Inelastic Equity Markets: New Evidence From A Reform of U.S. Trust Law

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Abstract

We study the equity market implications of a reform in the laws that govern trust investments, implemented in a staggered fashion across U.S. states from 1986 to 2006. The introduction of the *prudent investor rule* systematically alters the relative attractiveness of stocks within the cross-section of U.S. equities for trust funds. As trust funds account for a substantial fraction of institutional equity holdings in our sample period, our empirical setting provides a rare opportunity to study the impact of a regulatory change on institutional investor holdings and relative prices in the U.S. equity market. We show both theoretically and empirically that, in response to the law change, trusts rebalance their portfolios away from "prudent" stocks, which were implicitly advantaged under the old regulatory regime. Stocks bought by trusts after the law change substantially outperform stocks sold by those funds. In this new and unique setting, we derive an upper bound estimate on the price elasticity of demand of the average U.S. stock of 11. Our results are in line with the inelastic markets hypothesis.

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1 Introduction

Institutional investors are central players in today's financial markets and understanding their impact on asset prices has become the focus of a large academic literature. An important strand in this literature, recently summarized by Gabaix and Koijen (2021) under the label *inelastic markets hypothesis*, posits that changes in institutional investor demand can change asset prices.[1] The inelastic markets view stands in contrast to the more traditional efficient markets view that asset prices reflect fundamental value and are independent of investor demand.

In this paper, we provide novel evidence in line with inelastic markets. We address two central questions. The first question is what causes markets to be inelastic. We argue and provide empirical evidence for the view that financial regulation can make institutional investor demand inelastic. The second question is whether shifts in demand by institutional investors change asset prices. Our contribution is to provide, to our knowledge for the first time, evidence from a natural experiment based on staggered state-level law changes that affect institutional investor demand for the entire cross-section of U.S. stocks. Our empirical setting thus provides a rare opportunity to study the impact of a regulatory change on institutional investor holdings and relative prices in the U.S. equity market, i.e., one of the largest, most liquid, financial markets in the world.

The reform we study is the Uniform Prudent Investor Act (UPIA), which was implemented across states in the U.S. from 1986 to 2006. The core feature of the UPIA we exploit is that it reorients the standard of "prudence," by replacing so-called *prudent man laws*, which governed trust investments under the old regime, by the *prudent investor rule*. The duty of prudence is one of the key corporate governance tools in trust management. It aims to ensure that the manager of a trust invests the funds held in trust for the beneficiaries in a prudent manner. Before the law change, under the prudent man rule, prudence was assessed asset-by-asset, meaning that a trust fund manager needed to make sure that each asset individually could be considered a prudent investment. After the law change, under the prudent investor rule, prudence was determined

[1] Gabaix and Koijen (2021) distinguish between macroelasticity and microelasticity. Our study is concerned with the latter.

on a portfolio level, meaning that a trust may now invest into individual assets which courts may consider imprudent in isolation, as long as the trust portfolio as a whole can be considered prudent. In addition, the new regime requires trust fund managers to exploit diversification benefits, whereas diversification played no role under the old regime.

Using the UPIA reform as a laboratory to study the effect of institutional investors on asset prices has a number of attractive features. First, the prudent investor rule's adoption of a portfolio perspective was motivated by advances in portfolio theory in the finance literature since Markowitz (1952), not by a desire to affect fundamentals of any firms held by trusts. Second, trust investments are economically substantial and changes in asset holdings across many trusts can plausibly matter for asset prices. Third, while the reform only affects trust funds, other financial institutions, such as mutual funds, hedge funds and insurance companies, are not directly affected because they are governed by different legal rules. We can thus use them to construct counterfactuals. Fourth, as we show in a theoretical model, the law change is associated with clear predictions about the change in holdings we should see: trusts' demand for prudent assets should go down, while demand for other assets should go up. If markets are inelastic, the model predicts that prices for these assets should move in parallel.

In the first part of the paper we examine the holdings of trusts around the introduction of the UPIA. Across a set of prudence-related characteristics we borrow from prior literature (e.g., CAPM beta, dividend yield, firm age, profitability, being part of a large index, and volatility), we find that, before the introduction of the UPIA, trusts allocate more money to prudent stocks, and less money to other stocks ("imprudent stocks"). This is true both, when we compare trusts across states, and when we compare trusts with other financial institutions within a given state. For instance, prior to the reform, the weight of prudent stocks in trusts' portfolios are on average almost 12 percentage points higher than the weight of prudent stocks in the portfolio of an institution in the same state and date that is not subject to prudent man laws.

A main finding in the first part of the paper is that this difference reduces substantially after the introduction of the UPIA. Specifically, after the reform, the difference in the portfolio weights of prudent stocks between trusts and non-trusts shrinks from 12 percentage points to only 3 percentage points. With more controls in a more rigorous regression framework, this difference reduces further. These results are consistent with the view that the old prudent man laws, and the associated stock-by-stock approach to determining a portfolio's prudence, effectively put a binding constraint on the stocks trusts were willing hold. Regulation therefore induced what we label "regulatory tilts" in the holdings of an important class of institutional investors. With the introduction of the new prudent investor rule, regulatory tilts are significantly reduced, due to the new portfolio-level approach to determining a portfolio's prudence. In our setting this reduces demand for prudent stocks and, at the same time, increases demand for other, less prudent, stocks. The nature of the holdings data, and the staggered introduction of the law changes allow us to document and identify the associated changes in demand in a comparatively clean fashion. Overall, our results in the first part of the paper show that the new regulatory approach towards measuring prudence in trusts has a substantial impact on the holdings of these institutions and leads to predictable and systematic shifts in the relative demand across stocks.

In the second part of the paper we ask whether the demand shifts induced by the regulatory change in prudence laws are associated with changes in relative prices. We find that in the 12 months after the reform, a value-weighted zero-investment portfolio that goes long stocks that trusts are predicted to buy (i.e., less prudent stocks) and short stocks trusts are predicted to sell (i.e., prudent stocks) earns a monthly alpha of 0.548%. Over the course of a year, this represents a risk-adjusted return of 6.6%. Estimates from portfolios formed on quintiles of a measure of trust buying and selling yield similar conclusions, but even larger magnitudes. The annual risk-adjusted returns of the spread strategy that is long stocks in the top quintile (Q5) and short stocks in the bottom quintile (Q5) is 7.1% (= 0.592% $\times$ 12). These findings are consistent with the view that the change in trust fund governance we examine induces economically large and long-lived shifts in relative prices of assets bought and sold by trust funds.

Finally, we derive estimates of the elasticity of demand for U.S. stocks based on our state-level regulatory change setting. We find an upper bound of the average price elasticity of U.S. stocks of 11. Our estimate from our state-level regulatory change – which to our knowledge is among the first such estimates for the entire cross-section of U.S. stocks in the literature – complements the estimates from other approaches described in Gabaix and Koijen (2021) and yields comparable results. Even though our estimates are a little larger than most others presented by Gabaix and Koijen (2021), they are very far from the null of an elastic market. Our results thus support the inelastic markets hypothesis.

2 Relation to Prior Literature

Our paper provides new evidence on the impact of financial regulation to the literature on inelastic markets (Gabaix and Koijen (2021)). To the best of our knowledge, our setting is unique in that it allows us to study the impact from changing regulations in staggered state-level law change setting. Our work, which uses a natural experiment from a law change as a source of identification, therefore complements seminal recent work on demand-based asset pricing, which uses instrumental variables to identify demand effects in asset-demand systems (Koijen and Yogo (2019), Koijen, Richmond, and Yogo (2022)).

Gabaix and Koijen (2021) present an overview of estimates of the price elasticity of demand from various approaches in the literature. For the microelasticities, which is most relevant to our study, they report estimates between 0.3 and 2 and conclude that the typical estimate is around 1, which is much lower than the microelasticity in standard asset pricing models which is 5,000 or above. They also report a variety of methods and setting researchers have employed to derive these estimates, which is a notoriously difficult empirical challenge. We contribute by providing a new and unique setting and a new estimate of the elasticity of U.S. stocks.

Our results also speak to the large debate on the slope of demand curves for stocks. A prominent older literature analyzes index additions as demand shifters (e.g, Shleifer (1986), Harris and Gurel (1986), Wurgler and Zhuravskaya (2002), Chang, Hong, and Liskovich (2014)) and finds that demand curves for stocks slope down. While this work has shaped the subsequent debate, there is still an ongoing discussion as to using index additions as sources of identifying information (e.g, Patel and Welch (2017), the three papers on index additions in CFR issue 12-1). Other work has analyzed corporate events such as spin-offs (e.g., Abarbanell, Bushee, and Smith Raedy (2003)), the expiration of IPO lock-up expiration provisions (e.g., Ofek and Richardson (2000)), or corporate bond downgrades (e.g., Ellul, Jotikasthira, and Lundblad (2011)), as alternative events that may affect investor demand. While the findings in these studies are generally in line with demand effects, one concern about single-firm event-based studies is that an omitted variable drives both the event and the price change. Abstracting from identification concerns, since single-firm studies focus by construction on only a small subset of firms, it remains an open question how effects generalize. In particular, if one is interested in the demand curves for the largest and most liquid stocks, what one can infer from studying firms at the cutoff of, say, the Russell 1,000 is limited.

An alternative to studying changes that affect single firms is to analyze events that affect many firms simultaneously. One set of studies uses fire sales to identify demand shifts (e.g., Coval and Stafford (2007), Edmans, Goldstein, and Jiang (2012)) for stocks sold by mutual funds. Wardlaw (2020) and Berger (2023) question the validity of fire sales shocks as instruments for exogenous demand shifts. Other studies exploit index reconstitutions. Kaul, Mehrotra, and Morck (2000) analyze index changes for Canadian stocks in 1996, and Greenwood (2005) analyzes changes in the composition of the Nikkei Index in April 2000. An attractive feature of these studies is that the way the index was changed is plausibly orthogonal to firm fundamentals, while affecting many large firms, and demand for them, simultaneously. A caveat is that index reconstiutions are rare, one-off events, so it is hard to rule out that other concurrent factors are driving the result.

The existing literature can essentially be grouped in two sets of studies. Studies that involve single-firm events (e.g., an index addition), which are observed (for different firms) across time. And studies that involve many firms (e.g, via an index reconstitution) at a single point in time (or few points in time, as is the case for fire sales). Our paper contributes by providing evidence that comes from observing many firms across many points in time. Relative to single-firm event-based studies, our setting can attenuate some pertinent identification issues and speak to the full cross-section of stocks. Complementing index reconstitution studies from other countries such as Japan and Canada, our paper provides across-time evidence on the impact of institutional demand on stock prices for the U.S. equity market.

One other paper that provides evidence on many firms and many points in time in an entirely different setting is Hartzmark and Solomon (2022) who analyze stock returns around dividend payment dates. They show that pre-announced events (trades induced by dividend reinvestment) have price impact when they occur. Our paper is different, because we show that prices move in anticipation of trading by trusts that will occur in the future.

Our work also adds to the rich literature on the role of delegated asset management in financial markets (e.g., French (2008), Stein (2009), Stambaugh (2014), Zingales (2015)). This literature has developed around the role of institutions for market efficiency, and on the consequences of delegation for investors' wealth accumulation. We contribute to this literature by highlighting that regulation designed to curb agency issues in the delegation process, may have unintended side-effects on prices in inelastic markets.

Our work builds on a small set of prior papers that analyzes prudent man laws and the prudent investor rule. In the empirical legal literature, Schanzenbach and Sitkoff (2007) find that personal trusts allocate a greater fraction of the fund's wealth towards equities following the introduction of UPIA. Schanzenbach and Sitkoff (2017) use the same data and find that, after the UPIA, fund assets correlate more strongly with the S&P500. Our paper is different, because our data allows us to look inside trusts' equity portfolios, focus on individual stock returns, and thus study the impact the UPIA has had on relative prices. In finance, Del Guercio (1996) showed that bank managers significantly tilt the composition of their portfolios toward stocks that are viewed by the courts as prudent, while mutual fund managers do not. Since her data is pre-UPIA, she cannot examine the effect of the law change on portfolios and prices. Hankins, Flannery, and Nimalendran (2008) study the introduction of UPIA to understand institutional preferences for dividend-paying stocks. Since they do not consider prices, their results do not speak to the inelastic market hypothesis.

3 Institutional Background

In this section we provide some institutional background on trusts and trust law.[2]

3.1 Trusts

In its most basic form relevant for our paper, a trust is an investment vehicle which a "settlor" sets up with the intention of supporting one or more fund beneficiaries. The settlor selects "the trustee", who is responsible for distribution, management, custody and administration of the wealth in the trust. Historically, going back at least to 14th century England, trusts were a legal vehicle to conveniently pass on wealth (then usually in the form of real estate) from one generation to the next. This has changed. As observed by Langbein (2004):

> Today's trust has ceased to be a conveyancing device for land and has become, instead, a management device for holding a portfolio of financial assets. [...] Such a portfolio requires skilled and active management. Investment decisions need to be made and monitored, the portfolio rebalanced and proxies voted.

Responsible for the "skilled and active management" Langbein describes are the trustees, which, for modern trusts are usually fee-paid professional service providers in bank trust departments, trust companies, and other institutions that offer trust services. From a finance perspective, then, a trust is simply a form of delegated financial management in which the trustee manages a portfolio of assets on behalf of her clients.

There are many legal variants of the basic trust structure. The prototypical case is an irrevocable personal trust in which the settlor is an individual who transfers assets to the trust for the benefit of the ultimate owners, such as, for example, spouses or children. In an irrevocable

[2] Because the law is particularly relevant for the governance of trusts, and because the associated body of legal rules is both complex and voluminous, our brief account in this section draws heavily on prior work of legal scholars. In particular Sitkoff (2003), Schanzenbach and Sitkoff (2007) and Sitkoff (2019) have been very helpful and we refer interested readers to these papers for additional legal background on trusts.

trust, the settlor gives up all ownership rights on those assets and there is no option to reverse that decision once the fund is set up. The fund is then managed by the trustee. Irrevocable trusts are a tax advantaged way to transfer wealth from one generation to another. By contrast, in a revocable trust (often also called a living trust ("inter vivo")) the settlor retains the option of getting the assets out of the fund again. The cost of this added flexibility, apart from non-trivial legal and administrative costs, is that tax advantages associated with irrevocable trusts are often not available for revocable trusts. Upon the passing away or incapacitation of the settlor, revocable funds often become irrevocable funds.

Trusts are often set up by wealthy individuals or families for purposes of estate planning, shielding assets from creditors, tax optimization, probate avoidance, charity, or philanthropy. While they share the basic structure above, the specific legal form of a trust is dictated by the purpose. State laws across the U.S. are of key importance for the specific legal arrangements that are available to a potential settlor.

Unless otherwise mentioned, most of our discussion in the following is from the perspective of a personal irrevocable fund. In our empirical work below, in line with the objectives of our study, we will focus on those trusts in which form 13F filing institutional investors as professional trustees have discretion to make investment decisions. Trusts in which the settlor retains most of the decision rights are thus not part of our study.

3.2 Agency Problems in Trusts

Being a form of delegated asset management, agency concerns are central to trusts. While the trustee is installed by the settlor to manage the assets of the trust for the benefit of the beneficiaries, the trustee has substantial discretion in how to manage these assets.[3] Since trustee actions are not perfectly observable, and since writing complete contracts is usually not feasible, the potential for agency problems in trusts is thus substantial. Exacerbating agency problems for

[3]Strictly speaking, the trustee has "legal title to the property. However, the trustee's legal title is subject to equitable or beneficial ownership rights in one or more beneficiaries. This separation of legal and beneficial ownership—functionally a separation of ownership and control—imposes fiduciary intermediation between the beneficiary and the trust property." (Sitkoff (2019)).

trusts is the fact that, contrary to corporate executives, trustees enjoy legal protection against removal in normal circumstances. In addition since, contrary to boards or institutional investors in the corporate context, settlors and beneficiaries are often not experts (e.g., spouses or underage children), their ability to monitor trustees may often be particularly limited.

