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Controlling Externalities: Ownership Structure and Cross-Firm Externalities

Law Working Paper N° 603/2021
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Dhammika Dharmapala
University of Chicago Law School and ECGI
Vikramaditya Khanna
University of Michigan Law School and ECGI

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Abstract

The increasingly influential "universal owner" theory posits that index funds have incentives to reduce cross-firm externalities to maximize portfolio value. We develop a more general conceptual framework for understanding how firms' ownership structures and company law affect the internalization of cross-firm externalities. This approach takes account of the fact that across the world most firms have controlling shareholders. We introduce the concept of "controller wealth concentration" as a determinant of controllers' pecuniary incentives to internalize externalities. Our framework suggests that, in principle, dual class (and other controlling minority) structures have the hitherto ignored advantage of allowing controllers to diversify their personal wealth (thereby potentially mitigating cross-firm externalities). We provide some evidence that controllers' personal wealth is nonetheless typically undiversified and discuss possible reasons why controllers fail to diversify. We conclude that controlling shareholders typically have weak pecuniary incentives to internalize externalities, underscoring the importance of government regulation of externalities.

Keywords: Controlling shareholders; externalities; dual class stock I.

Dhammika Dharmapala

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Vikramaditya Khanna

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CONTROLLING EXTERNALITIES: OWNERSHIP STRUCTURE AND CROSS-FIRM EXTERNALITIES

Dhammika Dharmapala [†] **& Vikramaditya S. Khanna** [‡]

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Abstract

The increasingly influential "universal owner" theory posits that index funds have incentives to reduce cross-firm externalities to maximize portfolio value. We develop a more general conceptual framework for understanding how firms' ownership structures and company law affect the internalization of cross-firm externalities. This approach takes account of the fact that across the world most firms have controlling shareholders. We introduce the concept of "controller wealth concentration" as a determinant of controllers' pecuniary incentives to internalize externalities. Our framework suggests that, in principle, dual class (and other controlling minority) structures have the hitherto ignored advantage of allowing controllers to diversify their personal wealth (thereby potentially mitigating cross-firm externalities). We provide some evidence that controllers' personal wealth is nonetheless typically undiversified and discuss possible reasons why controllers fail to diversify. We conclude that controlling shareholders typically have weak pecuniary incentives to internalize externalities, underscoring the importance of government regulation of externalities.

Keywords: Controlling shareholders; externalities; dual class stock

I. INTRODUCTION

In the last decade, debates over core aspects of the corporation have taken center stage across multiple fields of scholarly inquiry.[1] Although there are many motivations for this renewed

[†] Paul H. and Theo Leffmann Professor, University of Chicago Law School (dharmap@uchicago.edu). We thank two anonymous referees, Dhruv Aggrawal, John Armour, Madison Condon, Luca Enriques, Zohar Goshen, Alperen Gozlugol, Daniel Hemel, Kobi Kastiel, Aniel Kovvali, Joshua Mitts, Michael Ohlrogge, Mariana Pargendler, Frank Partnoy, Elizabeth Pollman, Dan Puchniak, Gabriel Rauterberg, workshop participants at the University of Chicago, Columbia University, George Mason University and the Oxford Business Law Workshop, and conference participants at the American Law and Economics Association meetings and the Global Corporate Governance Colloquium (especially our discussant Yupana Wiwattanakantang) for helpful comments. We also thank Billy Stampfl, John Friess and Shreya Ram for outstanding research assistance. Dharmapala acknowledges the financial support of the Lee and Brena Freeman Faculty Research Fund at the University of Chicago Law School. Any remaining errors or omissions are our own.

[‡] William W. Cook Professor, University of Michigan Law School (vskhanna@umich.edu).

[1] As one example of a vast literature, see Colin Mayer "Reinventing the Corporation" *Journal of the British Academy*, 4, 53–72 (2016).

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attention, a critical one is rising concern about externalities generated by firms. The canonical example of such externalities involves activities giving rise to climate change and other adverse environmental consequences, although there are other significant examples as well (such as what many view as the role of some digital platform firms in facilitating hate speech and undermining democratic political systems).[2] As the harms from externalities grow and concerns over the lack of effective government regulation mount, there has been a growing emphasis on alternative mechanisms that may induce firms to internalize externalities.

