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DID REFORM OF PRUDENT TRUST
INVESTMENT LAWS CHANGE
TRUST PORTFOLIO ALLOCATION?

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Did Reform of Prudent Trust Investment Laws Change Trust Portfolio Allocation?

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Abstract

This paper investigates the effect of changes in state prudent trust investment laws on asset allocation in noncommercial trusts. The old *prudent man rule* favored "safe" investments and disfavored "speculation" in stock. The new *prudent investor rule* directs trustees to craft an investment portfolio that fits the risk tolerance of the beneficiaries and the purpose of the trust. Using state- and institution-level panel data from 1986 through 1997, we find that after adoption of the new prudent investor rule, institutional trustees held about 1.5 to 4.5 percentage points more stock at the expense of "safe" investments. Our findings explain roughly 10 to 30 percent of the overall increase in stock holdings in the period studied. The rest of the increase appears to be attributable to stock market appreciation. We conclude that, even though trust fiduciary laws are nominally default rules, institutional trustees are nonetheless sensitive to changes in those rules.

I. INTRODUCTION

"How do you make a small fortune? Give a bank a large one to manage in trust" (Dukeminier and Krier 2003, p. 1335). So goes an old saw about the banking industry that reflects long experience with risk-averse, conservative trust investing by institutional trustees operating under the *prudent man rule* of trust investment law. The prudent man rule favored "safe" investments such as government bonds, disfavored "speculation" in

stock, and under the rule the courts assessed the prudence of each investment in isolation rather than in the context of the portfolio as a whole. In the last twenty years, however, all states have replaced the old prudent man rule with the new *prudent investor rule*. Drawing on the teachings of modern portfolio theory, the new prudent investor rule directs the trustee to invest based on risk and return objectives reasonably suited to the trust and instructs courts to review the prudence of individual investments not in isolation but in the context of the trust portfolio as a whole. The new prudent investor law thus abolishes all categorical restrictions on permissible types of investments, thereby rejecting the old law's hostility to investment in stock.

The effects of this legal reform have been largely unstudied,[1] but are potentially quite important. State trust investment law governs the investment of substantial sums of money. At year-end 2004 federally-reporting institutional trustees alone held roughly $1 trillion in one million noncommercial trust funds. Further, with the increasing use of perpetual trusts, and the rise of the inter vivos revocable trust as a popular mode of non-

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[1] Begleiter (1999) surveyed 239 banking institutions in Iowa about their interpretation of the new Iowa prudent investor rule. Of the 61 institutions replying, a substantial majority indicated that they employed risk/return analysis in making trust investments and that the new prudent investor rule did not flatly prohibit specific investments. Begleiter did not undertake a before-and-after comparison.

In an unpublished paper, Hankins et al. (2005) examine the effect of prudent trust investment laws on the preference for dividend-paying stocks among institutional investors such as insurance companies and bank trust departments. Based on SEC filings they find that, between 1990 and 2000, such institutions increased their holdings in non-dividend paying stocks after a state's adoption of the new prudent investor law. However, their sample data does not distinguish between personal trusts and funds not covered by state prudent investor rules, such as ERISA benefit funds. By contrast, our data isolates actively-managed personal trust funds from other institutional holdings, more closely aligns those funds with the applicable state law, and we exclude principal and income reform. Moreover, we use ERISA funds, which are governed by federal law, as a control group in some specifications.

probate transfer, the volume of investment capital managed by trustees is likely to grow substantially.[2]

This paper investigates the effect of the change from the prudent man rule to the prudent investor rule on stock holdings in noncommercial trusts. In the period under study, 35 states adopted the new prudent investor rule.[3] Using state- and institution-level panel data from 1986 through 1997, we find that after a state's adoption of the prudent investor rule, trust institutions held about 1.5 to 4.5 percentage points more stock at the expense of "safe" investments. This shift to stock amounts to a 3 to 10 percent increase in stock holdings and accounts for roughly 10 to 30 percent of the overall increase in stock holdings in the period under study. We provide some evidence that the rest of the increase is attributable to stock market appreciation.

Even though trust investment laws are nominally default rules, we conclude that such rules matter in the presence of agency costs and unreliable judicial enforcement of opt outs. Moreover, by showing that trustees are sensitive to changes in trust fiduciary law, our findings imply that the fiduciary obligation is a viable means of trust governance.

The remainder of this paper is organized as follows. Section II motivates the empirical analysis by reviewing the law and economics of trust investment and the prior literature. Section III explains our research design, the nature of our dataset, and our identification strategies. Section IV reports our results. Section V concludes.

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[2] The 2006 Uniform Prudent Management of Institutional Funds Act applies the new prudent investor rule to charities organized as nonprofit corporations (charities organized as trusts are covered directly by state trust investment law) (see *Uniform Prudent Management of Institutional Funds Act* 2006, Pref. Note & §3; *Restatement (Second) of Trusts* 1959, §389).

[3] Nine of those 35 repeals, however, came in 1997, the last year of the study. See infra Figure 1 and Appendix Table 1.

II. THE LAW AND ECONOMICS OF TRUST INVESTMENT

A. Fiduciary Administration

A trust is a fiduciary relationship in which the trustee holds legal title to specified property, entrusted to him by the settlor, and manages that property for the benefit of one or more beneficiaries. Hence the trust separates risk-bearing (the beneficiaries) and management (the trustee) (Sitkoff 2004).

To safeguard the beneficiary from mismanagement or misappropriation by the trustee, trust law supplies a set of default terms known as fiduciary duties that prescribe the trustee's level of care (the duty of prudence) and proscribe misappropriation (the duty of loyalty). Such terms are open-ended standards that are enforced through ex post litigation, in effect an after-the-fact judicial completion of the trust deal.[4] Moreover, because trust default law makes it difficult for the beneficiary to remove the trustee, and because the beneficiary's interest is typically inalienable (i.e., there is no market for trust control), the threat of fiduciary litigation is the primary force for minimizing agency costs in the modern trust relationship.[5] With respect to managing the trust's investment portfolio, unless the settlor provides otherwise, the trustee's fiduciary duty of prudence is defined by the default law of trust investment.

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[4] See infra note 18 and text accompanying.

[5] See Langbein (1995) and Sitkoff (2003, 2004) for contractarian and agency-cost analysis of trust fiduciary law.

B. The Constrained Prudent Man Rule

After the South Sea Bubble burst in 1720, the English Court of Chancery developed a list of presumptively proper investments for trustees. These "legal lists," which were widely adopted in the United States, generally favored investment in government bonds and first mortgages, and proscribed investments in equity.[6]

In the seminal case of *Harvard College v. Armory* (26 Mass. 446, 469 [1830]), the Supreme Judicial Court of Massachusetts rejected the legal list approach and adopted what came to be known as the prudent man rule. The court held that the trustee must "observe how men of prudence, discretion and intelligence manage their own affairs, not in regard to speculation, but in regard to the permanent disposition of their funds, considering the probable income, as well as the probable safety of the capital to be invested." Nudged by the American Bankers Association, which in the 1940s sponsored a model statute codifying *Armory*, most states abandoned their legal lists for the prudent man rule.[7]

By the mid-twentieth century, however, the prudent man rule devolved into a highly constrained default. For example, the 1959 Restatement (Second) of Trusts, an influential summary of the common law that was frequently cited by courts (see Langbein 2001, p. 67:n.3), took the position that investing in "speculative" stock (defined to include stock in any company other than one "with regular earnings and paying regular dividends which may reasonably be expected to continue"), buying securities on margin,

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[6] For further discussion of the relevant law, see Langbein and Posner (1976, pp. 3-4); Friedman (1964, pp. 567-68). For a specific example, see King v. Talbot, 40 N.Y. 76 [1869], which restricted trust investment to government bonds and first mortgages and forbid investment in corporate securities.

[7] The model prudent man rule statute and the role of the banking lobby is discussed in Langbein and Posner (1976, p. 5) and Shattuck (1951, pp. 499-504, 508-09).

or buying discounted bonds was presumptively improper.[8] By contrast, "[o]rdinarily it is proper for a trustee to invest in . . . bonds of the United States or of the State or of municipalities, in first mortgages on land, or in corporate bonds" (*Restatement (Second) of Trusts* 1959, §227 cmts. f, m). Indeed, the 1992 Restatement (Third) of Trusts, which rejects the old prudent man rule in favor of the new prudent investor rule, criticized the old rule and the prior Restatement on the ground that "broad categories of investments and techniques often came to be classified as 'speculative' and thus as imprudent per se" (*Restatement (Third) of Trusts: Prudent Investor Rule* 1992, pp. 3-4).

Moreover, judicial review of the trustee's investments operated ex post, inviting hindsight bias in the form of "post hoc searches for evidence that investments were too risky" (Rachlinski 2000, pp. 79-80).[9] Thus, if a higher risk investment did not pay off, the trustee faced potential liability for imprudently "speculating" in stock.[10] Worse still, courts assessed the prudence of each investment in isolation rather than in the context of the portfolio as a whole, exposing the trustee to liability for a decline in the value of one stock even if that stock was part of a properly diversified portfolio.

At the same time, court decisions suggest that it was difficult to contract out of judicial scrutiny. Neither specific authorization in the trust instrument to make a particu-

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[8] Because the old prudent man rule was hostile to investment in stock of companies that did not pay regular dividends, the repeal of the old law in favor of the new rule might be relevant to the growing literature that examines the declining incidence of cash dividends among publicly-traded firms. See, for example, Fama and French (2001); Amihud & Li (2006).

[9] *In re Chamberlain's Estate* (156 A. 42, 43 [1931]), is an egregious example: "It was common knowledge, not only amongst bankers and trust companies, but the general public as well, that the stock market condition [in August 1929] was an unhealthy one, that values were very much inflated, and that a crash was almost sure to occur. In view of this fact, I think it was the duty of the executors to dispose of these stocks immediately upon their qualification as executors."