The central governance tool to ensure trust funds are not mismanaged or misappropriated is thus trust law. As Sitkoff ((2019), p.2) explains: "Trust law's answer to this problem of agency costs is to subject a trustee to fiduciary duties in the trustee's exercise or nonexercise of the trustee's powers. Fiduciary principles are thus the primary beneficiary safeguard in modern trust practice."

3.3 Trust Fiduciary Law: The Duty of Prudence

Trust law subjects a trustee to fiduciary duties, which are duties to, and enforceable by, beneficiaries. Main fiduciary duties are the *duty of loyalty*, and the *duty of prudence*. The duty of loyalty is a legal barrier against self-dealing by trustees. More pertinent to our analysis is the duty of prudence, also known as the duty of care, which holds that a trustee "has a duty to administer the trust as a prudent person would, in light of the purposes, terms, and other circumstances of the trust, exercising reasonable care, skill, and caution" (Sitkoff ((2019), p.7)). The duty of prudence, and the definition of what constitutes prudent trustee behavior, has particular implications for the investment decisions a trustee can make.

For a long time, the generally accepted standard of prudence for trust investments in the U.S. was the so-called *prudent man rule*. This rule descended from the 1830 court decision in the seminal case of *Harvard College v. Amory*, and inspired the Restatement of the Law (Second) (1959), one of the most influential texts in trust law before the regulatory change we exploit in this paper. The Restatement encouraged courts to assess the prudence of a trustee's investment decisions based on the individual characteristics of a given asset. In effect, the prudence of an investment portfolio of a given trust was determined asset-by-asset without any portfolio considerations. Because being in breach of the duty of prudence would result in personal liability for the trustee, the asset-by-asset determination of prudence gave trust fund managers a strong incentive to invest mainly in assets which courts would likely consider prudent.

Across asset classes, the prudent man rule incentivized trust fund managers to tilt away from equities and towards low risk assets such as U.S. treasuries. Within equities, trusts have an incentive to tilt towards a specific subset of the equity universe considered prudent. In the absence of an unambiguous definition in the legal texts, the existing related literature, motivated by actual court rulings, has suggested several characteristics that signalled prudent equity investment under the prudent man rule, including: a firm's CAPM beta, firm age, dividend yield, profitability, stock return volatility, and S&P index membership (e.g., Del Guercio (1996), Gompers and Metrick (2001), Bennett, Sias, and Starks (2003)).

The regulatory change we exploit in this paper is the Uniform Prudent Investor Act (UPIA) which was drafted by the National Conference of Commissioners on Uniform State Laws and subsequently put into state law in a staggered fashion across U.S. States. UPIA is a trust law reform which reorients the standard of prudence, explicitly linking it to "modern portfolio theory" in finance.[4] The key new requirement introduced by UPIA was that prudence should be assessed "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". This new *prudent investor rule*, which superseded the old prudent-man rule, thus explicitly takes a portfolio perspective and allows trustees to invest into assets that previously would have been deemed not prudent. UPIA also explicitly requires trust fund managers to diversify their portfolio. By 2006, the UPIA, and with it, the prudent investor rule, was adopted by all U.S. States.

The transition from the prudent man rule to the prudent investor rule constitutes an attractive opportunity to study the impact of institutional investors on stock prices for two reasons. First, the rule change has a direct impact on the portfolio of stocks held by trust funds. Under the prudent man rule, each individual stock needed to satisfy the standard of prudence, while under the prudent investor rule, only the final portfolio as a whole needs to satisfy those stan-

[4]The first paragraph of the preface of the UPIA makes this motivation explicit. We provide the preface in the Appendix.

dards. Compared with the prudent man rule, the prudent investor rule thus leaves more scope for investing in stocks which were not considered prudent under the old regime. Specifically, after the law change, we would expect trust fund managers to increase their investments in stocks that were previously deemed not sufficiently prudent because, (i) the prudent investor rule encourages, and such stocks improve, portfolio diversification, because (ii) under the prudent investor rule, investing too much into prudent assets might itself be considered imprudent, and because (iii) professional trust fund managers are usually compensated as a percentage of assets under management, which gives an incentive to increase risk much in the spirit of the classical Jensen and Meckling (1976) principal agent framework.

A second advantage is that the law change reflects advances in academic finance, explicitly citing "modern portfolio theory" as a core motivation for UPIA. The law change was in no obvious way designed to benefit the firms held by trusts directly, which helps attributing causality in case we find that stock returns change when the law changes.

We close this section with two additional observations. First, there are cases in which a trustee delegates a function of trusteeship. In this case, fiduciary standards still apply because the trustee must exhibit prudence in "selecting, instructing, and periodically monitoring the agent" (Sitkoff ((2019), p.15)). In addition, the agent owes then a duty of care to the trustee. This minimizes the possibility that a trustee can circumvent prudent investment laws simply by hiring an agent who would then invest in assets which would be considered "imprudent" if held by the trustee herself. More generally, as Schanzenbach and Sitkoff (2007) argue and document with examples, there were practical limits on the ability to contract around the prudent man rule – for example, by explicitly authorizing a trustee to invest in "imprudent" securities – because courts would often nevertheless evaluate the trustee's behavior relative to the prudent man standard in case of an ex post legal dispute. In short, while the duty of prudence is formally a default law, prior research shows that it has substantial teeth and is broadly relevant for trusts.

Second, we note that UPIA does not affect other institutional investors such as mutual funds, hedge funds, and insurance companies. Pension funds are subject to the Employee Retirement

Income Security Act (ERISA, 1974), which does impose prudence and loyalty duties on pension fund managers, related to the duties relevant for trusts. The core difference is that ERISA is a federal law (which predates UPIA by two decades) while UPIA is implemented as state law. By design of our state-level difference-in-difference tests, federal laws cannot affect our results.

4 Theoretical Framework

We derive our main predictions in a simple model that captures the relation between trust managers' portfolio choice and the prudent-man legal standard, as well as the dynamics of asset prices around the passage of the UPIA law in a stylized way. The model builds on, and closely follows, earlier work on inelastic prices and delegated portfolio management by Pavlova and Sikorskaya (2023). The key insight from the model is that prudent man laws induce "regulatory tilts" in the portfolios of trusts, and that changes in the law yields testable predictions for holdings and prices. The model also informs our estimation of demand elasticities later in the paper.

There are two periods, $t = 0$ and $t = 1$. There is a riskless asset, with a rate of return r normalized to zero, and N risky assets (stocks) paying cash flows of D_i for stock i at time t=1. Let $D_i = \bar{D}_i + \epsilon_i$, where $\bar{D}_i$ is the expected cash flow from asset i and $\epsilon_i \sim N(0, \sigma_\epsilon^2)$ is an idiosyncratic shock that is uncorrelated across assets.[5] Risky assets are in fixed supply. We define a vector for period-zero prices $S = (S_1, ..., S_N)$ and a vector for period-one returns $R = D - S$, with covariance matrix $\Sigma = \sigma^2 I_{N\times N}$.

There are two broad types of investors, namely direct investors and asset managers. Asset managers are further partitioned into two subgroups, namely fund managers and trust managers. All investors have constant absolute risk aversion (CARA) preferences with a coefficient of risk aversion γ. Direct investors choose their demand for risky assets θ_D so as to maximize their expected utility from final wealth $E(u(W_D)) = -exp\{-\gamma W_D\}$, with $W_D = W_0 + \theta_D' (D - S)$. As is standard in CARA-normal models, this gives rise to the following demand for risky assets:

[5] Common shocks to stock returns can be included in the model, but we abstract from them for brevity.

$$\theta_D^* = \frac{1}{\gamma}\Sigma^{-1}(\bar{D} - S). \tag{1}$$

Other investors delegate their investment to fund managers. Fund managers are compensated based on a combination of fixed salary $\phi_F \geq 0$, performance-based pay on the return of the fund they manage, R_F, as well as for performance relative to an exogenous benchmark B_F such that the final wealth of a fund managers is: $W_F = \phi_F + a_F R_F + b_F(R_F - B_F)$, where $a_F \geq 0, b_F > 0$. This captures the realistic feature that benchmarking to an index like, for example, the S&P500 and compensation contracts that depend on performance relative to an index are very common.[6] Denote the weights of asset i in the benchmark index by $\omega_{F,i} \geq 0$ and denote the corresponding vector of weights by ω_F. Fund managers then choose the vector of their demand for the N assets θ_F so as to maximize their expected utility of managerial compensation, $E(u(W_F)) = -exp\{-\gamma W_F\}$, which yields:

$$\theta_F^* = \frac{1}{\gamma(a+b)}\Sigma^{-1}(\bar{D} - S) + \frac{b}{a+b}\omega_F. \tag{2}$$

There are two key insights from equation (2). First, the existence of benchmarks creates incentives for fund managers to tilt their portfolio holdings toward the benchmark. Second, demand becomes partly inelastic because the second term does not depend on assets' risk and return characteristics.

The new feature we introduce into the model are trust managers. We start from the assumption that the general structure of compensation for trust managers is the same as for other fund managers, i.e., $W_T = \phi_T + a_F R_T + b_F(R_T - B_T)$. While we are not aware of a comprehensive study on trust fund manager compensation contracts, we believe this is plausible and can be justified on several grounds. Most importantly, it can be shown that benchmarking emerges endogenously as part of an optimal contract in a setting of delegated portfolio management which, as in the case of trusts, involves a principal-agent relationship (Kashyap, Kovrijnykh, Li, and Pavlova (2023)).

[6] For example, Ma, Tang, and Gomez (2019) document that a large majority of mutual fund managers has a compensation contract that features benchmarking. Performance-evaluation relative to benchmarks are also very common for most other types of institutional investors (e.g., Bank for International Settlements (2003)).

In practice, beneficiaries will almost surely evaluate trust managers and determine whether they want to terminate a trust arrangement (in the case of a revocable trust), and/or potentially sue a trust manager (in the case of an irrevocable trust), based on their performance relative to some benchmark. Finally, in cases in which the trustee hires an outside asset manager to invest on behalf of the trust, contracts will likely be benchmarked, as is common across the asset management industry.

Like fund managers, trust managers make their investment choice θ_T to maximize their expected utility $E(u(W_T)) = -exp\{-\gamma W_T\}$. The key difference is that trust managers are likely to face, on average, a more conservative benchmark than other fund managers, because trust law induces a regulatory incentive to manage portfolios in a prudent manner. To model this in a simple and tractable way, we assume that the composition of the benchmark for trust managers is governed by $\omega_T = \omega_F - c\hat{\psi}$, where $\hat{\psi} = (\hat{\psi}_1\ \hat{\psi}_2\ ...\hat{\psi}_N)'$ is a column vector tracking the extent to which a given stock is considered prudent according to trust law. For $\hat{\psi}_i < 0$ stock i is "prudent," for $\hat{\psi}_i > 0$ it is "imprudent". The parameter $c \geq 0$ governs the strength of the law-induced incentive to favor prudent stocks and shun imprudent stocks. The optimal portfolio selected by trust managers is given by:[7]

$$\theta_T^* = \frac{1}{\gamma(a+b)}\Sigma^{-1}(\bar{D} - S) + \frac{b}{a+b}\omega_T = \theta_F^* - \frac{bc}{a+b}\hat{\psi}. \tag{3}$$

Equation (3) shows that, in the absence of trust law and a duty of prudence, $c = 0$ and trust managers would in our model choose the same portfolio as the average other fund, because they would face the same benchmark. With trust law and prudence-related rules, $c > 0$ and equation (3) shows that trust funds optimally tilt their portfolios toward stocks deemed prudent, and away from stock deemed imprudent. This portion of trust demand is inelastic. We label this property of trust law on portfolio holdings "regulatory tilt". We summarize this in our first prediction:

[7]The level of base pay is allowed to differ in our model across manager types. In line with the previous literature, we take the contract parameters a and b as exogenous and we further assume that a and b are the same across all types of asset managers (e.g., Pavlova and Sikorskaya (2023)). Endogenizing these parameters would be interesting, but well beyond the scope of our paper and is left for future research. See Kashyap, Kovrijnykh, Li, and Pavlova (2023) for a paper that endogenizes benchmarking in delegated asset management.

Prediction 1: *Relative to other institutional investors, trusts tilt towards prudent stocks.*

We now turn to the pricing implications. There is a mass λ_D of direct investors, a mass λ_F of fund managers, and a mass λ_T of trust managers. In order for the market to clear, the sum of the demand of these three sets of investors has to equal the supply $\bar{\theta}$ of the risky assets:

$$\begin{aligned} &\lambda_D\theta_D + \lambda_F\theta_F + \lambda_T\theta_T \\ &= \frac{1}{\gamma}[\lambda_D + \frac{1}{a+b}(\lambda_F + \lambda_T)](\bar{D} - S) + \frac{b}{(a+b)}(\lambda_F + \lambda_T)\omega_F - \frac{bc\lambda_T}{(a+b)}\hat{\psi} = \bar{\theta}. \end{aligned}$$

Solving for equilibrium prices S yields:

$$S = \bar{D} - \gamma A\Sigma[\bar{\theta} - \frac{b}{a+b}(\lambda_F + \lambda_T)\omega_F + \frac{bc}{a+b}\lambda_T\hat{\psi}]. \tag{4}$$

where $A = \frac{1}{\lambda_D + \frac{\lambda_F + \lambda_T}{a+b}}$. Equilibrium prices have many intuitive properties: they decline when risk aversion increases, when risk increases, and when the supply of the risky assets increases. Moreover, as in prior literature, the prices of stocks included in a benchmark will rise relative to stocks that are not in the benchmark. Finally, and related, the tilt of trusts' benchmark toward prudent stocks, causes these stocks to have, ceteris paribus, higher prices in equilibrium compared to less prudent stocks.

We can now analyze the impact of a change in trust law. In our model, the old prudent man laws imply a regulatory tilt, governed by parameter c which leads trusts to overweight prudent assets and underweight imprudent assets. The introduction of UPIA does two things: first, by moving away from an asset-by-asset approach to measuring the prudence of trust investments, the new law makes the prudence characteristics of each individual asset less important and, second, the new law emphasizes proper diversification which leads trust benchmarks to more closely resemble the benchmarks of other well diversified institutional investors. In our model, both effects can be conveniently modelled as a reduction c.

Denote the new level of c after the law change as c_1 and assume $0 < c_1 < c$. From equation (4) we can then derive price changes around the introduction of UPIA:

$$\Delta S = -\gamma A \Sigma \frac{b \Delta c}{a+b} \lambda_T \hat{\psi}, \tag{5}$$

where $\Delta S \equiv S_1 - S$ is the price change due to UPIA and $\Delta c \equiv c_1 - c$ is the change in c which, by assumption, is negative. Thus, $\Delta S_i < 0$ for prudent stocks and $\Delta S_i > 0$ for imprudent stocks.

Prediction 2: *After the UPIA law change, the prices of prudent stocks decrease, while the prices of imprudent stocks increase.*

Demands by investors changes as follows. Denoting post-UPIA quantities again by a subscript 1 we have:

$$\Delta \theta_D^* \equiv \theta_{D1}^* - \theta_D^* = \frac{1}{\gamma} \Sigma^{-1} (-\Delta S), \tag{6}$$

$$\Delta \theta_F^* \equiv \theta_{F1}^* - \theta_F^* = \frac{1}{a+b} \Delta \theta_D^*, \tag{7}$$

where the last equality follows from $\theta_F^* = \frac{1}{a+b}\theta_D^* + \frac{b}{a+b}\omega_F$ and the fact that UPIA does not change the benchmarks of non-trust fund managers. Since $\Delta S_i < 0$ for prudent stocks, the above equation shows that, in equilibrium, non-trust investors will hold more prudent stocks after the introduction of UPIA, and vice versa for imprudent stocks. Finally, we have:

$$\begin{aligned} \Delta \theta_T^* = \Delta \theta_F^* - \frac{b \Delta c}{a+b} &= \frac{1}{\gamma(a+b)} \Sigma^{-1} (-\Delta S) - \frac{b \Delta c}{a+b} \hat{\psi} \\ &= \frac{\lambda_D (a+b) + \lambda_F}{\lambda_D (a+b) + \lambda_F + \lambda_T} \frac{b(-\Delta c)}{a+b} \hat{\psi} \end{aligned} \tag{8}$$

For imprudent stocks, with $\hat{\psi}_i > 0$, the holdings of trusts therefore increase after the law change, and vice versa for prudent stocks.

