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Specificity and Time Horizons

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ABSTRACT

This Essay argues that the short-termism debate would benefit from greater clarity and specificity regarding time horizons. I make four points. First, optimal time horizons vary in discernible ways. Second, the potential mismatch between actual and optimal time horizons should generate a range of responses. Third, investors and managers can discern and disclose estimates of actual and optimal time horizons (e.g., using categories such as preconscious, fast conscious, slow conscious, and discounting). Fourth, market participants, policy makers, and scholars should use such estimates to be more precise about time horizons. For example, critics of hedge fund activism could recognize that activists' time horizons have been in the range of one or more years, instead of simply describing them generically as short-term.

INTRODUCTION

In this Essay, I argue that scholars and policy makers should be more specific about investor time horizons. I make four points. First, investor time horizons vary and different types of investors have different optimal time horizons. Second, and accordingly, normative approaches to varying investor time horizons also should vary. Third, it is possible to be more precise about investor time horizons; I suggest several categories of conceptually distinct time horizons. Fourth, market participants, policy makers, and scholars should be more precise about time horizons; I suggest several ways for them to do so, including through disclosures of time horizon estimates.

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Questions about the optimality of time horizons are challenging in the debate about short-termism.[1] For example, some scholars and policy makers argue that the time horizons of firm managers should be long-term, in part because the relevant investor time horizons—the time horizons of equity capital generally—are permanent and perpetual.[2] However, this argument typically stops short of concluding that the optimal time horizon of investors and firms actually should be or is infinite.[3] Instead, the appropriate time horizon is presumptively "long-term-*ish*" but can vary based on circumstances.[4]

Conversely, time horizons might not appear important in the corporate finance literature, where decisions by managers depend on discounting to facilitate the comparison of cash flows over time.[5] Approaches to firm decisions based on net present value—or internal rates of return versus cost of capital—purport to be indifferent to time horizons. Yet, these financial approaches are not agnostic about time horizons, particularly given the uncertainty and low present value of distant future cash flows.[6] Moreover, in practice, managers facing capital budgeting

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1. For an excellent review of the short-termism debate, see Michal Barzuza & Eric Talley, *Short-Termism and Long-Termism* 12–21 (Va. Law & Econ., Research Paper No. 2, 2016).

2. For example, consider how Vice Chancellor Travis Laster described the fiduciary obligations of directors in one recent opinion: "A Delaware corporation, by default, has a perpetual existence. Equity capital, by default, is permanent capital. In terms of the standard of conduct, therefore, the fiduciary relationship requires that the directors act prudently, loyally, and in good faith to maximize the value of the corporation over the long-term for the benefit of providers of presumptively permanent equity capital, as warranted for an entity with presumptively perpetual life in which the residual claimants have locked in their investment." Frederick Hsu Living Trust v. ODN Holding Corp., No. 12108-VCL, 2017 WL 1437308, at *36–37 (Del. Ch. Apr. 25, 2017). Margaret Blair has further argued that this concept of equity capital lock-in historically has been a central feature in the development of corporations. *See* Margaret Blair, *What Corporate Law Achieved for Business Organizers in the Nineteenth Century*, 51 UCLA L. REV. 387, 388–89 (2003). There are interesting outstanding questions (beyond the scope of this essay) about the extent to which equity capital lock-in matters to modern corporations, given the ability of corporations to provide for redemption and changes in share repurchases/issuance, changes in the amounts of outstanding equity capital at both public and private corporations, and the relatively small—though increasingly significant—percentage of investors that have time horizons approaching permanence or perpetuity.

3. For example, the directors of a firm nearing insolvency can be required to favor short-term liquidation over long-term continuation of the firm's business. *See* Prod. Res. Grp. L.L.C. v. NCT Grp., Inc., 863 A.2d 772, 791 n.60 (Del. Ch. 2004); Credit Lyonnais Bank Nederland N.V. v. Pathe Commc'n Grp., No. 12150, 1991 WL 277613, at *34 n.55 (Del. Ch. Dec. 30, 1991).

4. *See, e.g.*, Paramount Commc'n, Inc. v. Time Inc., 571 A.2d 1140, 1150 (Del. 1989) ("[D]irectors, generally, are obliged to chart a course for a corporation which is in its best interests without regard to a fixed investment horizon.").

5. *See generally* WILLIAM W. BRATTON, BRATTON'S CORPORATE FINANCE: CASES AND MATERIALS (8th ed. 2016).