[10] See, for example, *First Alabama Bank of Montgomery v. Martin* (425 So. 2d 415, 427 [1983]), holding that investment in a set of stocks that underperformed was imprudent "speculation" because the trustee had intended to sell them after appreciation). See also Rachlinski (2000, pp. 79-81), collecting cases.

lar investment[11] nor a broad exculpation clause insulated the trustee from judicial review (Dukeminier et al. 2005, pp. 540-43). Not surprisingly, prior studies have found bank trust departments to be among the most conservative of institutional investors.[12]

C. The Modern Prudent Investor Rule

In the latter part of the twentieth century, scholars and sophisticated practitioners familiar with modern portfolio theory (MPT) began calling for reform of the prudent man rule (see, for example, Gordon 1987; Langbein and Posner [1976, 1977]; Longstreth 1986). As the critics rightly noted, risk is correlated with return and unsystematic risk can be diversified away. Assessing the prudence of a particular investment therefore requires consideration of the portfolio as a whole, the beneficiary's tolerance for risk, and the purpose of the trust. Critics also noted that investment in long-term, fixed-rate obli-

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[11] Even if the trust instrument gave the trustee such a power, the courts still assessed whether the trustee's exercise of the power was prudent under the circumstances. "An authorization by the terms of the trust to invest in a particular type of security does not mean that any investment in securities of that type is proper" (*Restatement (Second) of Trusts* 1959, §227 cmt. v). Although a sound principle in theory—the existence of a power does not speak to the prudence of its exercise—in practice judicial review of the trustee's exercise of the power to make a particular investment was informed by the existing, constrained default rules. For example, in a well-known 1977 California decision, even though the trust instrument authorized every kind of investment "irrespective of whether said investments are in accordance with the laws then enforced in the State of California pertaining to the investment of trust funds," the court held the trustees liable for breach of the prudent man rule. "While the declaration of trust may possibly enlarge the prudent-investor standard as far as the Type of investment is concerned," explained the court, "it cannot be construed as permitting deviations from that standard in investigating the soundness of a specific investment." *Estate of Collins* (139 Cal.Rptr. 644, 646:650 [1977]).

[12] Based on SEC filings of institutional stock holdings prior to 1990, Del Guercio (1996) concluded that bank trust departments were the most conservative institutional investors. Although Del Guercio did not exploit differences in state laws (few states adopted the new prudent investor rule during the period of her study), she attributed bank trust departments' relative conservatism to the prudent man rule. Using SEC filings from 1983-1997, Bennet et al. (2003) also examined differences in asset allocations across institutional investors, likewise finding that bank trust departments invested quite conservatively. Both Del Guercio and Bennett et al. base their analyses on SEC filings that detail the institution's aggregate investment profile, which likely includes not only personal trusts but also employee benefit and other funds. As such, their data is less refined than ours.

Taking a different approach, but reaching a similar result, Longstreth (1986) surveyed the 50 largest bank trust departments, college and university endowments, private foundations, and corporate pension fund sponsors. Of the institutions replying, bank trust departments reported being most constrained by the legal standards governing their investment practices.

gations with little default risk, which were favored under the old prudent man rule, exposes the trust fund to considerable inflation risk.

In the mid to late 1980s a handful of states responded to the cogency of these criticisms by repealing the old prudent man rule in favor of a new prudent investor rule. But widespread repeal of the old prudent man rule did not come until the early 1990s. The deathblows to the old rule were two: (1) the 1992 Restatement (Third) of Trusts sections on prudent trust investment and (2) the 1994 Uniform Prudent Investor Act (hereinafter "UPIA"). Thanks in large part to the influence of the UPIA and the Restatement Third, today every state has repealed the old prudent man rule in favor of the modern prudent investor rule.[13]

A further stimulus for reform, which was cited expressly by the drafters of the UPIA and the Restatement, was the Employee Retirement Income Security Act of 1974 (ERISA). As interpreted by an authoritative 1979 regulation, prudent investment under

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[13] We treat any statute that instructs courts to evaluate the prudence of a particular investment in light of the composition of the trust portfolio as a whole as an adoption of the modern prudent investor rule even if the statute is not based on the Restatement or the UPIA. Appendix Table 1 details our dating of the modern prudent investor laws. The language of the UPIA is a bit more precise than some of the earlier statutes in that it expressly abolishes all categorical restrictions on investments, §2(e), and forbids hindsight review, §8. The Restatement and UPIA also consolidate the duty to diversify into the definition of prudence (see UPIA 1994, §3; Restatement (Third) of Trusts: Prudent Investor Rule 1992, §227(b)), and liberalize the rules respecting delegation of investment authority (see UPIA 1994, §9; Restatement (Third) of Trusts 1992, §171).

The Restatement Third, approved by the American Law Institute in 1990 and published in 1992, has the potential to complicate our study of the prudent investor statutes in two ways. First, by validating MPT and clarifying legal issues through its extensive commentary, the Restatement may have provided an important aid in interpreting the handful of modern prudent investor statutes adopted prior to 1992. Second, by influencing "industry practice—what other trustees similarly situated [are] doing" (Langbein 1996, p. 644), the Restatement might have affected portfolio design in states that were late to adopt the modern prudent investor rule. However, in unreported regressions we find that stock holdings in reform states increased even more relative to those in non-reform states after the Restatement Third was promulgated, and in some specifications we did not detect any additional effect of the Restatement. Therefore, even if the new Restatement affected portfolio allocations, the prudent investor rule statutes nonetheless had a significant independent effect. We suspect that the Restatement may have enhanced relative differences between reform and non-reform states by providing commentary that substituted for a body of case law interpreting the new prudent investor rule statutes.

ERISA requires consideration of the role that each investment plays in the context of the portfolio as a whole.[14] Thus, the federal courts employ a total portfolio approach in ERISA litigation involving the prudence of individual pension trust investments.[15]

D. Does Default Trust Investment Law Matter?

As reformulated (and made gender-neutral), the new prudent investor rule provides that the "trustee's investment and management decisions respecting individual assets are evaluated not in isolation but in the context of the trust portfolio as a whole and as a part of an overall investment strategy having risk and return objectives reasonably suited to the trust" (UPIA 1994, §2).[16] Like the old law, the new law is nominally a default rule that may be altered by the terms of the trust (UPIA 1994, §1(b)).

Default rules should only matter in the presence of transaction costs. If the settlor can cheaply specify investment goals in the trust instrument, and if the trustee's compliance with those instructions is easily observed, the recent change in prudent trust invest-

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[14] See 29 C.F.R. §2550.404a-1(b)(1)(i), interpreting ERISA §404(a)(1)(B), 29 U.S.C. §1104(a)(1)(B). The official commentary to the regulation explains: "The 'prudence' rule in the Act sets forth a standard built upon, but that should and does depart from, traditional trust law in certain respects. The Department is of the opinion that (1) generally, the relative riskiness of a specific investment or investment course of action does not render such investment or investment course of action either *per se* prudent or *per se* imprudent, and (2) the prudence of an investment decision should not be judged without regard to the role that the proposed investment or investment course of action plays within the overall plan portfolio" (*44 Fed. Reg. 37,221* Jun. 26, 1979, p. 37,222).

[15] See, for example, *Laborers National Pension Fund v. Northern Trust Quantitative Advisors*, (173 F.3d 313, 322 [1999]) (reversing the district court for reviewing the investment in question "in isolation under the common law trust standard, instead of according to the modern portfolio theory required by ERISA policy as expressed by the Secretary's regulations"). On the other hand, some scholars have argued that trustees operating under ERISA nonetheless have invested cautiously in part because the large size of ERISA funds creates a significant liability exposure (see Del Guercio 1996, p.36). See also Longstreth (1986, p. 35). In a related vein, Brav and Heaton (1998) have argued that employee benefit funds tend to favor dividend-paying stocks, widely regarded as safer investments, and this may explain the relative underperformance of non-dividend paying stocks.

[16] *Restatement (Third) of Trusts: Prudent Investor Rule* 1992, §227(a) is similar. The reporters of the *Restatement (Third)* and UPIA have published articles summarizing the new Restatement and UPIA respectively (see Halbach 1992; Langbein 1996).

ment standards should have had little effect on trust investment in practice. Indeed, survey evidence suggests that such opt outs were common (see Gordon 1987, p. 76 n.99). Thus, scholars such as Jeffrey Gordon, John Langbein, and Richard Posner have theorized that the old rule endured for so long in part because sophisticated parties could opt out of its application (Gordon 1987; Langbein and Posner 1976; Posner 2003).[17]

There are, however, good reasons to suppose that default rules of prudent trust investment nonetheless influence trust investment in practice. First, comprehensive opt outs are infeasible,[18] which is to say that trust agreements are necessarily incomplete contracts and hence default fiduciary rules remain relevant. Second, as previously discussed, under the old law courts were skeptical of opt outs.[19] Third, the trustee's litigation risk was asymmetric. Under the old law the beneficiary had no viable cause of action for a too-conservative portfolio (government bonds were in effect per se prudent).[20] At the same time, if an investment in stock did not pay off, in hindsight courts sometimes deemed such an investment to have been imprudent "speculation" without consideration

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[17] Gordon (1987) also examines the political economy of trust law reform and other institutional features of trust practice as complementary explanations for the durability of the prior law. Although Langbein and Posner (1976) emphasize the default nature of the prior law, in more recent work Langbein predicted an increase in trust investment in equity following adoption of the new prudent investor rule (Langbein 1996, p. 654:654 n.83).