Prediction 3: *After the UPIA law change, the holdings of prudent stocks by trusts decrease, while the holdings of imprudent stocks increase.*

To measure the demand elasticity, we can use the change in *inelastic* trust demand due to UPIA as a shock to the supply of shares to the rest of the market. We refer to such a change as a change in residual demand (henceforth ΔRD). The price-elasticity of demand can then be recovered by relating the change in residual demand to the change in price. In our model, the change in inelastic trust demand due to UPIA corresponds to:

$$\Delta RD = -\frac{b\Delta c}{a+b}\lambda_T\hat{\psi} \tag{9}$$

We do not observe the shock to inelastic demand directly, but, by virtue of equation (3), we can recover it from the difference between the holdings of trusts and funds, which are quantities we can observe. Specifically:

$$\Delta\left(\theta_T^* - \theta_F^*\right) \equiv \left(\theta_{T1}^* - \theta_{F1}^*\right) - \left(\theta_T^* - \theta_F^*\right) = -\frac{b\Delta c}{a+b}\hat{\psi} \tag{10}$$

leads to:

$$\Delta RD = \lambda_T \Delta\left(\theta_T^* - \theta_F^*\right) \tag{11}$$

We will construct an empirical counterpart to ΔRD in equation (11) in the empirical part of our paper below. We can then compute the price-elasticity of demand as $\frac{1}{b}$, based on the following cross-sectional regression, estimated around the law change:

$$Ret_{it} = a + b\Delta RD_{it} + \epsilon_{it}. \tag{12}$$

While residual demand in equation (11) is both theoretically correct under our model and measurable in the data, an empirical concern is that the change in fund and trust holdings across time are endogenous with the law change in the actual data. In our empirical section below, we therefore prefer to work with the difference in trust and other fund holdings before the law change, i.e., $(\theta_T^* - \theta_F^*)$, which is not subject to this concern. From equation (3) we know that the latter is equal to $-\frac{bc}{a+b}\hat{\psi}$. Thus, using the difference in the holdings rather than the difference in the difference of the holdings in our demand elasticity tests means that we are estimating an upper bound on the demand elasticity if $c_1 > 0$. If $c_1 = 0$, i.e., if the law change eliminates most of the difference between trust and other fund holdings, we will recover the demand elasticity without error. In any case, we can sensitivity check our elasticity estimates for different assumptions about the reduction in c towards zero.

5 Data

5.1 UPIA adoption by US States

The Uniform Prudent Investor Act (UPIA) was incorporated into state law by U.S. states at different points in time. To obtain implementation dates, we start with a list of States that have adopted the UPIA and, for each State, the associated state laws from the FDIC.[8] We then manually collect the effective date for each law, with main sources being state government websites and WestLaw. From 1986 to 2006, fifty-one states have adopted the Uniform Prudent Investor act.[9] Table 1 shows the resulting implementation dates.

5.2 Institutional Investor Data

We use institutional equity holdings obtained from the Thomson Reuters Institutional Holdings 13F Database. The database covers equity holdings of all institutional investors who exercise "investment discretion" over assets under management of at least $100 million. Such investors must report their holdings to the SEC on form 13F on a quarterly basis.

To identify trusts, we obtain institutional investor classification data used in DeVault, Sias, and Starks (2019), a finely-grained proprietary data set of Thomson Reuters institutional clas-

[8]Source: `https://www.fdic.gov/regulations/examinations/trustmanual/appendix_c/appendix_c.html` (retrieved: June 2020).

[9]The Uniform Prudent Investor Act (UPIA) was drafted in 1994. Early adoptions are possible because some states, for example Illinois, worked off early drafts of the UPIA and the Restatement (Third) of Trusts from 1992 on which the UPIA is based. Other States, like Delaware, were model states on which some of the UPIA was based. Following the FDIC, and similar approaches in Schanzenbach and Sitkoff (2007) and Schanzenbach and Sitkoff (2017), we use the date of the state law that first incorporates the essential features of UPIA as implementation date.

sifications to identify 57 different organizational types.[10] Based on this classification, we define an institution as a trust if it belongs to one of the following organizational types: Bank and Trust, Banking Institution, Commercial Bank, Private Bank, Savings Bank, Trust Bank, and Trust Company. Throughout the paper we refer to these entities as "trust funds," or, for brevity, "trusts." This classification reflects the fact that bank trust departments have historically been key institutions to manage trust assets and to act in a fiduciary capacity for trust assets. A main advantage of the DeVault, Sias, and Starks (2019) classification in our setting is that there exist trust companies which are not banks. While we capture them with our detailed classification, we would miss them using the more standard classification of five investor types.[11]

Using 13F data allows us to analyze the impact of the UPIA law change on a security-by-security level. That is, we can answer questions that relate to how trusts allocate their investments across securities *within* the universe of U.S. equities and therefore study the impact of the law change on portfolio composition and security prices. Other data sources, like until 2008 the SDI data from the FDIC, which also provide data on trust assets, do not provide details on which stocks are held, and are therefore not suitable for our context. Moreover, in contrast to our 13F data, the FDIC data do not cover non-depository trust managers, i.e. trusts that are not banks.

While we believe the 13F data, combined with the 57-category DeVault, Sias, and Starks (2019) institutional classification, is the best data available for our purposes, it is not without limitations. First, we observe holdings aggregated at the institution level and not trust-by-trust. Second, among the stocks reported on form 13F, some may not be covered by state-level trust law. For example, banks also manage pension trusts, which are governed by ERISA, a federal law. That said, in our staggered across-state setting, this should not impact our inferences because UPIA only applies to trusts and because, in the case of pension trusts, federal law, like ERISA can by design not affect our difference-in-difference estimates. If anything, stocks not covered by state-level trust law would likely work against us because it induces noise into our estimation.

[10] We thank Rick Sias and Laura Starks for making the classification data available to us.

[11] While our classification is more accurate, we obtain qualitatively similar results in our main holdings and return tests when using banks in the standard Bushee (e.g., Bushee (2001)) classification.

Third, and related: given that banks were not allowed to invest in securities outside of their fiduciary capacity before the repeal of the Glass-Steagall act in 1999, our data should closely track the stock holdings in a bank's trust department up to 1999. However, after 1999, equity holdings reported on form 13F may contain non-fiduciary assets (for example, banks trading on their own account). We deal with this issue in two ways. In our baseline tests, we use the assignment of trusts described above also for observations after the year 1999. While institutions could, in principle, hold equities then for other reasons, we argue it is reasonable to assume that institutions with a substantial bank trust department before 1999 will most likely have a substantial bank trust department also for many years after 1999. Even if their business changes, such changes will take time to be implemented. That said, as a robustness check, we identify institutions which potentially hold other assets (because they become bank holding companies or because they file certain regulatory forms), and show that our main results are qualitatively similar when we drop them from the sample. While dropping those institutions is almost surely too conservative, it is useful in showing that our findings are not induced by the changes in banking regulation in the late nineties.

We assume that the location of the 13F reporting institution's headquarters is the relevant jurisdiction in matters of a breach of fiduciary duty.[12] We obtain information about institutional investors' historical headquarters location from the SEC Analytic Suite database, which gathers information from the SEC Edgar website. We complement this information with data provided from the Federal Deposit Insurance Corporation (FDIC). We merge information about headquarter location with the Thomson Reuters 13F Database using the fund name. We are able to obtain headquarter location for 77% of the institutional investors in the Thomson Reuters 13F Database, accounting for 76% of the total dollar value invested by all institutions.

Table 2 reports summary statistics separately for trusts and the remaining 13F institutions.

[12]This is an approximation. Strictly speaking, the relevant jurisdiction will be where the trust resides, which is usually at the location of the handling institution. Our approach follows Schanzenbach and Sitkoff (2017) who use a similar approximation and also provide relevant legal background. Before interstate branching in 1997 the approximation should be very accurate. After 1997 there may be some noise in the data in case a trust is located in another state than the headquarter of the reporting entity. While it is hard to gauge the amount of this noise, the most likely effect on our results will be that it works against us in making it harder for us to identify results with any precision. We see no reason why it should bias any of our conclusions.

The columns *% all Institutions* report the fraction of total dollar value of the portfolios reported by 13F institutions accounted for by trusts and all other institutions, respectively. The share of institutional equity holdings managed by trusts in our sample period is close to 20% on average and therefore substantial.

5.3 Firm-level Data and the Definition of Prudent Equity Investments

We obtain stock returns and other firm-level characteristics from the CRSP-Compustat merged database. We include all stocks with share code 10 and 11, traded on the NYSE, AMEX and Nasdaq.

What constitutes a prudent equity investment is not unambiguously defined in the legal texts. To a substantial degree it is a matter of interpretation by courts. Based on the prudent man rule and the associated comments in the Restatement of the Law (Second) (1959),[13] and following prior work of Del Guercio (1996), Gompers and Metrick (2001), and Bennett, Sias, and Starks (2003), our analysis focuses on a set of six firm-level characteristics that can plausibly be linked to prudence: a firm's CAPM beta, firm age, dividend yield, profitability, stock return volatility, and S&P Index membership. We provide the respective variable definitions in the appendix.

To account for the fact that each of the six variables above is a noisy proxy of the prudence of a given stock, we combine those variables into one index as follows. First, for each year, we define the investable stock universe as the set of stocks that where held by any 13F institution in our sample in the previous 40 quarters. Second, separately for each quarter, we sort stocks into terciles by dividend yield, profitability (return on equity), CAPM beta, and stock return volatility. For firm age, we sort stocks into three groups: age > 15 years, age between 5 and 15 years and age < 5 years. For S&P 1,500 membership we form two groups: member/non-member. We then assign, separately for each characteristic k, a score equal to -1 to the tercile or groups that is most prudent (old firms, S&P 1,500 member, high dividend yield and profitability, low

[13] See the "Prudent Man Rule" section and the associated comments in Appendix C of FDIC Trust Examination Manual (retrieved: July 2019).

CAPM beta and stock return volatility), we assign 0 to the middle group, and 1 to the tercile or group that corresponds to the least prudent stocks (young firms, S&P 1,500 non-member, low dividend yield and profitability, high CAPM beta and stock return volatility). For a given stock i at time t, we then define a prudence index as:

$$\psi_{it} = \sum_{k=1}^{6} Score_{it}^{k}, \tag{13}$$

where $Score_{it}^{k}$ is the score for each variable k. We ensure that scores are constructed using information that would be available to investors at date t (see appendix for details on variable construction). ψ thus ranges from -6 to 6, with -6 indicating the most "prudent" stocks and 6 indicating the most "imprudent" stocks.

The ψ measure is our empirical analogue to the parameter $\hat{\psi}$ in the model in Section 4. Just like for $\hat{\psi}$, lower values of ψ correspond to more prudent stocks. The main difference to the model is that we no longer have a clear cutoff value that delineates prudent from imprudent stocks. This reflects the reality that prudence is determined by courts and that no hard and fast rules exist that would allow trustees to determine prudence. Rather, some stocks, due to their characteristics, are more likely defensible as prudent in court than others. ψ can thus be though of as a measurement device to determine the likelihood that a court would find a stock to be prudent, rather than imprudent. A clear delineation is thus not available. Neither is it needed in most of our tests, because we are concerned with the prudence of one stock relative to the prudence of another stock. That said, we will later present evidence that suggests a value of ψ around -3 to be most consistent with a cutoff between clearly prudent stocks and other stocks.

Table 3, Panel A presents summary statistics for the main variables used.

6 Results on Holdings

6.1 Regulatory Tilts: Holdings Differences before the Law Change

We begin by documenting regulatory tilts towards prudent stocks by trusts (prediction 1 of the model in Section 4). Table 4 shows simple univariate differences in the holding characteristics of trust and non-trust institutions. In all tests in this section, we only use data one year before the adoption of a UPIA statute in each state. We first compute for each institution a value-weighted average for each characteristic across all stocks, with weights given by a stock's weight in the institution's portfolio. We then take an equal-weighted average across all trusts and non-trusts, respectively. The results in Table 4 show significant regulatory tilts: trusts invest in stocks with smaller CAPM Beta, more profitable stocks, older stocks, S&P 1,500 stocks, and less volatile stocks compared to other institutions. When we aggregate the six characteristics into the ψ index to reduce noise, we find a large and highly significant difference between trusts and non-trusts. This is consistent with Prediction 1 of the model in Section 4. When we take a value-weighted average across institutions, the differences become a bit smaller in magnitude, but, on the other hand, statistically more significant, without the central message changing.

Because UPIA represents a law change on the state-level, our next analysis focuses on state-level portfolios. We define the weight of a given stock i at time t in the state-level portfolio of its headquarter state as:

$$w_{ist}^{T} \equiv \frac{I_{ist}^{T}}{\sum_i I_{ist}^{T}} \tag{14}$$

where I_{ist} stands for the dollar amount of investment by trusts in state s at time t in stock i and superscript T stands for "Trusts". The corresponding weight for all other institutions ("non-trusts") is

$$w_{ist}^{NT} \equiv \frac{I_{ist}^{NT}}{\sum_i I_{ist}^{NT}}. \tag{15}$$

Table 5, Panel A presents state-level portfolio weights, computed a year before the state introduced a UPIA statute, separately for four quartiles of our prudence index ψ. We thus ask, what fraction of the state-level portfolio is invested in the respective prudence quartiles. Table 5, Panel A shows a clear pattern: compared with all other institutions trusts hold a greater fraction of their assets (79.6% vs. 67.7%) in the most prudent group ($\psi \leq -3$) and less in all other prudence categories. The third column shows that the differences are significant, both economically and statistically, in particular for the most prudent stocks ($\psi \leq -3$) and, to a lesser extent, the next set of prudent stocks ($-2 \leq \psi \leq 0$). There is also a difference for the other two quartiles ($\psi \geq 1$), but in terms of the dollar value of assets, these quartiles are small. Figure 1 presents the same evidence for all groups of ψ. All patterns are consistent with the existence of a regulatory tilt among trusts towards stocks that courts would be likely to view as prudent, in line with our model.

Table 6 presents results for the six constituent measures of ψ. We first sort all stocks into terciles for each measure that was employed in constructing ψ and call the outer terciles prudent and imprudent, respectively (we naturally use only two groups for S&P index membership). We then compute, separately for each stock-state-date, the difference between the state-level portfolio weights $\Delta w_{ist} \equiv w_{ist}^{T} - w_{ist}^{NT}$ and average across all stock-state-dates in the respective category. The resulting quantity thus captures the average overweighting of stocks by trusts relative to non-trusts in the same state and date conditional on those stocks being relatively prudent or imprudent.

Table 6, Panel A shows that, for each individual measure, trusts tilt towards the prudent characteristic. For example for CAPM betas, trusts invest 8.4 percentage points more of their portfolio assets into low beta stocks that other institutions in the same state and date, but 8.3 percentage points less in stocks with high betas.

In sum, all results in this section are consistent with Prediction 1 of the model in Section 4: prudent man laws induced regulatory tilts, i.e. trust law before UPIA represented a binding portfolio constraint for trust investments that led trusts to invest substantially more than other institutions in prudent stocks, and less in other stocks.