6. The standard practice in financial valuation is to use a terminal period beyond which the present value of future cash flows is discounted differently, though the techniques vary. *See, e.g.*, DFC

questions use not only net present value and internal rate of return methodologies, but they also apply methods with specified time horizons, such as payback periods.[7]

Although the short-termism debate often appears polarized, the temporal imprecision in the above arguments, and others, suggest that the two sides might not be so far apart in particular situations.[8] A judge who references a view that equity capital is permanent might determine that the optimal approach for a particular firm is immediate dissolution or sale. A professor who adheres to the net present value rule might determine that the optimal approach for a particular firm is to favor long-term investment.

This Essay argues that market participants, policy makers, and scholars all should be more specific about the length of actual and optimal time horizons for particular parties. It is possible to describe and disclose, even roughly, the variation in investor time horizons. There are bases for distinguishing categorically among investor types based on their actual or optimal time horizons. Investors and managers would benefit from greater specificity with respect to actual or optimal time horizons and public disclosures of time horizon estimates and distributions.

The goal of this Essay is to suggest that policy makers and scholars address time horizons with greater particularity using broad-based categories and empirical findings instead of generalizations. The main message is to think more precisely about actual and optimal time horizons and to openly disclose such thinking.

I. THE VARIATION IN OPTIMAL TIME HORIZONS

Notions of optimality are fundamental in economics and finance. Historically, the development of the theory of capital mostly involved an optimization framework: Sir John Hicks initially formulated capital theory as an optimization problem for the firm.[9] Kenneth J. Arrow developed this framework in various ways, focusing on the basic proposition that "for any fixed stock of capital goods there is at any moment a most profitable current policy."[10] In general, much of the ongoing short-termism debate

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Glob. Corp. v. Muirfield Value Partners, L.P., 2017 WL 3261190 (Del. Aug. 1, 2017) (describing several experts' use of terminal periods and values).

7. *See* John R. Graham & Campbell R. Harvey, *The Theory and Practice of Corporate Finance: Evidence From the Field*, 60 J. FIN. ECON. 187, 196–201 (2001) (finding that more than half of finance managers use payback periods).

8. For example, participants at the conference appeared to agree that the holding periods of hedge fund activists were considerably longer than those of many other investors.

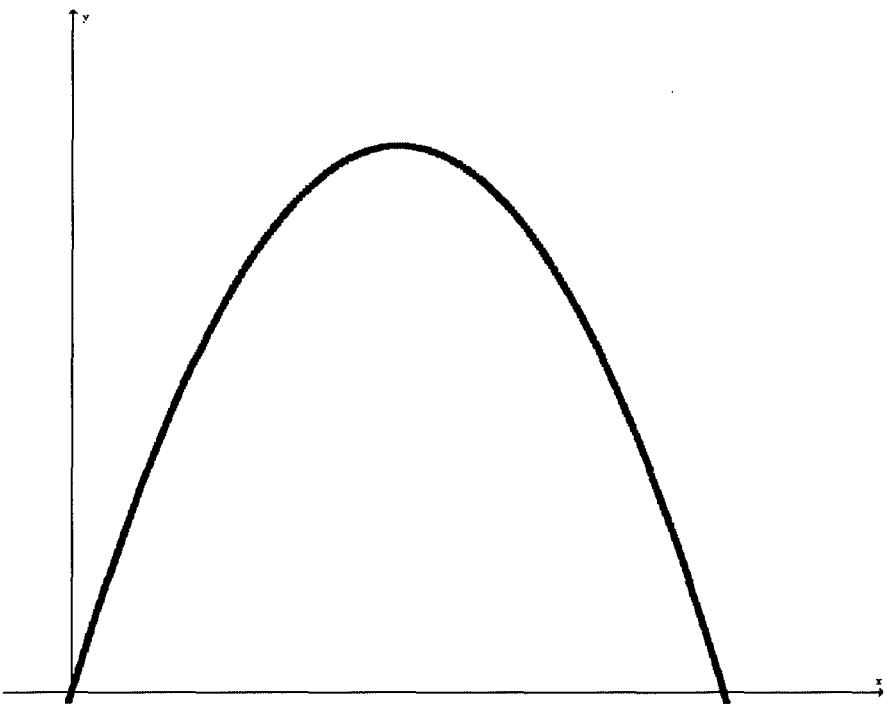
9. *See generally* JOHN R. HICKS, VALUE AND CAPITAL (2d ed.1939).

10. KENNETH J. ARROW, INST. FOR MATHEMATICAL STUDIES IN THE SOC. SCI., TECHNICAL REPORT NO. 146: OPTIMAL CAPITAL POLICY WITH IRREVERSIBLE INVESTMENT 2 (1966).

can be characterized in Arrow's language as a fundamental question about whether a current "myopic" decision optimally reflects future contingencies.[11] Although the theory of capital does not explicitly model optimal time horizons, the concept of optimality is central to the underlying framework.[12]

One way to conceptualize the notion of an optimal time horizon is to imagine a functional distribution that describes the costs and benefits arising from a range of time horizons. This functional distribution could be applied to investor time horizons or, more generally, to temporal decision-making. The central notion is that there is a relationship between a time horizon and associated costs and benefits, just as the theory of capital more generally has assessed marginal costs and benefits.[13]

Consider Figure 1 below.