[18] The condition of financial markets, the needs of the beneficiaries, and in many trusts the identity of the beneficiaries will vary over time. Hence it is impossible for the donor to specify in advance what the trustee should do in all contingent future states of the world.

[19] See supra note 11 and text accompanying. The related phenomena of network effects, status quo bias, and herd behavior in contract drafting further exacerbate the difficulty of opting out (see, for example, Kahan and Klausner 1996, pp. 353-65; Korobkin 1998).

[20] As Langbein put it, "under traditional law beneficiaries have had little recourse when trustee performance has been indifferent, but not so egregious as to be in breach of trust" (Langbein 2001, p. 76).

of whether it was sensible ex ante in the context of the portfolio as a whole.[21] Finally, typical industry compensation arrangements, which are based on the total corpus of the trust and are roughly one percent or less per annum, provided little incentive for the trustee to increase returns given the asymmetric litigation risk.[22]

In general, the new law applies prospectively to existing trusts (see UPIA 1994, §11). Thus, after adoption the new rule applies to all the trustee's subsequent investment decisions, including the failure within a "reasonable time" to reallocate a portfolio that was crafted to comply with the prior law but does not satisfy the new law (see UPIA 1994, §4; *Restatement (Third) of Trusts 1992,* §229).

On the other hand, compliance with the modern prudent investor rule will not always require a portfolio reallocation. The risk tolerance of the beneficiaries and the purpose of the trust may require a conservative investment strategy; consider, for example, the paradigmatic trust for the benefit of a widow and orphans.[23] Further, the new law does not require immediate reallocation if the benefits of doing so are outweighed by the

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[21] Further, professional trustees such as the institutional trustees in our sample are held to an even higher standard of care (see *Restatement (Second) of Trusts* 1959, §174); UPIA §2(f); *Restatement (Third) of Trusts: Prudent Investor Rule* 1992, §227 cmt. d).

[22] Often the purpose of the trust is to supply a reliable source of income to the surviving spouse and children, who have a low tolerance for risk. By contrast, an institutional trustee with a portfolio of trust funds under its management is likely to be risk-neutral, or at least less risk-averse than the beneficiaries. For this reason, the benefits of trying to solve the incentive problem by setting the trustee's compensation in relation to the trust's annual return are likely to be outweighed by the costs of exacerbating the risk-sharing problem. The fundamental difficulty is that the optimal solution to the principal-agent problem with a risk-averse principal and a risk-neutral (or at least less risk-averse) agent, selling the project to the agent, is foreclosed by the transferor's use of the trust form instead of an outright transfer. On this account the settlor is the trustee's primary principal (see Sitkoff 2004, pp. 648-49).

[23] As the official comment to UPIA 1994, §2 explains, "tolerance for risk varies greatly with . . . the purposes of the trust and the relevant circumstances of the beneficiaries. A trust whose main purpose is to support an elderly widow of modest means will have a lower risk tolerance than a trust to accumulate for a young scion of great wealth." In a similar vein, the contemporaneous practitioner literature predicted that adoption of the new rule "will not cause a radical restructuring of existing trust investment portfolios," but rather will affect only "those trusts having purposes and circumstances which would cause the prudent investor to invest a portion of the portfolio in more growth-oriented, less conservative types of investments, or to apply more aggressive and sophisticated management techniques." (Welch 1991, pp. 20-21).

attendant tax and other transaction costs (see UPIA 1994, §4; *Restatement (Third) of Trusts* 1992, §229).

Accordingly, the extent to which adoption of the new prudent investor rule prompted greater investment in equity will be a function of the risk tolerance of the beneficiaries of the trusts in our sample, the transaction costs of portfolio reallocation and the meaning of "reasonable time," and the extent to which settlors had been able successfully to opt out of the prior law.

III. RESEARCH DESIGN

A. Data

The trust data come from annual reports to federal banking authorities by federally-regulated financial institutions such as banks, savings and loan associations, and trust companies. Federal law requires these institutions to report their trust holdings, including total trust assets, number of trust accounts, and allocation of trust assets among stocks, bonds, and other investment categories. The data are at the institution level; individual account data are not reported. From 1968 until 2001, the Federal Financial Institutions Research Council published annual reports of trust holdings by regulated entities, summarizing the results by state (Federal Financial Institutions Examination Council 1985-2000). Since 2001, the FDIC has published those reports and has made bank-level data

available online.[24] The FDIC provided us with a CD-ROM of bank-level data from 1986
to 2000.

The trust holdings of regulated institutions are reported in categories entitled
"Employee Benefit Trusts,"[25] "Personal Trusts," and "Estates." The "Personal Trusts"
category includes private and charitable trusts,[26] both inter vivos and testamentary, but
excludes commercial trusts and employee benefit plans. Reporting institutions state their
holdings as of December 31 of the reporting year. We therefore code all adoptions of the
new prudent investor rule ("*Prudent Investor*") as taking place in the year the legislation
took effect (see Appendix Table 1). The asset allocation of trust holdings is broken down
among the following categories: (1) stock (common and preferred combined);[27] (2) inter-

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[24] An interactive site allows one to obtain new data, state by state at
http://www2.fdic.gov/sdi/main.asp. Older reports, from 1996 through 2000, may be obtained at
http://www2.fdic.gov/structur/trust/index.asp.

[25] "Employee Benefits Trusts" is divided into two categories: (1) where the institution "exercises in-
vestment discretion in the capacity as trustee," and (2) where the bank is an "investment manager as de-
fined in Section 3(38) of [ERISA, 29 U.S.C. §1002(38)]." We use only data reported in the first category,
when the institution acts as trustee. When the reporting institution operates as an "investment manager"
instead of a trustee, its investment decisions are subject to direction from the trustee and the institution may
be responsible for only a subset of the fund's assets. For example, a trustee might allocate a portion of the
trust fund to bank *A*, directing *A* to invest its share of the fund entirely in stock, while allocating the rest of
the fund to bank *B*, directing *B* to invest entirely in mortgages and bonds. For a discussion, see *In re Uni-
sys Saving Plan Litigation* (74 F.3d 420, 439 [1996]).

[26] "In making investments of trust funds the trustee of a charitable trust is under a duty similar to that
of the trustee of a private trust" (*Restatement (Second) of Trusts* 1959, §389).

[27] Shares in certain mutual funds (but not municipal bond funds, which are reported as local govern-
ment bonds, or money market funds, which have their own category) are reported as stock holdings. To the
extent that shares in mutual funds are reported as stock even if the underlying mutual fund is invested in
bonds, the relative percentage of stock holdings might be overstated. This potential overstatement is not a
concern, however, for several reasons. First, most of the year-to-year variation in the percent stock variable
can be explained by stock market movements, which tells us that the investments reported as stock are cor-
related with the stock market. Second, in the period under study mutual funds moved aggressively into
corporate bonds, foreign government bonds, and high-yield bonds, holding more in those categories than
U.S. government bonds by the mid-1990s (Investment Company Fact Book 2006, p. 74). As compared to
U.S. government bonds, these other types of bonds are associated with a greater risk of default and ex-
change-rate risk. Hence an increase in the percent stock variable attributable to mutual fund holdings
would still imply a riskier portfolio, which is our underlying inquiry and thus the reason we use percent
stock as our principal outcome variable. Third, in unreported regressions we combined the separately re-
ported corporate bonds category with stock holdings and found slightly stronger effects, which implies that

est-bearing accounts; (3) U.S. treasuries; (4) local government bonds; (5) money-market funds; (6) other short-term obligations (mainly commercial paper); (7) other bonds; (8) mortgages; (9) real estate; and (10) miscellaneous. "Other bonds" includes corporate and foreign government obligations and "real estate" includes a variety of real estate investments.

Although the data are available from 1986 through 2004, we examine only the years 1986 through 1997 for three reasons. First, the data are reported by state of the reporting institution's charter. Prior to 1997, interstate banks tended to operate as bank holding companies (which the Federal Reserved designates as the "high holder") with separately-chartered and hence separately-reporting banks in different states.[28] Although there is flexibility in the choice-of-law rules, the applicable fiduciary law is typically the law of the trustee's state of residence. Accordingly, our coding of *Prudent Investor* should capture the law applicable to the reported assets.

Beginning in 1997, however, the Riegle-Neal Act of 1994 authorized banks and bank holding companies to convert independently chartered banks in other states into branch offices of a single interstate bank (*Pub. L. No. 103-328, U.S.C.C.A.N.* 1994, p. 2338). Because the data are collected by institution and then aggregated to the state level by state of the reporting institution's charter, the interstate bank mergers and branching allowed by the Riegle-Neal Act has the potential to bias our results by changing the state in which assets are reported without a corresponding change in governing law.

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we have not conflated a movement from corporate bonds to corporate bond mutual funds with an increase in stock holdings (regressions on "other bonds" alone showed a weak positive effect of the reform).

[28] Banks could maintain interstate branches under narrow circumstances prior to 1997, but a study conducted by the Federal Reserve found that few banks did so (see McLaughlin 1995).

Second, after 1997 many states reformed their principal and income rules. These reforms could affect trust asset allocation directly because they made less rigid the formal distinction between capital gains and income.[29] Prior to 1997, principal and income rules were for the most part uniform across the states.

Third, as a result of the jurisdictional competition for trust funds, state laws concerning the Rule Against Perpetuities and self-settled asset protection trusts became significantly differentiated beginning in 1997.[30] Although these changes do not bear directly on trust investment law, they nonetheless have the potential to affect trust investment practice. Perpetual trusts and self-settled asset protection trusts have a different timeframe and purpose that might warrant heavier investment in equities.[31]

Figure 1 illustrates the geographic and temporal variation in the prudent investor rule's pattern of adoptions through 1997, the period under study. As can be seen, there is substantial variation across regions and over time.