6.2 Trusts' Portfolio Choices around the Introduction of the UPIA

6.2.1 Institutional Portfolio-Level Evidence

The UPIA reorients the standard of prudence from an asset-by-asset perspective to a portfolio perspective, and it also requires fund managers to diversify their portfolios. If the old prudent man laws represented a binding constraint on the ability of trust fund managers to invest in imprudent stocks, the law change relaxes that constraint and make it easier for trust fund managers to make investments that would have been considered imprudent under the old law. According to Prediction 3 of the model in Section 4, we expect trusts to reduce their holdings of prudent stocks and increase their holdings of other stocks after the law change.

Table 5, Panel B presents results consistent with this hypothesis. The table is computed for all trusts and non-trusts in a given state-date four years after the enactment of the UPIA; otherwise it is completely analogous to Table 5, Panel A. The patterns are consistent with an impact of the UPIA: the pronounced differences in holdings between trusts and non-trusts observed in Panel A have largely vanished in Panel B. Among the most prudent stocks ($\psi \leq -3$), the difference of 11.9% ($t = 3.1$) has reduced to 3.0% ($t = 1.1$). Conversely, among the next set of stocks ($-2 \leq \psi \leq 0$), the difference of 8.2% ($t = 2.3$) before UPIA has reduced to just 0.5% ($t = 0.3$) after UPIA. The differences for the remaining two groups have also reduced, but most of the action is in the first two portfolios. Overall, Table 5 shows that portfolios of trusts and non-trusts become much more similar after the enactement of UPIA.

Table 6, Panel B presents a similar analysis for the components of ψ, again computed four years after the UPIA was enacted. As before, we observe a substantial reduction in the differences in portfolios by trusts and non-trusts compared with the results in Panel A. This is true for every measure we look at. Across both Panels in Table 6, the alignment of the individual measures is reassuring and lends support to ψ as a reaonable summary measure of prudence for a given stock.

We present regression results next. Because states encoded the UPIA into state law in a staggered fashion, and because UPIA only applies to trusts, we estimate:

$$\textit{Portfolio Share}_{j,s,q} = \alpha_j + \alpha_{s,q} + \beta_1 \textit{Trust}_{j,s,q} + \beta_2 \textit{UPIA}_{s,q} \times \textit{Trust}_{j,s,q} + \epsilon_{j,q}, \tag{16}$$

where $\textit{Portfolio Share}_{j,s,q}$ is the portfolio weight of a given group of stocks, in the portfolio of institutional investor j, in state s, in quarter q. We run this regression separately for the four quartiles of ψ we used previously. The above specification allows us to eliminate a substantial amount of potentially confounding variation. α_j are institutional investor fixed effects, which control for stable differences in portfolio choices between trusts and all other institutions, arising, for example, from unobserved managerial traits or client preferences. Since trust assignment can change for a given institution in our data, the $\textit{Trust}_{j,s,q}$ variable is not subsumed by the fixed effect. $\alpha_{s,q}$ are state $\times$ date fixed effects, which allow us to compare trusts to non-trusts within the same state at the same point in time. Any variation on the state-date level, such as, for example, local economic conditions or the local political environment therefore does not affect our estimates as long as those factors affect both trusts and non-trusts in the same way. $\textit{UPIA}_{s,q}$ is an indicator variable that takes value 1 if state s has already adopted the prudent-investor rule in quarter q. The coefficient of interest in our analysis is β_2, which captures the causal impact of the regulation on trust demand for prudent and imprudent stocks when UPIA is introduced in a state. For each state that passes the new law, we include 40 pre-event quarters and 40 post-event quarters in the analysis. We cluster standard errors at the institution and date (year-quarter) level.

As Baker, Larcker, and Wang (2022) emphasize, heterogeneous treatment effects can introduce bias in standard difference-in-differences estimators. In our study, this concern arises because trusts in states that have already passed a UPIA law are used as comparison units for trusts in states adopting the law later. Since outcomes from earlier-treated trusts might reflect treatment effects, they could pose a "bad comparison" problem, potentially biasing staggered DiD treatment effect estimates, even with random treatment assignment. To address this, we also employ the Sun and Abraham (2021) estimator, designed for settings with heterogeneous treatment effects. This approach uses only never-treated or last-treated trusts as comparison units and calculates the overall treatment effect from a series of cohort-time-specific treatment effects. In our setting, for each cohort an institution can either be a treated unit (trust funds in states enacting UPIA) or a comparison unit (all other institutions).

Consistent with Prediction 3, results in Table 7, Panel A, show that upon the adoption of UPIA, trusts reduce their holdings of low ψ ("prudent") stocks by 3.7 percentage points compared with other institutions headquartered in the same state. At the same time, trusts increase the fraction of their portfolio invested in the stocks we label "less prudent" stocks, which are stocks with values of ψ between -3 and 0, by 3.2 percentage points. This indicates that roughly 89% (= 3.2/3.6) of the trust money disinvested from prudent stocks is reinvested into this category of "less prudent" stocks. By contrast, trusts seem to reinvest much less in the two categories identifying more imprudent stocks ($\psi > 0$): trusts change their holdings of "less imprudent" and "imprudent" stocks by amounts that are economically and statistically small. Overall, then, trusts rebalance away from the most prudent stocks towards stocks that are more speculative, in relative terms, but, in absolute terms, still reasonably prudent.

Because there are institutions that switch in the classification from trust to non-trust and vice versa, the coefficient on the trust indicator is also identified. Consistent with the idea of regulatory tilts, Table 7 shows that institutions increase their holdings of the most prudent stocks, while reducing their holdings of other stocks, once they become classified as trusts.

Panel B presents results for the Sun and Abraham (2021) estimator, which, if anything get stronger both statistically and economically in line with the findings from Panel A. This indicates that biases from heterogeneous treatment effects are not a large concern in our setting.

Figure 2 presents a dynamic version of this analysis. We estimate:

$$Portfolio\ Share_{j,s,t} = \alpha_j + \alpha_{s,t} + \sum_{t=-15}^{15} \beta_t \mathbb{1}(time = t) \times Trust_{j,s,t} + \epsilon_{j,t} \tag{17}$$

where $\mathbb{1}(time = t)$ are indicator variables that take value 1 if state s has adopted the prudent-investor rule in each semester t in event time, from $t = -15$ to $t = 15$ (we use semesters, rather than quarters, to reduce noise in our estimates). Event time is defined relative to the adoption of a UPIA statute as described in Table 1. For ease of interpretation, we impose a common starting point equal to 0 at $t = -15$.

Consistent with results from Table 7, we find a clear pattern: as shown in the left panel, upon the passing of a UPIA statute, trusts rebalance their portfolio away from the most prudent stocks ($\psi \leq -3$) and towards stocks that are less prudent in relative terms ($-2 \leq \psi \leq 0$). The right panel shows that we do not observe a comparable pattern for the remaining two groups of "less imprudent" and "imprudent" stocks. Pre-trends are not visible in either panel. The analogous graph based on the Sun and Abraham (2021) estimator looks very similar, so we omit it for brevity.

6.2.2 Stock-Level Evidence

Next, we provide stock-level evidence. Specifically, we estimate:

$$\Delta w_{i,s,q} = \alpha_i + \alpha_{s,q} + \beta_{1,p}\mathbb{1}[p = \psi\text{-}Portfolio_{i,q}] \times UPIA_{s,q} + \gamma X_{i,q} + \epsilon_{i,q}, \tag{18}$$

where $\Delta w_{i,s,q}$ is defined for each stock i, in state s at time q as the total dollar investment for that stock and date across all trusts in that state divided by the total dollar amount invested across all stocks by trusts in that state, minus the analogous weight for that stock in the state-level portfolio of all other institutional investors. We define four ψ-portfolio indicator variables based on the ψ variable: $\psi \leq$ -3 for prudent stocks; -2 $\leq \psi \leq$ 0 for less prudent stocks; 1 $\leq \psi \leq$ 3 for less imprudent stocks; $\psi > 3$ for imprudent stocks. $UPIA_{s,q}$ is again an indicator variable that takes the value 1 if state s has adopted the prudent-investor rule in or after event quarter q, using 40 quarters before and after the introduction of an UPIA statute in the state. In all specifications, we control for a set of firm level variables $X_{i,q}$ which includes firm size, the book-to-market ratio, the previous 12-month return, the stock return over the previous month, and stock turnover (all defined in the Appendix). We also include state $\times$ date fixed effects ($\alpha_{s,q}$), which absorb any time-varying heterogeneity at the state-level (e.g., other changes in regulation, local economic activity) as well as firm $\times$ ψ-$Portfolio_{i,q}$ fixed effects (α_i). We cluster standard errors at both the firm and date (year-quarter) level.

Table 8 presents our results. Consistent with Prediction 3 and the results in Table 7, column 1 shows that the estimated coefficient β_1 on Prudent Stocks is negative. This indicates that Δw, the difference in holdings of prudent stocks between trusts and non-trusts, decreases after the adoption of UPIA legislation. Moreover, the positive coefficient on Less Prudent Stocks in column 2 indicates a shift: while the difference in holdings of less prudent stocks is negative before the adoption of UPIA laws, the positive coefficient in column 2 suggests that the holdings gap of less prudent stocks becomes smaller. Additionally, we note a positive coefficient for less imprudent stocks in column 3, implying a reduction in the holdings gap of less imprudent stocks. The coefficients in columns 1 and 2 exhibit similar magnitudes and are larger than the coefficient in column 3. This supports our previously documented finding that the portfolio rebalancing of trusts seems to be concentrated in the two categories of "prudent" and "less prudent" stocks.

In order to compare the changes in Δw with the difference in holdings before the enactment of the UPIA statue, we conduct the same regression as in equation (18), but include firm fixed effects instead of firm $\times$ ψ-$Portfolio_{i,q}$ fixed effects. While the former specification is more rigorous and eliminates more potentially confounding variation, using the latter specification with only stock fixed effects allows us to estimate Δw prior to the introduction of UPIA. Figure 3 plots Δw for the four different stock portfolios before the UPIA adoption in blue and Δw after the UPIA adoption in red. The figure shows that prior to the UPIA, the holdings gap between trusts and non-trusts is positive for prudent stocks, while the holdings gap is negative for less prudent and less imprudent stocks. Consistent with Prediction 3 and the results in Tables 7 and 8, the holdings gap decreases after the adoption of UPIA laws. The dark grey line represents the average holdings gap after the UPIA. It becomes much flatter, indicating once more that after the UPIA, portfolios of trusts and non-trusts become much more similar.

Overall, results in this and the previous section indicate that the introduction of UPIA statutes leads to significant changes in trusts' portfolio composition, consistent with the predictions of our theoretical framework. The direction and magnitude of these changes is consistent with prudent man laws being a driver of inelasticity in the U.S. equity markets.

7 Stock Returns around the Introduction of the UPIA

Results in the previous section indicate that after the adoption of UPIA statutes in US states, a significant fraction of money managed by trusts moves away from prudent stocks and into less prudent stocks. If equity markets are perfectly elastic, this changes in demand should not be associated with any observable movement in asset prices. Conversely, under the *inelastic markets hypothesis*, the prices of prudent stocks should decrease upon the adoption of UPIA, while the prices of less prudent stocks should increase (Prediction 2 from our theoretical framework).

7.1 Portfolio-Level Analysis

In Table 9, we start by implementing a portfolio-level analysis. At the end of each month t in which a state adopts an UPIA statute, we sort stocks into portfolios based on their values of $\Delta w/MV$. This variable represents the empirical counterpart to the residual demand by trusts described in equation (11). The variable is measured one quarter before the adoption of a UPIA law and is defined as:

$$\Delta w/MV_{i,(t-3)} = \frac{\sum_s AUM_{s,(t-3),trust} \times (Weight_{i,s,(t-3),trust} - Weight_{i,s,(t-3),others})}{MV_{i,(t-3)}} \qquad (19)$$

a positive value of $\Delta w/MV$ indicates that trusts were over-weighting stock i prior to a regulation change, and thus there will be a negative change in residual demand after an UPIA introduction. The opposite is true for cases in which $\Delta w/MV$ is negative, trusts were under-weighting stock i prior to a regulation change and residual demand will increase after an UPIA introduction. We follow Pavlova and Sikorskaya (2023) and divide by market capitalization to capture the realistic feature that the same change in demand should have a larger price impact for stocks with smaller market capitalization (a feature which our CARA normal model does not capture). We thus measure the total inelastic demand the stock attracts, as a fraction of the stock's market capitalization.

In the first three columns of Table 9, we categorize stocks based on their $\Delta w/MV$ values, distinguishing between positive and negative values. Specifically, the first column includes stocks displaying a negative $\Delta w/MV$, while the second column comprises those with a positive $\Delta w/MV$. The third column then presents the results of a spread strategy that is long the portfolio of positive $\Delta w/MV$ and short the one with negative $\Delta w/MV$. In the subsequent five columns of Table 9, we divide firms into quintiles based on their $\Delta w/MV$ values. The final column shows results of a spread strategy that involves taking long positions in stocks in the top quintile (Q5) and short positions in those in the bottom quintile (Q1). Stocks within these portfolios are value-weighted, and the portfolios are held for 12 months following their formation date. To evaluate the performance of these portfolios, we calculate the portfolios' alpha within a Fama and French (2015) five-factor model. This model includes market (MKT), size (SMB), value (HML), profitability (RMW), and investment (CMA) factors. We use Newey-West standard errors with a lag length of 12.

In our theoretical framework, the regulatory tilt of trust portfolios relative to non-trust portfolios stems from the prudence characteristics of stocks, indicated by their ψ value. However, in practice, trust holdings may diverge from those of other managers for reasons not directly related to trust law. These deviations, not being linked to trust law, are unlikely to be rebalanced in response to the enactment of a UPIA law in a state, as the underlying reasons for these differences are not expected to systematically change with changes in the legal environment. Conversely, as demonstrated in Section 6.2, trust funds significantly adjust their regulatory tilt around the introduction of UPIA statutes. Therefore, deviations in portfolio weights between trusts and non-trusts that are unrelated to trust law provide a powerful way to reinforce our interpretation of the results.

We divide our sample into two sets of stocks. The first set are stocks with either a positive

$\Delta w/MV$ and a ψ value at or below -3, or a negative $\Delta w/MV$ and a ψ value above -3, where ψ is measured as of the quarter preceding the regulatory change. We call this the "consistent" sample (withour theory). The second set comprises stocks with a positive $\Delta w/MV$ and a ψ value above -3, or a negative $\Delta w/MV$ and a ψ value at or below -3. We call this the "inconsistent" sample (with our theory). Intuitively, we seek to verify that price impact is observed for those stocks for which regulatory constraints induce inelasticity, but not for those stocks for which trust law should not represent a binding constraint. Specifically, if we observe that trusts underweight a particular stock even if it is very prudent, and vice versa, then that behavior cannot be induced by trust law, because trust law would push trusts to the exact opposite behavior. We present results in the following for both groups of stocks and show that prices move in line with our theory for precisely those stocks that should be affected by trust laws.

Panel A of Table 9 presents results for the sample of stocks where trust behavior is congruent with a regulatory tilt (the "consistent" sample). According to the coefficients in the first three columns of the panel, stocks that are under-weighted by trusts before an UPIA adoption (negative $\Delta w/MV$) outperform in risk-adjusted terms stocks that are over-weighted by trusts (positive $\Delta w/MV$). The results are not only statistically significant but also economically meaningful. The value-weighted zero-investment portfolio that goes long stocks with positive $\Delta w/MV$ and short stocks with negative negative $\Delta w/MV$ earns a monthly alpha of -0.548%. Over the course of a year, this represents a risk-adjusted return of -6.6%. Estimates from portfolios formed on quintiles of $\Delta w/MV$ yield similar conclusions, but even larger magnitudes. The annual risk-adjusted returns of the spread strategy that is long stocks in the top quintile (Q5) and short stocks in the bottom quintile (Q5) is -7.1% (-0.592% $\times$12).

