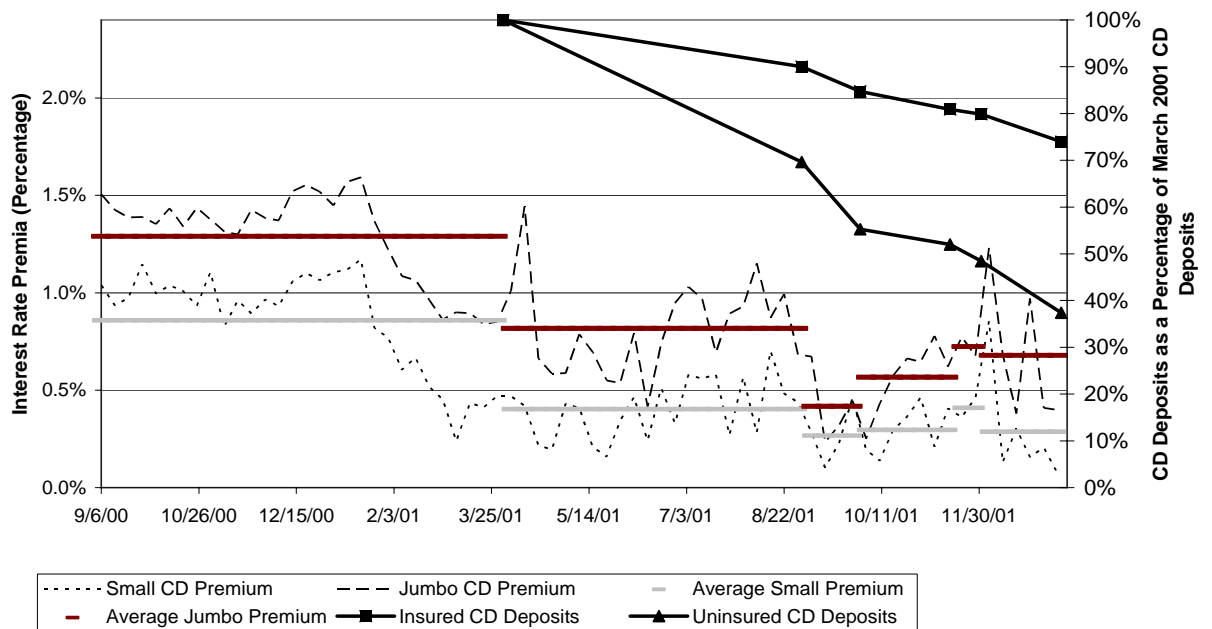


In Figure 6, we compare the average premia for jumbo and small CDs to the speed at which insured and uninsured deposits decline. Between March 2001 and closing, uninsured deposits in CDs ran off much faster than insured CD deposits. Uninsured CD balances declined by a substantial 63 percent, whereas insured CD balances declined by a more moderate 25 percent. Hamilton’s average premium for the jumbo and small CDs in September declined contemporaneously with an increase in the speed at which both insured and uninsured deposits flowed out of the bank. Between September 30 and November 15, Hamilton appears to have

the other (jumbo) group with balances in March 2001 in excess of \$100 thousand and up to \$120 thousand. Between March 31, 2001 and September 30, 2001, the average balance for the first group grew by \$1,797 from \$91,779 to \$93,576 while the average jumbo group balance grew by \$2,373 from \$107,424 to \$109,797. This difference in funding costs across the two groups reflects both the difference in rates and the fact that the higher rate was applied to the whole of the higher CD denominations.

raised the interest rate premia again. In the last two periods, although the premia for both small and jumbo CDs increased, only insured CD deposits appear to have been responsive to the increase in the premium. Uninsured deposits in CDs continued to decline even with a more generous premium.

