Modeling Managers As EPS Maximizers (Internet Appendix)

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November 9, 2025
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IA.1 Motivating Evidence

When you ask the people in charge of large public corporations how they make decisions, they usually start talking about increasing EPS (earnings per share). This is how CEOs respond in academic surveys. It is what CEOs tell their shareholders they are doing, and it is how they measure shareholder value in regulatory filings. Corporate executives talk about EPS growth so much that it makes sense to ask: What would the world look like if publicly traded companies were run by EPS maximizers?

IA.1(a) Survey Evidence

As far back as Lintner (1956), academic researchers have been using surveys to probe the motives behind managers' decisions. Collectively, this literature paints a clear picture: when given the opportunity to describe their goals, most managers point to EPS growth as their primary objective. For large public corporations, EPS is the main performance metric (Graham, Harvey, and Rajgopal, 2005; Dichev, Graham, Harvey, and Rajgopal, 2013).

Table IA.1(1) summarizes how financial executives describe their decision-making in 17 different survey-based papers over the past five decades. Different papers focus on different kinds of decisions, but there are many more check marks in column (2) than in column (1). Regardless of the decision, when you ask the manager of a large public corporation how they made it, she is more likely to talk about EPS growth. For instance, Brav, Graham, Harvey, and Michaely

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(2005) specifically reports that many "managers favor repurchases…to increase earnings per share." One manager surveyed in Graham and Harvey (2001) explains that when "funds are obtained by issuing debt, the number of shares does not remain constant and so EPS can increase."

For the most part, when survey respondents talk about maximizing NPV, they also report following the principle of EPS maximization. Only a couple of papers report no evidence of EPS maximization. In these cases, survey respondents were not given the opportunity to talk about EPS (column 3).

The fact that many academic researchers have a strong bias against EPS maximization makes managers' survey responses all the more surprising. There is a huge experimenter demand effect working in the opposite direction (Schwarz, 1999). Put yourself in the shoes of a corporate executive in one of these studies. Your favorite business school professor has just called to interview you about how you make decisions. This has to be flattering. It would be rude to tell him that all his in-class NPV calculations are irrelevant to your day-to-day decision-making. Yet, survey respondents still report maximizing EPS.

We also note that, while real-world corporate executives focus on EPS growth, they also consider other related variables, too. For example, many CEOs care about beating earnings/EPS growth expectations (e.g., see Lakonishok, Shleifer, and Vishny, 1994). There is evidence that managers may be willing to sacrifice some EPS today in exchange for a positive surprise. See Johnson, Kim, and So (2020) for recent evidence and an excellent review.

IA.1(b)   Shareholder Communications

The managers of large public corporations do not hide the fact that they are EPS maximizers. They explicitly tell their shareholders what they are trying to do. The situation is not like the one modeled in papers like Stein (1989), Stein (1996), and Aghion and Stein (2008). CEOs are not secretly maximizing EPS even though shareholders would like them to focus on long-term fundamentals. CEOs often have pay packages with explicit EPS targets (Healy, 1985; Murphy, 1999; Bergstresser and Philippon, 2006; Bennett, Bettis, Gopalan, and Milbourn, 2017).

You might suspect that market participants only use EPS growth as a quick-and-easy proxy for value creation. After all, executive-compensation packages often tie a manager's pay to the level of the share price. Managers often own large amounts of equity, too. But it is important to recognize that max Price is not the same thing as max NPV. In fact, if managers take their company's PE ratio as given, then max Price is formally equivalent to max EPS.

We also find that managers continue to focus on EPS growth even in high-stakes situations. For example, in early 2020 Xerox announced a plan to acquire Hewlett-Packard Co. Figure IA.1(2) shows the first slide from a presentation

Meta-Analysis Of The Survey Literature

Participants in study…	Are decisions based on…		
	NPV/DCF? say "Yes" (1)	EPS? say "Yes" (2)	EPS? not asked (3)
(a) Broad objectives			
Petty, Scott, and Bird (1975)		✓	
Graham et al. (2005)		✓	
Dichev et al. (2013)		✓	
(b) Capital structure			
Pinegar and Wilbricht (1989)		✓	
Graham and Harvey (2001)	✓	✓	
Bancel and Mittoo (2004)	✓	✓	
Brounen, De Jong, and Koedijk (2006)	✓		⊗
(c) Repurchases/issuance			
Baker, Gallagher, and Morgan (1981)		✓	
Tsetsekos, Kaufman, and Gitman (1991)		✓	
Badrinath, Varaiya, and Ferling (2000)		✓	
Graham and Harvey (2001)		✓	
Brav et al. (2005)		✓	
Brounen et al. (2006)		✓	
Caster, Elson, and Weld (2006)		✓	
(d) Cash holdings			
Lins, Servaes, and Tufano (2010)	✓		⊗
(e) Capital budgeting			
Schall, Sundem, and Geijsbeek (1978)	✓	✓	
Gitman and Maxwell (1987)	✓	✓	
Graham and Harvey (2001)	✓	✓	
Mukherjee, Kiymaz, and Baker (2004)	✓	✓	
Baker, Singleton, and Veit (2011)	✓	✓	

Table IA.1(1). Column (1): Managers reported using either NPV and/or DCF reasoning. Column (2): Managers said they maximized EPS. Column (3): Managers were not given the opportunity to talk about EPS maximization. Panel (a): Papers about managers' broad objectives. Panel (b): Papers about choosing capital structure. Panel (c): Papers about repurchases and new issuance. Panel (d): Papers about cash holdings. Panel (e): Papers about capital budgeting.

Figure IA.1(2). First slide from a February 2020 presentation by HP's CEO to the company's shareholders in opposition to Xerox's proposed takeover. [link]

made by HP's CEO aimed at convincing his shareholders to refuse Xerox's offer. The title is "Creating Value for HP Shareholders", and the first bullet point is "We plan to deliver non-GAAP EPS of $3.25-$3.65 in FY22 to HP shareholders." With his job on the line, HP's CEO talked a lot about the company's future operating profits, but he never once mentioned the net present value of these cash flows.

IA.1(c) Earnings-Call Transcripts

We find a similar pattern in other kinds of manager-investor interactions. For example, we analyze the transcripts of quarterly earnings calls using data from Capital IQ. Table IA.1(3) describes what managers say to interested market participants during these calls. Capital IQ's transcript data starts in 2004. The estimates in this table reflect the 2,243 public firms which could be matched to CRSP, were traded on a major exchange, and had a price above $5/sh.

We start with a sanity check. We are analyzing the transcripts of quarterly earnings calls, so it had better be the case that managers talk about earnings. The first row of Table IA.1(3) confirms that this is indeed the case. 97.0% of transcripts talk about "earnings", "EBIT", "EBITDA", or "net income". We do not estimate a perfect 100.0% value because Capital IQ only records the first 200 characters each time a new speaker chimes in on the call.