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[29] Prior to the principal and income reforms, the form of the investment return determined its classification as income or principal. The problem with this approach is that trusts are commonly set up to pay income to one beneficiary for life (often a surviving spouse) and then the principal to another beneficiary (such as a surviving child) on the first beneficiary's death (see Langbein (1994, pp. 667-69)). For example, suppose T bequeaths a fund to X in trust to pay the income to A for life and then the principal to B on A's death. If X invests in bonds or stocks that pay a cash dividend, under traditional law A is benefited because interest on bonds and cash dividends on common stock are classified as income. By contrast, if X invests in stocks that do not pay a cash dividend, under traditional law B is benefited because stock appreciation is classified as principal. Inasmuch as the trustee has a duty to act impartially and with due regard to the needs of the income and principal beneficiaries, the principal and income rules bear directly on the trustee's asset allocation. For discussion, see *Uniform Principal and Income Act* 1997, Pref. Note & cmt. to §104; DiRusso and Sablone (2005, pp. 274-88); Sitkoff (2004, pp. 652-54).

[30] See Sitkoff and Schanzenbach (2005). With the single exception of Delaware's abolition of the Rule Against Perpetuities in 1995, all of these changes occurred in 1997 or later. See id. at 430-33 (Table 1).

[31] See id. at 385-87. Regressions on the full sample tended to decrease the coefficient estimates a bit, but the results remained statistically significant.

Figure 1: Prudent Investor Rule (1997)
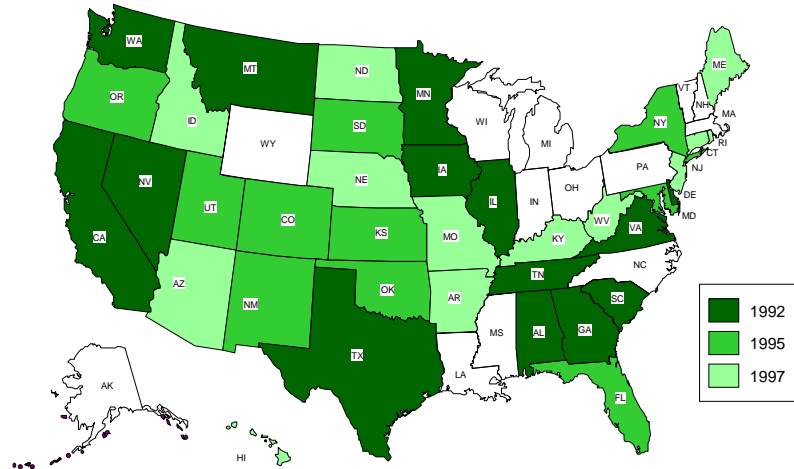
Given the distribution of adoptions over time, if stock-preferring trusts changed

states to take advantage of the new rule, our before-and-after analysis might yield biased

estimates. For at least three reasons, however, we think that this is unlikely. First, it is

difficult for an existing trust to change its situs without judicial approval. Second, in con-

trast to perpetuities, asset protection, and taxes, there is no practitioner or other literature

indicating that prudent trust investment laws influenced initial choice or subsequent

change of jurisdiction in the period under study (see Sitkoff and Schanzenbach 2005, pp.

378-79 n.71). Third, as discussed below, we test the effect of early versus later adoptions

of the new rule and find that later adoptions had a stronger effect, which implies no early

movement by stock-preferring trusts.

B. Identification Strategies

We focus on two dependent variables: (1) the percentage of personal trust funds invested in stock (*%Stock^{PT}*) and (2) the difference between the percentage of personal trust funds invested in stock and the percentage of employee benefit funds invested in stock (*%Stock^{PT}-%Stock^{EB}*).

1. Percent Stock

The data do not detail individual stock, bond, and real estate holdings, but rather aggregate holdings within each category. Percent aggregate stock holdings in personal trusts is, however, an important outcome variable in its own right for at least two reasons.[32] First, the old prudent man rule disfavored broad classes of equity holdings. Thus, if the prior law constrained trust portfolio asset allocation, we would expect to see reallocation toward equity after adoption of the new law. Second, the new law for the first time exposes the trustee to real litigation risk from too much caution. Because increased stock holdings at the expense of government bonds and other investments with little to no default risk imply higher risk portfolios, an increase in the percent stock holdings variable would indicate movement outward on the risk and return curve. Indeed, we show that the increase in stock holdings after adoption of the new law came largely at the expense of favored "safe" investments such as government bonds.

Our state-level specification is a straightforward differences-in-differences regression using state fixed effects:

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[32] Ideally, we would use Beta or some other measure of risk (such as variance of portfolio returns across states), but such measures require individual account data, which is not available.

(1) $\%Stock^{PT}_{jt} = \alpha + \lambda Year_t + \psi State_j + \delta PI_{jt} + E_{jt}$

Where α is a constant, j indexes state, and t indexes year. *PI* or *Prudent Investor* equals one in a state that has the new prudent investor rule.

In our bank-level analysis, we control for both state and bank fixed effects. For our bank fixed effects, we include in the regression a dummy at the level of the bank's top-level holding company (i.e., the institution that the Federal Reserve designates as the bank's "high holder"). Sometimes there is no entity apart from the chartered institution, in which case the high-holder is the bank itself. However, most banks in the sample are wholly owned by a holding company. Banks owned by the same "high holder" may share a common investment philosophy, operations manuals, and institutional culture. On this view, Citibank of South Dakota would have much in common with Citibank of New York—except insofar as the trusts held in South Dakota are subject to different state laws than those held in New York. Using "high holder" fixed effects allows us to exploit variation in state law while controlling for common management practices and institutional culture across separately-charted banks of a single holding company and while still including state-level fixed effects. Thus, in these models an important source of variation comes from bank holding companies that own reporting institutions in multiple states with different fiduciary standards. The bank-level data also allow us to report specifications using state-year effects. Accordingly, the bank-level regressions take the following form:

(2) $\%Stock^{PT}_{ihjt} = \alpha + \lambda Year_t + \psi State_j + Highholder_{hjt} + \delta PI_{jt} + E_{ihjt}$

where *i* indexes bank and *h* indexes high holder. *HighHolder* are bank holding company
fixed effects.

Because our dependent variable is a percentage, OLS regressions may not be
ideal.[33] Following the suggestion of Wooldridge and Papke (1996),[34] we report a specifi-
cation in which we exponentiate the right hand side and report odds-ratios.[35]

We condition on two additional independent variables in most specifications: (1)
log of the high holder's assets, and (2) percent of the high holder's employee benefit
funds invested in stock. The first variable is positively correlated with stock investment
in most specifications. Banks with relatively greater aggregate trust assets may experi-
ence economies of scale in trading securities and in obtaining expert investment advice.
We use log assets of the high holder because a small bank owned by a larger institution
should be more like the large institution than a small, independent bank (although using
log assets at the bank level made little difference to the results). In the corresponding
specifications for the state-level regressions, we use log total state assets. Asset levels at

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[33] First, the fitted values of the regressions may lie outside the 0 to 100 range, and it is not clear how to
interpret such a result. In the state-level regressions, all fitted values for all regressions lie between 0 and
100 (in fact, they are generally between 25% and 75%). In the bank-level regressions, however, between
100 and 150 fitted values were negative (albeit in a sample of nearly 23,000). None exceeded 100. Sec-
ond, the linear form of the OLS regression imposes a functional form that must be incorrect. The effect of
a continuous right hand side variable tends to dissipate as it gets very large or very small because the effect
must get smaller as the fitted value gets closer to the endpoints, 0 or 100.

[34] The transformation requires estimation by non-linear least squares, and was performed using Stata's
GLM command taking the "family" as binomial and the "link" as logistic. The estimation equation takes
the form:

$$E(Y|X) = \exp(X'B)/(1+\exp(X'B))$$

which constrains the fitted values of Y to be between 0 and 1.

[35] Another popular transformation is the logistic. This transformation is performed on the dependent
variable, however, and there is no clear procedure for how to do so in the presence of zero values.

the bank or state level may also proxy for sophistication of the trustee and the risk tolerance of the beneficiaries.

The second independent variable, percent of employee benefit funds invested in stock, helps to control for changes in institutional preferences for equity. Institution fixed effects are inadequate to account for differences between institutions if preferences for debt and equity changed within an institution over time or management was replaced.[36] Employee benefit trusts may be a suitable control. First, the investment of such trusts is governed by federal law under ERISA, not state prudent investor laws, and ERISA preempts inconsistent state law. Hence, the portfolio allocation of ERISA funds should be less sensitive than that of personal trusts to changes in state prudent trust investment laws. Second, changes in bank management or investment norms within the institution should affect personal trust and employee benefit trust funds similarly. Accordingly, controlling for the institution's or the state's percentage holdings in stock in employee benefit funds may remove an important part of the error term. As with institutional assets, we control for *%Stock^{EB}* on the high holder's level on the theory that the preferences we are attempting to capture are those of the controlling institution.

The period under study also experienced a significant increase in stock prices, with the S&P 500 nearly tripling between 1990 and 1997. If there is investor inertia, stock price appreciation has the potential to bias to our results upward if a state's propensity to have high stock holdings is correlated with the policy change. In addition, investor inertia and stock price appreciation may exacerbate problems of serial correlation.

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[36] To the extent that changing investment norms led to a general movement to stocks, such a trend would tend to work against our finding that the new prudent investor rule prompted an increase in trust investment in stock.