**Figure 6: One-Year CD Interest Rates and Run-Off
September 2000 - January 2002**



4.2. Depositor Discipline by Account Type

Heterogeneity in types of depositors could lead to differences in depositor discipline behavior that would be obscured at the aggregate level. We will be focusing primarily on two types of accounts which exhibited substantially different depositor behavior than the bank in general, Individual Retirement Accounts (IRAs) and business accounts. We will discuss the behavior of personal accounts including individual, joint, and trust accounts to a lesser extent as

they more closely resemble the behavior of the bank in aggregate. Changes in the deposit shares of various categories of depositors are shown in table 1.²²

Table 1
Aggregate Totals of Deposits by Account Type at Hamilton Bank

Acct. Type	Date	Insured (\$)	Uninsured (\$)	Total (\$)	% Unins.	% CD	Share of Total Deps		
							Ins.	Unins.	Total
Individual	3/31/2001	102,225,481	12,992,817	115,218,299	11.3%	88.7%			
	1/11/2002	86,916,144	5,811,573	92,727,717	6.3%	81.2%	8.4%	7.1%	8.3%
	% change	-15.0%	-55.3%	-19.5%					
Joint	3/31/2001	327,718,062	11,190,383	338,908,445	3.1%	88.2%			
	1/11/2002	259,430,761	6,126,495	265,557,256	2.3%	85.7%	25.1%	7.4%	23.8%
	% change	-20.8%	-45.3%	-21.6%					
IRA	3/31/2001	71,683,170	2,331,357	74,014,527	3.2%	99.9%			
	1/11/2002	63,165,242	2,153,119	65,318,361	3.3%	99.7%	6.1%	2.6%	5.9%
	% change	-11.9%	-7.6%	-11.7%					
Trusts	3/31/2001	639,778,343	36,138,270	675,916,614	5.4%	93.2%			
	1/11/2002	501,599,431	13,812,831	515,412,262	2.7%	92.2%	48.6%	16.8%	46.3%
	% change	-21.6%	-61.8%	-23.7%					
Business	3/31/2001	126,285,844	98,884,839	225,170,683	43.9%	48.2%			
	1/11/2002	105,282,041	53,357,476	158,639,517	33.6%	45.1%	10.2%	64.8%	14.2%
	% change	-16.6%	-46.0%	-29.5%					
Pension	3/31/2001	2,719,971	779,567	3,499,538	22.3%	91.3%			
	1/11/2002	2,568,361	175,453	2,743,814	6.4%	88.7%	0.2%	0.2%	0.2%
	% change	-5.6%	-77.5%	-21.6%					
Brokerage and Pass Through	3/31/2001	91,227,648	1,098,618	92,326,265	1.2%	86.8%			
	1/11/2002	12,901,362	893,443	13,794,805	6.5%	58.1%	1.3%	1.1%	1.2%
	% change	-85.9%	-18.7%	-85.1%					
All	3/31/2001	1,361,638,520	163,415,851	1,525,054,371	10.7%	85.0%			
	1/11/2002	1,031,863,343	82,330,389	1,114,193,733	7.4%	83.0%			
	% change	-24.2%	-49.6%	-26.9%					

Source: Authors' calculations.

4.2.1. Personal Accounts

Insured depositors represented a significant source of market discipline among personal accounts, which cover individual, joint, and trust accounts.²³ Although insured individual

²² This section describes disciplinary behavior specific to each account type rather than by depositor type. While we recognize that owners may have multiple types of accounts, for expository purposes we define the behavior of owners by their within-account-type activity. Thus, owners of certain account types can be defined as highly responsive to bank condition, even though as owners of other account types they may be found to exert less discipline.

²³ Individual, joint, and trust accounts are all separate insurance categories and are separately insured. The amount of insurance available per account in the joint and trust accounts can be considerably higher than that available to

deposits declined at a lower rate than uninsured deposits, nearly two-thirds of the \$22.5 million decline in total individual deposits was from insured deposits. Insured joint deposit balances declined by 21 percent, comparable to the rate of decline in insured individual accounts. Yet in dollar terms, the \$68.2 million decline in insured funds far exceeds the \$5.1 million decline in uninsured funds. Fully insured trust depositors ran off at the same rate as insured depositors in aggregate (22 percent), which is comparable to the rate for fully insured depositors in the other two types of personal accounts.²⁴ The magnitude of the change in insured funds, from \$639.8 million to \$501.6 million, suggests that insured trust depositors also significantly disciplined Hamilton.²⁵

4.2.2. Individual Retirement Accounts

To the limited extent that depositors holding IRAs exerted any discipline, almost all of this discipline came from insured deposits, particularly those of fully-insured accounts. Between March 2001 and closing, uninsured IRA deposits declined only 8 percent, from \$2.3 million to \$2.2 million. In contrast, over the same period insured deposits declined by nearly 12 percent, from \$71.7 million to \$63.2 million. The vast majority of insured deposits withdrawn from Hamilton were from fully-insured accounts (\$8.4 million of \$8.5 million).²⁶

individual accounts because each joint account holder, like each qualifying beneficiary-grantor pair, is separately insured to \$100,000. Thus it is possible for very large joint or trust accounts to be fully insured.