Along the x-axis is the potential time horizon of a decision-maker, ranging from the very short term on the left to the longer term as one moves to the right. Figure 1 can apply to time horizons in a very general sense. For example, the decision-maker might be a person responding to

11. *See id.* at 2–5 (describing the extent to which a "myopic" approach might incorporate future contingencies).

12. See *id.*

13. See *id.*

an email. With respect to a particular email, the decision-maker might respond instantly, or in a few minutes, or much later. Alternatively, the functional distribution could represent the time horizon of an investor, such as a hedge fund. The hedge fund might hold positions for only a few seconds, a few days, or a few years.[14]

Along the y-axis is the expected net benefit associated with a particular time horizon. Note that this formulation involves an assessment of the net benefit ex ante; the net benefit reflects the expected benefit from a particular time horizon at that point rather than potential ex post net benefits.

It is possible that this kind of expected net benefit specification would be constant (flat) regardless of time horizon. Alternatively, the expected net benefit associated with a particular time horizon could vary. The above discussion of the short-termism debate suggests that both sides recognize the potential for such variation: not every decision is optimally infinite or instantaneous. Although the functional specification of this variation is indeterminate, one stylized version would be a parabolic function like that described in Figure 1, which is concave (to the x-axis) with a maximum at some optimal time horizon.

This functional specification is consistent with the notion that time horizon choices are a kind of optimization problem. For example, responding instantly to an email might generate some benefit, but taking a moment to consider and craft a response might generate a greater benefit; conversely, after waiting too long to respond to the email, any benefit might begin to decline and at some point approach or reach zero. Similarly, a hedge fund might benefit more from a holding for a shorter or longer period of time, depending on the circumstances.

My claim here is not that the functional specification of net benefits from different time horizons follows any particular structure or shape. I will leave it to future scholars to develop theories about different specifications. Instead, I simply posit that in a particular situation there can be an optimal time horizon, and this optimal time horizon is likely to vary situationally.

This point is not merely theoretical. Consider hedge funds, generally, as an example. Some hedge funds are focused primarily on algorithm-driven strategies, and therefore would have an optimal time horizon

14. Historically, the median holding periods of hedge fund activists have been in the range of one year. *See generally* Alon Brav, Wei Jiang, Frank Partnoy & Randall Thomas, *Hedge Fund Activism, Corporate Governance, and Firm Performance*, 63 J. FIN. 1729 (2008).

skewed to the short term, with a maximum to the left in Figure 1.[15] Some hedge funds are focused on event-driven or market-based strategies for which the optimal time horizon might be several days or weeks.[16] Yet other hedge funds, including shareholder activists, have long-term optimal time horizons, in the range of one year or longer.[17] For such hedge funds, the maximum would be skewed further to the right in Figure 1. Based on empirical evidence, one might determine that different categories of hedge funds have different actual and optimal time horizons. I do not attempt to make that determination here; instead, my claim is simply that the optimal time horizon for these different categories of hedge funds is likely to vary.

Although generalized questions of time horizons can be controversial in theory, the optimal time horizon for a particular firm can be relatively straightforward in practice. For example, at the Berle IX Symposium, I raised the question of what the optimal time horizon would be for a firm that Professor Kent Greenfield and I might establish for one purpose: To bet on the Boston Red Sox winning the World Series in 2017. Putting aside questions of legality, what would be the optimal time horizon of such a firm and its investors? The answer is simple: Both would have an actual and optimal time horizon in the range of October 2017. The precise time horizon depends on several unknowns related to the playoffs, but at of the time of the symposium, the time horizon could be specified, undisputedly, as roughly three months.

It would make little sense to talk about the problems of short-termism for such a firm. Neither the investors nor managers of such a firm would focus on time horizons other than three months, unless they were trying to take advantage of fluctuations in the value of the bet over the interim before a result became known. Similarly, it would make little sense to talk about long-termism, permanent capital, or perpetual equity capital lock-in for such a firm. Professor Greenfield and I would plan simply to distribute any funds after the World Series (or not) and then dissolve the firm. Indeed, we might provide for such dissolution in advance so that our capital contribution would not be considered permanent in any event. To the extent we may worry about the long-term effects, we could do so separately (outside the context of this firm) but not because our time horizon as participants in the firm had changed.

