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Abstract

This study examines the use of poison pill plans in the banking industry. This research demonstrates that the increasing number of banks adopting a poison pill plan is related to increasing market concentration. There are two hypotheses explaining the intent of these adoptions: (1) Managerial Entrenchment and (2) Shareholder Interest. This study specifically examined these hypotheses in the banking industry between 1986 and 2003. Results indicated that comparison banks not adopting a poison pill had a significant improvement in ROE the year after their peers adopted a poison pill. Additional results of this research contradict the popularly held belief that a poison pill plan provides a significant improvement in the probability of survival.

I. Introduction

The 1980s was an era of expansive mergers and acquisitions fueled by the popularity of corporate raids. Although this drastically changed the landscape of many industries, the banking industry was relatively untouched. Commercial banks were protected from hostile takeovers by federal regulations. The McFadden Act of 1927 and the Bank Holding Company Act of 1956 supported the existence of 24,495 small banks[1] in 1985. However, by 2003 there were 11,021 small banks and 80 banks had adopted a poison pill plans (Critchfield, Davis, Davison, Gratton, Hanc, Samolyk, 2004). The Riegle Neal Interstate Banking and Branching Efficiency Act of 1994 was the catalyst of the rapid consolidation. Prior to this act, a commercial bank could only make acquisitions across state lines if state the bank was operating in and the state of the target allowed interstate banking. Riegle Neal removed state and federal restrictions on bank mergers creating rapid consolidation in the industry.

During this period of deregulation, a growing number of banks adopted poison pill plans. A poison pill plan is a defensive measure adopted by a management team to protect a company from an unwanted takeover. Functionally, this measure releases additional shares of stock, at a discount, to shareholders of record when an unwanted acquirer achieves pre-specified stake in the company[2]. This version of a poison pill plan is known as "flip-in rights." Stockholders are allowed to flip-in their "shareholder's rights"[3] in return for additional shares of the company (Fleischer and Sussman, 2000). Although, there are other varieties of poison pills, the flip-in right was predominantly used by the banking industry between 1987 and 2004.

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[1] Smaller banks are those classified as having assets under $1 billion.
[2] Most plans dictate that the acquirer is acting without board approval and has acquired between 15 and 20% of the companies outstanding shares.
[3] Poison Pill Plans are often referred to as shareholder's/stockholder's rights plan by the management team. This terminology displays the plans in the shareholder's interests.

In a corporation's poison pill announcement, mangers cite the adoption of the pill as a means to protect the rights of the shareholder. However the market reaction to the announcement of a poison pill is usually negative (Bojanic and Officer, 1994). Because a poison pill plan is adopted without shareholder approval, it strips power from the owners of the company. The loss of power decreases shareholders faith in management and is reflected by a decreasing stock price[4]. This response is further attributed to the managerial entrenchment hypothesis. According to this hypothesis, a management team adopted the poison pill out of self-interest (Malatesta and Walking, 1988 and Ryngaert, 1988). Contrary to this hypothesis, positive post-announcement stock returns are attributed to the use of a poison pill as a bargaining strategy (Comment and Schwert, 1995 and Heron and Lie, 2000). Long-term analysis in operating performance also proved poison pill adoptions have positive impacts (Danielson and Karpoff, 2006). These hypothesis and results demonstrate the effect of a poison pill varies based on the intent of the management and length of the study.

The commercial banks are unique because federal regulation minimizes the number of takeovers. The three prior hypotheses do not apply as neatly to banks because the intent behind a poison pill adoption is different. First, banking takeovers or mergers are characterized as being "friendly." Because of this, a poison pill used to entrench a management team is unnecessary. Secondly, hostile takeovers of commercial banks usually fail because of the stringent and lengthy approval process (Brewer III, Jackson III, and Wall, 2006). The time necessary for regulatory approval functions as a defensive measure. Finally, the absence of a poison pill plan in this industry has resulted in increased takeover premiums and management benefits (Brewer III, Jackson III, and Wall, 2006). Acquirers do not have to fear the implementation of costly

[4] Unless previously written into a corporation's bylaws, a management team can adopt a poison pill plan and most other defensive measures without a shareholder vote.

defensive measures and reward the target company accordingly. Despite these differences in the banking industry, more than 70 commercial banks adopted a poison pill plan between 1986 and 2003.

II. Literature review

A. Regulatory Changes

The United States banking industry has a long history of small and geographically diverse banks. In 1985 there were 14,349 banks with total assets of less than $1 billion, however, after the liberalization of interstate banking laws there were 7,337 banks in 1995 (Critchfield, Davis, Davison, Gratton, Hanc and Samolyk, 2004). The drastic decline in the number of commercial banks is attributed to two factors. First, technological improvements made distant acquisitions easier (DeYoung and Whalen, 1994). Fax machines, Internet connections, and cell phones, provided faster connections between bank branches. The Internet has created a paper-free medium of near instant responses, which has decreased the paper work and regulatory filing times.

The second trend resulting in the increase in merger activity was the relaxation of geographic branching restrictions (DeYoung and Whalen, 1994). In 1994 the Riegle Neal Act allowed for nation-wide consolidation of the banking industry. Prior to its passage, bank holding companies were only allowed to cross state lines if the state they were headquartered in and the state of their perspective target had legalized interstate banking. The Riegle Neal Act overrode the state acts and made interstate banking legal in almost every state[5].

The Riegle Neal Act not only deregulated interstate banking, but served as a catalyst for industry wide consolidations. Akhigbe, Madura, and Whyte (2004) examined a sample of 254 bank acquisitions between 1987 and 2001 and found that the Riegle Neal Act significantly

[5] Thus far __ banks have accepted the Riegle Neal Act of 1994.

increased the probability of a bank takeover. In relation to this increased probability, there was a resurgence of poison pill adoptions. Community banks that had been common businesses in small towns for 50 years needed a way to protect their identity from a larger acquirer. The answer to this problem was the adoption of a poison pill plan.

The literature provides many examples of why the banking industry has consolidated in the last two decades, but there is little evidence of the effect of the decreased number of banks. The regulatory changes resulted in an increased probability of takeover but this has not been correlated with a greater number of poison pill adoptions. Because the banking merger activity is fairly recent there is little data on the affect of a poison pill adoption. Specifically, a commercial bank may experience a positive or negative impact to firm value and operating performance after the adoption.