A rapidly growing body of scholarship notes that changes in ownership structure have led to a handful of index funds owning increasingly large stakes in publicly traded firms in the U.S. and argues that these funds are beginning to approximate fully diversified investors (i.e., what are sometimes termed "universal owners"). Diversified investors care about the overall value of their portfolio, rather than about the value of any particular firm in isolation. This leads them to care about cross-firm externalities: a negative externality generated by one firm in their portfolio that may reduce the value of other firms in their portfolio (for instance, those adversely affected by climate change).[3] Thus, diversified investors will seek – where feasible – to induce firms' managers to take account of externalities that affect other portfolio firms.[4] This has led to extensive debate among scholars about whether index funds really have the incentives and capability to act in this way in diffusely held US firms.[5]

However, diffusely held firms are not the only ownership structure of importance. Most firms across the world (and many large ones in the US) are controlled firms.[6] For instance, the

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[2] e.g. Siva Vaidhyanathan *Antisocial media: How Facebook disconnects us and undermines democracy*. Oxford University Press, 2018.

[3] See e.g. Simon Dietz, Alex Bowen, Charlie Dixon, and Philip Gradwell. "'Climate value at risk' of global financial assets." *Nature Climate Change* 6, no. 7, 676-679 (2016). This study estimates that the "value at risk" of global financial assets due to climate change is quite substantial. As they explain (p. 676): "[T]here are two principal ways in which climate change can affect the value of financial assets. First, it can directly destroy or accelerate the depreciation of capital assets, for example through its connection with extreme weather events. Second, it can change (usually reduce) the outputs achievable with given inputs, which amounts to a change in the return on capital assets, in the productivity of knowledge, and/or in labour productivity and hence wages."

[4] See Hansen, Robert G., and John R. Lott Jr. "Externalities and corporate objectives in a world with diversified shareholder/consumers." *Journal of Financial and Quantitative Analysis* (1996): 43-68; Anabtawi, Iman. "Some skepticism about increasing shareholder power." *UCLA L. Rev.* 53 (2005): 561-599; Armour, John, and Jeffrey N. Gordon "Systemic harms and shareholder value." *Journal of Legal Analysis* 6, no. 1 (2014): 35-85; Coffee, John C. "The Future of Disclosure: ESG, Common Ownership, and Systematic Risk." *European Corporate Governance Institute-Law Working Paper* (2020); Condon, Madison, 2020. "Externalities and the Common Owner", 95 *Washington Law Review* 1; Gordon, Jeffrey N. "Systematic Stewardship." *Columbia Law and Economics Working Paper* 640 (2021).

[5] Many scholars express skepticism that index funds have the incentives to have much impact. See e.g. Morley, John D., "Too Big to Be Activist." 92 *Southern California Law Review* 1407 (2018); Christie, Anna, "The Agency Costs of Sustainable Capitalism" (January 13, 2021). *UC Davis Law Review*, Vol. 55, No. 2, 2021, Forthcoming, University of Cambridge Faculty of Law Research Paper No. 7/2021, Available at SSRN: https://ssrn.com/abstract=3766478; Giovanni Strampelli "Can BlackRock Save the Planet? The Institutional Investors' role in Stakeholder Capitalism" *Harvard Business Law* Review, forthcoming.

[6] For evidence on the prevalence of controlled ownership structures, see e.g. La Porta, Rafael, Florencio Lopez-de-Silanes, and Andrei Shleifer. "Corporate ownership around the world." *The journal of finance* 54, no. 2 (1999): 471-517; Faccio, Mara, and Larry H.P. Lang. "The ultimate ownership of Western European corporations." *Journal of financial economics* 65, no. 3 (2002): 365-395; Aminadav, Gur, and Elias Papaioannou. "Corporate control around the world." *The Journal of Finance* 75, no. 3 (2020): 1191-1246; Amel-Zadeh, Amir, Fiona Kasperk, and Martin

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FANG firms (Facebook, Amazon, Netflix and Google), which represented around 13% of the market capitalization of the S&P 500 in 2021, are *all* dominated by controlling shareholders.[7] Indeed, considered in the aggregate and across the world, controlled firms may matter more for generating (and, potentially, for controlling) externalities than diffusely held firms.[8] In light of this, we broaden the aperture in this paper to include controlled firms as well and develop a more general conceptual framework for understanding how firms' ownership structures and company law affect the internalization of cross-firm externalities. This contributes to the existing scholarship by analyzing a different set of legal and economic mechanisms, hitherto largely ignored, through which these externalities may (or, more pertinently, may not) be internalized.