Under three simplifying assumptions, however, we may remove the increase in percent stock attributable to stock market appreciation. First, we assume that income in the form of interest and cash dividends is largely paid to out to the beneficiaries. Most trusts have an income beneficiary and there are significant federal income tax incentives not to retain such income in trust (see McGovern and Kurtz 2004, p. 705 §15.5). Second, we assume that the value of all non-stock investments does not change. This assumption will tend to exaggerate the effect of increases in stock prices, because it does not account for the counter effect of increases in the value of other investments.[37] Third, we assume that the increase in the average portfolio is the same as the increase in the S&P 500. Under these assumptions, we difference out the increase in percentage stock holdings year to year and take the resulting "Net Percentage Stock" as our dependant variable in one specification.[38]

2. *Employee Benefits Control Group*

In a second set of regressions, we use employee benefit funds as a control group by taking *%Stock^{PT}-%Stock^{EB}* as our dependent variable. Using employee benefit funds as a control group has a number of advantages. In the bank-level specifications, it eliminates the problem encountered when banks report no stock holdings, discussed in the results section below. Although the values of the dependent variable are constrained to be between -100 and 100, all fitted values in all specifications are well within this range. In addition, simply controlling for *%Stock^{EB}* as a right-hand side variable does not account

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[37] For example, bond prices increased over the course of the 1990s.

[38] Letting $\Delta SP=(S\&P_t-S\&P_{t-1})/S\&P_{t-1}$, we net out the increase in percentage stock holdings resulting from stock price increases as follows:

Net %Stock$_t$ =%Stock$_t$-[ΔSP*%Stock$_{t-1}$/(1+ΔSP*%Stock$_{t-1}$)]

for a divergence between the two variables over time. As discussed below, we find

strong time trends in employee benefit portfolio allocations. By contrast, taking the dif-

ference $\%Stock^{PT}$-$\%Stock^{EB}$ conditional on state and year dummies removes both (1) the

strong time trends that were common to both variables (including the possible effect of

the Restatement) and (2) state-specific differences, and it does so without the addition of

many new interaction terms. In sum, taking the difference between the two should re-

move all fixed and time-varying error common to both variables. Placebo regressions

using $\%Stock^{EB}$ as the dependent variable indicate that the reform had no effect on asset

allocation in employee benefit funds.[39]

In the ERISA control group specifications the coefficient on *PI* is interpreted as

the change in the difference between the percentage stock in personal trusts and in em-

ployee benefit funds after adoption of the new law. The result is thus similar to a first-

difference regression. The specification takes the following triple-difference form in the

state-level regressions:

$$(3)\ \%Stock^{PT}_{jt}\text{-}\%Stock^{EB}_{jt} = \alpha + \lambda Year_t + \psi State_j + \delta PI_{jt} + E_{jt}$$

The bank-level regressions take a quadruple difference form, reflecting the addi-

tion of high-holder fixed effects. Because employee benefit funds are governed by ER-

ISA, not state law, we use $\%Stock^{EB}$ at the highholder level on the theory that doing so

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[39] For example, in the placebo regression corresponding to Model 2 of Table 1 the coefficient was -2.2 with a p-value of .207.

removes the component of the error term owing to institutional preferences for stock.[40]

Thus we estimate the following:

$$(4)\ \%Stock_{ihjt}^{PT} - \%Stock_{hjt}^{EB} = \alpha + \lambda Year_t + \psi State_j + \delta PI_{jt} + HighHolder_{hjt} + E_{ihjt}$$

IV. RESULTS

A. Percent Stock in Personal Trusts (%Stock^{PT})

Figures 2 and 3 trace the percent stock (*%Stock^{PT}*) and percent safe (*%Safe^{PT}*) investments in personal trusts by reform status and year using the state-level data. Consistent with the old prudent man rule, we define "safe" investments to include federal, state, and municipal bonds, interest-bearing bank accounts, money market funds, and mortgages.[41] Taken together, Figures 2 and 3 suggest that trusts in the states that adopted the new prudent investor rule held more stock (on the order of 1-4% depending on the year) at the expense of "safe" investments.

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[40] Even if the bank does not hold employee benefit funds, the highholder may through other banks.

[41] The remaining investment categories "other bonds," "real estate," and "short-term obligations" varied substantially over the period and resist classification as "risky" or "safe." Investments in these categories typically amounted to less than 10% of the average portfolio.

**Figure 2: Percentage Trust Funds Held as Stock
by Year and Reform Status**
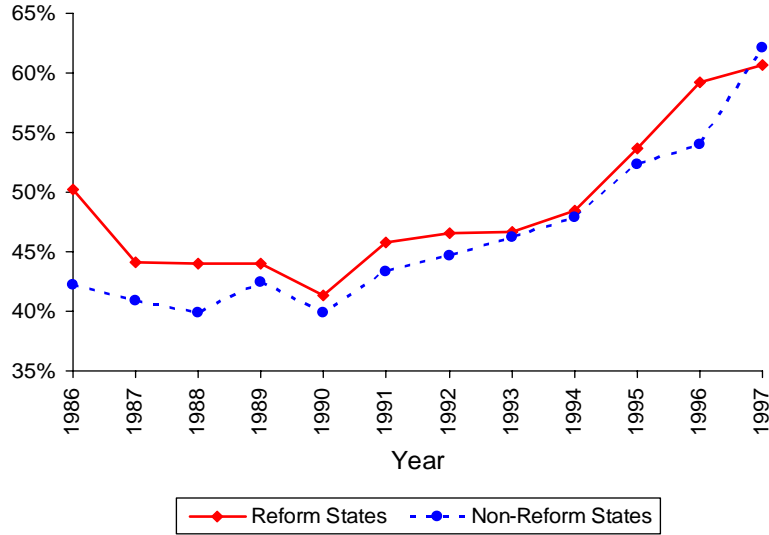
**Figure 3: Percentage Trust Funds Held as Safe
by Year and Reform Status**
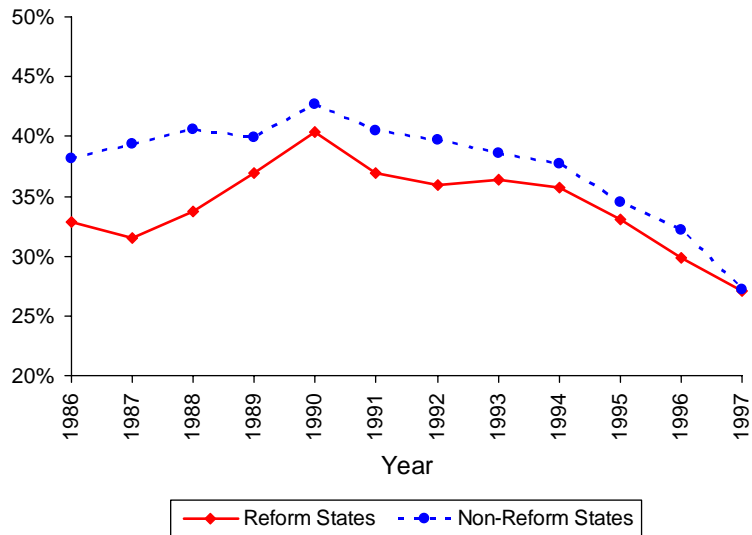
Figure 4 traces *%Stock^PT* and *%Safe^PT* investments in reform states before and after adoption of the reform. Both variables were detrended.[42] As can be seen, the lines for stock and safe investments are almost perfect mirror-images, with what appears to be a movement from safe investments to stock after adoption of the new prudent investor rule. Prior to the reform, the percentage of trust funds invested in each category were similar and remained relatively stable. Pre-reform, stock composed 41% of the average reform state's detrended aggregate portfolio and safe investments averaged 39%. After the reform, however, the two diverge almost immediately. Post-reform, stocks accounted for 47% of the average reform state's detrended aggregate portfolio and safe investments averaged 34%.

**Figure 4: Percentage Trust Funds Held as Stock and Safe
by Years Since Reform (detrended)**

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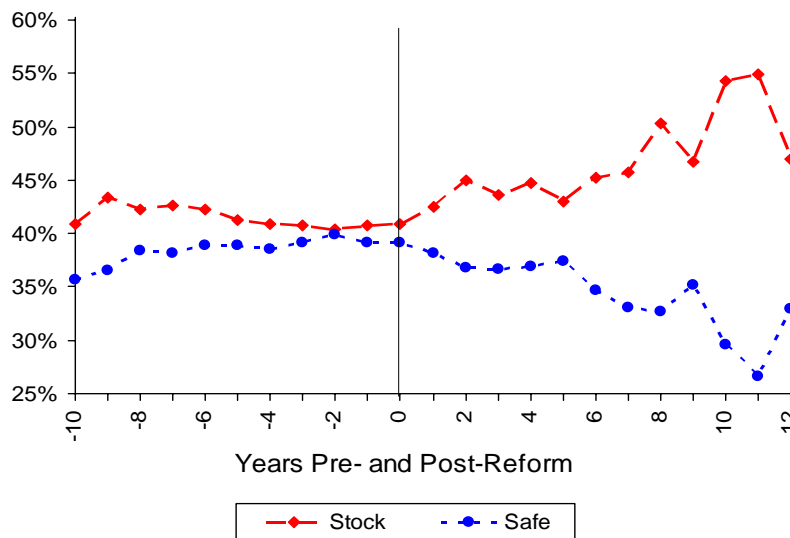
[42] The variables were detrended by running a regression with only year dummies on the full sample (1986 through 1997), with 1986 as the excluded year, and then subtracting the year coefficients from the observed average in that year.

Tables 1 and 2 correspond to Equations 1 and 2, presenting the results for

%Stock^{PT} using the state-level and bank-level data respectively. Each table presents the

basic model and a number of alternate specifications as checks for robustness and correc-

tions for possible bias caused by serial correlation in the error terms.