Panel B examines the subset of "inconsistent" stocks where trust overweighting is not aligned with a regulatory tilt induced by trust law. In contrast to Panel A, we do not observe a significant difference in the risk-adjusted performance of stocks across different $\Delta w/MV$ values for this subsample. Moreover, the point estimates for the alphas of the spread strategies in this panel are either considerably smaller than those in Panel A or exhibit the opposite sign. These findings are important, as they support our interpretation that the observed price changes for the "consistent" sample are driven by the regulatory shifts. They are also informative about potential alternative explanations for the return patterns we observe based on, for example, concurrent shifts in the underlying fundamentals of the stocks or concurrent changes in available information. If those alternative explanations were driving our results, we would expect to see similar results between Panel A and Panel B. We do not. We observe return patterns in line with inelastic markets induced by financial regulation precisely for those stocks for which we expect to see them, but not for other stocks.

To further support the notion that it is institutional demand changes, rather than unobserved changes in fundamentals, driving asset price changes, we conduct a falsification test. The rationale behind this test is straightforward: if the primary drivers of returns were changes in fundamentals (or information), then the precise timing of regulatory changes would matter less. This is because changes in fundamentals should not systematically coincide with the implementation of UPIA statutes. To operationalize this idea, we follow the non-parametric permutation procedure as outlined in Chetty, Looney, and Kroft (2009). In each iteration of this procedure, we randomly reassign to each firm a different year-month for the introduction of the UPIA statute in a state, using the entire sample period from 1983 to 2010. This reassignment is done with replacement. We then repeat our portfolio-level analysis from Table 9 using this falsified data set.

Figure 4 reports the empirical cumulative distribution function (cdf) generated from running each of the regression models in 1,000 random iterations of this procedure and capturing the placebo coefficient estimate. The vertical dotted line indicates the position of the actual coefficient estimate for the alpha of a portfolio and the implied p-value when placed in the context of the cdf. We report results for both spread strategies: the one that is long on portfolios with positive $\Delta w/MV$ and short on those with negative $\Delta w/MV$, and the one based on the top and bottom quintiles of $\Delta w/MV$. In both cases, the p-value is below 1%, suggesting that the timing of the regulatory changes is crucial in determining the documented effect on asset prices.

To sum up, results in this section support the *inelastic markets hypothesis*. Changes in financial intermediaries' demand due to changes in regulation can distort asset prices.

7.2 Stock-Level Analysis and Demand-Elasticity Estimates

In this section we test whether the different stock market performance of firms with different values of $\Delta w/MV$ is robust to a stock-level multivariate regression setting, where we can explicitly control for other determinants of stock returns. We run OLS regressions of stock performance over 12 monthly return observations for each stock-event combination on $\Delta w/MV$ and firm-level control variables as follows:

$$Ret_{i,t} = \alpha_t + \beta \Delta w/MV_{i,(t-3)} + \gamma X_{i,(t-1)} + \epsilon_{i,t} \tag{20}$$

where the dependent variable $Ret_{i,t}$ represents stock i's performance in month t. The main independent variable, $\Delta w/MV$, is the change in residual demand and is defined as in equation (19). The vector $X_{i,(t-1)}$ includes characteristics for firm i in month $t-1$. These firm-level variables include market-cap, book-to-market, previous 12-month return, lag 1-month return, and turnover. We cluster standard errors at the stock and time (year-month) level.

Results are reported in Table 10. As in the previous section, we separate the analysis between stocks where we predict trust law should matter (reported in Panel A) and stocks where our theory does not make predictions (reported in Panel B). Panel A indicates that stocks which were over-weighted by trusts prior to the regulatory change due to their prudence characteristics, exhibit on average lower returns compared to stocks that were under-weighted by trusts. The economic magnitudes are similar to those observed in the portfolio-level analysis of Table 9. Specifically, a one-standard deviation increase in $\Delta w/MV$ (3.05%) is associated with monthly returns ranging from -0.276% to -0.372%. This translates to an annual underperformance of approximately -3.3% to -4.5%. Notably, Panel B does not reveal any significant results. This supports the notion that stocks over- or under-weighted by trusts for reasons not connected to trust law do not experience significant price changes following the enactment of UPIA laws.

We also implement the non-parametric permutation procedure as outlined by Chetty, Looney, and Kroft (2009) on the results presented in Table 10. We randomly reassign, with replacement, the year-month of the UPIA statute introduction for each firm. Subsequently, we re-estimate the regressions for all four columns of Table 10 using this modified data. This procedure is replicated 1,000 times. The results, illustrated in the panels of Figure 5, consistently show p-values below 5%, with half of them displaying p-values below 1%. This suggests that we can reject, with at least 95% confidence, that we would obtain the same impact on asset prices at other points in time, reaffirming the specific influence of the UPIA statute introductions.

Having established that shifts in trusts' demand due to regulatory changes can significantly affect asset prices, we next estimate the price-elasticity of this demand. Equation (20), serving as the empirical counterpart to equation (12) from our theoretical framework, enables us to derive the price-elasticity of demand in response to the inelastic trust demand shift due to UPIA. This UPIA-based elasticity estimate can be derived from Table 10, Panel A. Column (1) indicates that $Ret_{i,t}/\Delta RD = 0.108$,[14] thus the corresponding price elasticity of demand is $-1/0.108 = -9.3$. The estimates ranges from -8.2 to -11.1 in the other columns of the table.

As discussed in Section 4, this elasticity estimate is an upper bound that depends on how much of the regulatory distortion is eliminated by the new law. If the UPIA eliminated the incentive to tilt towards prudent stocks completely, then our estimate would equal the true elasticity. While it seems plausible to think that UPIA still pushes trusts towards investing in a prudent manner, the fact that diversification and a portfolio perspective is emphasized suggests that trustees may have find it easier to align their portfolios with the market portfolio, which would imply that regulatory tilts should be substantially reduced. Our empirical results from the holdings section are in line with this, as we find throughout that holdings differences are greatly reduced, sometimes getting close to zero. Therefore, we believe our results are most consistent with believing that the average price elasticity of U.S. stocks is at most 11, and probably a bit lower than that. Our estimate from a state-level regulatory change – which to our knowledge is among the first such estimates for the entire cross-section of U.S. stocks in the literature

[14] The change in residual demand ΔRD has the opposite sign relative to $\Delta w/MV$.

– complements the estimates from other approaches described in Gabaix and Koijen (2021) and yields comparable results. Even though our estimates are a little larger than most others presented by Gabaix and Koijen (2021), they are very far from the null of an elastic market. Our results thus support the inelastic markets hypothesis.

8 Additional Analyses

The adoption of the UPIA and the consequent rebalancing of trust portfolios could potentially influence other firm-level variables. If these variables are relevant to stock returns, their changes due to UPIA could provide an alternative explanation for the results observed in the previous section. In other words, the price shifts in prudent and imprudent stocks might not be solely due to the direct effects of trust portfolio choices, but *indirectly* because of changes in other firm-level factors. If this were true, even our falsification tests might not fully isolate the direct impact of trusts' demand changes, as these other variables would be changing at the same time as the regulatory shocks. To explore this possibility, we repeat the estimation of equation (20) but with different dependent variables, including institutional ownership, liquidity, analyst forecast, and profitability. While examining the impact of UPIA adoption on every known return predictor would be impractical, we have chosen these four variables as they are plausibly affected by the behavior of trusts around the regulatory changes. We look at institutional ownership as it could change as a direct result of UPIA adoption, particularly if the counterparties to trusts' trades are retail investors, thereby altering the overall fraction of a firm shares in the hand of institutional investors. Likewise, changes in stock liquidity could directly stem from the trading activities of trusts. Additionally, we consider analyst forecast and profitability, to take into account the possibility that other relevant firm fundamentals might change around the staggered introduction of UPIA regulations.

Results are presented in Table 11. For each of the four variables we show results of specifications (3) and (4) of Table 10, Panel A. We do not find any evidence that any of the four variables is significantly affected by the passage of UPIA laws. The absence of any measurable impact of the regulatory changes is hard to reconcile with a role of the four variables in explaining our results in the previous section.

9 Conclusion

This paper studies whether regulation of financial intermediaries distorts asset prices. We propose that regulation acts as a coordination device for multiple otherwise independent institutional asset managers. We conjecture that, by shaping many institutions' excess demand for certain stock characteristics, regulation can distort the relative pricing of the investments it promotes or admonishes. To test this theory, we exploit the staggered adoption of a new fiduciary duty standard, enacted in the US between 1986 and 2007. The introduction of the Uniform Prudent Investor Act removes trust funds' obsolete legal incentives of avoiding stocks that were deemed imprudent based on their individual characteristics.Our analysis proceeds in two steps. First, we study the impact of the enactment of UPIA statutes on the portfolio holdings of bank trusts. We provide causal evidence that the UPIA reform, which mandates that courts should judge on a bank trust manager's adherence to fiduciary duty by assessing the adequacy of the portfolio as a whole, leads to significant changes in the bank trusts' portfolio choices. Trusts reduce their holdings of stocks that were deemed prudent in isolation under the old prudent-man rule, and to which they were overallocated. At the same time, trusts increase their holding of stocks that were deemed imprudent under the old prudent-man rule, and to which they were underallocated.

Second, we analyze the implications of trust funds' portfolio rebalancing in the aftermath of the UPIA adoption on the pricing and returns of prudent and imprudent stocks. In particular, we conjecture that a relative overpricing of prudent over imprudent stocks existed under the prudent-man standard, and that the introduction of UPIA should lead to the correction of such mispricing. This mechanism accords well with the model of capital markets of Merton (1987). In support to our hypothesis, we observe that in the twelve months after the removal of the prudent-man rule, prudent stocks have lower returns and imprudent stocks have higher returns. In addition, we do not find any statistically significant evidence of a reversal in the second or third year after the UPIA adoption, which is consistent with the correction of a pre-existing mispricing rather than with a story of price pressure. We conclude that regulation of financial intermediaries does affect asset prices.

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Table 1: Uniform Prudent Investor Act by Year

This table lists the states that have adopted the Uniform Prudent Investor Act, or similar legislation, together with the date of adoption based on the FDIC regulation.

State	UPIA Statute Enactment	State	UPIA Statute Enactment
Alabama	16/05/1989	Nebraska	13/09/1997
Alaska	23/05/1998	Nevada	17/04/1989
Arizona	20/07/1996	New Hampshire	01/10/2004
Arkansas	01/08/1997	New Jersey	05/06/1997
California	01/01/1996	New Mexico	01/07/1995
Colorado	01/07/1995	New York	01/01/1995
Connecticut	13/06/1997	North Carolina	01/01/2000
District of Columbia	10/03/2004	North Dakota	01/08/1997
Delaware	03/07/1986	Ohio	22/03/1999
Florida	01/10/1993	Oklahoma	01/11/1995
Georgia	01/03/1988	Oregon	09/09/1995
Hawaii	14/04/1997	Pennsylvania	25/06/1999
Idaho	01/07/1997	Rhode Island	06/08/1996
Illinois	01/01/1992	South Carolina	05/06/1990
Indiana	01/07/1999	South Dakota	01/07/1995
Iowa	01/07/2000	Tennessee	01/07/2002
Kansas	01/07/1993	Texas	01/01/2004
Kentucky	15/07/1996	Utah	01/07/2004
Maine	01/01/1997	Vermont	01/07/1998
Maryland	01/07/1996	Virgin Islands	12/08/2004
Massachusetts	04/12/1998	Virginia	01/07/1992
Michigan	01/04/2000	Washington	01/01/1985
Minnesota	01/01/1997	West Virginia	01/07/1996
Mississippi	01/07/2006	Wisconsin	30/04/2004
Missouri	25/06/1996	Wyoming	01/07/1999
Montana	30/09/1989		

Table 2: U.S. Equity Holdings by Trusts and Other Institutional Investors

This table shows summary statistics for equity holdings of institutional investors in the Thomson Reuters 13F database, using the Rick Sias institutional investor classification scheme. We only include institutional investors for which we are able to obtain the headquarters location from the SEC Analytic Suite database and/or the Federal Deposit Insurance Corporation (FDIC). The statistics are calculated using end-of-year holdings. We use 2010 as our baseline and adjust all other dollar values for inflation. *%all Institutions* is the fraction of the total dollar value of the portfolio reported by 13F institutions that is accounted for by trusts and all other institutions, respectively. *%Prudent Stocks* is the average percentage of shares outstanding of prudent stocks ($\psi \leq$ -3) held by trusts and all other institutions, respectively.

	Trusts				All Other Institutions			
Year	N	Value Holdings (in $B)	% all Institutions (in %)	% Prudent Stocks (in %)	N	Value Holdings (in $B)	% all Institutions (in %)	% Prudent Stocks (in %)
1980	104	228.77	24.44	5.25	270	707.41	75.56	13.88
1981	107	206.02	25.09	5.73	284	615.03	74.91	14.61
1982	113	245.64	25.55	6.13	320	715.89	74.45	15.53
1983	124	326.82	25.28	6.34	368	966.18	74.72	17.98
1984	123	300.92	24.79	6.18	408	912.96	75.21	18.08
1985	128	435.16	27.04	7.14	458	1,174.24	72.96	19.68
1986	132	462.93	24.27	7.02	520	1,444.15	75.73	23.12
1987	138	481.78	25.45	7.86	571	1,411.05	74.55	23.63
1988	138	491.88	25.52	8.08	599	1,435.87	74.48	22.12
1989	135	592.37	24.85	8.60	648	1,791.19	75.15	23.26
1990	137	530.12	25.11	8.86	696	1,580.72	74.89	24.45
1991	143	740.59	25.84	9.58	749	2,125.48	74.16	24.91
1992	147	818.69	25.68	9.89	813	2,369.23	74.32	27.07
1993	148	989.86	25.50	9.34	871	2,892.46	74.50	25.52
1994	153	863.82	23.94	9.72	917	2,744.23	76.06	25.90
1995	167	1,107.61	22.63	9.16	1,019	3,787.51	77.37	28.74
1996	161	1,424.88	21.59	8.01	1,118	5,173.68	78.41	28.68
1997	169	1,539.91	18.31	8.49	1,284	6,871.18	81.69	33.01
1998	180	1,984.33	19.28	7.95	1,434	8,308.60	80.72	34.96
1999	181	2,068.29	16.99	7.15	1,594	10,102.46	83.01	33.10
2000	176	1,983.52	17.49	6.49	1,758	9,358.57	82.51	31.50
2001	173	2,032.89	18.96	6.16	1,754	8,690.45	81.04	33.78
2002	159	1,408.41	17.65	7.25	1,828	6,570.10	82.35	35.14
2003	147	1,807.23	15.87	7.65	1,927	9,582.16	84.13	34.56
2004	152	2,231.09	17.24	7.14	2,105	10,707.57	82.76	42.96
2005	143	1,828.10	13.98	7.47	2,298	11,250.16	86.02	42.07
2006	135	2,124.72	14.19	7.84	2,555	12,846.35	85.81	46.42
2007	134	2,154.63	12.33	7.57	2,808	15,317.83	87.67	49.46
2008	131	1,524.23	16.83	6.97	2,890	7,532.55	83.17	52.03
2009	136	1,547.41	11.84	8.07	2,824	11,522.89	88.16	53.09
2010	140	1,786.38	14.31	7.91	2,862	10,701.06	85.69	51.08
2011	140	1,653.97	14.16	7.29	3,006	10,027.48	85.84	52.97
2012	146	1,811.11	13.78	7.98	3,172	11,336.16	86.22	49.44

Table 3: Summary Statistics

This table presents summary statistics for the main firm variables used in the paper. The summary statistics are calculated based on the full sample from 1983 to 2010. A detailed description of all the variables is reported in the Appendix. Panel A presents summary statistics on stock characteristics. Panel B presents summary statistics on portfolio shares. Portfolio share is the fraction of the portfolio invested by institutional investors in one of the four portfolios based on the ψ variable. Prudent stocks are defined as $\psi \leq$ -3, less prudent stocks as -2 $\leq \psi \leq 0$, less imprudent stocks as $1 \leq \psi \leq 3$, and imprudent stocks are defined as $\psi > 3$. ψ is a composite measure of the six prudence variables, defined in the main text (equation 13).