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15. *See* Robert P. Bartlett III & Justin McCrary, *How Rigged Are Stock Markets?: Evidence from Microsecond Timestamps* (Nat'l Bureau of Econ. Research, Working Paper No. w22551, 2016) (describing trading by high-frequency traders as involving fractions of seconds).

16. *See* FRANK PARTNOY, WAIT: THE ART AND SCIENCE OF DELAY 43–48 (2012).

17. S*ee generally* Brav, Jiang, Partnoy & Thomas, *supra* note 14 (analyzing the benefits of hedge fund activities for shareholders and surveying the large-sample evidence about hedge fund activism).

Alternatively, consider Tejon Ranch Corporation, the target of an activist campaign that Professor Steven Davidoff Solomon and I launched in May 2015 and pursued for nearly two years.[18] Many of the most salient questions throughout our experience with Tejon Ranch related to optimal time horizons. Our optimal time horizon was roughly the same as our actual time horizon of about two years.[19] In less time, we would not have had the opportunity to meet with senior management, press our proposed reforms, attend an annual meeting, and follow up on our proposals; the expected costs would have been relatively high, and the expected benefits would have been low. On the other hand, if we had remained invested in the company for a period substantially longer than two years, then the expected costs (including illiquidity) would have been significantly higher; it is unlikely that a ten- or twenty-year time horizon would have yielded us many additional benefits.[20]

Note from the above discussion that it is unclear whether and when actual and optimal time horizons might coincide. One way of reframing the short-termism debate is to focus on the divergence between actual and optimal time horizons. Such a reframing might lead participants in the debate to be more specific about the nature of their criticisms and arguments, and to focus on what factors might cause a divergence between actual and optimal time horizons.

The above discussion also raises a broader question: When would it matter that an actual time horizon differed from the optimal time horizon? If markets are informationally and allocatively efficient, does it make sense to talk about an investor's optimal time horizon? Put another way, under what circumstances would an investor's time horizon matter? If markets are efficient, would there be any consequence when an investor's time horizon differed from the optimal time horizon of a firm?

This broader question could also help to focus the short-termism debate. The argument that investor time horizons are suboptimally short-term depends, at least in part, on the argument that short-term prices do not reflect certain information. For example, if various market failures or long-term externalities are not reflected in short-term prices, then a short-term investor time horizon might be suboptimal.[21]

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18. *See* Frank Partnoy & Steven Davidoff Solomon, *Frank and Steven's Excellent Corporate-Raiding Adventure*, ATLANTIC (May 2017), https://www.theatlantic.com/magazine/archive/2017/05/frank-and-stevens-excellent-corporate-raiding-adventure/521436/ [https://perma.cc/VZ8Q-VH8V].

19. *See id.*

20. Other investors in Tejon Ranch arguably had both longer and shorter optimal time horizons than ours. Several large shareholders told us their time horizon was measured generationally, or at least in decades. Yet, the volume of daily Tejon Ranch share trading was substantial, suggesting that many investors had shorter time horizons than two years. *See id.*

21. *See, e.g.*, PARTNOY, *supra* note 16, at 233–46.

Again, my point is that it is difficult to conclude that investor or manager time horizons are too short-term or too long-term without some idea of what the optimal time horizons might be. More fundamentally, such optimal time horizons are unlikely to be fixed or infinite. They are likely to vary, and any variation in optimality arguably should be a part of the policy discussion about investor time horizons.

II. POSSIBLE APPROACHES TO VARYING TIME HORIZONS

If one accepts the proposition that optimal investor time horizons vary, the next question is a normative one. What are the possible approaches to varying optimality in investor time horizons?

First, one approach would be to attempt matching the time horizon of a firm's managers to the *optimal* time horizon of the firm's investors in a way that is similar to duration matching for asset–liability purposes.[22] Of course, the viability of such an "optimal time horizon matching" approach would depend on being able to articulate a meaningful measure of optimality among a firm's investors. Such a measure would be easier to assess for small firms with a handful of investors or for larger firms with substantially homogeneous investor categories.

Much of the short-termism debate is arguably related to this idea of matching investor and manager time horizons. For example, the argument that the optimal time horizon of investors should be long-term, measured in decades, whereas the actual time horizon of firm managers is much shorter-term, measured in months, is really an argument that time horizon mismatch is normatively undesirable.