There are lots of ways to keep track of a firm's earnings. People do not have to think about a firm's earnings as evenly split up across shares any more than they have to think about a calendar as evenly split up into 52 weeks. These are both arbitrary conventions. But they are conventions nonetheless.

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Transcripts Of Quarterly Earnings Calls

Concept	Search Query	% of firms
Earnings	"Earnings" or "EBIT(DA)" or "Net Income"	97.0%
Dilutive/Accretive	"Diluti(ve|on)" or "Accreti(ve|on)"	76.2%
Net Present Value	"(Net) Present Value" or "PV"	15.3%
Discount Rate	"(Discount|Hurdle) Rate" or "Cost Of Capital" or "WACC" or "OCC"	34.8%
NPV or Discount Rate		40.4%

Table IA.1(3). Column (2) reports the query we used to search for the concept in column (1). Column (3) shows the percent of all 2,243 firms in our sample that had at least one transcript satisfying this query. Sample: 2004 to 2023.

The people running large public corporations use specific technical jargon to make it easier to reason about EPS maximization. A project is called "dilutive" if it will lower a firm's EPS. Conversely, an "accretive" project will boost the firm's EPS. People use these terms when talking about how a specific corporate policy will affect a firm's EPS. And Table IA.1(3) shows that 76.2% of firms use this precise language when discussing their company's status with shareholders.

By contrast, our analysis shows that 84.7% of firms have never used the term "present value" in a quarterly earnings call since 2004. Only 34.8% of firms have talked about a "discount rate" or any related term during this time. We are being as inclusive as possible when counting mentions of these two terms. Still, 3 out of 5 firms have never mentioned either term during a conference call at any point over the past two decades.

When managers talk about EPS, they get deep into the weeds. They explain how a specific action will be accretive or dilutive to shareholder value. When managers mention NPV, they often use it as a buzzword. They rarely bother to discuss inputs to the model, and their investors do not see any need to press them on their omission. This analysis is consistent with the results in Gormsen and Huber (2025), which show that most S&P 500 firms have never given a specific numeric value for the company's discount rate in a conference call.

IA.1(d) Regulatory Filings

Suppose a public company has a shareholder vote, its CEO leaves, or the firm takes out a large loan. In these situations, the Securities and Exchange

Language Used In Regulatory Filings

	#	% that mention… EPS	NPV/DCF
	(1)	(2)	(3)
2001–2022	1,694,415	21.2%	1.8%
2001–2005	358,385	18.9%	1.3%
2006–2010	463,869	20.9%	1.5%
2011–2015	377,502	22.2%	2.0%
2016–2020	349,907	22.8%	2.4%
2021–2022	144,752	21.0%	1.8%

Table IA.1(4). Summary of the language used in 8-K filings for all publicly listed firms from January 1st 2001 through December 31st 2022. Data come from EDGAR. Column (1): Total number of 8-K filings. Column (2): Percent of 8-K filings that included either "Earnings Per" or "EPS". Column (3): Percent of 8-Ks that included at least one of the following strings: "NPV", "(Present|Discounted) Value", "DCF", "Discounted Cash Flows", "Economic Value added".

Commission (SEC) requires the firm to file a Current Report on Form 8-K within four business days. Earlier research has shown that EPS is the standard metric that companies use when evaluating the economic impact of corporate events in 8-K filings (Amel-Zadeh and Meeks, 2019).

Table IA.1(4) summarizes the content of 1,694,415 filings from 2001 to 2022. Column (1) reports the total number of 8-K filings in EDGAR during the sample period. The first row of column (2) then shows that 21.2% of all filings include either "Earnings Per" or "EPS". We do not require "Share" because in some cases the earnings are reported using slightly different jargon, such as "earnings per partnership unit". Column (3) gives the percentage of all 8-K filings that include at least one of the following strings: "NPV", "(Present|Discounted) Value", "DCF", "Discounted Cash Flows", "Economic Value added".

When leading a quarterly earnings call, managers are trying to focus on what they see as the most important items affecting their shareholders. By contrast, when deciding whether to file an 8-K, lawyers are trying to be as thorough as possible to avoid future litigation. For example, many 8-K filings are the result of minor amendments to the company's ByLaws, which explains why only around 1/5th of all 8-Ks mention EPS. The context is different in each case. The nature of the difference makes it all the more surprising that only 1.8% of all 8-K filings talk about NPVs or discounted cash flows.

It is noteworthy that 49 out of 50 8-K filings do not talk about NPV in any capacity. To academic researchers, NPV maximization is "the golden rule of financial decision-making. (Berk and DeMarzo, 2007)" To corporate lawyers, the concept does not even warrant the inclusion of some boilerplate legalese. Every mutual-fund advertisement ends with the disclaimer, "past performance does not guarantee future results." The absence of similar language here is telling.

IA.1(e)   Two Case Studies

We now provide two short case studies, which give additional context showing how market participants use EPS. In the first case study, we look at an 8-K filing from Humana Inc that announced a change in its expected membership growth. Even though it would be easy to plug this change in growth rates into a DCF model, the company chose to interpret the effects using EPS instead. In the second case study, we describe how market participants handled General Electric's reverse split in 2021. The company was required to restate its past EPS figures to avoid biasing this key performance metric.

Humana Inc. When an 8-K does mention NPV or discounted cash flows, these terms typically refer to a specific security. For example, when a firm awards its CEO new stock options, it must file an 8-K. It is not uncommon for these sorts of reports to talk about the "present value" of the CEO's newly awarded options. This is where the bulk of "NPV" and "DCF" mentions in 8-K filings come from. It is rare to see an 8-K apply take a present-value approach to pricing the whole firm.

Humana Inc's January 9th 2023 8-K is representative of the broader pattern (Humana Inc, 2023). The company had to make this filing because it increased its expected membership growth. If there were ever a time for a firm to use NPV logic, it is here. An increase in expected membership growth directly translates into one of the key parameters in the standard Gordon-growth DCF model.

Yet the 8-K filing contains no discussion of future cash flows or how Humana planned on discounting them. Here is how the company interpreted events:

> "The Company intends to reiterate its commitment to grow 2023 Adjusted earnings per common share ("Adjusted EPS") within its targeted long-term range of 11–15 percent from its expected 2022 Adjusted EPS of approximately $25.00. As communicated on the Company's third quarter 2022 earnings call on November 2, 2022, it expects the consensus estimate of approximately $27.90 to be in line with its initial Adjusted EPS guidance."

When submitting this official legally-binding form to the SEC, Humana chose to focus almost exclusively on EPS.