The importance of controlled firms to addressing externalities raises a fundamental, yet largely unexamined, question. Under the presumption – which appears reasonable, as discussed below - that index funds have limited ability to influence the behavior of controlled firms with respect to these externalities, what other mechanisms might be available to encourage controllers to take into account the externalities their firms generate? Through this inquiry, we set the stage for developing a more general conceptual framework, as noted above.

To characterize the incentives of controllers with respect to externalities, we introduce a concept that we term "controller wealth concentration" (CWC). This is defined as the fraction of a controller's aggregate personal wealth that consists of stock in the firm that she controls. We argue that a controlling shareholder's CWC is a crucial determinant of the extent to which she is likely to internalize externalities (absent personal intrinsic motivation or liability risk).[9] In particular, a controller whose wealth consists entirely of stock in her controlled firm has little pecuniary incentive to avoid activities that adversely affect the value of other firms (except to the extent that avoiding such activities increases the value of the controlled firm itself, for instance by generating goodwill, or reduces its liability risks). The potential conflict between the interests of controlling shareholders with high CWC and diversified minority shareholders has given rise to litigation in the Delaware courts, highlighting the practical importance of this issue.[10]

Schmalz. "Mavericks, Universal, and Common Owners-The Largest Shareholders of US Public Firms" ECGI Finance Working Paper No. 838/2022 (2022) The last of these focuses of US firms, showing that a significant fraction have controlling blockholders.

[7] See discussion and evidence cited in Section III *infra*. The original source of the FANG acronym (now FAANG to reflect the addition of Apple) is Jim Cramer from MSNBC in 2013, see *Cramer: Does Your Portfolio Have FANGs?*, MAD MONEY, Feb, 05, 2013, available at: https://www.cnbc.com/id/100436754. If we include Microsoft and Apple in the FANG grouping then these six firms represent around 25% of the S&P 500 by market capitalization by the middle of 2021. See Edward Yardeni and Joe Abbott *Stock Market Briefing: FAANGMs*, July 2, 2021, available at: https://www.yardeni.com/pub/faangms.pdf.

[8] See Armour, Enrique and Wetzer, July 02, 2021 blog (https://www.law.ox.ac.uk/business-law-blog/blog/2021/07/corporate-carbon-reduction-pledges-beyond-greenwashing) which cites to https://climateaccountability.org/carbonmajors.html.

[9] We also define a related concept – the controller's delta – that represents the change in a controller's personal wealth when the value of her controlled firm increases by a dollar (taking account of any externalities that this increase in value imposes on other firms).

[10] A complaint was filed in the Delaware Court of Chancery in October 2022, stating (in part): "This is an action to remedy breaches of fiduciary duty by Meta's [the parent company of Facebook] directors and officers. Meta is the largest social media network company in the world, with 3.5 billion users—43% of humanity. Its business decisions inevitably create financial impact well beyond its own cash flows and enterprise value and have significant impacts on the global economy. While defendants have a duty to operate the Company as a business for the financial benefit of its stockholders, those stockholders are often diversified investors with portfolio interests beyond Meta's own

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On the other hand, a controller whose wealth consists primarily of assets outside of her controlled firm (i.e., with low CWC) can then decide whether or not to place those assets in a mostly diversified portfolio of other firms. If she chooses to hold a mostly diversified portfolio, then she will be more in the position of a "universal owner" who cares (mostly) about portfolio value. She will thus wish to choose policies for the controlled firm that take account of cross-firm externalities (and moreover, as a controller, is well positioned to influence the behavior of the controlled firm). Thus, controllers with low CWC who choose to diversify are more likely to internalize at least some of the cross-firm externalities generated by their controlled firms. Low CWC is then a necessary, but not sufficient, condition for diversified controllers and some degree of internalization.