Second, an alternative approach would be to attempt to match the time horizon of a firm's managers to the *actual* time horizon of the firm's investors (as opposed to the optimal investor time horizon). This "actual time horizon matching" approach would depend on being able to articulate a meaningful measure of actual investor time horizons.[23] However, there is evidence that some such measures would be reasonably straightforward

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22. Insurance companies and pension funds often seek to match their liabilities with assets that will generate sufficient cash flows to cover those liabilities at the appropriate times and in the requisite amounts. *See, e.g.*, Zvi Bodie, *On Asset-Liability Matching and Federal Deposit and Pension Insurance*, 88 FED. RES. BANK ST. LOUIS REV. 323 (2006) (assessing the risks of asset-liability mismatches). One interesting question for proponents of the equity capital lock-in argument is whether equity investments—as presumably the longest-term investment assets—are an appropriate match for long-dated fixed liabilities.

23. For example, Anne Tucker has investigated the actual investor time horizons of mutual funds. *See* Anne Tucker, *The Long and Short of Portfolio Turnover Ratios and Mutual Fund Investment Time Horizons* (2017) (working paper) (on file with Univ. of Iowa Coll. of Law Journal of Corp. Law).

to calculate.[24] As with an optimal matching approach, reliance on an actual matching approach would be easier to assess for small firms or for larger firms with a more homogeneous investor base. Although one could calculate the mean or median actual investor holding periods, it is unclear the extent to which one should take into account the distribution of actual holding periods. Should the approach change for firms with an investor base that has a wider (or narrower) standard deviation of actual investor holding periods?

Another difficulty is that actual and optimal investor time horizons can change over time. How should the approach change as demographics, investor preferences, or technology change? For example, imagine a firm that has college-age investors today. Should that firm's approach to temporal decision-making change as these investors age? What if the age distribution of investors remains constant but the generational preferences change over time (as is likely if, for example, millennial investors care more about the longer term)? What if technology leads investors with shorter attention spans to adopt shorter time horizons?

Third, another alternative would be for firm managers to consider some time horizon other than actual or optimal investor time horizons, including a time horizon that matched the timing of potential externalities or the time horizon of non-shareholder stakeholders. Advocates of such positions might conclude that firm managers should have a long-term time horizon of, say, 100 years. If so, the debate about short-termism would benefit from a clear articulation of what that time period might be, along with bases for a conclusion that it is optimal.

Finally, one might decide to reject all of the above arguments and conclude instead that firm managers should not make decisions based on, or even consider, time horizons at all. Who might advocate such a position? Advocates of market efficiency would conclude that time horizons do not matter much, or alternatively, that the costs of a policy focusing on particular time horizons might be greater than the benefits. Instead, managers should simply follow the net present value rule and take on projects whose net discounted present value is positive; according to this approach, any questions about time horizons are implicitly resolved when managers calculate their cost of capital and discount future cash

24. Several of the participants in the Berle IX conference have undertaken efforts to specify investor time horizons for different categories of investors. *See id.* (assessing empirical research on mutual fund investor time horizons); K.J. Martijn Cremers & Simone M. Sepe, *Institutional Investors, Corporate Governance, and Firm Value*, 41 SEATTLE U. L. REV. 387 (2018) (assessing a range of empirical approaches to investor time horizons). Moreover, data regarding certain categories of investors' time horizons is available from Form 13-F filings and from commercially available databases.

flows.[25] Likewise, even if markets are not efficient, it might be too costly to implement policies focused on particular time horizons. As noted above, in practice, finance professionals often consider time horizons explicitly in their capital budgeting decisions, finance theory notwithstanding. Are such managers inappropriately short-sighted?

The above discussion demonstrates that the relative benefits and costs of the various approaches depend on the difficulty of articulating a precise actual or optimal time horizon. If it were costly to determine investor time horizons, then a policy that focuses on a precise temporal measure would be dubious. On the other hand, to the extent it is relatively straightforward to articulate an actual or optimal investor time horizon, a policy of ignoring investor time horizons is at least as dubious. The central question thus becomes whether it is possible to articulate the variation in actual and optimal investor time horizons in a meaningful and useful way.

III. CATEGORIES OF TIME HORIZON VARIATION

Next, I suggest some categories of investor time horizons. Although Figure 1 suggests that optimal time horizons are continuous, with small variations in net benefits for particular changes in time horizons, it arguably would be very costly to discern very small variations in actual or optimal time horizons with great specificity. However, it is relatively straightforward to distinguish categorically among clusters of investor time horizon variation. Put simply, time horizons can be put into buckets based on the length of time.

In previous research, I described ways in which temporal clusters can be useful in assessing a range of decisions.[26] I will not recite the details of that research here, but I will simply note that these temporal clusters are distinguished by significant and substantive differences in the physiological and financial aspects of decision-making that arise during different periods of time. Specifically, for purposes of categorizing investor time horizons, one might separate the x-axis of Figure 1 into four categories, which I will label: Preconscious, Fast-conscious, Slow-conscious, and Discounting.