B. Poison Pill Defensive Measures

According to Malatesta and Walking (1988) and Ryngaert's (1988) hypothesis, a banks management team adopts a poison pill out of self-interest. The cost of this maneuver is measured by a decrease in share price. After the announcement, stockholders lose faith in the management team's abilities or are upset about the poison pill adoption not being raised raise for a vote. Bojanic and Officer (1994) discovered that the shareholder reactions decrease the stock return by –0.475% two days after the plan is announced. However, there are many variables that surround the adoptions of a poison pill plan. Unless the adoption is the response to an immediate takeover bid, the effects are not fully measured in a two-day period. Opposite this scenario, if a poison pill was adopted as a routine measure, then the two-day effect is representative of the

shareholders reactions. A two-day period is too short to analyze the banking industry, as its adoptions are predominantly classified as "routine measures"[6].

Additional research on the banking industry supports the Comment and Schwert (1995) and Heron and Lie's (2000) value hypotheses. Brewer III, Jackson III, and Wall's (2006) found that bank management uses defensive measures as bargaining tools. However, the bargains raised the takeover premium but also benefited the managerial team by securing a large severance package or a position in the acquiring company. Additionally, this industry is historically characterized for its friendly takeovers, and the deals are friendliest when the bank management has an assured interest in the deal (Brewer III, Jackson III, and Wall, 2006). The stockholders benefit when this interest is based on stock ownership.

A positive affect of adopting a poison pill plan is an increase in takeover premium. Strategically, this creates firm stability allowing for long-term research and development (Pearce II and Robinson Jr., 2004). The Riegle Neal Act has increased the probability of a bank takeover, but the results on the number of anti-takeover strategies adopted have not been measured. Using the Akhigbe et al (2004) results as a basis, the logical result of an increased probability of a bank takeover is an increased number of poison pill adoptions.

Additional evidence supports Comment and Schwert (1995) and Heron and Lie's (2000) increased value hypothesis. The traditionally "friendly" terms[7] mergers and acquisitions in the banking industry are conducted under reduces cases of managerial entrenchment. However, friendly deals use a poison pill as leverage in negotiating the takeover premium and details (Heron and Lie, 2000). If a poison pill is adopted to increase firm value, an increase in Return

[6] Based on the announcements from the Lexis/Nexis database. Many banks rationalize their adoption of a poison pill plan as a routine measure necessary to protect the shareholders from an unfair or unwanted takeover.
[7] Friendly takeovers are defined as the Target making an offer to the shareholders that the board of directors has approved.

on Equity (ROE) will be noted. Additionally, poison pill adoptions have proven to positively increase operating performance as measured by Return on Assets (ROA) (Danielson and Karpoff, 2006).

However, economy wide studies found that a poison pill adoption can have a negative affect on value and performance (Srinidhi and Sen, 2002). A poison pill enables a company to engage in long-term research and development, which decreases ROE and ROA. Under these conditions, the poison pill adoption yields positive results in the long-term. In comparison with Malatesta and Walking (1988) and Ryngaert (1988), who noted negative market reactions, these studies noted positive financial results over a longer period.

C. The Banking Industry

Current banking literature explains the acquisition trend, but does not explain the effect of a poison pill adoption. In the post Riegle-Neal period, banks are engaging in acquisitions to diversify into new geographic areas and product markets based on the "earnings diversification" hypothesis (Brewer III, Jackson III, and Jagtiani, 2000). The intent is to create banks that are "too-big-to-fail" and can exploit the remaining regulations by sheer size. As a result of the "grow or die philosophy," large commercial banks are actively acquiring community banks. In response, many community banks are making friendly takeover attempts to increase their size. However, the bulk of these mergers fail due to the lack of financial resources and stringent regulations (Kline, 1997).

In the years since the Riegle Neal Act of 1997, the number of community banks has drastically declined. Prior literature has demonstrated that the disappearance of the small community banks is related to the changing regulatory state (Akhigbe, Madura, and Whyte, 2004). From this, it is hypothesized that the market consolidation will positively relate to the

number of poison pill adoptions. Second, an adoption will result in increased bank valuation and operating performance, consistent with Comment and Schwert's (1995) and Heron and Lie's (2000) hypothesis. Finally, the adoption of a poison pill will result in an increased probability of that a bank will not be acquired one year after adoption[8].

III. Data

Data for this study consists of the population of commercial banks adopting poison pill plans between 1986 and 2004. The original population contained 75 commercial banks. Five banks were eliminated from the final sample due to a lack of data the sample size was restricted to 70. This sample was gathered from the LexisNexis database using the search terms "commercial bank" and "poison pill plan announced" or "shareholders rights plan." A comparison sample of 70 banks that did not adopt poison pill plans between 1986 and 2004 was also gathered. The comparison banks were matched based on their poison pill peer's year of plan adoption and total assets.

The sample banks were limited to publicly traded, commercial banks, without foreign offices. This resulted in a sample size of 70 banks. After each bank's poison pill announcement was found, the Federal Depositors Insurance Corporation (FDIC) website was searched to verify their certification number and prior history of mergers and acquisitions. Additionally, none of the banks were subject to failures the year after the poison pill adoption.

With the sample of poison pill banks and peer banks the Chicago Federal Reserve database was used to provide Net Income (NI), Total Assets (TA) and Capital Equity (CE) data From this information, ROE was calculated with the formula CE divided by NI. Using NI divided by TA, the ROA for each bank was calculated. Additionally, each bank's market share

[8] This is measured as the probability that a poison pill plan will help a bank survive the year following the adoption as compared to a bank that does not have defensive measures.

percentage was calculated using the Hirschman-Herfindahl Index (HHI) formula. The HHI formula is presented below.

$$H = \sum_{i=1}^{n} s_i^2$$

Where

s_i = the market share of firm I in the market

n = the number of firms in the industry

$H = 1/N$ to one, with N = the number of firms in the market

The two control variables used were Gross Domestic Product (GDP) growth rate and the Herfindahl-Hirschman Index (HHI). The GDP data was acquired from the St. Louis Federal Reserve website for the years 1986 through 2004. From the yearly data the growth rate was calculated using an Excel spreadsheet. The HHI data was calculated using the yearly data provided by the Chicago Federal Reserve website. Similar to the market share calculations, HHI used an Excel spreadsheet and the HHI formula to calculate the banking industry concentration.