General Electric. We have provided a substantial amount of evidence suggesting that the managers of large public corporations are laser-focused on increasing their EPS. Moreover, the evidence that we have presented so far is just the tip of the iceberg (e.g., see Malenko, Grundfest, and Shen, 2023). As far as we can tell, academic researchers seem to be the only group of people who believe that managers are not mainly interested in increasing their firm's EPS.

Many researchers have a sense that it would be easy for a manager to manipulate her EPS numbers. For example, suppose a firm has $\mathbb{E}[\text{Earnings}_1] = \$100$ and #Shares = 100 to begin with, giving it an EPS = \$1. Following a 1-for-2 reverse split, the company would have #Shares = 50 and an EPS = \$2. We have spoken to several researchers who saw this hypothetical scenario as proof that managers could not be EPS maximizers.

But there is a simple reason why EPS-maximizing managers are not clamoring for reverse splits in the real world. People have thought about this loophole and closed it. After a reverse split, a firm has to retroactively update its previously reported EPS values. In the above example, when the manager announced the new \$2 EPS, her shareholders would be wholly unimpressed given that she would also have to tell them that her previous EPS was \$2, too.

When GE did a 1-for-8 reverse stock split on July 30, 2021, it posted answers to shareholder FAQs (General Electric Co, 2021), one of which was: "How did the reverse stock split affect the FY'20, 1Q'21, and 2Q'21 EPS and the FY'21 Outlook and how will it impact the future calculation of net earnings or loss per share?"

> "We have adjusted our net earnings or loss per share for FY'20, 1Q'21, and 2Q'21 to reflect the reverse stock split. We have also updated our EPS from March '21 Outlook to reflect the change in share count. This adjustment simply reflects the reduced share count from the reverse stock split and does not otherwise change our previous Outlook.
>
> Additionally, in financial statements issued after the reverse stock split becomes effective, per share net earnings or loss and other per share of common stock amounts for periods ending before the effective date of the reverse stock split will be adjusted to give retroactive effect to the reverse stock split."

This is why EPS-maximizing managers are not in charge of companies whose entire market cap is packed into a single equity share. EPS is not a manipulation-proof measure. But it is not as easy to manipulate as many academic researchers seem to think. There are regulations in place to address obvious shortcomings, such as how to deal with reverse splits. The fact that these policies are needed is further evidence that managers are trying to boost their EPS.

IA.2 Outside The Scope Of Our Model

This section gives four examples of real-world complications outside the scope of a simple static max EPS model. Each case shows how the data sometimes move in ways our model cannot explain. However, none of these scenarios is evidence against EPS maximization. They all suggest that real-world corporate executives are EPS maximizers to a good first approximation. The main concern is not that real-world CEOs are maximizing something other than EPS. It is that, after decades of pursuing the same goal, so many nuances have organically emerged that a naïve calculation is no longer good enough. Luckily, this turns out not to be the case. These cases illustrate the sorts of wrinkles that we envision being added to our model in future work.

IA.2(a) Off-Balance Liabilities

The accounting treatment of leases underwent a significant transformation with the implementation of Accounting Standard Codification (ASC) 842 in 2019, which replaced the previous standard, ASC 840.[1] This change fundamentally altered how companies report their lease obligations and the associated expenses. And this alteration had substantial implications for the observed relationship between EPS and leverage in our data.

Under the previous accounting standard (ASC 840), operating leases generated a straight-line expense pattern over the lease term. Companies would simply recognize rent expense evenly throughout the lease period. This approach was predictable and resulted in a consistent EPS impact. More importantly, operating leases were considered off-balance sheet transactions, with only footnote disclosures required.

The revised standard (ASC 842) fundamentally changed this approach by requiring public companies to recognize right-of-use assets and lease liabilities on their balance sheets. This change brought transparency to previously hidden obligations, but it also forced firms to recognize a new expense that impacted its EPS. Under ASC 842, the expense recognition consists of two components: Interest expense on the lease liability, which is higher in earlier years of the lease and decreases over time as the liability is reduced; and straight-line depreciation of the right-of-use asset over the lease term. The combination of these two expense components results in a front-loaded expense pattern, creating an immediate hit to a firm's EPS.

American Airlines provides a clear illustration of this impact due to its extensive fleet leasing operations.[2] The airline industry is particularly affected by

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[1] See https://asc.fasb.org/842/tableOfContent.

[2] Jean Eaglesham. "Airlines Get a Break in New Accounting for Leases." *Wall Street Journal.* Nov

lease accounting changes because aircraft leases represent significant financial commitments that extend over many years. American Airlines preemptively adopted ASC 842 at the end of FY2018, and this step lowered its Q4 earnings by $16m. With 462m diluted shares outstanding in December 2018, the company discussed in their Q1 earnings call how ASC 842 reduced their quarterly EPS by approximately $0.035/sh.[3] When annualized, this represents about $0.14/sh reduction, or 3% of the firm's $4.55/sh earnings in FY2018.

What makes this example particularly noteworthy is that nothing changed in the underlying business reality. American Airlines was operating the same aircraft on the same leases with the same payment obligations. The only difference was the accounting treatment, yet we saw a meaningful impact on management's key performance metric, EPS. On top of this, with the company's leasing agreements now on-balance sheet, the firm's leverage rose as well. Thus, the change in accounting standards lead to a shift in the data that our simple static max EPS model does not explain.

The implementation of ASC 842 has influenced corporate decision-making around leasing in several important ways. The front-loaded expense recognition pattern has incentivized companies with extensive lease portfolios to reconsider their leasing strategies. Some firms have begun negotiating shorter lease terms to reduce the front-loading effect, as shorter leases minimize the difference between early-year and later-year expenses. This represents a significant shift in corporate behavior driven purely by accounting considerations.

ASC 842 has also prompted some companies to reconsider their lease-versus-buy calculus. Leasing previously offered some big accounting advantages due to its off-balance-sheet treatment. These advantages have now been largely eliminated. As a result, some companies have shifted toward asset ownership instead of leasing when the economics are comparable.

Additionally, companies have invested significant resources in restructuring contracts to potentially avoid lease classification altogether. By designing arrangements that fail to meet the technical definition of a lease under ASC 842, companies can achieve different accounting treatments even when the economic substance might be similar to a leasing arrangement.

The impact has been particularly pronounced in industries with extensive leasing activities, such as retail, airlines, restaurants, and logistics. For example, our model has a harder time fitting the EPS-vs-leverage relationship for retailers with large store networks in 2018 and 2019. Asset-light technology companies were less affected by ASC 842, and we see no associated change in model fit.