Variable	Obs.	Mean	Median	SD
Panel A: Stock Characteristics				
ψ	241,077	-0.22	0.00	2.98
Market Capitalization ($B)	241,077	2.84	0.31	8.76
Book-to-market	241,077	0.66	0.54	0.50
Previous 12-month Return	241,077	0.18	0.09	0.59
CAPM Beta	241,077	1.10	1.00	0.77
Firm Age (Years)	241,077	15.86	10.08	16.02
Dividend Yield	241,077	0.01	0.00	0.02
Profitability	241,077	0.01	0.05	0.17
Return Volatility	241,077	0.13	0.11	0.08
S&P Index	241,077	0.63	1.00	0.48
Panel B: Portfolio Shares				
Prudent Stocks ($\psi \leq$ -3)	77,277	0.61	0.68	0.26
Less Prudent Stocks (-2 $\leq \psi \leq 0$)	77,277	0.25	0.23	0.15
Less Imprudent Stocks ($1 \leq \psi \leq 3$)	77,277	0.11	0.05	0.15
Imprudent Stocks ($\psi > 3$)	77,277	0.03	0.00	0.09

Table 4: Average Prudence Characteristics before UPIA: Trust and Other Institutions

This table presents the averages for seven measures of prudence for trusts and non-trusts and the difference between trusts and non-trusts one year before the enactment of the UPIA statute. ψ is a composite measure of the six prudence variables, defined in the main text (equation 13). A detailed description of the other six measures of prudence is reported in the Appendix. Sample averages are calculated as the value-weighted average of each institution and equal-weighted or value-weighted averages at the US level. We include states with at least two trusts per state. t-statistic are shown in parentheses.

	Equal-Weighted Average			Value-Weighted Average		
	Trust	All Other Institutions	Difference	Trust	All Other Institutions	Difference
ψ	-3.56	-2.50	-1.05	-3.32	-2.92	-0.40
			(7.45)			(13.17)
CAPM β	0.94	1.09	-0.16	1.02	1.07	-0.05
			(5.88)			(7.70)
Dividend Yield	2.4%	1.9%	0.5%	2.2%	1.8%	0.3%
			(3.38)			(6.86)
Firm Age	39.0	31.0	8.0	38.0	34.0	4.0
			(7.58)			(14.71)
Profitability	5.5%	3.1%	2.4%	5.3%	4.8%	0.5%
			(1.36)			(6.55)
S&P Index	86.4%	79.7%	6.7%	92.3%	91.4%	0.9%
			(2.97)			(2.32)
Volatility	7.2%	8.7%	-1.5%	7.8%	8.3%	-0.5%
			(5.09)			(7.10)

Table 5: ψ Quartile Holdings Differences Between Trusts and Other Institutions Around the Law Change

This table presents the average weight by ψ quartile computed in Panel A one year before the enactment of the UPIA statute and in Panel B four years after the enactment of the UPIA statute. The weight by ψ quartile is calculated as the portfolio holdings of trusts (all other institutions) for prudent, less prudent, less imprudent and imprudent stocks in each state and then aggregated at US level. Prudent stocks are defined as $\psi \leq$ -3, less prudent stocks as -2 $\leq \psi \leq$ 0, less imprudent stocks as 1 $\leq \psi \leq$ 3, and imprudent stocks are defined as $\psi >$ 3. ψ is a composite measure of the six prudence variables, defined in the main text (equation 13). Difference is calculated as the difference between trusts and all other institutions portfolio holdings for prudent, less prudent, less imprudent and imprudent stocks in each state and then aggregated at US level. We include states with at least two trusts per state. *t*-statistic are shown in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: One year before the enactment of the UPIA statute			
	Trusts	All Other Institutions	Difference
Prudent ($\psi \leq$ -3)	79.64%***	67.70%***	11.94%***
	(49.79)	(16.90)	(3.09)
Less Prudent (-2 $\leq \psi \leq$ 0)	17.17%***	25.35%***	−8.18%**
	(12.41)	(6.81)	(2.32)
Less Imprudent (1 $\leq \psi \leq$ 3)	2.74%***	5.83%***	−3.10%***
	(5.96)	(6.01)	(-3.43)
Imprudent ($\psi >$ 3)	0.45%***	1.11%***	−0.67%***
	(3.76)	(4.81)	(-3.12)
Panel B: Four years after the enactment of the UPIA statute			
	Trusts	All Other Institutions	Difference
Prudent ($\psi \leq$ -3)	75.20%***	72.24%***	2.96%
	(28.35)	(26.56)	(1.14)
Less Prudent (-2 $\leq \psi \leq$ 0)	20.00%***	20.47%***	−0.47%
	(10.64)	(11.93)	(-0.26)
Less Imprudent (1 $\leq \psi \leq$ 3)	3.59%***	6.12%***	−2.53%***
	(5.40)	(6.54)	(-3.40)
Imprudent ($\psi >$ 3)	1.20%*	1.16%***	0.04%
	(2.12)	(4.42)	(0.07)

Table 6: Six Prudence Variables Holdings Differences Between Trusts and Other Institutions Around the Law Change

This table presents the average Δw for prudent and imprudent stocks, identified using the six prudence variables. Δw for prudent and imprudent stocks is calculated as the difference between trusts and all other institutions portfolio holdings for prudent and imprudent stocks in each state and then aggregated at US level. For CAPM β, dividend yield, profitability and volatility, prudent and imprudent stocks are defined as the ones that belong to the extreme terciles of the distribution of a given stock characteristic. For firm age, prudent stocks are defined as age $>$ 15 years, while imprudent stocks are defined as age $<$ 5 years. For S&P Index, prudent stocks are defined as members of the S&P 1,500 Index, while imprudent stocks are non-members of the S&P 1,500 Index. Average portfolio holdings are computed one year before the enactment of the UPIA statute for each state. We include states with at least two trusts per state. *t*-statistic are shown in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: One year before the enactment of the UPIA statute

	CAPM β	Dividend Yield	Firm Age	Profitability	S&P Index	Volatility
Prudent	8.40%***	7.83%**	2.59%***	−0.03%	1.96%	10.27%**
	(2.72)	(2.57)	(3.35)	(−0.02)	(0.80)	(2.55)
Imprudent	−8.33%***	−7.55%***	−0.28%**	−6.72%*	−1.96%	−2.63%***
	(−3.37)	(−3.46)	(−2.08)	(−1.83)	(−0.80)	(−3.19)
Difference	16.72%***	15.38%***	2.87%***	6.69%	3.92%	12.90%***
(t-stat)	(4.23)	(4.10)	(3.66)	(1.57)	(1.13)	(3.14)

Panel B: Four years after the enactment of the UPIA statute

	CAPM β	Dividend Yield	Firm Age	Profitability	S&P Index	Volatility
Prudent	2.60%	4.81%*	1.11%	1.20%	−0.79%	0.86%
	(0.86)	(1.75)	(1.11)	(0.51)	(−0.47)	(2.55)
Imprudent	−4.24%	−4.68%*	−0.10%	−1.05%	−0.79%	−1.16%
	(−1.60)	(−1.90)	(−1.54)	(−0.83)	(−0.47)	(−1.08)
Difference	6.84%*	9.49%**	1.22%	2.25%	−1.57%	2.01%
(t-stat)	(1.70)	(2.58)	(1.21)	(0.84)	(−0.66)	(0.68)

Table 7: UPIA and Changes in Trusts' Portfolio Choice: Difference-in-Differences

This table presents results obtained estimating the following institution-level panel regression:

$$PortfolioShare_{j,s,q} = \alpha_j + \alpha_{s,q} + \beta_1 Trust_{j,s,q} + \beta_2 UPIA_{s,q} \times Trust_{j,s,q} + \epsilon_{j,q}$$

$PortfolioShare_{j,s,q}$ is the fraction of the portfolio invested by institutional investor j, headquartered in state s, in year-quarter q, in one of the four portfolios based on the variable ψ: $\psi \leq$ -3; -2 $\leq \psi \leq$ 0; 1 $\leq \psi \leq$ 3; $\psi > 3$. ψ is our primary prudence variable. α_j and α_{sq} are institutional investor and state $\times$ date fixed effects, respectively. $UPIA_{s,q}$ is an indicator variable that takes the value 1 if state s has adopted the prudent-investor rule in year-quarter q. The indicator variable $UPIA$ is constructed based on the dates indicated in Table 1. $Trust_{j,s,q}$ is an indicator variable for trusts. We include in the analysis up to 40 pre-event quarters, and 40 post-event quarters around the passage of each law. We include states with at least two trusts per state. In Panel A, we use the two-way fixed effects estimation and in Panel B, we use the Sun-Abraham (2021) estimation. t-statistic based on standard errors clustered at both the institutional manager and date level are shown in parentheses in Panel A and z-statistics are shown in parentheses in Panel B. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: Two-way fixed effects

	Prudent Stocks ($\psi \leq$ -3)	Less Prudent Stocks (-2 $\leq \psi \leq$ 0)	Less Imprudent Stocks (1 $\leq \psi \leq$ 3)	Imprudent Stocks ($\psi > 3$)
Trust	0.061**	−0.053**	−0.013**	0.005
	(2.49)	(−2.18)	(−2.04)	(1.63)
UPIA × Trust	−0.037***	0.032***	0.009**	−0.004
	(−4.33)	(5.02)	(2.07)	(−1.55)
Investor FE	Yes	Yes	Yes	Yes
State × Date FE	Yes	Yes	Yes	Yes
Observations	77,277	77,277	77,277	77,277
Adjusted R^2	0.79	0.48	0.61	0.56

Panel B: Sun-Abraham (2021)

	Prudent Stocks ($\psi \leq$ -3)	Less Prudent Stocks (-2 $\leq \psi \leq$ 0)	Less Imprudent Stocks (1 $\leq \psi \leq$ 3)	Imprudent Stocks ($\psi > 3$)
Trust	0.079***	−0.071***	−0.013**	0.005**
	(6.43)	(−6.67)	(−2.36)	(2.00)
UPIA × Trust	−0.039***	0.043***	0.009	−0.005
	(−4.25)	(3.72)	(1.11)	(−0.07)
Investor FE	Yes	Yes	Yes	Yes
State × Date FE	Yes	Yes	Yes	Yes
Observations	77,277	77,277	77,277	77,277

Table 8: UPIA and Changes in Trusts' Overallocation to Prudent Stocks

This table presents results obtained estimating the following firm-level regression in event time:

$$\Delta w_{i,s,q} = \alpha_{i,p} + \alpha_{s,q} + \beta_{1,p}\mathbb{1}[p = \psi\text{-}Portfolio_{i,q}] \times UPIA_{s,q} + \gamma X_{i,q} + \epsilon_{i,q}$$

$\Delta w_{i,s,q}$ is expressed in basis points. $\Delta w_{i,s,q}$ is the difference between the weight of stock i in the portfolio of trusts in state s, in quarter q, computed as the total dollar amount invested for that stock and date across all trusts in that state, divided by the total dollar amount invested across all stocks by those investors, and the analogous weight for that stock in the state-level portfolio of all other institutional investors. $\alpha_{s,q}$ are state $\times$ date fixed effects, and $\alpha_{i,p}$ are stock $\times$ ψ-Portfolio fixed effects. We define four ψ-Portfolios indicator variables based on the ψ variable: $\psi \leq$ -3 for prudent stocks; -2 $\leq \psi \leq$ 0 for less prudent stocks; 1 $\leq \psi \leq$ 3 for less imprudent stocks; $\psi > 3$ for imprudent stocks. ψ is our primary prudence variable, and defined in the main text (equation 13). $UPIA_{s,q}$ is an indicator variable that takes the value 1 if state s has adopted the prudent-investor rule in event quarter q. $X_{i,q}$ includes *Size*, *Book-to-market*, *Previous 12-month Return*, $Return_{t-1}$, and *Turnover*. To control for outliers, we winsorize Δw at the 0.5% level. We include in the analysis up to 40 pre-event quarters, and 40 post-event quarters around the passage of each law. t-statistic based on standard errors clustered at both the firm and date level are shown in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively. A complete list of definitions for these variables is provided in the Appendix.

	(1)	(2)	(3)	(4)
Prudent Stocks x UPIA	−0.584***			
	(−3.60)			
Less Prudent Stocks x UPIA		0.516***		
		(4.17)		
Less Imprudent Stocks x UPIA			0.204**	
			(2.26)	
Imprudent Stocks x UPIA				−0.047
				(−0.68)
Controls	Yes	Yes	Yes	Yes
State $\times$ Date FE	Yes	Yes	Yes	Yes
Stock $\times$ ψ-Portfolio FE	Yes	Yes	Yes	Yes
Observations	2,800,962	2,800,962	2,800,962	2,800,962
Adjusted R^2	0.11	0.11	0.11	0.11

Table 9: Δw and Stock Returns - Calendar Time Portfolios

This table shows estimates from factor regressions using monthly value-weighted portfolio and factor returns. The dependent variables are excess returns of portfolios formed based on Δw/MV. This variable is measured one quarter before the adoption of a UPIA law $(t-3)$ and is defined as:

$$\Delta w/MV_{i,(t-3)} = \frac{\sum_s AUM_{s,(t-3),trust} \times (Weight_{i,s,(t-3),trust} - Weight_{i,s,(t-3),others})}{MV_{i,(t-3)}}$$

The factors are the five (Fama and French 2015) factors. At the end of each month t in which there is an UPIA law adoption, we sort stocks into portfolios using values of Δw/MV. We build portfolios of stocks with negative Δw/MV (column Neg Δ W), portfolios of stocks with positive Δw/MV (column Pos Δ), a long-short portfolio that buys stocks with positive Δw/MV and shorts stocks with negative Δw/MV (column Pos-Neg), portfolios of stocks in the different quintiles of Δw/MV (column Q1 through Q5), and a long-short portfolios that buys stocks in the top quintile by Δw/MV and shorts stocks in the bottom quintile by Δw/MV (column Q5-Q1). Portfolios are held for the subsequent 12 months after formation date. In Panel A, we present results for the sample of stocks that trusts overweight (underweight) due to the "regulatory tilt". These are defined as the stocks with a value of $\Psi \leq -3$ and a positive Δw/MV, or a value of $\Psi > -3$ and a negative Δw/MV. In Panel B, we focus on stocks that trusts overweight (underweight) for reasons unrelated to "regulatory tilt", and include those stocks excluded from Panel A. Returns are expressed as percentages. The sample period runs from 1983 to 2010. t-statistics based on Newey-West standard errors with 12 lags are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Consistent Sample

	Neg Δ W	Pos Δ W	Pos-Neg	Q1	Q2	Q3	Q4	Q5	Q5-Q1
Alpha	0.271**	-0.216***	-0.487***	0.379***	0.024	0.065	-0.030	-0.213***	-0.592***
	(2.50)	(-2.94)	(-2.87)	(2.79)	(0.34)	(0.70)	(-0.35)	(-3.06)	(-3.06)
MKT	1.006***	1.043***	0.037	0.999***	0.951***	0.925***	1.000***	1.010***	0.011
	(44.46)	(71.22)	(1.20)	(46.27)	(49.60)	(31.45)	(52.17)	(75.54)	(0.34)
SMB	0.181***	0.021	-0.160**	0.241***	0.226***	0.279***	0.052	-0.068**	-0.309***
	(4.04)	(0.66)	(-2.28)	(6.36)	(3.60)	(3.32)	(0.90)	(-2.35)	(-5.03)
HML	-0.149***	0.196***	0.345***	-0.066*	-0.078***	-0.126***	0.090	0.164***	0.231***
	(-3.52)	(3.69)	(4.13)	(-1.68)	(-2.74)	(-3.13)	(1.38)	(3.25)	(2.89)
RMW	-0.261***	0.322***	0.583***	-0.264***	-0.151***	-0.238**	0.205*	0.331***	0.594***
	(-5.09)	(4.35)	(5.32)	(-3.93)	(-3.37)	(-2.23)	(1.83)	(4.81)	(4.74)
CMA	-0.034	0.148**	0.181	-0.135*	-0.013	0.094	-0.079	0.172**	0.307**
	(-0.45)	(2.07)	(1.53)	(-1.95)	(-0.19)	(1.25)	(-1.05)	(2.26)	(2.45)
N. Months	336	336	336	336	336	336	336	336	336