Our framework thus suggests that the existence of cross-firm externalities fundamentally transforms how we should understand some of the most basic issues in corporate governance. For instance, a large literature in corporate law and governance has detailed the negative consequences of the divergence between cash flow rights and control rights typically associated with CMS. In particular, it is widely (and quite reasonably) thought that such a divergence creates incentives for controllers to engage in self-dealing transactions and to extract pecuniary private benefits of control (by, for instance, "tunneling" from the controlled firm to other related firms in which the controller holds larger cash flow rights).[11] Thus, for example, there has been a vigorous debate about whether a dual class structure (used typically to entrench founder control) is normatively desirable.[12] In contrast, within our framework, a dual class structure gives the controller the opportunity to diversify her personal wealth. A controller who does so (while facing greater incentives for self-dealing, as in the conventional account) also faces stronger incentives to

financial success. If the decisions that maximize the Company's long-term cash flows also imperil the rule of law or public health, the portfolios of its diversified stockholders are likely to be financially harmed by those decisions. . . For a corporation whose impact is so widespread, the well-established doctrine of stockholder primacy cannot be rationally applied on behalf of investors without recognizing the impact of portfolio theory, which inextricably links common stock ownership to broad portfolio diversification. The economic benefits from—indeed the viability of—a system of corporate law rooted in maximizing financial value for stockholders would vanish if it forced directors to make decisions that increased corporate value but depressed portfolio values for most of its stockholders. But this is precisely how the Company has operated: Defendants have ignored the interests of all of its diversified stockholders, making decisions as if the costs that Meta imposes on such portfolios were not meaningful to stockholders. This circumstance is particularly troubling because it favors the small subset of stockholders who control the Company through the ownership of highly concentrated positions of high-voting common stock, including the Company's CEO and Chairman. For this controlling subset, maximizing the value of the Company by undermining the global economy is financially beneficial." See *McRitchie v. Zuckerberg et al.*, available at: https://theshareholdercommons.com/wp-content/uploads/2022/10/Stamped-Complaint-FINAL-10.3.22.pdf

[11] See e.g. Bebchuk, Lucian A, Reinier H. Kraakman and George Triantis, 2000. "Stock Pyramids, Cross-Ownership and Dual Class Equity: The Mechanisms and Agency Costs of Separating Control From Cash-Flow Rights", in *Concentrated Corporate Ownership* (R. Morck, ed.), pp. 445-460; Masulis, Ronald W., Cong Wang and Fei Xie, 2009. "Agency Problems at Dual-Class Companies", 64 *Journal of Finance* 1697; Adams, Renee and Daniel Ferreira, 2008. "One Share-One Vote: The Empirical Evidence", 12 *Review of Finance* 51.

[12] See e.g. Gompers, Paul A., Joy Ishii, and Andrew Metrick. "Extreme governance: An analysis of dual-class firms in the United States." *The Review of Financial Studies* 23, no. 3 (2010): 1051-1088 for empirical evidence, and Bebchuk, Lucian A., and Kobi Kastiel. "The untenable case for perpetual dual-class stock." 103 *Va. L. Rev.* 585 (2017): for a normative discussion.

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internalize cross-firm externalities.[13] We present a simple example that illustrates the inefficiency that arises when an undiversified controller chooses firm policies that reduce aggregate shareholder wealth across the economy by failing to internalize cross-firm externalities (for instance, under a legal regime that mandates one-share-one-vote (OSOV)). In principle, a legal regime that permits the issuance of dual class stock can mitigate this inefficiency.[14]

We then use publicly available data sources to construct measures of CWC for the controlling shareholders of a global sample of 25 large and important technology-focused firms. In general, CWC is typically very high relative to that of a diversified portfolio, varying from about 50% to close to 100%. For instance, the controlling shareholders of Amazon and Facebook have CWC of over 90%. This situation prevails *despite* the existence of controlling minority ownership structures (generally termed CMS) – such as dual class stock – that permit controlling shareholders to exert control while holding modest cash flow rights. Thus, we observe primarily undiversified controllers, which should make it less likely that they will internalize cross-firm externalities. This, in turn, limits the capability of index funds to influence controlled firms with respect to cross-firm externalities.

While our analysis suggests that dual class structures create an opportunity for more diversified controllers, our data nonetheless shows that controllers typically do not avail themselves of this opportunity. We thus explore various possible explanations that may limit the extent to which controllers diversify, even when a CMS is available. These include founders' over-optimism about their firms, shareholders' desire to limit the extraction by controllers of pecuniary private benefits of control, the need to incentivize founders' ongoing effort, and founders' incentives to defer capital gains taxes. We discuss potential reforms that may motivate controllers to diversify their holdings, but ultimately conclude that these are likely to have only modest effects on controllers' incentives to internalize externalities.