IV. Methodology

To analyze why the commercial banks began adopting poison pills in the mid-1990s a Pearson's Correlation was run on HHI and the number of poison pills adopted in each year. A second Pearson's Correlation was measured the effects of GDP on the yearly number of adoptions.

A Non-Parametric Wilcoxon Sign Ranks Test was run to measure the before and after affect of a poison pill adoption on ROE and ROA. The test was also run on the comparison sample and combined samples.

The Wilcoxon Sign Ranks test compares matched observations providing insight about differences between the two populations. A positive result indicates that the post-adoption ROE

or ROA was higher. A negative result indicates that the pre-adoption ROE or ROA was higher. However, significance is required to determine that there is a difference in the before and after data.

A logistic regression measured the probability that a poison pill adopting bank would have a greater probability of survival one year post-adoption. The surviving groups were designated from the acquired groups by the dummy variable ID2. This variable designated the survivors with a "1" and the acquired banks with a "2." The ID2 dummy served as the dependent variable in the logistic regression. A second dummy variable, ID, was used as an independent variable measuring the probability that the poison pill banks had a greater chance of survival. The ID dummy designated poison pill banks with a "0" and comparison banks with a "1." Remaining independent variables included ROE and ROA. Control variables included GDP and HHI.

The logistic regression measures the probability that the dependent variable is equal to 1. Using the interpretation of $E(y)$ as a probability in logistic regression formula:

$$E(y) = P(y = 1 \mid x_1, x_2, \ldots, x_p)$$

The probability of the poison pill adopting bank having a greater ROE, ROA, or chance of survival was measured. The value of $E(y)$ ranges from 0 to 1, with $E(y)$ gradually approaching 1 as the value of x becomes larger, where x serves as the independent variable. Conversely, the value of $E(y)$ approaches 0 as the value of x becomes smaller. The fact that $E(y)$ ranges from 0 to 1, with the resulting curve forming the equation, describes the probability that the dependent variable equals 1 (Anderson, Sweeney, and Williams, 2005).

V. Results

A. Results of the Correlation Analysis Using GDP

The result of the correlation analysis on GDP and number of adoptions is provided in Figure 1. In this graph, the year of the poison pill adoption is listed on the X-axis and the number of plans adopted is listed on the left side Y-axis. The trend line presents the year over year change in GDP as measured by the numbers on the right Y-axis.

Insert Figure 1 here

The results of the correlation proved a negative relationship between GDP growth rate and the number of poison pills adopted in a year existed. A Pearson Correlation indicated at ten percent and five percent significance that GDP and Year have a correlation of –0.253. This inverse relation demonstrates that as the GDP growth rate increases, the number of poison pills adopted decreases. Opposite this, as GDP growth rate decreases the number of poison pills increases. Table 1 provides the full correlation matrix including the exact significance levels.

Insert Table 1 here

The nature of these results is do not imply increases in GDP growth rate cause decreased poison pill adoptions, but there is a relationship between changes in GDP and the number of adoptions. If poison pills increase firm value, then an adoption during an economic downturn would boost a bank's financial value. However, it has yet to be proven that the adoption of a poison pill plan positively impacts firm value or operating performance in a bank.

B. Results for the Correlation Analysis Using HHI

The second correlation is graphically presented in Figure 2. The lay out of the graph has the year of the poison pill adoption on the X-axis and the number of adoptions on the Y-axis. However, the trend line provides the data for the HHI, which measures the industry

concentration, taking values between 0 and 1. A HHI of "0" indicates a completely free market while "1" indicates a monopolistic market. These values are reported on the right Y-axis of the Figure 2.

Insert Figure 2 here

Figure 2 graphically shows the increasing market concentration as the HHI trend line rises over the years. The Pearson Correlation revealed a positive coefficient of 0.451 at significance levels of ten, five, and one percent. This relationship demonstrated that as the market became more concentrated, the number of poison pills adopted increases. Table 2 provides the results of the Pearson Correlation.

Insert Table 2 here

These results demonstrated that banks adopt poison pills in relation to increasing market concentration. Because the purpose of the pill is to protect a firm from unwanted acquisition, these results are in line with past research (Malatesta and Walking, 1988, Ryngaert, 1988). This correlation explains why the poison pills resurgence in the banking industry during the mid-1990s. The Riegle Neal Act of 1997 allowed for a steep increase in market concentration, which related to an increasing number of poison pill adoptions. The national association banks wanted to expand their market presence and acquired more banks. In response, the traditionally small and independent banks sought to maintain their identity through the adoption of a poison pill.

C. Results for the Non-Parametric Comparison

The results for the before and after effects of poison pill adoption on ROE and ROA were measured with the Wilcoxon Sign Ranks test, presented in Table 4. This non-parametric test was run in three, groups presented in three different panels. Panel A provides the ROE and ROA results for the poison pill group of banks. Panel B presents the results for ROE and ROA of

comparison group. The PostROE and ROE variables were analyzed first. In all three panels Post ROE represents the ROE the year before the adoption. ROE then measures the ROE the year after the adoption. Similarly, PostROA represents the ROA one year prior to the adoption. ROA represents the ROA one year after the adoption. The results provided in Panel C are for the cross sample comparison representing the overall industry.

Insert Table 3 here

The results for the non-parametric test on the poison pill group are negative on ROE and ROA. The implications are that the ROE and ROA was higher after the poison pill adoption. These results would be consistent with the increase in operating performance and firm valuation hypothesis but they are non-significant at p-values of ten percent (Comment and Schwert, 1995, Heron and Lie, 2000).

The comparison sample also provided a negative effect on ROE and ROA for the three years surrounding the adoption. However, the results on the before and after ROE measure were statistically significant. At p-values of ten and five percent, the ROE was higher for the comparison banks in the year after their poison pill peers adoption. This result was unexpected and is possibly explained by the managerial entrenchment hypothesis (Malatesta and Walking, 1988, Ryngaert, 1988). Because these banks did not adopt a poison pill, the shareholders did not show a significant negative reaction in the form of decreased ROE.