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25. As noted above, the key question would be about net present value (NPV) based on assumptions regarding discount rates and timing, but the time horizon itself would not be determinative. It is worth noting, that many executives reject the NPV approach to the extent it has deleterious timing consequences. *See generally* John R. Graham et al., *The Economic Implications of Corporate Financial Reporting*, 40 J. ACCT. & ECON. 3 (2005) (finding that executives abandon the NPV rule when it would have negative quarterly earnings implications).

26. *See generally* PARTNOY, *supra* note 16.

Preconscious. Preconscious time horizons are generally in the range of 500 milliseconds or less.[27] The neuroscientist Benjamin Libet demonstrated that human beings are not capable of consciously reacting in less than half a second.[28] Most algorithmic and computer-driven or automated trading strategies are designed to execute and respond in milliseconds or even microseconds.

In the preconscious category, policy questions relate not to investor psychology but to market design. For example, might auctions more efficiently and fairly allocate the information gains to superfast trading? Should high-frequency traders be required to post intraday margin requirements? These are important questions but are not generally related to corporate governance.

From the perspective of investor time horizons, preconscious investors are categorically different. Indeed, they are arguably not "investors" at all. Share purchasers who trade in and out of stocks intra-day do not exercise the voting or litigation rights associated with share ownership.[29] To the extent algorithmic traders do not hold shares for more than a day, they typically are not even considered to be shareholders for corporate governance purposes.[30]

Fast-conscious. The fast-conscious category refers to time horizons ranging from half a second up to a few minutes.[31] During this time horizon category, human beings are capable of conscious reaction, but they also tend to make certain kinds of behavioral mistakes. Although there is no strong biological basis for the distinction some psychologists make between System 1 and System 2, one might think of the fast-conscious categories as belonging within System 1.[32]

In the fast-conscious category, investor protection themes become more important. From the perspective of investor time horizons, the fast-conscious category is a source of concern for some scholars and policy makers who worry about short-term focus. Are shareholders who buy and sell within a period of seconds and minutes less likely to incorporate a firm's long-term perspective? Under what circumstances will market prices adjust within the fast-conscious time horizon to reflect new long-

27. *See id.* ch. 1–4.

28. *See id.* at 28–31.

29. *See generally* Bartlett & McCrary, *supra* note 15 (analyzing trading positions that are purchased and sold intra-day).

30. For example, such purchasers and sellers of shares would not be counted as record date holders entitled to vote.

31. *See* PARTNOY, *supra* note 16, ch. 5–8.

32. *See generally* DANIEL KAHNEMAN, THINKING, FAST AND SLOW (2012) (arguing for a distinction between the faster, more automatic System 1 and the slower, more analytic System 2).

term information? Unlike the preconscious category, the fast-conscious category is a rich source of many of the fundamental questions in law and finance.

Slow-conscious. The slow-conscious category refers to time horizons of hours, days, weeks, and months.[33] This temporal category roughly corresponds to what some psychologists call System 2.[34] This is a more contemplative time horizon, though, it is not without behavioral effects. Slow-conscious decisions are prone to be based on "clock time," as opposed to "event time," so time periods can be used as measuring sticks in ways that are potentially suboptimal.[35]

In the slow-conscious category, questions about the quarterly and annual focus of the securities disclosure regime and compensation metrics used to measure executive performance become more relevant. Is the slow-conscious time horizon slow enough to incorporate the concerns suggested by those who argue that firms should be managed with the permanence of equity capital in mind?

Discounting. Finally, discounting refers to longer-term time horizons, also within the category some psychologists call System 2, but with a sufficiently long-term horizon of years and decades so that discount rates start to more significantly impact decisions.[36] For example, if an investor has a time horizon of decades, the discount rate becomes one of the most important, if not the dominating, determinants of value and return.

The discounting category encompasses the truly long term. From an investor time horizon perspective, the difficult questions about discounting are the extent to which long-term costs and benefits can be accurately measured, and also what discount rate is appropriate. To what extent should firms, or their regulators, apply lower social discount rates to long-term cash flows, as opposed to firm- or project-related cost of capital rates? Much of the short-termism debate is about externalities: how should the timing externalities be measured, and how should they be discounted?[37]

The lines between these four categories can be blurry but nevertheless help to divide time horizons roughly. If investors or managers

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33. *See* PARTNOY, *supra* note 16, ch. 9–12.

34. *See* Jim Holt, *Two Brains Running*, N.Y. TIMES (Nov. 27, 2011), http://www.nytimes.com/2011/11/27/books/review/thinking-fast-and-slow-by-daniel-kahneman-book-review.html (reviewing DANIEL KAHNEMAN, THINKING, FAST AND SLOW (2012)).