The premise of the current literature on cross-firm externalities is that government failures and political dysfunction preclude the choice of socially optimal public policies to control corporate externalities. It is thus imperative, in this view, that viable alternative mechanisms

[13] Despite the emphasis in the discussion so far on negative externalities, such as those typically associated with climate change, the analysis above can be straightforwardly extended to the case of positive externalities. In principle, it is possible that firms may generate positive externalities for each other. Then, an undiversified controller (with high CWC) would fail to internalize these positive externalities and choose too low a level of activity for her firm. Inducing the controller to diversify would lead her to internalize these externalities and therefore to increase her firm's activity level.

[14] A recent working paper (Battocletti, V., Enriques, L. and Romano, A., 2022. Dual Class Shares in the Age of Common Ownership. European Corporate Governance Institute-Law Working Paper 628) addresses a similar set of issues. However, their central point is that dual class structures should be restricted so that undiversified controllers become less influential and diversified index funds can exert greater influence on firms' policies. This is quite different from the argument we develop about dual class stock potentially facilitating controller diversification. Another recent working paper (Pacces, A.M., 2023. Controlling Shareholders and Sustainable Corporate Governance: The Role of Dual-Class Shares. European Corporate Governance Institute-Law Working Paper, (700)) also discusses the links between dual class stock and externalities. However, its central claim is that index funds – while able to internalize externalities among their portfolio firms – are unable to incentivize innovation (for instance, to reduce carbon emissions). The paper suggests that providing founder/controllers with dual class stock can incentivize the latter to innovate. Our emphasis is instead on the incentives that dual class stock creates for controller diversification.

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emerge to internalize these externalities in this "second best" world. The "universal owner" perspective entails that the growth of index fund ownership provides precisely such a mechanism. However, we argue that the influence of index funds on portfolio firms' behavior is likely to be confined mostly to firms with no controlling shareholder. We then provide a broader perspective that encompasses controlled firms, which are of enormous importance globally, but are also very significant in the United States. In principle, diversified controlling shareholders can serve a similar internalization function as index funds, and would (if they so choose) be substantially more effective than index funds in influencing firms' behavior. However, examples of diversified controllers seem to be rare, and the potential policy levers for encouraging controller diversification are limited. This suggests that the potential for "universal ownership" via index funds to solve the pressing problems of corporate externalities is severely constrained in a world where undiversified controlling ownership structures play an important role.[15] This further

[15] Four fairly significant issues are bracketed in our analysis. One concerns the rather special (albeit widely-discussed) class of externalities involving product market competition. Here, the internalization of cross-firm externalities involves reductions in product market competition and reduces social welfare through the impact on other parties (such as consumers) whose welfare is impacted in the opposite direction to the relevant publicly-traded entities. In contrast, we focus on the case where – even though much of the externality may not be reflected in stock market values because some of the impact is on parties that are not listed firms – the stock market effects of the external harm are in the same direction as for entities outside the market. Because of this difference, our analysis would apply in reverse in the product market context. That is, ownership and control by undiversified controlling shareholders would be beneficial, as it impedes the internalization of product market externalities. Policy would aim to prevent these controllers from diversifying their portfolios. Our framework can thus shed some light on the product market context, even though it is not our primary focus.

Second, we do not directly address the case of state-owned enterprises (SOEs), where governmental entities are the controlling shareholders of publicly-traded corporations. It might be thought that political mechanisms, rather than pecuniary incentives, would be most determinative of whether SOEs take account of external harms. On the other hand, the basic premise of the literature on cross-firm externalities is that governments have failed to choose socially optimal public policies to control corporate externalities. Thus, one might not have much faith that political mechanisms would lead to the internalization of externalities. In any event, we do not focus on the SOE setting in our discussion.

Third, we do not discuss situations in which index funds might influence controlled firms in ways besides visible voting contests or engagements. There is mounting evidence in the context of diffusely held firms that index funds may often achieve certain goals without needing to proceed through (or complete or even win) a salient voting contest or engagement. See William T. Allen, Reinier H. Kraakman and Vikramaditya S. Khanna, *Commentaries and Cases on the Law of Business Organization* at 6.9.3.2 (6th edition, Wolters Kluwer, 2021); Michael Garland, Jennifer Conovitz, and Yumi Narita, *NYC's Comptroller Boardroom Accountability 3.0 Results*, Harv. L. School Forum on Corp. Gov., June 24, 2020. Available at: https://corpgov.law.harvard.edu/2020/06/24/nyc-comptrollers-boardroom-accountability-3-0-results/. These sorts of "behind-the-scenes" deals or successes may be likely with controlled firms as well for a number of reasons. For instance, the controller might be interested in the views of index funds (outside of voting outcomes) because such funds may be important in raising capital at some other point in time, the funds may have stakes (or be able to influence those with stakes) in the controller's other firms or investments, the funds may have expertise on the topic being considered, or the funds may be socially or politically salient enough that they can influence the reputation of the firm and the controller in important ways or even influence regulation. In our analysis, we do not address these alternative ways in which index funds might be important because these deals are difficult to observe and they seem sufficiently idiosyncratic that they do not appear to provide a reliable basis for expecting index funds to facilitate the internalization of cross-firm externalities.