D. Increased Probability of Survival

Of the 140 banks in the sample 10% were acquired the year after the adoption of a poison pill plan[9]. Additional data detailing the acquiring companies' names is provided in Table 6 of

[9] This figure is derived from the entire sample including both Poison Pill adopting banks and their comparison/peer bank. The total sample size was thus 140 banks, 70 that adopted a poison pill plan and 70 matched peer banks. The 10% figure was based on 14 banks out of the total 140 that were acquired the year after the adoption of the provisions.

the appendix. The dummy variable ID served as the primary independent variable. In the logistic regression it measured the probability that a poison pill bank was more likely to survive than non-poison pill bank. However, the results proved to be non-significant. This meant that poison pill banks did not have a different probability of survival than their non-adopting peers. The GDP and HHI control variables were also non-significant.

The results of the logistic regression are provided in two panels of Table 3. Panel A provides the results for the logistic regression that used ROA and ID as its independent variables. Panel B provides the results for the logistic regression that used ROE and ID as its independent variables. The complete results of both regressions are presented below.

Insert Table 4 here

The non-significant results were noted when using either ROA or ROE as an independent variable. The first logistic regression, using ROA and ID as the independent variables, provided a positive B value, but was non-significant. The second regression using ROA and ID again provided positive B values, but also lacked significance. However, this configuration provided the highest B value for the ID variable. These results were contrary to my hypothesis that a poison pill bank would have a greater chance of survival as compared with a bank that did not adopt a poison pill plan.

Conclusion

The 1997 implementation of the Riegle Neal act opened the banking industry to cross border mergers and acquisitions. During the same time period, the number of poison pill plans adopted by banks experienced a second increase. The objective of this study was to examine the effect of the regulatory changes on the use of poison pills and to discover the cause of the resurgence in popularity of the plan. Based on data from other industries it was known that a

poison pill can have varying effects, depending on the variables measured and time frame used. Finally, the purpose of a poison pill adoption, as stated in numerous corporate announcements, was to protect the shareholders against an unfair takeover offer. Therefore the adoption of a poison pill should have increased a bank's probability of survival.

The correlation analysis strongly related the post Riegle Neal market concentration to an increasing number of poison pill adoptions. These results were significant at all p-values and provide some rationale for the mid-1990s surge in the popularity of the poison pill. The relationship with GDP growth rate was inverse and not as strong. This meant that adoption was probably not due to economic factors. The strongest explanation is offered by the increasing market concentration as measured by HHI. In response to an increasing number of takeovers, smaller banks needed to adopt defensive measures, a poison pill, to protect their independence.

In contrast to the previous research of Comment and Schwert (1995) and Heron and Lie (2000), a significant improvement in firm value or operating performance after the poison pill adoption was not noted. In addition, a significant result was noticed in the before and after comparison of ROE for the comparison bank sample. This result was unexpected, as the poison pill was hypothesized to improve ROE in the adopting banks (Danielson and Karpoff, 2006).

The results for the logistic regression on survival probability also proved to be contrary to the original hypothesis. These results came closest to significance when using ROE as the independent variable. One explanation for the lack of significance is the relatively short post adoption time period examined. Looking at one year post-adoption is not long-term enough to measure survivability for banks that adopt poison pills as routine measures. The one-year time frame only accounts for mergers that were started during the adoption year and therefore rules out future acquisitions.

Additionally, the three-year time frame limited the poison pills effect on ROE and ROA. Danielson and Karpoff (2006) and Srinidhi and Sen (2002) noted their significant results using time periods of three to five years post-adoption. Because this sample data extended into 2004, it was impossible to get the data for five years after the adoption. Increasing the time frame would also increase the probability that a bank is subject to a hostile offer.

The non-parametric test results may have been insignificant because the variables used were not entirely representative of the banking industry. These variables, ROE and ROA, were drawn from past poison pill studies that examined the all economic sectors. However, the banking industry is different than most sectors because they do not conduct research and development, are greatly affected by inflation, and answer to more investors. A future direction of this study is to examine the poison pills effect on the number of deposits and loans issued in the years after the announcement.

Altogether, this study offers explanations for the resurgence of the poison pill in the mid-1990s. However, it was unable to significantly prove that a poison pill adoption positively affected firm valuation and operating performance as noted by Comment and Schwert (1995), Heron and Lie (2000), and Danielson and Karpoff (2006). Also, logistic regression results did not support the hypothesis that the adoption of a poison pill plan increases the probability that a bank will have a greater probability of survival one year post adoption.

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Appendix

A. Statistical Analysis

Table 1 provides the correlation analysis of Year and GDP. The year variable represents the total number of poison pill adoptions for a particular year. The GDP variable is the United State year over year change in Gross Domestic Product (GDP) as measured by the St. Louis Federal Reserve Board. The Pearson's Correlation provides a –0.253 relation at 10% and 5% significance. This indicates that as GDP increases the number of poison pill adoptions decreases. The inverse relationship also means that as the number of poison pill adoptions increase, the GDP is likely to decrease. These results are graphically presented in Figure 1.

Table 1

Correlation Analysis of Year and GDP

	Year	GDP
Year		
Pearson Correlation	1.000	-0.253
Sig. (2-tailed)		0.034
N	70	70
GDP		
Pearson Correlation	-0.253	1.000
Sig. (2-tailed)	0.034	
N	70	70

Table 2 presents the results of a correlation analysis on Year and HHI. The year variable represents the number of poison pill plans adopted by commercial banks in a specific year. The HHI variable is the Herfindahl-Hirschman Index, which measures the level of market concentration. A HHI of 1 represents a monopolistic market while a HHI of 0 represents a very open market. Results of the Pearson's Correlation demonstrate a 0.451relationship between Year and HHI. As the market consolidates, as measured by the HHI, the number of poison pill plans adopted increases. This result supports the hypothesis that poison pill plans are adopted in response to market consolidations. Banks adopted these defensive measures in responses to the Riegle Neal regulatory changes that increased the probability of a takeover as demonstrated by Akhigbe, Madura, and Whyte (2004). Graphical representation of this analysis is provided in Figure 2.

Table 2

Correlation Analysis of Year and HHI

	Year	HHI
Year		
Pearson Correlation	1.000	0.451
Sig. (2-tailed)		0.000
N	70	70
HHI		
Pearson Correlation	0.451	1.000
Sig. (2-tailed)	0.000	
N	70	70

Table 3 provides the results of the Non-Parametric Test that measured the before and after changes resulting from a poison pill adoption. Panel A provides the results for the poison pill banks measuring first Return on Equity (ROE). The change in ROE is negative following a poison pill adoption, but this difference is non-significant. Similarly, the Return on Assets (ROA) variable is negative, but the results are non-significant. Panel B provides the before and after comparison data for the peer banks that did not adopt a poison pill plan. The ROE variable is negative, and statistically significant. This implies that the comparison group had a higher ROE the year after the poison pills were adopted. The ROA variable is also negative, but is non-significant. Overall, the adoption of a poison pill plan does not directly increase ROE or ROA in the one year follow up.