15th, 2019. [link]

[3]American Airlines investor relations: [link]

IA.2(b) Software-Development Costs

The accounting treatment of software-development costs represent another important area where nuances outside of our model matter. General research-and-development (R&D) expenses must be immediately expensed. By contrast, software-development costs enjoy a unique status. Under ASC 985-20[4] and ASC 350-40[5], companies can capitalize certain kinds of software-development costs, transforming what would have been a large upfront expense into an asset on the balance sheet, which can be gradually expensed over the software's useful life—typically something like 3 to 5 years.

This accounting wrinkle can make a big difference for a company's EPS. When capitalizing the cost, the near-term EPS impact is substantially reduced, as only the annual amortization affects earnings in any given year. This smoothing effect can be particularly important for companies making large investments in software infrastructure or product development. Capitalizing the cost also shifts the timing of the expense into future periods, allowing companies to match expenses with the revenue generated by the software. Finally, the capitalization approach reduces earnings volatility for companies with significant, periodic software development initiatives. Rather than experiencing a large EPS drop during the development cycle followed by a rebound during the commercialization phase, the company can stabilize its earnings.

Microsoft provides an informative example of software development capitalization's impact on EPS, though the company does not specifically disclose capitalized software development amounts in recent annual reports. As one of the world's largest cloud service providers, Microsoft makes enormous investments in developing and expanding its Azure cloud platform, with total R&D expenses reaching \$27.2bn in fiscal year 2023 [source].

To understand the potential EPS impact of software-capitalization rules, imagine that Microsoft was suddenly unable to capitalize 10% of its annual R&D spending, approximately 10% $\times$ \$27.2bn = \$2.7bn in 2023. Previously, the company could amortize this cost over, say, 5 years. Now the company has to expense the full amount in the current year, \$2.7bn rather than \$2.7bn / 5 years = \$540m. With 7.4bn diluted shares outstanding at the time [source], Microsoft's 2023 EPS would suddenly fall by 3% on account of having to expense an additional $\frac{(1-1/5) \times \$2.7\text{bn}}{7.4\text{bn sh}}$ = \$0.29/sh in software-development costs.

The magnitude of this impact helps explain why software companies carefully structure their development processes to maximize capitalizable portions. By structuring development workflows to clearly delineate research phases

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[4]See https://asc.fasb.org/985/20/showallinonepage.
[5]See https://asc.fasb.org/350/40/showallinonepage.

(which must be expensed) from application development phases (which can be capitalized), companies can significantly enhance their reported earnings.

The ability to capitalize certain software development costs creates several strategic incentives that influence corporate decision-making. Companies are motivated to prioritize development projects that meet capitalization criteria over those that don't, even when the non-capitalizable projects might offer similar or better value. This accounting-driven prioritization can influence product roadmaps and technology investment decisions.

Companies also structure their development processes specifically to maximize the portion of costs that qualify for capitalization. This might include creating distinct phases with clear documentation thresholds that align with accounting requirements, rather than following what might otherwise be more efficient development methodologies.

The timing of major development initiatives may be influenced by a desire to smooth EPS results. Companies might accelerate or delay certain development activities based on current-period earnings needs, potentially distorting optimal technology development timelines. All of this is outside the scope of our model. However, the example serves to illustrate how corporate executives still consider longer-term consequences when maximizing near-term EPS growth.

These incentives are particularly strong for public technology companies, where EPS growth and stability are closely watched by analysts and investors. Software-intensive businesses across all sectors—from financial services firms developing proprietary trading platforms to retailers building e-commerce systems—face these same accounting considerations.

IA.2(c) Acquired vs. Internal IP

M&A accounting under ASC 805[6] creates one of the most significant disparities in how similar economic activities are treated for financial reporting purposes. This accounting standard governs how companies record the acquisition of other businesses, and it gives differential treatment to acquired intellectual property (IP) vs. internally developed IP.

When a company acquires another business, it must allocate the purchase price to identifiable assets and liabilities at their fair values, with any excess recorded as goodwill. Critically, this means that acquired IP—patents, technologies, customer relationships, and even internally developed software——can be recognized as separate intangible assets on the balance sheet. By contrast, when a company develops similar IP internally, the accounting standard generally prohibits the firm from recognizing these as assets. Instead, the costs incurred

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[6]See https://asc.fasb.org/805/10/showallinonepage.

to develop internal IP are typically expensed and directly reduce earnings in the period when the investment is made.

This creates a fundamental asymmetry in EPS impact between building and buying IP. With internal development, the full cost immediately reduces earnings, creating a significant drag on EPS. With IP acquisition, the purchase price is allocated between identifiable intangible assets (amortized over their useful lives) and goodwill (not amortized but tested for impairment). This typically results in a much smaller annual EPS impact spread over many years.

Facebook's (now Meta) acquisition of WhatsApp in 2014 illustrates the accounting disparity. The social media giant initially announced the deal for approximately $19bn in February 2014, but the final price ultimately reached $21.8bn by the time the acquisition closed in October 2014 due to an increase in Facebook's stock price.[7] According to Facebook's official SEC filings, WhatsApp had generated just $10.2m in revenue for 2013 while posting a net loss of $138m. In the first half of 2014, prior to acquisition, WhatsApp reported revenue of only $15.9m with a staggering net loss of $232.5m. Most of this loss was attributed to stock-based compensation...more on this shortly.

In their acquisition accounting, Facebook allocated an extraordinary $15.3bn of the purchase price to goodwill, which is not subject to regular amortization. Only $2bn was allocated to identifiable intangible assets, primarily "acquired users," which would be amortized over their useful life of around 6 years. At the time, Facebook had approximately 2.7bn diluted shares outstanding. So, the annual amortization of the $2bn in identifiable intangibles created an expense of approximately $350m per year, which translated to $\frac{\$350m}{2.7bn\ sh} = \$0.13/\text{sh}$ in EPS dilution or roughly 12% $= \frac{\$0.13/sh}{\$1.10/sh}$ of Facebook's FY2014 GAAP EPS.[8]

Now consider the counterfactual: What if Facebook had attempted to build WhatsApp's user base and technology internally? Had the company invested even half of the acquisition price in internal R&D to develop a competing messaging platform, the amount would have been expensed as incurred, creating a massive hit to earnings, $\frac{50\% \times \$21.8bn\ /\ 6\ years}{2.7bn\ sh} = \$0.67/\text{sh}$, amounting to more than half of Facebook's FY2014 GAAP diluted EPS, $1.10/sh.

The favorable accounting treatment for acquired vs. internally developed IP incentivizes companies to pursue acquisition strategies rather than organic growth in several important ways. Technology and pharmaceutical companies face strong incentives to acquire innovation rather than develop it internally. Even when the economic cost might be higher (acquisition premiums often

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[7]Alexei Oreskovic. "Facebook's WhatsApp acquisition now has price tag of $22 billion". *Reuters.* Oct 6th, 2014. [link]

[8]Facebook investor relations: [link].

exceed the cost of internal development), the accounting treatment can make acquisitions more attractive from an EPS perspective.