Panel B: Inconsistent Sample

	Neg Δ W	Pos Δ	Pos-Neg	Q1	Q2	Q3	Q4	Q5	Q5-Q1
Alpha	0.017	0.288**	0.271	0.051	-0.080	-0.104	0.105	0.246***	0.196
	(0.24)	(2.27)	(1.62)	(0.57)	(-1.36)	(-1.53)	(1.01)	(2.66)	(1.37)
MKT	1.102***	1.049***	-0.053	1.128***	0.991***	0.984***	0.951***	1.077***	-0.052
	(59.73)	(32.17)	(-1.22)	(48.58)	(89.34)	(74.85)	(46.74)	(42.12)	(-1.36)
SMB	0.151***	-0.045	-0.196***	0.206***	0.077***	0.101***	0.192***	0.009	-0.197***
	(4.29)	(-0.96)	(-3.26)	(5.69)	(3.42)	(3.31)	(4.70)	(0.25)	(-3.59)
HML	0.117	-0.175**	-0.292**	0.136**	0.113***	-0.042	-0.102**	-0.137***	-0.273***
	(1.55)	(-2.45)	(-2.26)	(2.25)	(4.53)	(-1.48)	(-2.53)	(-3.03)	(-3.23)
RMW	0.114	-0.296***	-0.410***	0.197***	0.117***	-0.046	-0.267***	-0.264***	-0.461***
	(1.18)	(-4.30)	(-3.14)	(3.77)	(3.03)	(-1.07)	(-3.93)	(-4.61)	(-5.64)
CMA	-0.041	-0.159	-0.117	0.001	0.041	0.103*	0.004	-0.011	-0.013
	(-0.34)	(-0.93)	(-0.44)	(0.02)	(0.85)	(1.83)	(0.06)	(-0.11)	(-0.10)
N. Months	336	336	336	336	336	336	336	336	336

Table 10: Δw and Stock Returns - Panel Regressions

In this table we report estimates of the model:

$$Ret_{i,t} = \alpha_t + \beta \Delta w/MV_{i,(t-3)} + \gamma X_{i,(t-1)} + \epsilon_{i,t}$$

the dependent variable is the return of stock i in month t. The independent variable Δw/MV is measured one quarter before the adoption of a UPIA law $(t-3)$ and is defined as:

$$\Delta w/MV_{i,(t-3)} = \frac{\sum_s AUM_{s,(t-3),trust} \times (Weight_{i,s,(t-3),trust} - Weight_{i,s,(t-3),others})}{MV_{i,(t-3)}}$$

where the sum in the numerator is computed across all states s that adopt UPIA law. $AUM_{s,(t-3),trust}$ measures the total asset under management of trusts headquartered in state s one quarter before the adoption of a UPIA law. $Weight_{i,s,(t-3),trust}$ measures the weight of stock i in the portfolio of trusts headquartered in state s one quarter before the adoption of a UPIA law. $Weight_{i,s,(t-3),others}$ measures the weight of stock i in the portfolio of all other institutions headquartered in state s one quarter before the adoption of a UPIA law. $MV_{i,(t-3)}$ is the stock market capitalization of stock i in month $t-3$. Our universe of stocks is restricted to the set of stocks with a non-missing value of $\Delta w/MV$. If multiple UPIA laws are adopted in the same month, we aggregate the values of $\Delta w/MV$ by summing them. In Panel A, we present results for the sample of stocks that trusts overweight (underweight) due to the "regulatory tilt". These are defined as the stocks with a value of $\Psi \leq -3$ and a positive Δw/MV, or a value of $\Psi > -3$ and a negative Δw/MV. In Panel B, we focus on stocks that trusts overweight (underweight) for reasons unrelated to "regulatory tilt", and include those stocks excluded from Panel A. $X_{i,t-1}$ is a matrix of firm-level controls including: size (market capitalization), book-to-market, previous 12-month cumulative stock return, lagged 1-month return, and turnover. All controls are measured as of month $t-1$. α_t denotes time (year-month) or industry (Fama-French 48)-time fixed effects. We adjust for serial correlation by clustering standard errors at the stock and time (year-month) level. t-statistics are reported in parentheses. * denotes significance at the 10% level, ** denotes significance at the 5% level and *** denotes significance at the 1% level.

Panel A: Consistent Sample

	(1)	(2)	(3)	(4)
Δw/MV	-0.108***	-0.122***	-0.097***	-0.090***
	(-2.84)	(-3.58)	(-4.51)	(-6.03)
Size		0.022	0.101	0.115
		(0.20)	(0.98)	(1.24)
Book-to-market		0.351	0.419**	0.547***
		(1.64)	(2.26)	(4.09)
Previous 12-month Return		0.223	0.873**	0.814***
		(0.53)	(2.46)	(3.18)
Return$_{t-1}$		-1.383	-2.570*	-3.653***
		(-0.85)	(-1.85)	(-3.88)
Turnover		-0.299	-0.314	-0.251
		(-1.18)	(-1.32)	(-1.41)
Time FE			Yes	Yes
Industry x Time FE				Yes
Observations	241,077	241,077	241,077	241,077
Adjusted r^2	0.001	0.001	0.094	0.149

Panel B: Inconsistent Sample

	(1)	(2)	(3)	(4)
Δw/MV	0.006	0.006	0.005	0.007
	(0.92)	(1.12)	(0.78)	(1.62)
Size		-0.023	0.031	0.082
		(-0.17)	(0.24)	(0.72)
Book-to-market		0.688***	0.760***	0.821***
		(3.03)	(3.70)	(5.69)
Previous 12-month Return		0.335	0.930*	0.908**
		(0.53)	(1.70)	(2.34)
Return$_{t-1}$		-2.096	-3.033*	-3.994***
		(-1.14)	(-1.75)	(-2.95)
Turnover		0.112	0.045	-0.043
		(0.30)	(0.13)	(-0.17)
Time FE			Yes	Yes
Industry x Time FE				Yes
Observations	165,353	165,353	165,353	164,685
Adjusted r^2	0.000	0.002	0.093	0.153

Table 11: Δw and Changes in Firm Characteristics

In this table we report estimates of the model:

$$\Delta Y_{i,t} = \alpha_t + \beta \Delta w/MV_{i,(t-3)} + \gamma X_{i,(t-1)} + \epsilon_{i,t}$$

where $\Delta Y_{i,t}$ is one of the following variables: the growth rate of median analyst forecast for stock i; the growth rate of institutional ownership of stock i between event date t and event date $t-1$ of event s; the growth rate of stock i's Amihud illiquidity; the growth rate of stock i's ROA. The independent variable Δw/MV is measured one quarter before the adoption of a UPIA law ($t-3$) and is defined as:

$$\Delta w/MV_{i,(t-3)} = \frac{\sum_s AUM_{s,(t-3),trust} \times (Weight_{i,s,(t-3),trust} - Weight_{i,s,(t-3),others})}{MV_{i,(t-3)}}$$

where the sum in the numerator is computed across all states s that adopt UPIA law. $AUM_{s,(t-3),trust}$ measures the total asset under management of trusts headquartered in state s one quarter before the adoption of a UPIA law. $Weight_{i,s,(t-3),trust}$ measures the weight of stock i in the portfolio of trusts headquartered in state s one quarter before the adoption of a UPIA law. $Weight_{i,s,(t-3),others}$ measures the weight of stock i in the portfolio of all other institutions headquartered in state s one quarter before the adoption of a UPIA law. $MV_{i,(t-3)}$ is the stock market capitalization of stock i in month $t-3$. Our universe of stocks is restricted to the set of stocks with a non-missing value of $\Delta w/MV$. If multiple UPIA laws are adopted in the same month, we aggregate the values of $\Delta w/MV$ by summing them. $X_{i,t-1}$ is a matrix of firm-level controls including: size (market capitalization), book-to-market, previous 12-month cumulative stock return, lagged 1-month return, and turnover. All controls are measured as of month $t-1$. α_t denotes time (year-month) or industry (Fama-French 48)-time fixed effects. We adjust for serial correlation by clustering standard errors at the stock and time (year-month) level. t-statistics are reported in parentheses. * denotes significance at the 10% level, ** denotes significance at the 5% level and *** denotes significance at the 1% level.

	Analyst Forecast		Institutional Ownership	
	(1)	(2)	(3)	(4)
Δw/MV	-0.001	-0.002	0.034	0.027
	(-0.44)	(-1.12)	(1.13)	(1.17)
Observations	193,220	192,664	237,739	237,279
Adjusted r^2	0.002	0.003	0.000	-0.025
	Liquidity		Profitability	
	(1)	(2)	(3)	(4)
Δw/MV	0.105	0.499	0.008	-0.003
	(1.06)	(1.02)	(0.59)	(-0.20)
Controls	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Industry x Time FE		Yes		Yes
Observations	227,502	227,089	230,869	230,397
Adjusted r^2	-0.000	0.037	-0.000	-0.019

Figure 1: Prudence in the Trust and Non-Trust Portfolios one year before UPIA

This figure displays the share of the portfolio holdings of institutional investors in each of the thirteen portfolios, based on the ψ variable, one year prior to the adoption of a UPIA statute. The red bars represent the trusts' share of portfolio holdings, while the gray bars represent the non-trusts' share of portfolio holdings.

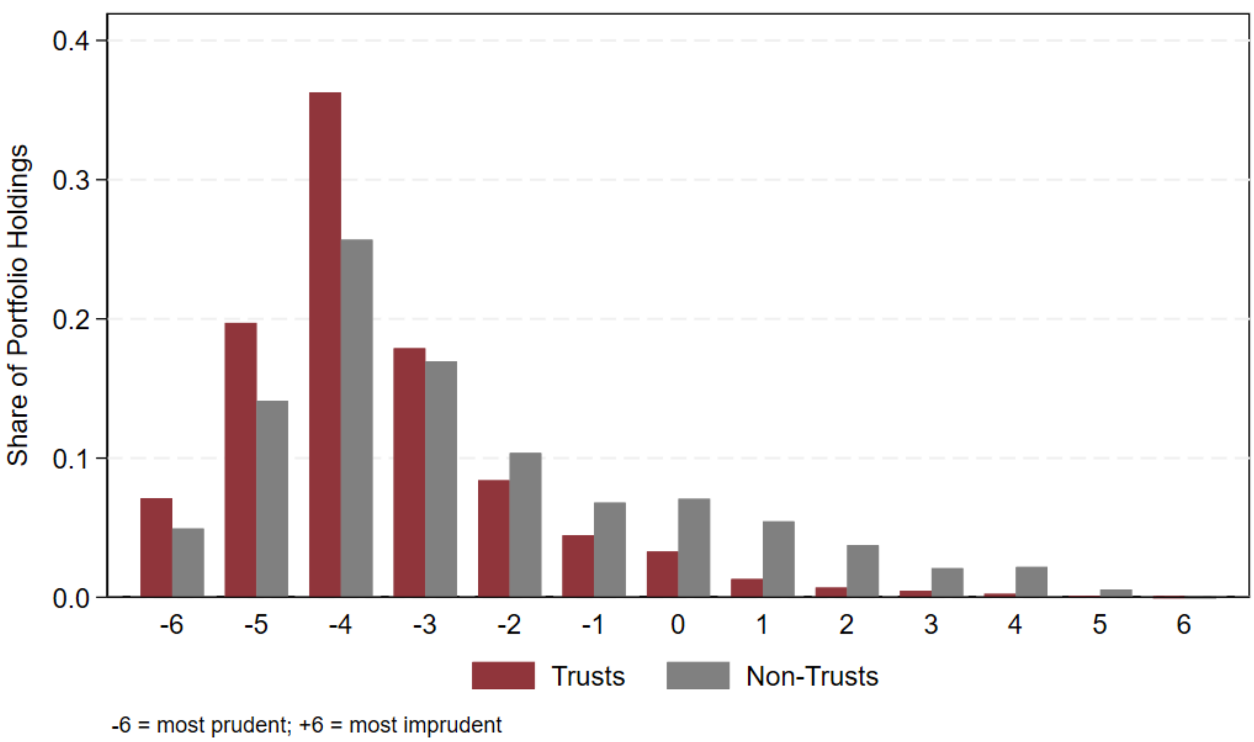


Figure 2: Trusts Funds' Portfolio Composition around the enactment of the UPIA

This figure presents a dynamic version of changes in trusts' portfolio choice around UPIA, see equation 17 in the main text. The four portfolios are based on the ψ variable: Prudent stocks are defined as $\psi \leq -3$, less prudent stocks as $-2 \leq \psi \leq 0$, less imprudent stocks as $1 \leq \psi \leq 3$, and imprudent stocks are defined as $\psi > 3$. Event time is defined relative to the adoption of a UPIA statute as described in Table 1. Standard errors clustered at both the institutional manager and date level and 5% Confidence Intervals are shown.