Table 3

Changes in operating performance before and after poison pill adoption

	Statistical data			
	Mean	Median	Z Score	Asymp. Sig. (2-tailed)
Panel A: Changes in performance measured in the poison pill group				
PostROE-ROE			-1.428	0.153
PostROA-ROA			-1.441	0.150
Panel B: Changes in performance measured in the peer group				
PostROE-ROE			-2.000	0.045
PostROA-ROA			-1.253	0.210
Panel C: ROE & ROA as measured in both samples				
ROE ID 0	0.1396	0.1210	-0.467	0.641
ROE ID 1	0.0999	0.1329		
ROA ID 0	0.0129	0.0098	-0.604	0.546
ROA ID 1	0.1084	0.1227		

Table 4 presents the results of the logistic regression. This test measured the probability that the adoption of a poison pill plan improved the chances of survival. The independent variable ID2, represented surviving banks with a "1" and acquired banks with a "0." The control variables included Gross Domestic Product (GDP) and Herfindahl-Hirschman Index (HHI). The dummy variable ID differentiated poison pill banks with a "0" from the comparison banks, "1." Two Logistic Regressions were run. The first used the independent variables ROA and ID. The second used ROE and ID. Panel A provides the results for the effect on ROA and notes a positive B value for both ROA and ID. This denotes that surviving banks have stronger Returns on Assets and benefit from adopting poison pill plans, however, these results are non-significant. The second regression, presented in Panel B examined the impact of Return on Equity and ID. The B value was positive indicating an increase in ROE for surviving banks and increased probability of survival, but the results were non-significant. The conclusion is that poison pill adoptions do not significantly increase a bank's probability of survival one year after adoption.

Table 4

Logistic Regression Analysis

	Equation Variables					
	B	S.E.	Wald	df	Sig.	Exp(B)
Panel A: Effect on ROA						
GDP	0.158	0.242	0.429	1	0.513	1.171
HHI	-7.19	22.463	0.102	1	0.749	0.001
ROA	18.916	25.817	0.537	1	0.464	2.00E+08
ID	0.614	0.589	1.089	1	0.297	1.849
Constant	1.322	0.891	2.202	1	0.138	3.752
Panel B: Effect on ROE						
GDP	0.165	0.245	0.456	1	0.500	1.180
HHI	-7.788	22.264	0.122	1	0.726	0.000
ROE	0.584	0.594	0.965	1	0.326	1.793
ID	1.286	0.904	2.021	1	0.155	3.617
Constant	1.389	0.892	2.427	1	0.119	4.012

B. Descriptive Statistics

Table 5 provides the name of each of the banks in the study that adopted a poison pill provision between 1986 and 2004. This table provides information detailing the purpose behind the adoption: Friendly Deal, Routine Measure, Unsolicited Proposal, Sudden Stake Accumulation, and Hostile Tender Offer. In total, 93% of the population cited "routine measures" as their rationale for adoption. Of the other four justifications, only the sudden stake accumulation was used by more than one bank. The hostile tender offer description, which is most commonly associated with a poison pill adoption, was used by one bank. The furthest column to the right details the status of the board of directors on the date of the adoption. The combination of a staggered board and poison pill is the strongest defensive measure a company can take. Unfortunately, the staggered board information for the comparison sample was not found and therefore not analyzed in this study.

Table 5

Poison Pill Bank Descriptions

	Date of Adoption	Plan Description	State	Staggered Board
1st Constitution Bancorp	3/18/2004	Routine Measure	New Jersey	No
Andover Bancorp Inc	2/16/1989	Routine Measure	Massachusetts	No
Arrow Financial Corp	5/13/1997	Routine Measure	New York	No
BNCcorp	5/30/2001	Routine Measure	North Dakota	Yes
BSB Bancorp Inc	5/22/1989	Routine Measure	New York	No
BT Financial Corp	3/27/1991	Routine Measure	Pennsylvania	No
BancorpSouth Inc	3/28/2001	Routine Measure	Mississippi	Yes
Barnett Banks Inc	2/21/1990	Routine Measure	Florida	No
Bryn Mawr Bank Corp	11/18/2003	Routine Measure	Pennsylvania	No
CB Bancshares Inc	3/16/1989	Routine Measure	Hawaii	No
California Bancshares Inc	6/30/1995	Friendly Deal	California	No
California Independent Bancorp	11/21/2002	Routine Measure	California	No
Capital Corp of the West	9/26/1997	Routine Measure	California	No
Central Co-Operative Bank	10/24/1991	Routine Measure	Massachusetts	No
Citizens Banking Corp	7/20/1990	Routine Measure	Michigan	No
City Holding Co	4/10/1991	Routine Measure	West Virginia	No
Civic Bancorp	11/11/1996	Routine Measure	California	No
Commerce Bancshares Inc	8/23/1988	Routine Measure	Missouri	No
Commonwealth Bancshares Corp	7/11/1990	Routine Measure	Pennsylvania	No
Community Banks Inc	2/12/2002	Routine Measure	Pennsylvania	Yes
Community Financial Group Inc	1/21/1998	Routine Measure	Tennessee	No
Community First Bankshares Inc	1/5/1995	Routine Measure	North Dakota	No
First Interstate of Iowa Inc	12/11/1991	Routine Measure	Iowa	No
First Union Corp	12/18/1990	Routine Measure	North Carolina	No
First Virginia Banks Inc	7/27/1988	Routine Measure	Virginia	No
Firstar Corp	1/19/1989	Routine Measure	Wisconsin	No
Fulton Financial Corp	6/21/1989	Routine Measure	Pennsylvania	No