35. For a description of clock time vs. event time see PARTNOY, *supra* note 16, at 197–208.

36. *See id.* ch. 13–14.

37. I considered some of these questions, with a particular focus on firm decisions that impact human life, for Berle VIII. *See* Frank Partnoy, *Corporations and Human Life*, 40 SEATTLE U. L. REV. 399 (2017).

are skeptical about being precise in describing time horizons, they could begin by using the above categories. For example, trade organizations might group their institutional investor members based on their time horizon categories. Likewise, a board of directors might ask its proxy advisory or solicitation firms to divide the firm's investor base into the above four categories, with approximate percentages for each.

These four rough categories also should be useful to policy makers and therefore are relevant to my final topic here: how might policy makers use investor time horizons more precisely? I now turn to the potential policy responses to varying time horizons.

IV. TIME HORIZON-RELATED POLICY RESPONSES

Policy makers already take into account differences among the above four categories in various contexts, albeit not explicitly or precisely. For example, consider judicial doctrine. The business judgment rule and general judicial deference to business decisions can be thought of as jurisprudentially based on a relatively long-term slow conscious (or discount rate) temporal category. One reason for judges to presume business decisions are proper is that it is helpful for directors and officers to be able to make long-term plans without the scrutiny of litigation and adjudication, particularly if investors are too focused on short-term results. If policy makers believe that the appropriate temporal category for most business decisions is relatively long-term, the business judgment rule is an appropriate tool for implementing and supporting that belief.

Alternatively, if policy makers prefer to match managerial and investor time horizons, they might determine that a shorter time horizon is preferable. When it is likely that a company will be sold, or perhaps will become bankrupt, the optimal time horizon is arguably shorter. Accordingly, the business judgment rule might no longer be an appropriate jurisprudential mechanism in such circumstances, and instead, judges might consider implementing a policy based on a shorter-term time horizon, perhaps in the fast-conscious range.

Both the *Revlon* doctrine[38] and the zone of insolvency cases discussed earlier represent such a shorter temporal approach. If the sale or insolvency of a company is nearly inevitable, the rationale for deference to a longer-term time horizon becomes weaker. Courts view arguments from directors and officers more skeptically when it has become inevitable that a company will be sold.[39] Instead, the role of the managers become

38. *See* Revlon, Inc. v. MacAndrews & Forbes Holdings, Inc., 506 A.2d 173, 182 (Del. 1986) (requiring that board fiduciary duties in the context of a sale of the company be focused on the short-term interests of shareholders and applying enhanced scrutiny to board decision in this context).

39. *See id.*

shorter term: something closer to maximizing the sale price of the company and thus deferring longer term questions to the buyer. Likewise, courts focus on short-term transactions when a company is near bankruptcy. Judges become more skeptical of arguments that a particular long-term strategy is optimal under such short-term temporal pressures.

These jurisprudential approaches collectively vary based on investor time horizons. If the investor time horizon is very long-term, the business judgment rule is appropriate. If the investor time horizon is significantly shorter-term, enhanced judicial scrutiny might be more appropriate.

More generally, judges might decide explicitly when a time horizon is too short for purposes of corporate law and corporate governance. The intra-day ownership of high-frequency traders and their lack of involvement in corporate governance suggests that they should not be counted as investors in any meaningful sense. Moreover, the costs associated with determining the volume of algorithmic trading during specific intra-day time horizons are significant. But what about a shareholder who buys one millisecond before the record date cutoff and then sells immediately thereafter?

Beyond the judicial context, policy makers already have adopted rules that target behavioral effects in both the fast conscious and slow conscious categories. Suitability and margin requirements, as well as fiduciary rules, arguably are designed to protect some categories of investors in relatively short-term time horizons. Should policy makers be more explicit about time horizons in these circumstances? Might private ordering solutions be deemed more reasonable when the investor time horizons are longer-term but scrutinized when there is short-term time pressure? Consider for example the "cooling off" periods for purchases of some products, including cars.

With respect to the longest-term discount rate time horizon, there has been an extensive debate about the potential costs to future generations. Scholars have been particularly focused on questions related to social discount rates. Such focus is warranted because if a firm's cost of capital is used, then even very substantial long-term externalities, including degradation of the planet, have small present value costs. What if, instead of focusing on discount rates, policy makers were more explicit about time horizons in assessing costs? Should there be a difference between costs that will be incurred in one generation versus one century versus one millennium?

Finally, there are important policy questions related to the disclosure of time horizons, either in the four categorical clusters described above or perhaps more precisely. Should managers discuss or disclose their views

of investor time horizons? When might disclosure of time horizons be beneficial?