²⁴ The category of trusts includes two types of trusts—revocable and irrevocable trusts—that are insured separately. For irrevocable trusts (those whose grantor has given up the ability to cancel or change the trust), the beneficiary is not required to be related to the grantor in order to qualify for deposit insurance. However, irrevocable trusts constituted less than 0.2 percent of overall trusts, so we examine both types of trusts together.

²⁵ Since trusts are more likely to involve professional management than other types of accounts, the high rate of run-off in trusts is consistent with the notion that sophisticated depositors are more responsive to bank conditions than other types of depositors.

²⁶ Potential costs associated with IRA withdrawals such as withholding and early withdrawal penalties may serve to discourage IRA depositors from disciplining the bank. The mindset that IRAs are long-term savings vehicles may also produce the unintended consequence that IRA holders refrain from managing their IRAs, regardless of the condition of their financial institutions.

4.2.3. Business Accounts

Uninsured depositors with business accounts imposed significant depositor discipline. Between March 2001 and closing, uninsured business accounts declined by 46 percent, comparable to the decline in joint accounts and substantially less than that observed for trusts. Once offsets are considered, however, it becomes evident that business account owners were among the most responsive in decreasing their exposure to losses before failure. Applying the total offsets for uninsured business accounts at closing of \$31.9 million results in \$21.4 million, or 14 percent, of business deposits were unprotected when the bank closed. In fact, uninsured deposits of businesses that were unprotected by offsets fell by 69 percent between March 2001 and closing. In contrast, insured business deposits declined by only 17 percent over the same period.²⁷

5. Conclusion

Using account level data over six periods between March 2001 and January 2002 for a recently failed institution, we examine the disciplinary behavior of both uninsured and insured depositors at the account level. We find that over this period a large portion of uninsured deposits were withdrawn as the bank deteriorated, but in magnitude the largest amount withdrawn was from fully-insured accounts. We find risk premia for both uninsured and insured CDs, and this finding further confirms the presence of depositor discipline.

²⁷ Owners of transaction accounts (checking and money market accounts) were less responsive than the owners of CDs, perhaps reflecting the differential in costs of exerting discipline. For businesses the transaction accounts are likely to represent funding associated with daily activities and bank-provided services. Consequently, aside from the general costs associated with closing an account, the closure of a transaction account also requires that the business incur the costs of establishing a similar service relationship with another financial institution. Between March 2001 and closing, uninsured and unprotected (not offset) business CDs dropped 91 percent, or \$29.7 million, from \$32.8 million to \$3.1 million. By contrast, over the same period half the unprotected uninsured money in transaction accounts remained at closing (\$18.3 million). At closure transaction accounts constituted 86 percent of all uninsured and not offset business deposits, compared to only 53 percent of such business deposits in March 2001.

Our analysis also reveals differential depositor discipline by account type. Uninsured business depositors responded strongly to Hamilton Bank's deteriorating health by significantly lowering their exposures. Personal account holders withdrew large balances that were fully insured. Uninsured individual retirement account owners exerted essentially no depositor discipline throughout the entire period. The small amount of withdrawals of individual retirement account funds was nearly entirely attributable to the decisions of depositors that were fully insured, and the percentage declines in insured and uninsured deposits in IRAs were considerably smaller than declines in other types of accounts.

These findings have several significant implications. First, potential sources of depositor discipline can be expanded to include fully insured depositors. Second, the relative immobility of uninsured IRAs at Hamilton may lend support to legislative attempts to increase IRA coverage. If enhanced coverage for a special class of depositors like IRA account holders would minimally affect depositor discipline, protecting this class would not create large changes in the incentives of banks or depositors. Enhanced coverage of other account holders, in contrast, might compromise the influence of depositor discipline. Finally, the evidence suggests that educational efforts have sufficiently alerted most account holders to the risks associated with holding uninsured deposits, although enhanced educational efforts may still benefit IRA holders.

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