When determining acquisition strategies, companies may specifically target firms with substantial IP that can be recognized on the balance sheet. This accounting consideration can influence target selection and valuation. During acquisition accounting, companies have incentives to allocate as much of the purchase price as possible to goodwill (which is not amortized) rather than to identifiable intangible assets (which are amortized). This allocation process, while subject to accounting rules and auditor oversight, involves significant judgment and can be influenced by a desire to minimize future EPS dilution.

These accounting incentives are particularly strong in industries where IP is a significant portion of enterprise value: tech stocks, pharmaceuticals, media, and consumer products. For example, pharmaceutical companies regularly acquire biotech firms with promising drug pipelines rather than investing equivalent amounts in internal R&D, partly due to the favorable accounting treatment. Like with the previous example, the accounting treatment of acquiring vs. developing IP suggests that CEOs maximize short-run EPS by financing projects over the long-run.

It's also hard to think of an example that is more "outside the scope of our model". The whole idea behind our simple static max EPS model is that, when a manager purchases the assets needed to create her firm, she has to finance them somehow. She gets to choose the debt-vs-equity mix, but in our model both choices will affect her firm's EPS in some way. It's just not possible for the manager to acquire assets without giving up some earnings. Facebook's acquisition of WhatsApp clearly violates this principle. Nevertheless, the example still shows just how important EPS accretion is to firms' decision making.

IA.2(d) Stock-Based Compensation

The accounting treatment of stock-based compensation under ASC 718[9] creates a complex set of EPS impacts that significantly influence how companies structure employee compensation. This accounting standard requires companies to recognize the fair value of equity awards as an expense over the service period, typically the vesting period of the awards.

Stock-based compensation is a double whammy for EPS, hitting both the numerator and the denominator. First, the expense recognition reduces earnings. Companies must determine the fair value of equity awards at grant date and then expense this value over the vesting period. For high-growth companies that rely heavily on equity compensation, the expense can be substantial. Second,

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[9]See https://asc.fasb.org/718/10/showallinonepage.

stock-based compensation increases a firm's share count. Outstanding stock options, restricted stock units, and other equity awards are included in the diluted share count based on the treasury stock method. In response to these accounting effects, many companies have adopted the practice of reporting non-GAAP financial metrics that exclude stock-based compensation expenses.

Tesla's approach to stock-based compensation provides a compelling example of how these accounting rules affect EPS.[10] The electric-vehicle manufacturer, like many high-growth technology companies, uses equity compensation extensively to attract and retain talent without depleting cash reserves. In 2021, Tesla reported significantly different GAAP and non-GAAP EPS figures primarily due to the treatment of stock-based compensation. Tesla's 2021 GAAP EPS was \$1.63/sh. The company's 2021 non-GAAP EPS was \$2.26/sh.[11] The difference between these figures was \$0.63/sh, representing a 39% increase. Where did it come from? Well, Tesla had a \$2.2bn stock-based compensation expense in 2021 that they chose not to include in their non-GAAP EPS calculation. With approximately 3.5bn diluted shares outstanding, including this expense would have reduced the company's EPS by exactly $\frac{\$2.2\text{bn}}{3.5\text{bn sh}} = \$0.63/\text{sh}$.

The magnitude of this difference highlights why companies place such emphasis on non-GAAP metrics when communicating with investors. In Tesla's case, excluding stock-based compensation transformed the perception of their earnings performance dramatically. While investors and analysts are increasingly sophisticated about these adjustments, the non-GAAP figures often receive more attention in financial media and analyst reports. This practice is particularly common among technology companies and has led to ongoing debates about the appropriate measurement of corporate performance.

The structure and timing of equity awards may be influenced by accounting considerations. Companies might choose specific types of equity vehicles (options versus restricted stock units, for example) or vesting schedules based partly on how they affect expense recognition patterns. High-growth companies use equity compensation more extensively because their investors often focus on revenue growth rather than GAAP profitability. Hence, the negative EPS impact of stock-based compensation may have less market consequence than it would for mature companies.

These accounting-driven decisions are most prevalent in technology companies and other high-growth sectors where competition for talent is intense and equity compensation is a critical recruitment and retention tool. In contrast,

[10]John Tobey. "Tesla's 'Hidden' Shareholder Risk: Executive Options, Pushed To The Limit." *Forbes.* Apr 27th, 2021. [link]

[11]See https://ir.tesla.com/_flysystem/s3/sec/000156459021002645/tsla-8k_20210127-gen.pdf.

traditional industrial companies with unionized workforces and government contractors with cost-plus contracts typically rely less on equity compensation and are therefore less affected by these accounting considerations.

Managers have a choice about the kind of EPS statistic to report. This does not imply that EPS is particularly prone to being manipulated. That would be like arguing that banks are particularly susceptible to being robbed. No. It's just where the money is. There are lots of variations on EPS for the same reason that short frequently used words ("give", "be", "is") have the longest dictionary definitions. These variations are missing from our model and our empirical analysis, which relies on the consensus next-twelve-month EPS forecast in IBES. Nevertheless, we still explain important patterns in the data.

IA.3 Data Construction

We construct our sample based on Compustat data (annual frequency) and data from the WRDS Ratios Suite, matched via their linking algorithm. "PERMNO" is the main identifier for firms.

We include firms that are traded on one of the three major US exchanges (NYSE, Nasdaq, AmEx), have a share code of 10 or 11, and have a share price over $5 in CRSP. We exclude firms below the 30th percentile of the NYSE market cap distribution in the month of their fiscal year-end based on the BE/ME breakpoints provided in Ken French's data library (https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html). Following the existing corporate-finance literature, we exclude firms in the financial and utility industries (SIC codes 4900-4999 and 6000-6999). To be included in our analysis for the current year $t = 1$, a firm must have a next-twelve-month EPS forecast in the IBES monthly unadjusted summary file between 11 and 13 months before the $t = 1$ fiscal year-end (we opt for the earliest estimate available).

We supplement the main dataset with information retrieved from several other datasets. We use the SDC's New Issues dataset for data on debt and equity issuances, and we use their M&A dataset for data on acquisitions. We download data on simulated pre-interest marginal tax rate data from John Graham's website (Duke University; https://people.duke.edu/~jgraham/taxform.html).

Overall, our dataset contains 45,115 firm-year observations, between 1976 and 2023. All variables have been winsorized at the 1st and 99th percentiles, within a calendar year. Below we describe how we construct each variable:

- Excess earnings yield (ExcessEY): The median one-year EPS forecast taken from the IBES unadjusted EPS summary file, divided by the share price on the same date as in IBES, minus the 10-year Treasury rate (St Louis Fed's FRED; https://fred.stlouisfed.org/series/DGS10).