Table 1 demonstrates a consistent, statistically significant effect from adopting the

new prudent investor rule. In Model 1, the most basic model, the percentage of stock

held in the average trust fund increases by 1.72 percentage points after the reform. In

Model 2, which further conditions on log total state assets and the percentage of assets

held as stock in employee benefit funds, the coefficient on *Prudent Investor* increases

slightly to 2.11 and is more precisely estimated. To put these coefficients in perspective,

in the period under study the average state held 47% of its personal trust assets in stock

and average state stock holdings increased roughly 14 percentage points between the late

1980s and mid 1990s. Hence, taking the coefficient of 2.11 at face value, our results im-

ply that adoption of the new prudent investor rule explains about 15 percent of the 14

point increase.

To confirm that these increases came at the expense of investments favored by the

rule rather than corporate bonds and real estate, in unreported regressions we took

%Safe^{PT} as our dependent variable, defining "safe" as before. The results mirrored those

of the *%Stock%^{PT}* regressions, with similar but oppositely signed coefficients, implying a

roughly one-for-one tradeoff of safe for stock. For example, in the *%Safe^{PT}* regression

based on Model 2, the coefficient on *Prudent Investor* was -2.02 and was significant at

the 1 percent level. Accordingly, we conclude that the increase in stock came at the ex-

pense of investments with little to no default risk, the sort of investments that the old prudent man rule had favored.

Given the uncertainty associated with new legal rules and the law's sensitivity to the tax and other transaction costs of portfolio reallocation in determining whether the trustee complied with the new rule within "a reasonable time," the effect of the reform may not be a discrete jump in stock holdings. Indeed, Figure 4 indicates that the effect of reform may have increased over time. Model 3 divides the reform into two periods: 0-2 years since reform and 3 years or more since reform. In addition, to test explicitly for the presence of a biasing trend, we include a dummy variable for the three years prior to reform. The results are consistent with Figure 4. There is no change in stock holdings in the years prior to reform, and the effect of reform may increase slightly after the first three years.

Model 4 weights the data by total state assets for a picture of the national average. In this specification the coefficient is cut in half and is significant at just over the 5% level. However, Model 5 splits the weighted regression of Model 4 into the same time periods as Model 3, and the effect of the reform three years out or more is strongly significant and large (coefficient of 3.37), while the effect during the first three years is insignificant and small (coefficient of .6). Thus, the weighted regressions also suggest a large, if somewhat delayed, effect.

In addition to tax and other transaction costs that might justify a slower reallocation after enactment of the new rule, the larger effect of the reform over time may also stem from the fact of early enactments prior to the new Restatement by states with substantial trust assets such as California and Delaware. In unreported regressions, we al-

lowed separate effects before and after the adoption of the Restatement. In these regressions the reform had a larger effect post-Restatement. However, the larger effect post-Restatement was not evident in the *%Stock^{PT}-%Stock^{EB}* specifications, which may control better for contemporaneous changes, so we do not draw any firm conclusions.

A potentially serious concern in differences-in-differences studies is the presence of serial correlation (Bertrand, Duflo, and Mullainathan 2004), particularly with financial variables (especially if investment patterns are persistent). Models 6, 7, and 8 take various approaches to deal with the problem. Model 6 adds state-specific time trends, and the coefficient on *Prudent Investor* decreases to 1.71 but remains significant at the 5% level. Model 7 clusters the standard errors at the state level. The standard error increases from .62 to .86, but the coefficient remains significant with a p-value of .02.

In Model 8 we examine the effect of the reform after netting out the increase in percentage stock that would result from a static portfolio allocation and appreciation in stock prices by taking "Net Percentage Stock" as the dependent variable. The impact of the new prudent investor rule remains about 2.0 percentage points. Thus, our previous results hold even with our rough and noisy method of removing appreciation bias. In addition, the year effects diminish (or, early on, are negative) and no longer indicate a trend during the 1990s (the year effect for 1997 is indistinguishable from 1987, the excluded year). Accordingly, we attribute the remainder of the increase in stock holdings to stock market appreciation and investment inertia.

Model 9 presents the results using the exponential transformation of the right hand side variables. The odds ratio on *Prudent Investor* is 1.094 and is significant at less than the 1% level, indicating that the percent of trust assets held as stock increased after

the reform. Taking all other variables at their means, the odds ratio implies an increase in stock holdings of roughly 2.5 percentage points, a slightly larger result than in our OLS estimates

Table 2 presents the results using the specification of Equation 2. All standard errors reflect clustering by state. Model 1 uses the full sample. The coefficient on *Prudent Investor* is small and insignificant, and the estimated coefficient on *Prudent Investor* is very close to zero.

One problem with the bank-level data is that many banks have few assets in personal trust accounts. In the period under study, 19% of bank-year observations for personal trust funds report no stock being held in such funds. Much of this seemingly strange result is attributable to banks with few trust assets. In the sample years 1986-1997, more than one-fourth of the bank-year observations report $1 million or less in personal trust assets, and 45% of this subset reports holding no stock. These small sums may represent only a few accounts, which can greatly distort the bank's reported asset allocation. Among banks with trust assets over $1 million, only 7% of bank-year observations report no stock holdings. A large number of zero stock holdings creates censoring problems and small banks, whose asset holding could swing wildly, probably add a lot of noise to the data.

Model 2 restricts the sample to banks that also report employee benefit funds and controls for *%Stock^{EB}*. In this subsample, 8% of the bank-year observations report holding no stock, reducing concerns about the data being censored at zero.[43] The coefficient on *Prudent Investor* increases to .9, but is still not statistically significant. Weighting the

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[43] Excluding those trust institutions whose high holder did not have employee trust funds drops only about five percent of total trust assets.

data reduces the influence of low-asset banks, and it increases the coefficient a bit in Model 3, though again the coefficient is not statistically significant.[44]

Including state-year effects in Model 4 increases the coefficient on *Prudent Investor* to 1.4, though it is still not significant. However, weighting with state-year effects in Model 5 suggests that the adoption the prudent investor rule increased stock holdings by 3.9 percentage points (significant at less than the 1% level). The odds-ratio in the transformed Model 6 is 1.076, which is quite close to that of the state-level result of 1.094, and implies an increase of roughly 2.0 percentage points in stock holdings after the reform.

In sum, the state-level OLS regressions suggest that the percentage of personal trust funds invested in stock increased between 1.5 and 2.1 percentage points after adoption of the new prudent investor rule, with a slight increase in later years and a slightly larger estimate in the transformed model. The weighted and transformed bank-level regressions suggest an effect in this neighborhood as well, although the asset-weighted estimate using state-year effects was roughly twice as large as the state-level estimates. In the period under study, the average state held 47% of its personal trust assets in stock. Accordingly, these results suggest a modest increase in trust investment in stock post-reform.

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[44] Unreported regressions restricting the sample to larger banks or only banks with employee benefit funds yielded results close to those of Model 1. The coefficient increases appreciably only when we condition on $\%Stock^{EB}$.

B. Percent Stock in Personal Trust Funds Minus Percent Stock in Employee Benefit Funds (*%Stock^{PT}-%Stock^{EB}*)

Using the state-level data, Figures 5 and 6 trace *%Stock^{PT}-%Stock^{EB}* by year (Figure 5) and by years before and after adoption of the new prudent investor rule (Figure 6). Unlike Figure 2, which showed a consistent difference in the stock holdings of personal trusts between reform and non-reform states, Figure 5 does not show a consistent difference between *%Stock^{PT}-%Stock^{EB}* in reform versus non-reform states. Figure 6 traces *%Stock^{PT}-%Stock^{EB}* (detrended) in reform states before and after the adoption of the reform. The graph here suggests that stock holdings in employee benefit funds grew relative to personal trusts prior to reform, but the trend reversed after the reform. This reversal suggests a relative increase in stock holdings in personal trusts after the reform.

**Figure 5: *%Stock^{PT} – %Stock^{EB}*
by Year and Reform Status**
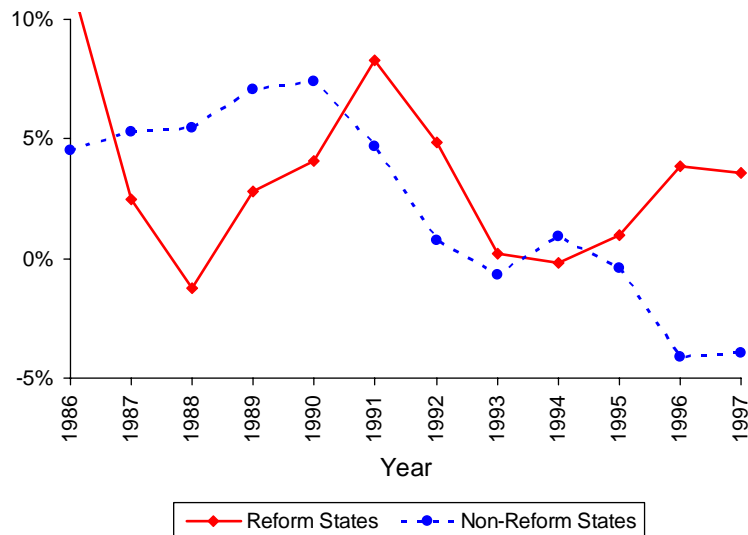
Figure 6: *%Stock^{PT} – %Stock^{EB}*
by Years Since Reform (detrended)
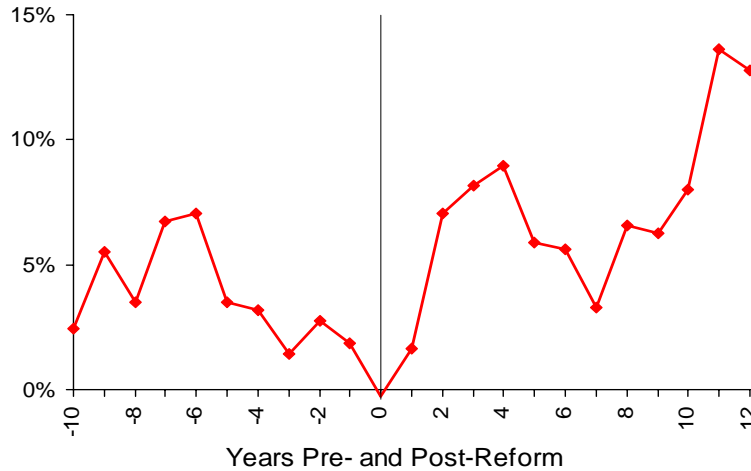
Table 3 presents the state-level results for the specification presented in Equation 3. The estimated effect of *Prudent Investor* in Model 1 is 4.34 percentage points (significant at the 1% level), roughly twice as large as the estimate from the same specification in Table 1. Weighting the data (Model 2) reduces the estimated coefficient by about one-third, but it remains statistically significant. When we separate the reform into different periods in Models 3 and 4, similar effects to the *%Stock^{PT}* regressions are obtained, but the evidence for a delayed effect is stronger. Controlling for state-specific trends or clustering by state in Models 5 and 6 makes little difference.