Glen Burnie Bancorp	2/17/1998	Unsolicited Proposal	Maryland	No
Hancock Holding Co	2/21/1997	Routine Measure	Mississippi	No
Independent Bank Corp	1/24/1991	Routine Measure	Massachusetts	No
LNB Bancorp,Inc	10/24/2000	Routine Measure	Ohio	No
LSB Bancshares Inc	2/11/1998	Routine Measure	North Carolina	No
Lakeland Bancorp Inc	8/24/2001	Routine Measure	New Jersey	Yes
Lenox Bancorp Inc	6/13/1999	Routine Measure	Ohio	No
Lincoln Financial Corp	12/19/1989	Routine Measure	Indiana	No
MNB Bancshares Inc	3/30/2001	Routine Measure	Kansas	Yes
MassBank Corp	1/16/1990	Routine Measure	Massachusetts	No
Mercantile Bancorp	5/23/1988	Routine Measure	Missouri	No
NBT Bancorp Inc	11/16/1994	Routine Measure	New York	No
NSD Bancorp Inc	9/13/2002	Routine Measure	Pennsylvania	Yes
National Community Banks Inc	12/19/1990	Routine Measure	New Jersey	No
National Penn Bancshares Inc	8/23/1989	Routine Measure	Pennsylvania	No
North Fork Bancorp Inc	2/28/1989	Routine Measure	New York	No
North Side Savings Bank	4/18/1996	Sudden Stake Accumulation	New York	No
Northern Trust Corp	10/17/1989	Routine Measure	Illinois	No
Old Second Bancorp Inc	9/17/2002	Routine Measure	Illinois	Yes
Pacific Bank NA	11/6/1996	Routine Measure	California	No
Pacific Capital Bancorp	12/15/1999	Routine Measure	California	No
Patriot National Bank	4/15/2004	Routine Measure	Connecticut	No
Peoples Bancorp of Worcester Inc	3/28/1989	Sudden Stake Accumulation	Massachusetts	No
Provident Bankshares Corp	1/18/1995	Routine Measure	Maryland	No
Quincy Savings Bank	9/28/1992	Routine Measure	Massachusetts	No
Second National Financial Corp	9/14/1998	Routine Measure	Virginia	No
Sierra Tahoe Bancorp	12/27/1995	Routine Measure	California	No
Silicon Valley Bancshares	10/27/1998	Routine Measure	California	No
SouthTrust Corp	2/22/1989	Routine Measure	Alabama	No
Southside Bancshares Corp	5/27/1993	Routine Measure	Missouri	No
Suffolk Bancorp	10/23/1995	Hostile Tender Offer	New York	No
Surety Capital Corp	6/19/1997	Routine Measure	Texas	No
Tolland Bank	6/20/1989	Routine Measure	Connecticut	No
Trustcompany Bancorp	3/29/1990	Routine Measure	New Jersey	No
US Bancorp	11/10/1989	Routine Measure	Oregon	No
UST Corp	10/13/1995	Routine Measure	Massachusetts	No
Union Planters Corp	1/19/1989	Routine Measure	Tennessee	No
United National Bancorp	11/1/2001	Routine Measure	New Jersey	Yes
Village Bancorp Inc	9/23/1996	Routine Measure	Illinois	No
Waltham Corp	1/23/1989	Routine Measure	Virginia	No

Washington Trust Bancorp Inc	8/16/1996	Routine Measure	Rhode Island	No
Wintrust Financial Corp	7/31/1998	Routine Measure	Illinois	No
Zions Bancorp	9/27/1996	Routine Measure	Utah	No

Table 6 provides the descriptive statistics for the fate of both bank samples one year after the poison adoption. Out of the original population of 70 banks that had adopted poison pills, five were acquired one year later. From the comparison sample, 9 banks were acquired in the same one year period. In spite of the larger number of non-poison pill banks being acquired, a logistic regression did not reveal a significant decrease in the probability of takeover associated with a poison pill adoption .

Table 6
Bank Descriptions

Poison Pill Bank	Acquirer	Comparison Bank	Acquirer
1st Constitution Bancorp		Walpole Co-Operative Bank	
Andover Bancorp Inc		Farmers First Bank	
Arrow Financial Corp		Bank One Trust Co. NA	
BNCcorp	BNC National Bank	Union Center National Bank	
BSB Bancorp Inc		Liberty Bank for Savings	
BT Financial Corp		First Amarillo Bancorporation, Inc.	Boatmen's First National Bank
BancorpSouth Inc		National City Bank	
Barnett Banks Inc		Continental Bank Corp	
Bryn Mawr Bank Corp		Community Bank & Trust	
CB Bancshares Inc		First National Bank in Wichita	
California Bancshares Inc	US Bank of California	Wesbanco, Inc.	
California Independent Bancorp		Park National Bank	
Capital Corp of the West		First Bank National	Grand National Bank
Central Co-Operative Bank		First National Bank of Hutchinson	
Citizens Banking Corp		Key Bank of Western NY NA	Keybank NA
City Holding Co.		Pioneer Bancorp, Inc.	
Civic Bancorp		Durant Bank & Trust Co.	
Commerce Bancshares Inc		Norwest Bank Nebraska	
Commonwealth Bancshares Corp		New Hampshire Savings Bank Corp	New Dartmouth Bank[1]
Community Banks Inc		Banterra Bank	
Community Financial Group Inc		Marquette Bank Rochester NA	Wells Fargo Bank Minnesota
Community First Bankshares Inc		Bank of Tazewell County	
First Interstate of Iowa Inc	Boatmen's Bank of North Iowa	Ameribanc, Inc.	
First Union Corp		Mellon Bank Corp	
First Virginia Banks Inc		United Bank & Trust Co.	
Firstar Corp		Emigrant Savings Bank	
Fulton Financial Corp		Planters National Bank & Trust Co.	RBC Centura Bank
Glen Burnie Bancorp		Bankwest of Nevada	