- Is Value Stock: A (0/1) indicator variable that is one for firm-year observations where ExcessEY > 0% and zero otherwise.

- Was Value → Is Growth: A (0/1) indicator variable that is one if a firm transitioned from being a value stock in the previous year (ExcessEY$_{n,t-1}$ > 0%) to being a growth stock in the current year (ExcessEY$_{n,t}$ < 0%).

- Was Growth → Is Value: A (0/1) indicator variable that is one if a firm transitioned from being a growth stock in the previous year (ExcessEY$_{n,t-1}$ < 0%) to being a value stock in the current year (ExcessEY$_{n,t}$ > 0%).

- Total Debt/Assets: 'DEBT_ASSETS' from WRDS Ratios Suite, defined as total debt ('LT') divided by total assets ('AT').

- Financial Leverage > 0%: Following Strebulaev and Yang (2013), a firm-year is considered to have non-zero financial leverage if 'DEBT_AT' from the WRDS Ratios Suite is greater than 0%. We allow firms that have either 'DLTT' or 'DLC' missing to be included.

- Will Issue Debt: A firm will issue debt in the following year if the field 'SE-CURITY' in the SDC New Issues dataset for the year after the current fiscal year-end (#1) contains any of the following 'BD', 'BKD', 'BOND', 'BUYOUT', 'CD', 'COUPON', 'CP', 'CRT', 'DBS', 'DEB', 'DEBT', 'FL', 'FIX', 'FRN', 'FX', 'LEAS', 'LOAN', 'LYON', 'MORTGAGE', 'MT', 'NOTE', 'NT', 'OBL', 'REV', 'SENIOR', 'SR', 'SUB', 'TERM', 'ZERO', and (#2) is not classified as convertible debt ('CNV', 'CONV', 'CV', 'CVT', 'DECS'), preferred shares ('PERPET', 'PF', 'PFD', 'PREF', 'PRFD', 'PS', 'TRUPS'), or structured products ('ABS', 'CDO', 'CLO', 'DERIV', 'ETF', 'ETN', 'GTD', 'MBS', 'PACS', 'PASS', 'PERL', 'PERQ', 'SABRE', 'SPV', 'STEER', 'STEP', 'STP', 'STRY', 'SYNT').

- Will Issue Equity: A firm will issue equity in the following year if the field 'SECURITY' in the SDC New Issues dataset for the year after the current fiscal year-end (#1) contains any of the following 'ADS', 'ADR', 'CLASS', 'CL', 'COMMON', 'EQUITY', 'OPTION', 'ORD PART', 'PAR VAL', 'RIGHT', 'SHARES', 'SHS', 'STK', 'STOCK', 'UNIT', 'WT' and (#2) is not classified as debt, convertible debt, preferred shares, or structured products.

- Will Repurchase Shares: Following Kahle and Stulz (2021), repurchases during the fiscal year $t = 1$ are defined as the purchase of common and preferred stock ('PRSTKC') minus any reduction in the value of preferred stock (calculated as redemption 'PSTKRV', liquidating 'PSTKL', or par value 'PSTK', whichever is available, in this order), all in $t = 1$. A firm-year is considered to have repurchased shares in the upcoming year if the amount repurchased in the following fiscal year is greater than 1% of its market capitalization at the end of the current fiscal year ($t = 0$).

- ΔCash/Assets: Change in cash and short-term investments ('CHE') from year $t = 0$ to year $t = 1$ divided by total assets ('AT') at $t = 0$.

- $\log_2$(Market Cap): The base-2 log of a company's market capitalization at fiscal year-end ($t = 0$) calculated using CRSP, as the number of shares ('SHROUT' $\times 10^3$) times the absolute value of the share price ('abs(PRC)').

- Profitability: Profitability is calculated using Compustat data as the operating income before depreciation ('OIBDP') divided by total assets ('AT').

- Book To Market: BM in the WRDS Ratios Suite. This variable represents book equity divided by market equity. Book equity is computed as the

sum of stockholders' equity of the parent company ('SEQ'), deferred taxes and investment tax credit ('TXDITC', or the sum of deferred taxes 'TXDB' and investment tax credit 'ITCB'), minus preferred shares (calculated as the first available among 'PSTKRV', 'PSTKL', and 'PSTK'). Market equity is computed as Compustat items 'PRCC_F' $\times$ 'CSHO' or CRSP items 'abs(PRC)' $\times$ 'SHROUT'/10^3.

- Return On Assets (ROA): ROA from WRDS Ratios Suite. It is calculated as operating income before depreciation ('OIBDP') divided by the average of the beginning-of-year and end-of-year total assets ('AT'). If 'OIBDP' is missing, then sales minus operating expenses ('SALE' minus 'XOPR'), or total revenue minus operating expenses ('REVT' minus 'XOPR') are used, in this order.

- Tangibility: Tangibility is computed using Compustat data. It is defined as net Property, Plant and Equipment ('PPENT') divided by total assets ('AT'). Missing 'PPENT' values are set to zero.

- Marginal Tax Rate: Simulated pre-interest marginal tax rates, originally used in Graham (1996).

IA.4 Corporate Bond Yield

This section confirms that our main findings are robust to computing ExcessEY $\stackrel{\text{def}}{=}$ EY – rf using the Moody's Aaa corporate bond yield as the risk-free rate. Specifically, we compute a firm's excess earnings yield, ExcessEY, as the median one-year EPS forecast taken from the IBES unadjusted EPS summary file, divided by the share price on the same date as in IBES, minus Moody's seasoned Aaa corporate-bond yield (St Louis Fed's FRED; https://fred.stlouisfed.org/series/AAA).