In sum, the state-level regressions suggest that the difference between the percentage of stock holdings in personal trust funds and employee benefit funds was 3 to 4 points larger after adoption of the new prudent investor rule.[45]

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[45] To put these results in context, in 1986 personal trusts in the average state held 4 percentage points more in stock than was held in employee benefit funds (42% versus 38%). We interpret the coefficient of 4.3 on *Prudent Investor* and the coefficient of roughly -5.5 on the later year dummies to imply that the differential

The bank-level regressions reported in Table 4 tell roughly the same story and, unlike before, consistently confirm the state-level estimates. When the data are weighted by bank assets in Model 2, the coefficient on *Prudent Investor* is 4.45 (with a p-value of .059). This result is nearly identical to the coefficient of 4.34 estimated in Model 1 of Table 3, and it is not greatly different from the coefficient of 2.88 estimated using data weighted by state assets in Model 2 of Table 3.

V. CONCLUSION

The results of our empirical analysis demonstrate that changes in the default rules of prudent trust investing affected trust portfolio allocation. We therefore conclude that default rules matter in the presence of agency costs and unreliable judicial enforcement of opt outs. Further, our results provide the first empirical evidence that fiduciary law is a potentially viable means of governance in trust law. Although our findings do not speak to the optimal content of trust fiduciary law, confirming that trustee behavior is sensitive to changes in trust fiduciary law is important because the threat of fiduciary litigation is the primary force for minimizing agency costs in the modern trust relationship (see Sitkoff 2003, 2004).

Depending on the approach taken, the point estimates imply that the trust institutions in our sample increased stock holdings between 1.5 and 4.5 percentage points—an increase of 3 to 10 percent—after the adoption of the new prudent investor rule. Our

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remained nearly constant in states that adopted the new prudent investor rule but disappeared in states that did not adopt the reform. These results are consistent with the trends depicted in Figure 6. It is interesting to note that ERISA funds initially held a smaller percentage of stock than trust funds. One reason for this perhaps surprising discrepancy is that liability exposure in ERISA plans may be greater in view of their larger size and number of beneficiaries. In addition, ERISA funds typically do not pay taxes on investment income, which increases the relative rate of return on bonds for such funds.

findings, which endure across a variety of identification strategies and numerous robust-

ness checks, explain roughly 10 to 30 percent of the overall increase in stock holdings in

the period under study. The rest of the increase appears to be attributable to stock market

appreciation.

Assuming that 2 percentage points more of personal trust funds were invested in

stock as of 1997, a year when reported personal trust assets totaled nearly $750 billion,

roughly $15 billion more was invested in stock than otherwise would have been. This

result is more impressive when one considers that: (a) for many trusts the new law will

not require a reallocation (the inframarginal trusts); (b) the new law requires the trustee of

a non-complying trust to reallocate the trust portfolio within a "reasonable time" given

the tax and other transaction costs of reallocation; and (c) the institutional trustees that

make up our sample tend to have access to competent legal counsel and standard form

trust agreements with well-drafted opt-out provisions.[46]

Percentage stock holdings is an interesting outcome variable not only because of

the old rule's hostility toward stock, but also because it proxies for movement along the

risk and return curve. While we cannot be as firm in our conclusions here, the increase in

stock holdings after the adoption of the prudent investor rule suggests movement outward

on the risk and return curve.[47] The agency problems in trust law, together with trustee

compensation schemes, rigid doctrine, and hindsight bias, combined to make bank trust

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[46] In 2004, the average account size in our sample was $1 million.

[47] Indeed, by 2004 the average trust fund in our sample comprised almost 70 percent stock versus 20 percent "safe" investments. The increasing role of stock in trust portfolios and the movement of those portfolios outward on the risk and return curve tend to support reforms allied with the new prudent investor rule such as making less rigid the arcane formal distinction between capital gains and income, see supra note 29; formalizing the trustee's duty to diversify, see supra note 13; and measuring damages for imprudent trust investment in relation to a total return benchmark, see Halbach (1992, pp. 458-59); Sitkoff (2003, pp. 584-87).

departments notoriously conservative under the old law. We cautiously conclude that the

new prudent investor standard is welfare-enhancing.

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TABLE 1: STATE-LEVEL RESULTS FOR PERSONAL TRUST ACCOUNTS

Variable	Model 1	Model 2	Model 3	Model 4 Weighted	Model 5 Weighted	Model 6 State Trends	Model 7 (Cluster by State)	Model 8 Net %Stock Increase	Model 9 Exponential Transformation (odds ratios)
Prudent Investor	1.72*	2.11**		1.00$^+$		1.71*	2.11*	1.98**	1.094**
	(.70)	(.66)		(.53)		(.82)	(.86)	(.69)	(.037)
Prudent Investor (-3 to -1 years)			-.59		-.11				
			(.62)		(.57)				
Prudent Investor (0 to 2 years)			1.52*		.60				
			(.76)		(.65)				
Prudent Investor (≥3 years)			2.65*		3.37**				
			(1.11)		(.91)				
Log Total State Assets (inflation adjusted)		.034**	.033**	.044**	.039**	.039**	.034**	.036*	1.15**
		(.011)	(.006)	(.007)	(.007)	(.013)	(.013)	(.013)	(.058)
% Stocks in Employee Benefit Funds		.17**	.17**	.087**	.10**	.10*	.16**	.11**	2.06**
		(.031)	(.022)	(.021)	(.022)	(.041)	(.049)	(.017)	(.41)
1987	-1.42$^+$	-1.04	-1.02	-1.37	-1.34	-1.36	-1.04	N/A	.95*
	(.89)	(.85)	(.77)	(1.18)	(.73)	(.81)	(.47)		(.018)
1988	-2.37**	-2.03*	-2.01*	-2.47	-2.40*	-2.62	-2.03	-4.44**	.92**
	(.86)	(.85)	(.78)	(1.31)	(.73)	(1.44)	(.61)	(.77)	(.022)
1989	.0003	-0.11	-.09	-.93	-.93	-.83	-.11	-6.88**	.99
	(.83)	(.80)	(.80)	(1.09)	(.72)	(2.09)	(.69)	(.74)	(.027)
1990	-2.51**	-2.08*	-2.05**	-3.52	-.36	-3.13	-2.07	2.32**	.91**
	(.86)	(.81)	(.78)	(1.18)	(.75)	(2.78)	(.85)	(.80)	(.031)
1991	1.07	.44	.44	.42	.16	-.55	.44	-5.62**	1.02
	(.84)	(.80)	(.83)	(1.01)	(.73)	(3.46)	(.80)	(.75)	(.032)
1992	2.05*	.53	.49	.99	.64	-.35	.53	.10	1.02
	(.83)	(.81)	(.82)	(1.08)	(.76)	(4.15)	(.88)	(.075)	(.036)
1993	3.37**	1.17	1.16	1.67	1.34$^+$	.32	1.17	.31	1.05
	(.89)	(.87)	(.86)	(1.13)	(.77)	(4.85)	(1.00)	(.80)	(.042)
1994	5.05**	2.92**	2.97**	3.13**	2.74**	1.94	2.92	5.15**	1.12
	(.92)	(.91)	(.90)	(1.21)	(.80)	(5.56)	(1.08)	(.87)	(.048)
1995	9.06**	6.18**	6.15**	7.17**	6.45**	5.30	6.18**	-4.60**	1.28**
	(.97)	(.98)	(.95)	(1.34)	(.85)	(6.24)	(1.16)	(.89)	(.059)

Variable	Model 1	Model 2	Model 3	Model 4 Weighted	Model 5 Weighted	Model 6 State Trends	Model 7 (Cluster by State)	Model 8 Net %Stock Increase	Model 9 Exponential Transformation (odds ratios)
1996	13.41**	9.08**	9.00**	9.15**	8.24**	8.27	9.08**	1.91	1.45**
	(1.26)	(1.29)	(1.02)	(1.50)	(.92)	(7.15)	(1.51)	(1.21)	(.087)
1997	17.24**	12.7**	12.56**	13.22**	12.36**	12.00	12.70**	.40	1.71**
	(1.38)	(1.35)	(1.08)	(1.57)	(.98)	(7.79)	(1.76)	(1.54)	(.12)
R-Square	.8965	.9166	.9173	.9110	.9144	.9526	.9166	.8915	N/A

N=599 state-year observations (550 in Model 10). **sig. at <.01 level; *sig. at <.05 level, +sig. at <.10 level.   Huber-White robust standard errors in parentheses. All regressions include state dummies and a constant. Models 4 and 5 uses inflation-adjusted total state assets as sample weights.