Hancock Holding Co.		PNC Bank of New England	
Independent Bank Corp			Bank of America NA
		Security Pacific Bank NV NA	
LNB Bancorp,Inc		Valley Bank & Trust	
LSB Bancshares Inc		First MRCH Bank NA	
Lakeland Bancorp Inc		Harris Bank Hinsdale NA	
Lenox Bancorp Inc		Border Trust Co.	
Lincoln Financial Corp		Jefferson National Bank	
MNB Bancshares Inc		Bank of Northumberland	
MassBank Corp		Dubuque Bank & Trust Co.	
Mercantile Bancorp		Riggs National Corp	
NBT Bancorp Inc		State National Bank	
NSD Bancorp Inc		Bar Harbor Banking & Trust Co.	
National Community Banks Inc		Rochester Community Savings Bank	
National Penn Bancshares Inc		Valley American Bank & Trust Co.	
North Fork Bancorp Inc		Citizens National Bank of Evansville	
North Side Savings Bank			Meridian Bank, New Jersey
	North Fork Bank	United Counties Trust Co.	
Northern Trust Corp		American Express CNTRN Bank	
Old Second Bancorp Inc		Gold Bank	
Pacific Bank NA		Cambridge Trust Co.	
Pacific Capital Bancorp		Citizens Banking Co.	
Patriot National Bank		First National Bank of Florida	
Peoples Bancorp of Worcester Inc		Bank of A Levy	
Provident Bankshares Corp		National Bank of Alaska	
Quincy Savings Bank		First National Bank	
Second National Financial Corp		Swineford National Bank	
Sierra Tahoe Bancorp	Sierrawest Bank	Portsmouth Bankshares Inc.	
Silicon Valley Bancshares		First Financial Bancorp	
SouthTrust Corp		Bank Leumi Trust Co. of New York	
Southside Bancshares Corp		Union Bancshares, Inc.	
Suffolk Bancorp		Central Bank	
Surety Capital Corp		Chemical Bank Thumb Area	
Tolland Bank		Downington National Bank	
Trustcompany Bancorp		Sunwest Bank of Albuquerque NA	
US Bancorp		State Street Bank and Trust Co.	
UST Corp		State Bank of Axtell	
Union Planters Corp		First National Bank of Commerce	
United National Bancorp		Bank One WV NA	
Village Bancorp Inc		First National Bank of Buhl	

Waltham Corp	Bank of Commerce	
Washington Trust Bancorp Inc	Rapides Bank & Trust Co. in Alexandria	
Wintrust Financial Corp	Republic Bancorp	
Zions Bancorp	The Summit Bancorporation	Summit Bank

C. Market Statistic

Table 7 provides descriptive statistics for the variables used to measure the samples performance. Return on Equity (ROE) is defined as Net Income divided by Capital Equity. This variable examined value added by the adoption of a poison pill plan. Return on Assets (ROA) is defined as Net Income divided by Total Assets. This variable examined the effect of the adoption on operating performance. The "Before" and "After" indicators designate the variables that measured the year before data from the year after adoption data. Also, the sample is divided into two groups, the Poison Pill Sample and Comparison Group. The Poison Pill Sample is made up of the 70 banks that adopted a poison pill plan from 1988 to 2004. The Comparison Group is a sample of 70 separate banks that never adopted a poison pill plan and were matched with the Poison Pill Sample based on Total Assets.

Table 7

Descriptive Statistics

	N	Mean	Median	Std. Deviation
Poison Pill Sample				
ROE Before	70	0.1396	0.1210	0.1583
ROE After	65	0.1076	0.1216	0.1096
ROA Before	70	0.2264	0.0098	1.7494
ROA After	65	0.0085	0.0095	0.0095
Comparison Group				
ROE Before	70	0.0999	0.1329	0.2853
ROE After	61	0.1084	0.1227	0.0932
ROA Before	70	0.0094	0.0106	0.0084
ROA After	61	0.0091	0.0104	0.0066

Table 8 provides the descriptive statistics for the control variables used in the correlation analysis, non-parametric test, and logistic regression. The first variable is Gross Domestic Product (GDP) is the year over year change in the Gross Domestic Product of the United States. The year variable measures the number of adoptions that occurred in a particular year. Further frequency data for the number and years of the adoptions is provided in Table 9. Herfindahl-Hirschman Index (HHI) is a measure of market concentration. HHI takes on values between 1 (monopoly) and 0 (free market).

Table 8

Control Variables

	Min.	Max.	Mean	Median	Std. Deviation
GDP	-0.2	4.5	3.336	3.7	1.0817
Year	1988	2004	1994	1995	4.9117
HHI	0.00515	0.04904	0.01302	0.0072	0.0124

Table 9 provides the frequency distribution for the number of poison pill plans adopted in each year covered by this study. The greatest number of poison pill plans was adopted in 1989, in line with Srinidhi and Sen's (2002) observation. More than 20% of the banks that adopted poison pill plans did so in 1989. Other major trends include a resurgence of plan adoptions in the mid-1990s, centering on the implementation of the Riegle Neal Act of 1997.

Table 9

Date of Adoption Frequency Distribution

	Frequency	Percentage
1988	3	4.29%
1989	15	21.43%
1990	7	10.00%
1991	5	7.14%
1992	1	1.43%
1993	1	1.43%
1994	1	1.43%
1995	6	8.57%
1996	6	8.57%
1997	4	5.71%
1998	6	8.57%
1999	2	2.86%
2000	1	1.43%
2001	5	7.14%
2002	4	5.71%
2003	1	1.43%
2004	2	2.86%