rf = Moody's Aaa Corporate-Bond Yield
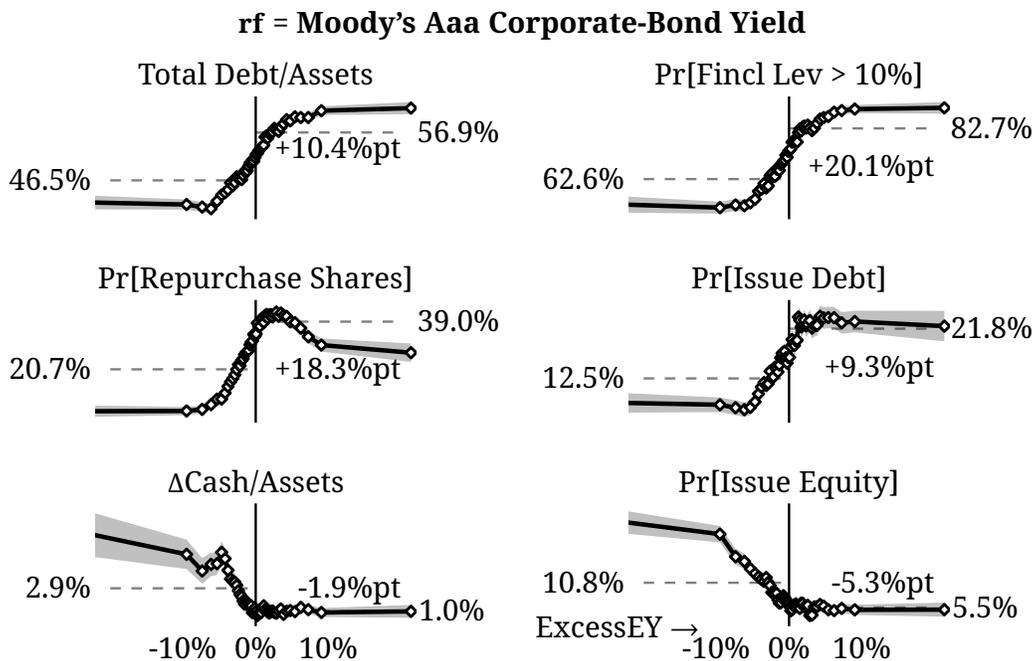
Figure IA.4(1). Binned scatterplots using firm-year observations from 1976 to 2023. Total Debt/Assets: Total liabilities in year t as a percent of total assets in year t. Pr[Fincl Lev > 10%]: 100 if firm has long-term debt worth > 10% of its assets in year t. Pr[Repurchase Shares]: Percent of observations that in year $(t + 1)$ repurchase ≥ 1% of shares outstanding in year t. Pr[Issue Debt]: 100 in year t if firm issues new debt in year $(t + 1)$. Pr[Issue Equity]: 100 in year t if firm issue new equity in year $(t + 1)$. ΔCash/Assets: Change in cash and cash equivalents in year $(t + 1)$ as a percent of total assets in year t. x-axis is excess earnings yield, ExcessEY = EY – rf. Percentages on left and right reflect average growth stock (ExcessEY < 0%; EY < rf; PE > 1/rf) and value stock (ExcessEY > 0%; EY > rf; PE < 1/rf).

rf = Moody's Aaa Corporate-Bond Yield

Dep Variable:	Total Debt/Assets			Fincl Lev > 10%		
	(1)	(2)	(3)	(4)	(5)	(6)
Is Value Stock ExcessEY > 0%	10.42*** (0.79)	10.44*** (0.67)	12.39*** (0.62)	20.14*** (1.42)	21.93*** (1.14)	20.04*** (1.12)
$\log_2$(Mkt Cap)			1.92*** (0.19)			3.83*** (0.35)
Profitability			−0.35*** (0.07)			−0.57*** (0.12)
Book To Market			−0.03** (0.02)			0.12*** (0.02)
Tangibility			0.17*** (0.01)			0.47*** (0.03)
Year FE	N	Y	Y	N	Y	Y
# Obs	44,961	44,961	43,815	45,062	45,062	43,910
Adj. R^2	5.7%	7.6%	15.8%	5.1%	6.7%	16.7%

Table IA.4(2). Total Debt/Assets: Total liabilities as percent of firm's total assets in current year. Financial Leverage > 10%: 100 if firm has long-term debt worth more than 10% of its assets in year t. Is Value Stock: 1 if firm has a positive excess earnings yield, ExcessEY > 0%. Numbers in parentheses are standard errors double-clustered by firm and year. *, **, and *** denote significance at 10%, 5%, and 1% levels. We do not report the intercept.

rf = Moody's Aaa Corporate-Bond Yield

Dep Variable:	Will Repurchase			Will Issue Debt		
	(1)	(2)	(3)	(4)	(5)	(6)
Is Value Stock ExcessEY > 0%	18.30*** (2.26)	15.12*** (1.85)	11.64*** (1.36)	9.32*** (1.17)	10.67*** (0.86)	8.66*** (0.61)
$\log_2$(Mkt Cap)			2.97*** (0.36)			7.54*** (0.35)
Profitability			0.84*** (0.05)			−0.19*** (0.03)
Book To Market			0.06*** (0.02)			0.09*** (0.01)
Tangibility			−0.16*** (0.03)			0.19*** (0.02)
Year FE	*N*	*Y*	*Y*	*N*	*Y*	*Y*
# Obs	37,896	37,896	37,034	45,115	45,115	43,912
Adj. R^2	4.0%	11.8%	16.1%	1.5%	3.3%	17.6%

Table IA.4(3). Will Repurchase Shares: 100 if a firm repurchases $\geq$ 1% of its market cap at the end of year t during year $(t+1)$. Will Issue Debt: 100 in year t if firm will issue new debt in year $(t+1)$. Is Value Stock: 1 if firm has a positive excess earnings yield, ExcessEY > 0%. Numbers in parentheses are standard errors double-clustered by firm and year. $\star$, $\star\star$, and $\star\star\star$ denote significance at 10%, 5%, and 1% levels. We do not report the intercept.

rf = Moody's Aaa Corporate-Bond Yield

Dep Variable:	Will Issue Equity			ΔCash/Assets		
	(1)	(2)	(3)	(4)	(5)	(6)
Is Value Stock ExcessEY > 0%	−5.28*** (0.63)	−5.48*** (0.76)	−2.64*** (0.50)	−1.86*** (0.35)	−2.19 (0.35)	−1.38*** (0.22)
$\log_2$(Mkt Cap)			−0.48*** (0.15)			1.92*** (0.19)
Profitability			−0.41*** (0.04)			−0.35*** (0.07)
Book To Market			−0.06*** (0.01)			−0.03** (0.02)
Tangibility			0.09*** (0.02)			0.17*** (0.01)
Year FE	*N*	*Y*	*Y*	*N*	*Y*	*Y*
# Obs	45,115	45,115	43,912	32,930	32,930	32,223
Adj. R^2	0.9%	2.1%	4.3%	0.9%	3.3%	4.5%

Table IA.4(4). Will Issue Equity: 100 in year t if firm will issue new equity in year $(t + 1)$. ΔCash/Assets: Change in cash and cash equivalents from year t to year $(t + 1)$ as a percent of total assets in year t. Is Value Stock: 1 if firm has a positive excess earnings yield, ExcessEY > 0%. Numbers in parentheses are standard errors double-clustered by firm and year. *, **, and *** denote significance at 10%, 5%, and 1% levels. We do not report the intercept.