TABLE 2: BANK-LEVEL RESULTS FOR PERCENT STOCK

Variable	Model 1 Full Sample	Model 2	Model 3 Weighted	Model 4 State-Year Effects	Model 5 State-Year Effects, Weighted	Model 6 Exponential Transformation (odds ratios)
Prudent Investor	.012	.90	1.13	1.40	3.91**	1.076**
	(.69)	(.57)	(.74)	(1.07)	(1.38)	(.023)
Log Total High Holder Assets	.029**	.022**	.0036	.022**	-.001	1.13**
	(.004)	(.004)	(.012)	(.004)	(1.71)	(.023)
% Stocks Employee Benefit Funds (HH)		.18**	.11**	.17**	.11**	2.49**
		(.011)	(.026)	(.01)	(.01)	(.11)
1987	-.91**	-.22	-1.64**	—	—	.98
	(.25)	(.26)	(.44)			(.013)
1988	-1.77**	-1.35	-2.45**	—	—	.92**
	(.32)	(.29)	(.49)			(.014)
1989	-1.12**	-.46	-.12	—	—	.97**
	(.33)	(.33)	(.75)			(.018)
1990	-2.43**	-1.47	-3.07**	—	—	.91
	(.44)	(.45)	(.75)			(.022)
1991	.09	.35	.82	—	—	1.01
	(.53)	(.49)	(.62)			(.025)
1992	2.36**	1.69**	1.20	—	—	1.07**
	(.63)	(.55)	(1.00)			(.027)
1993	5.37**	4.13**	1.34	—	—	1.20
	(.73)	(.58)	(1.22)			(.032)
1994	5.14**	3.65**	2.83*	—	—	1.17**
	(.74)	(.63)	(1.36)			(.032)
1995	7.44**	5.50**	7.10**	—	—	1.27**
	(.82)	(.69)	(1.56)			(.037)
1996	10.0**	7.19**	9.36**	—	—	1.35**
	(.93)	(.99)	(2.22)			(.053)
1997	13.7**	9.88**	14.4**	—	—	1.53**
	(1.01)	(1.10)	(2.30)			(.065)
R-Square	.2546	.3338	.7667	.3342	.3342	N/A
N	24,424	22,885	22,885	22,885	22,885	22,885

**sig. at <.01 level; *sig. at <.05 level, +sig. at <.10 level.   All regressions include state dummies, bank holding company fixed effects, and a constant. The standard errors are Huber-White robust and reflect clustering on the state level. Models 3 and 5 use inflation-adjusted total bank assets as sample weights. Year effects are suppressed on Models 4 and 5 because of state-by-year interactions.

TABLE 3: STATE-LEVEL RESULTS FOR %STOCK^{PT}-%STOCK^{EB}

Variable	Model 1	Model 2 Weighted	Model 3	Model 4 Weighted	Model 5 State Trends	Model 6 (Cluster by State)
Prudent Investor	4.34**	2.88**			3.17*	4.34**
	(1.35)	(1.07)			(1.36)	(1.60)
Prudent Investor (-3 to -1 years)			-1.40	.74		
			(1.18)	(1.17)		
Prudent Investor (0 to 2 years)			2.75^{+}	2.71*		
			(1.40)	(1.31)		
Prudent Investor (≥3 years)			7.01**	9.01**		
			(2.09)	(1.83)		
Log Total State Assets (inflation adjusted)	-.018	.024^{+}	-.023*	.014	-.042**	-.018
	(.011)	(.015)	(.011)	(.014)	(.012)	(.011)
1987	.51	1.08	.53	.60	.0058	.51
	(1.00)	(1.53)	(1.48)	(1.08)	(1.31)	(1.19)
1988	.40	1.46	.40	.47	-.35	.40
	(1.48)	(1.51)	(1.48)	(1.48)	(1.64)	(1.48)
1989	1.57	1.41	1.53	1.76	.64	1.57
	(1.49)	(1.49)	(1.49)	(1.49)	(2.05)	(1.49)
1990	1.61	1.58	1.51	1.97	.11	1.61
	(1.49)	(1.51)	(1.50)	(1.50)	(2.59)	(1.28)
1991	.35	1.10	.26	.62	-1.33	.35
	(1.50)	(1.48)	(1.50)	(1.50)	(2.98)	(1.51)
1992	-3.53*	-1.88	-3.75*	-4.30*	-5.55	-3.53*
	(1.38)	(1.51)	(1.54)	(1.51)	(3.45)	(1.39)
1993	-5.80**	-2.42	-5.94**	-6.63**	-8.17*	-5.80**
	(1.52)	(1.52)	(1.56)	(1.52)	(3.91)	(1.58)
1994	-4.77**	-2.25	-4.80**	-5.55**	-7.67	-4.77**
	(1.52)	(1.52)	(1.67)	(1.53)	(4.51)	(1.63)
1995	-5.45**	-2.36	-5.65**	-6.61**	-8.33	-5.45**
	(1.59)	(1.57)	(1.72)	(1.59)	(5.00)	(1.91)
1996	-5.90**	-5.17**	-6.21**	-7.29**	-9.01	-5.90**
	(1.63)	(1.61)	(1.76)	(1.63)	(5.52)	(1.98)
1997	-5.71**	-3.81*	-6.12**	-7.10**	-9.40	-5.71**
	(1.64)	(1.74)	(1.81)	(1.72)	(6.09)	(2.51)
R-Square	.9170	.9331	.9174	.9174	.9529	.9170

N=599 state-year observations.   **sig. at <.01 level; *sig. at <.05 level, +sig. at <.10 level.   Huber-White robust standard errors in parentheses. All regressions include state dummies and a constant. Models 2 and 4 use inflation-adjusted total state assets as sample weights.

TABLE 4: BANK-LEVEL RESULTS FOR %STOCK^{PT}-%STOCK^{EB}

Variable	Model 1	Model 2 Weighted	Model 3 State Trends
Prudent Investor	2.14**	4.45$^+$	2.09**
	(.53)	(2.34)	(.48)
Log Total High Holder Assets	.017**	.017**	.017**
	(.045)	(.005)	(.005)
1987	1.32**	1.34*	.94
	(.49)	(.50)	(.56)
1988	.69	.72	-.06
	(.68)	(.68)	(.81)
1989	1.09	1.17	-.01
	(.61)	(.61)	(.99)
1990	1.07	1.16	-.41
	(.68)	(.68)	(1.26)
1991	-1.12	-.96	-2.94**
	(.68)	(.82)	(1.56)
1992	-3.75**	-3.90**	-5.93**
	(.81)	(.82)	(1.83)
1993	-5.19	-5.36**	-7.75**
	(.89)	(.90)	(2.17)
1994	-6.19**	-6.35**	-9.12**
	(.89)	(.89)	(2.39)
1995	-6.26	-6.45**	-9.57**
	(.99)	(.99)	(2.66)
1996	-9.12**	-9.34**	-12.80**
	(1.06)	(1.05)	(2.99)
1997	-10.83**	-11.08**	-14.84**
	(1.29)	(1.31)	(3.25)
R-Square	.0504	.0504	.0587

N=22,885 state-year observations. **sig. at <.01 level; *sig. at <.05 level, +sig. at <.10 level. All regressions include state dummies, bank holding company fixed effects, and a constant. The standard errors of all models are Huber-White robust and reflect clustering on the state level. Model 2 uses inflation-adjusted total bank assets as sample weights.

Appendix

APPENDIX TABLE 1:
STATE PRUDENT INVESTOR LAW REFORMS

State	Non-UPIA MPT Statute[48]	UPIA[49]
Alabama	1989	2007
Alaska		1998
Arizona		1996
Arkansas		1997
California	1987	1996
Colorado		1995
Connecticut		1997
Delaware	1986	
Florida	1993	
Georgia	1988	
Hawaii		1997
Idaho		1997
Illinois	1992	
Indiana		1999
Iowa	1991	2000
Kansas	1993	2000
Kentucky	1996[50]	
Louisiana		2001
Maine		1997
Maryland	1994	
Massachusetts		1999
Michigan		2000
Minnesota	1986	1997
Mississippi		2006
Missouri		1996
Montana	1989	2003
Nebraska		1997
Nevada	1989	2003

[48] We include in this category any statute based on the 1992 Restatement (Third) or that in other language instructs courts to evaluate the prudence of a particular investment in light of the composition of the portfolio as a whole.

[49] We include in this category any statute based on the UPIA 1994.

[50] The Kentucky MPT-style prudent investor legislation applies only to institutional trustees. Ky. Stat. 286.3-277. Effective January 1, 2005, other trustees may seek court approval to be governed by this statute. Ky. Stat. §386.454(1). Other trustees who do not avail themselves of §386.454 are governed by a legal list. Ky. Stat. §386.020. Because our sample data includes only institutional trustees, we code Kentucky as a reform state beginning in 1996.

State	Non-UPIA MPT Statute[48]	UPIA[49]
New Hampshire	1999	2004
New Jersey		1997
New Mexico		1995
New York	1995	
North Carolina		2000
North Dakota		1997
Ohio		1999
Oklahoma		1995
Oregon		1995
Pennsylvania		1999[51]
Rhode Island		1996
South Carolina	1990	2001
South Dakota	1995	
Tennessee	1989	2002
Texas	1991	2004
Utah		1995
Vermont		1998
Virginia	1992	2000
Washington	1985	
West Virginia		1996
Wisconsin		2004[52]
Wyoming		1999

Current as of Lexis or Westlaw in April 2007.

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[51] Although Pennsylvania's statute deviates quite substantially from the UPIA, we need not resolve whether those deviations require coding Pennsylvania differently, as the Pennsylvania statute was enacted after the period under study.

[52] Prior to April 30, 2004, Wisconsin not only followed the constrained prudent man rule, but it also capped investments in common stocks at 50 percent of the total market value of the fund. See Wisc. Stat. §881.01 (2003).