For example, investors could publish their actual holding periods, along with a statement about their optimal time horizons. Firms could study the holding periods of their investors and then publish their findings. It would be useful for other investors and policy makers—as well as firm managers—to have an estimate of not only mean and median investor time horizons but also statistical distributions. One might compare the average holding period of time horizons of a firm's investors with those of other firms, including peers, to determine if the company's investor base is relatively short-term or long-term. Firm officers could assess whether the time horizons of their projects, or perhaps their own subjective time horizons, are shorter or longer than those of their investors. Firm directors could discuss explicitly what they determine to be a firm's optimal time horizon and even state a temporal range publicly.

As noted above, these market participants probably already have a rough idea of a firm's investor time horizons, as well as some notion of what their managers' time horizons should be. They already know whether a significant portion of a firm's shares are held by index funds or other long-term investors. They likely know the extent to which shares are held by hedge fund activists or mutual funds, which might have somewhat shorter-term time horizons. Advisory services provide information about the distribution of investors among individuals and institutions. All of this information is now available in a limited fashion.

However, what is not available, or published, is a weighted average or range that describes the time horizons of a firm's investors as of a particular point in time. Such a number or range could be published on a quarterly basis, or perhaps more frequently, to enable the tracking of changes. Likewise, the statistical distribution of investor time horizons could be published, either in terms of percentiles or standard deviations.

A weighted average would give judges, scholars, and policy makers a more precise measure of the time horizons of a particular firm's investors. Instead of simply suggesting that one group of investors has a long-term perspective, or that a different group is overly short-term, the weighted average would give an overall view of the firm's investors' time horizons.

Alternatively, investors also could publish their own time horizons, both actual time horizons based on their holding periods and optimal horizons based on the subjective beliefs of their senior employees. These numbers also could be useful. Indeed, corporate managers might rely on these time horizons instead of attempting to calculate time horizons on their own.

In addition, both the constituents of institutional investors and their regulators would benefit from knowing explicitly such estimates of actual and optimal time horizons. For example, pensioners with a time horizon of many years or decades would benefit from knowing whether their pension fund has a substantially shorter-time horizon. Publishing time horizon data could pressure managers of institutional investors to implement trading strategies that would result in a convergence between their time horizons and the time horizons of their constituents.

The business media and investors generally, also arguably, would benefit from the publication of this information. The data could be used in place of, or to confront or interrogate, assertions about investor time horizons. One could refer explicitly to such published time horizons in place of more generalized notions of short-term versus long-term.

On the other hand, perhaps there is not much of an appetite for such data as compared to more generalized assertions. For example, data about activist shareholder holding periods showing that activists have relatively long holding periods (of a year or more) has been available for more than a decade, yet many academics and policy makers nevertheless assert that such activists are short-term in nature. The appetite to use and consume it might limit the utility of any additional information.

Such measures also would generate some empirical challenges. For example, how should one weight the presence of high-frequency traders that hold shares only intra-day and clear out their positions as of the close of trading? Arguably, those investors should not be included given the complexity of calculating their intra-day holding periods and their status as very short-term shareholders. But it would be difficult and costly to tabulate their intra-day positions.

The question of when time horizons should be disclosed could be determined case by case, based on an analysis of costs and benefits. My modest argument here is that the optimal amount of disclosure of specific time horizons is not likely to be zero. More generally, my argument is that policy makers should be more specific than simply asserting "short-term" or "long-term."

CONCLUSION

Scholars and policy makers should be more explicit about investor time horizons. Investors, managers, and regulators should be more precise and explicit about actual and optimal time horizons. And the debate about "short-term" versus "long-term" should evolve into a debate about more narrowly circumscribed temporal categories.

I have suggested some ways of thinking about how market participants and regulators might be more precise about investor time

horizons. Institutional investors could describe their actual time horizons by publishing their holding periods over time. Firms could publish the distributions of their investors' time horizons, including periodic averages and standard deviations along with a statement about their own optimal time horizons. Regulators could differentiate among entities based on their time horizons. Many policy makers, including judges, already make such distinctions, at least implicitly.[40]

Perhaps most importantly, scholars could be more specific about what they mean when they discuss the normative implications of short-termism. At minimum, critics of hedge fund activists could recognize that activists' time horizons are in the range of one year or more, instead of simply describing them generically as short-term. The debate about short-termism would benefit from greater specificity about time horizons.

40. Dell, Inc. v. Magnetar Glob. Event Driven Master Fund Ltd, No. 565, 2016, 2017 WL 6375829 (Del. Dec. 14, 2017) (referencing terminal periods in assessing valuation analysis).