D. Figures

Figure 1

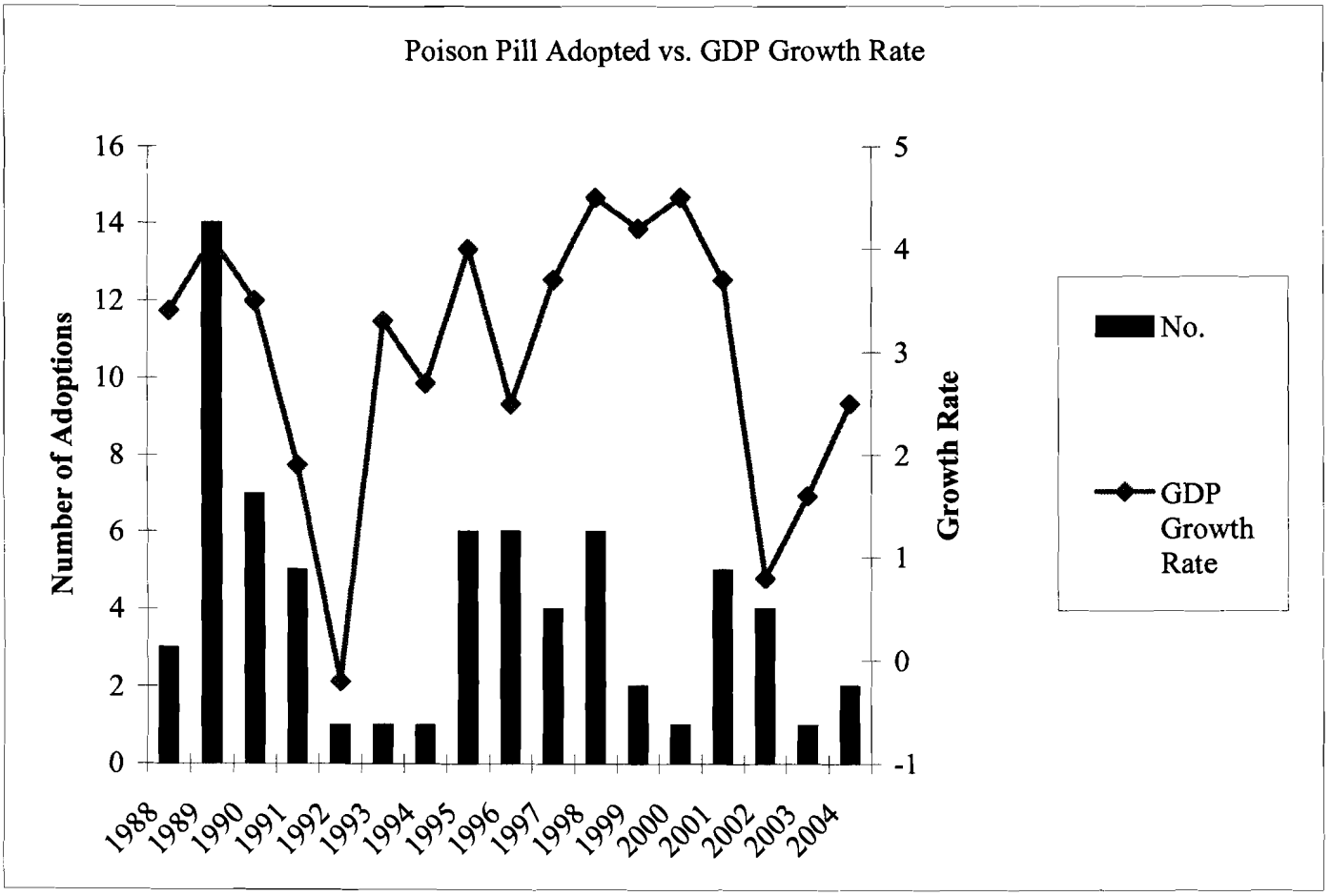
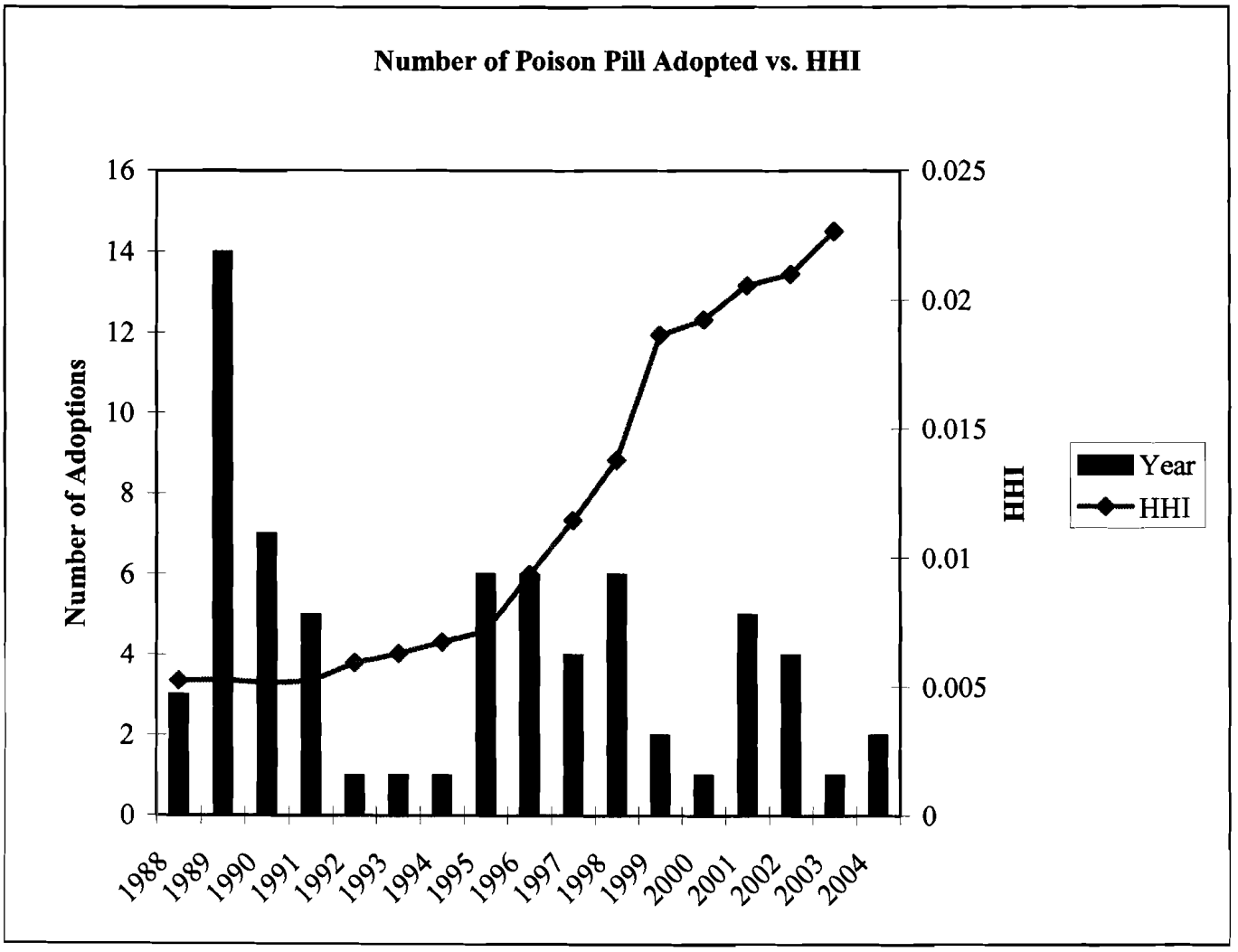


Figure 2


Number of Poison Pill Adopted vs. HHI
Number of Adoptions
HHI
Year
HHI
16
14
12
10
8
6
4
2
0
0.025
0.02
0.015
0.01
0.005
0
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004