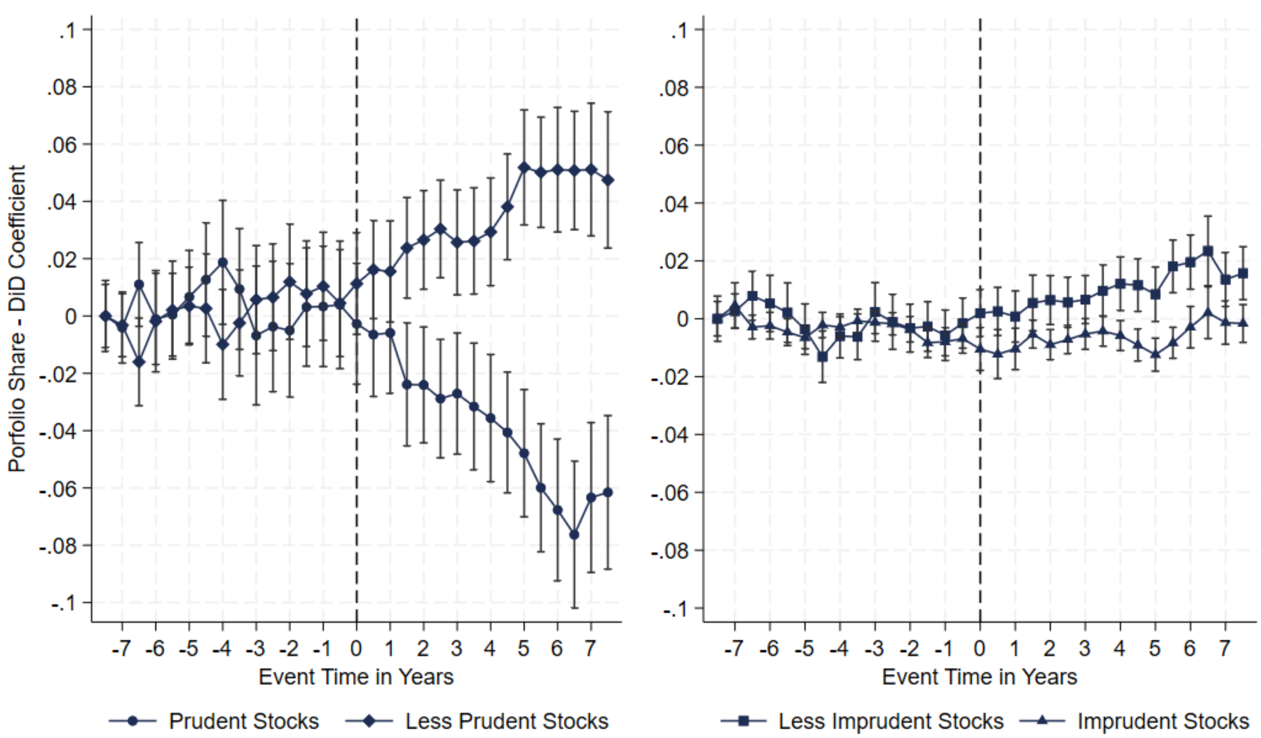


Figure 3: Trusts Funds' Overallocation to Prudent Stocks around the enactment of the UPIA

This figure presents changes in Δw of the four ψ-Portfolios around the adoption of the UPIA statue based on the following regression.

$$\Delta w_{i,s,q} = \alpha_i + \alpha_{s,q} + \beta_{1,p}\mathbb{1}[p = \psi\text{-}Portfolio_{i,q}] + \beta_{2,p}\mathbb{1}[p = \psi\text{-}Portfolio_{i,q}] \times UPIA_{s,q} + \gamma X_{i,q} + \epsilon_{i,q}$$

Δw is expressed in basis points. Δw is the difference between the weight of stock i in the portfolio of trusts in state s, in quarter q, computed as the total dollar investment in that stock and date across all trusts in that state divided by the total dollar amount invested in all stocks by those investors, and the analogous weight for that stock in the state-level portfolio of all other institutional investors. $\alpha_{s,q}$ are state $\times$ date fixed effects, and α_i are stock fixed effects. We define four ψ-Portfolios indicator variables based on the ψ variable: $\psi \leq$ -3 for prudent stocks; -2 $\leq \psi \leq 0$ for less prudent stocks; $1 \leq \psi \leq 3$ for less imprudent stocks; $\psi > 3$ for imprudent stocks. ψ is our primary prudence variable, and defined in the main text (equation 13). $UPIA$ is an indicator variable that takes the value 1 if state s has adopted the prudent-investor rule in event quarter q. $X_{i,q}$ includes *Size*, *Book-to-market*, *Previous 12-month Return*, $Return_{t-1}$, and *Turnover*. To control for outliers, we winsorize Δw at the 0.5% level. We include in the analysis up to 40 pre-event quarters, and 40 post-event quarters around the passage of each law. t-statistic based on standard errors clustered at both the firm and date level are shown in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively. A complete list of definitions for these variables is provided in the Appendix.

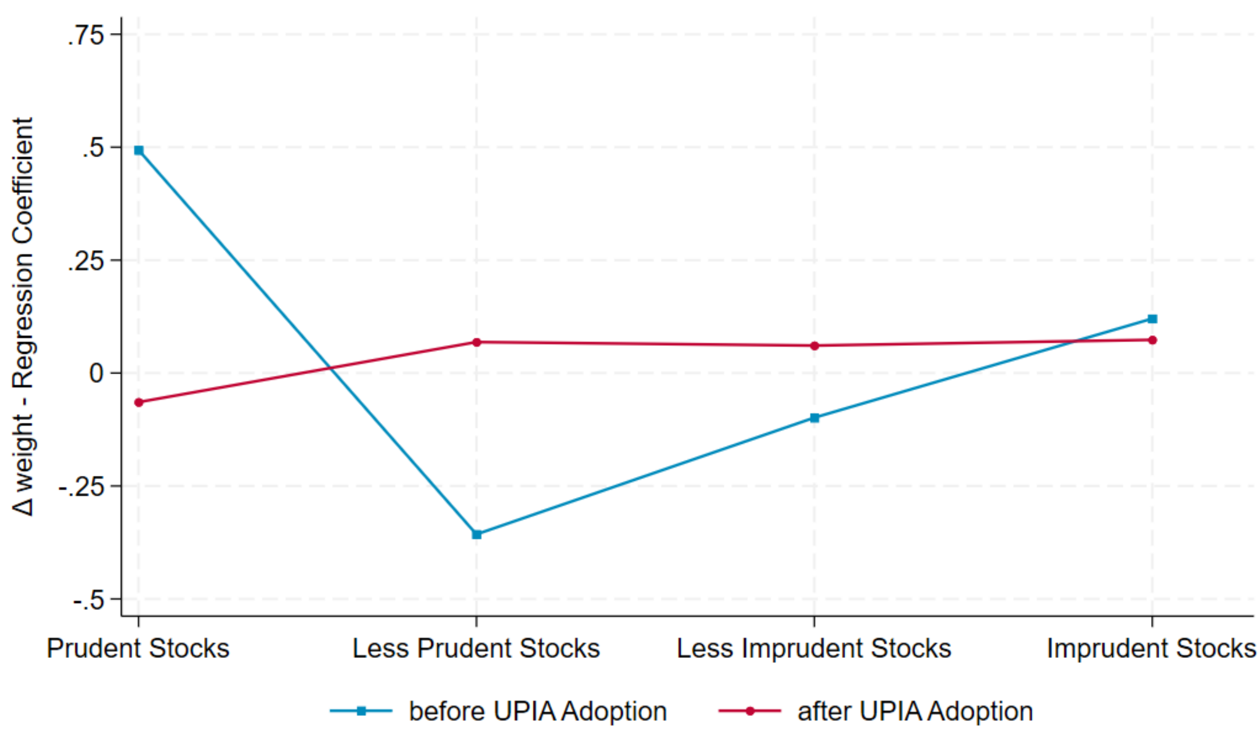
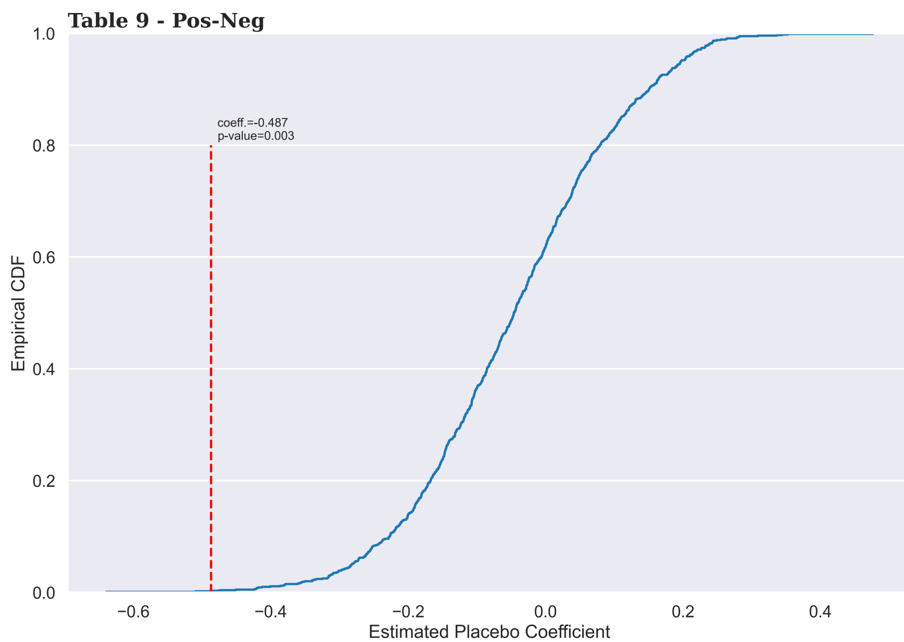


Figure 4: Non Parametric Permutation Tests: Δw and Stock Returns - Calendar Portfolios

This figure shows the results of the block permutation procedure following the method in (Chetty, Looney, and Kroft 2009). In each iteration, the date of a UPIA adoption is randomly re-assigned by firm with replacement as a placebo through the sample period. Our regressions of Table 9 are then estimated on the falsified data. The plots report the empirical cumulative distribution function (cdf) generated from running each of the regression models in 1,000 random iterations of this procedure and capturing the placebo coefficient estimate. The vertical dotted line indicates the position of the actual coefficient estimate for the impact that Δw has on stock returns and implied p-value when placed in the context of cdf. The implied p-value reported in each plot shows the proportion of the placebo coefficients that are contrasted with the actual regression coefficient.



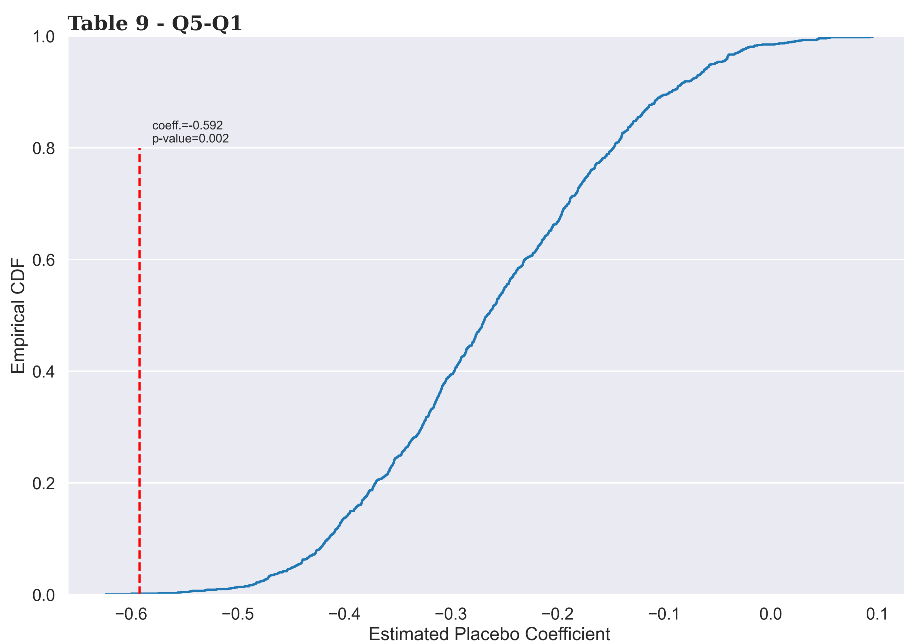
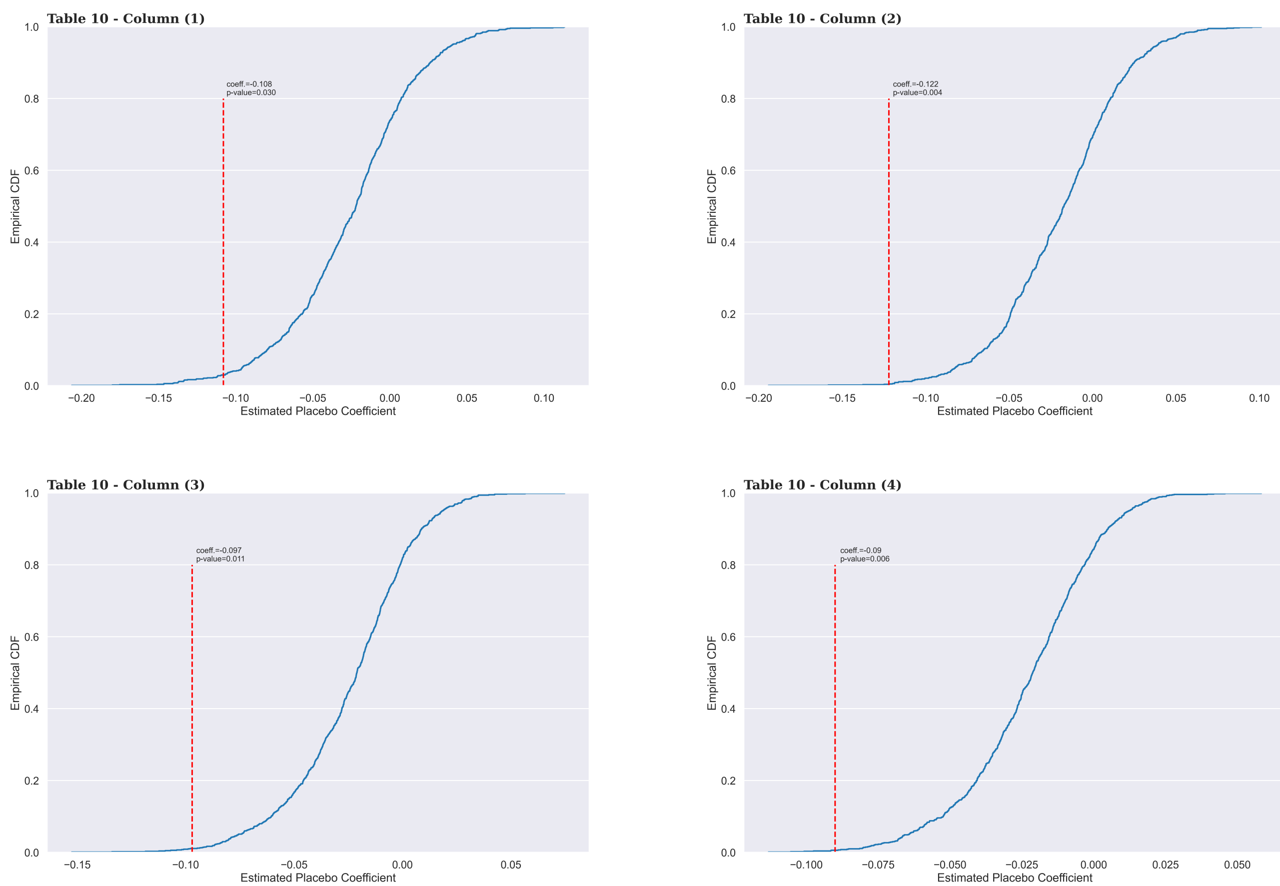


Figure 5: Non Parametric Permutation Tests: Δw and Stock Returns - Panel Regressions

This figure shows the results of the block permutation procedure following the method in (Chetty, Looney, and Kroft 2009). In each iteration, the date of a UPIA adoption is randomly re-assigned by firm with replacement as a placebo through the sample period. Our regressions of Table 10 are then estimated on the falsified data. The plots report the empirical cumulative distribution function (cdf) generated from running each of the regression models in 1,000 random iterations of this procedure and capturing the placebo coefficient estimate. The vertical dotted line indicates the position of the actual coefficient estimate for the impact that Δw has on stock returns and implied p-value when placed in the context of cdf. The implied p-value reported in each plot shows the proportion of the placebo coefficients that are contrasted with the actual regression coefficient.



APPENDIX

A UNIFORM PRUDENT INVESTOR ACT – PREFATORY NOTE

Over the quarter century from the late 1960's the investment practices of fiduciaries experienced significant change. The Uniform Prudent Investor Act (UPIA) undertakes to update trust investment law in recognition of the alterations that have occurred in investment practice. These changes have occurred under the influence of a large and broadly accepted body of empirical and theoretical knowledge about the behavior of capital markets, often described as "modern portfolio theory."

[...]

Objectives of the Act. UPIA makes five fundamental alterations in the former criteria for prudent investing. [...]

(1) The standard of prudence is applied to any investment as part of the total portfolio, rather than to individual investments. In the trust setting the term "portfolio" embraces all the trust's assets. UPIA § 2(b).

(2) The tradeoff in all investing between risk and return is identified as the fiduciary's central consideration. UPIA § 2(b).

(3) All categoric restrictions on types of investments have been abrogated; the trustee can invest in anything that plays an appropriate role in achieving the risk/return objectives of the trust and that meets the other requirements of prudent investing. UPIA § 2(e).

(4) The long familiar requirement that fiduciaries diversify their investments has been integrated into the definition of prudent investing. UPIA § 3.

(5) The much criticized former rule of trust law forbidding the trustee to delegate investment and management functions has been reversed. Delegation is now permitted, subject to safeguards. UPIA § 9.