IA.5 Regression Discontinuity

Our model predicts that EPS-maximizing managers on either side of the ExcessEY = 0% threshold will finance themselves in qualitatively different ways. If you moved a growth stock (ExcessEY < 0%) over into value-stock territory (ExcessEY > 0%), then the firm's EPS-maximizing manager should suddenly adopt a different constellation of policies. Tables 9(a)-9(c) provide empirical support for this claim by looking at how companies change their capital structure the year after they transition between value and growth.

At first glance, it might seem like a regression discontinuity (RD) design would offer an even sharper test. However, Proposition 3.4 says that movements across the value/growth dividing line will be associated with large changes in ExcessEY. Consider a marginal growth stock with an excess cap rate just below zero, $-\epsilon/2 < \text{ExcessCapRate} \stackrel{\text{def}}{=} \text{EY}(0) - \text{rf} < 0\%$ for some small $\epsilon > 0\%$. A tiny drop in share prices or interest rates would be enough to turn the company into a marginal value stock, $\Delta\text{ExcessCapRate} = +\epsilon$. But, if this were to happen, the firm would not remain on the margin for long. Its EPS-maximizing manager would immediately lever up, causing her firm's excess earnings yield, $\text{ExcessEY} \stackrel{\text{def}}{=} \text{EY}(\ell_\star) - \text{rf}$, to rise even more, $\Delta\text{ExcessEY} > +\epsilon$.

We report the results of an RDD specification in Figure IA.5(1). The top-left panel says that, when we use a flexible polynomial function of ExcessEY to predict the leverage of a marginal growth stock, we find an upper bound of $\Pr[\,\ell_\star \leq 48.8\% \mid -0.5\% \leq \text{ExcessEY} < 0.0\%\,] = 97.5\%$. For the corresponding group of marginal value stocks, we get a lower bound of $\Pr[\,\ell_\star \geq 49.7\% \mid 0.0\% < \text{ExcessEY} \leq +0.5\%\,] = 97.5\%$. There is a 0.9%pt gap between these two values, which is evidence of a statistically significant break in the data. There is an econometrically measurable gap in all but the bottom two panels corresponding to cash accumulation and new equity issuance.

It is worth noting that this analysis represents a fuzzy (rather than strict) RD design. We are using the excess earnings yield in instrumenting for the excess earnings yield that a manager has in mind when making decisions head at the time they make decisions with the excess earnings yield we calculate in our data. The short-term EPS forecast in our forward earnings yield, $\text{EY} = \frac{\mathbb{E}[\text{EPS}]}{\text{Price}}$, is the consensus analyst forecast in IBES. A firm's CEO may have a different $\mathbb{E}[\text{EPS}]$ in mind. Likewise, a firm's lowest possible interest rate might not be exactly equal to the 10-year Treasury rate at the time.

The key insight is that, if a small decline in the riskfree rate were to nudge a marginal growth stock into becoming a marginal value stock, then an EPS-maximizing manager would not want to remain a marginal value stock. She would lever up (Proposition 3.4). And, as a result, the levered excess earnings

Regression Discontinuity Design
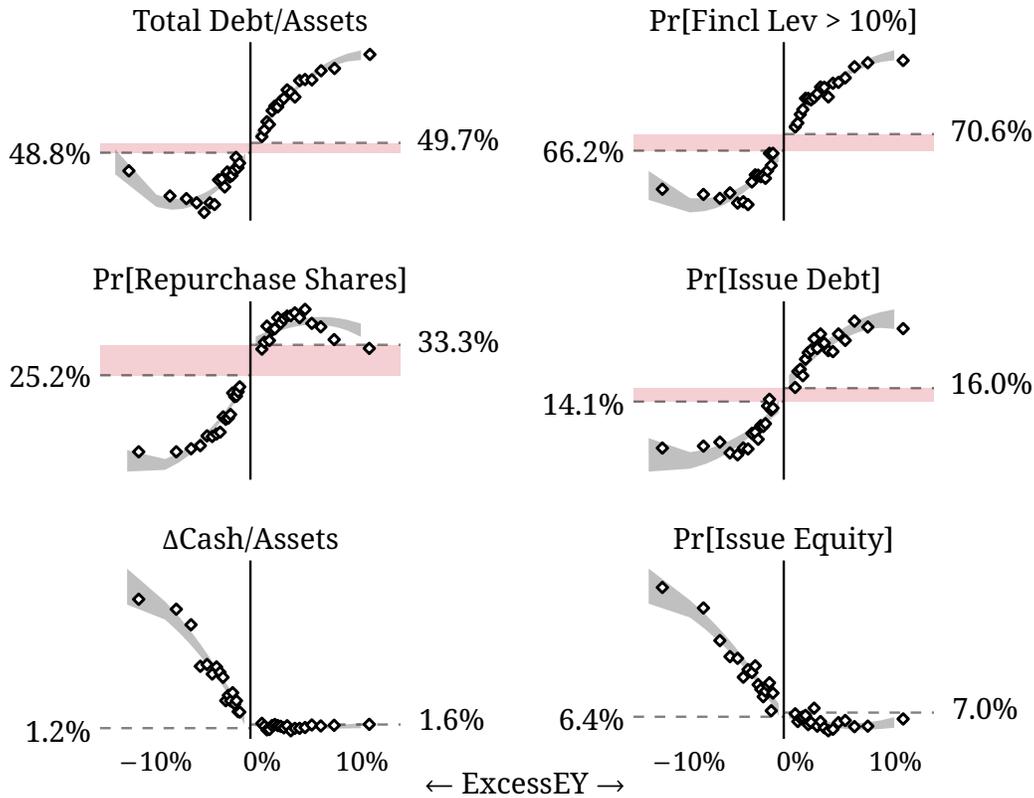
Figure IA.5(1). x-axis is excess earnings yield, ExcessEY $\stackrel{\text{def}}{=}$ EY$-$rf. To create each panel, we first fit a flexible polynomial function of ExcessEY to the observed data on growth stocks (ExcessEY < 0.5%pt) and a separate polynomial to the data on value stocks (ExcessEY > 0.5%pt). Grey ribbons show the 95% confidence interval for each curve. The point estimate and dashed line on left is the $+2 \cdot se$ upper bound of the negative fitted curve evaluated at ExcessEY $= 0$%. The point estimate and dashed line on right is $-2 \cdot se$ lower bound for the positive fitted curve evaluated at ExcessEY $= 0$%. The red shaded regions in the top four panels indicate a statistically significant discontinuity. The diamonds correspond to a binned scatterplot. Sample: firm-years observations from 1976 to 2023.

yield we observed in the data would be well above the riskfree rate (Proposition 3.5). Our model dictates that a firm with a small positive excess cap rate should have a large positive excess earnings yield. Consistent with this logic, we report in Table 1 that among stocks that switch between value and growth, the average change in ExcessEY is around 3%pt.

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