Finally, we do not directly discuss in any depth conglomerate firms or diversified business groups, which are ubiquitous in many parts of the world. Conglomerate enterprises operate in various different industries, thereby partially replicating a controller with a more diversified portfolio (even when the controller's wealth is concentrated in the business group). Our framework suggests that these structures may have some under-appreciated advantages, but it should be noted that these structures often exist in legal and economic environments quite different from those in the United States.

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underscores the importance of working on government regulation, even though it also faces several challenges.

Part II outlines the emerging "universal owner" theory of the internalization of cross-firm externalities by index funds. Part III introduces the concept of CWC and provides descriptive empirical evidence on the magnitude of CWC in a sample of major firms. We then develop a simple example showing how CMS can enhance the likelihood that controllers diversify their personal portfolios. Part IV provides a general discussion of the implications, and Part V concludes.

II. THE "UNIVERSAL OWNER" THEORY: INDEX FUNDS AND EXTERNALITIES

The literature on how index funds (and large asset managers) impact firm externalities has grown substantially in the last few years. Indeed, there has been an outpouring of scholarship putting forward arguments for how index fund common ownership might be beneficial in reducing certain kinds of externalities (e.g., externalities related to climate change). This general point about the incentives of "universal owners" has been understood for a long time, and is explained as follows by Professor Anabtawi:[16]

> "[U]niversal owners can be expected to feel the impact of actions by one company in their portfolio on their other portfolio companies. In other words, through its extensive holdings, the universal shareholder internalizes many of the externalities generated by the companies in which it invests. Universal owners are thus likely to favor activities of firms in which they own shares that minimize negative externalities . . . to the extent that those activities impose costs on . . . other firms in which they own an interest."

More recently, scholars have sought to identify the theoretical construct of "universal owners" with index funds, especially the "Big Three" funds (BlackRock, Vanguard, and State Street Global Advisors). Professor Condon argues that the portfolio perspective of index funds explains their increasing involvement in climate-related activism.[17] Professor Coffee analyzes the growing demand among index funds for Environmental, Social and Governance (ESG) disclosures, and attributes this phenomenon to a situation in which "high common ownership enables institutions to take collective action to curb externalities caused by portfolio firms, so long as the gains to their portfolio from such action exceed the losses caused to the externality-creating firms."[18] In a related but somewhat distinct contribution – based on Modern Portfolio Theory rather than the theory of externalities – Professor Gordon conceptualizes the role of index funds as being to engage in what he terms "systematic stewardship." As diversified owners, index funds care little about the idiosyncratic risk that is specific to individual firms, but do care about systematic or market-wide risks that affect their entire portfolio. Thus, index fund managers should pursue engagement with firms not in order to increase firm-specific value, but rather to reduce firms' contribution to systematic risks (such as those arising from climate change).

[16] Anabtawi op. cit. fn 4 at 585.
[17] Condon, op. cit. fn. 4.
[18] Coffee op cit. fn. 4 at p. ii.

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There is an active debate about whether index funds, in reality, have sufficiently strong incentives to pursue this vision of portfolio value maximization and systematic stewardship. For instance, as Professors Bebchuk, Cohen, and Hirst argue, such stewardship entails monitoring and engagement costs, and there may be agency costs between the index fund manager and the accountholders.[19] While critics of the "universal owner" perspective have raised many cogent points, we do not take a stand on this question.[20] Instead, we accept the universal owner theory's premises for purposes of argument, while confronting this perspective with the reality of a world in which concentrated ownership and controlling blockholders are widespread phenomena.

In light of this, a question that is important for our analysis is whether index funds may be influential in determining behavior even at *controlled* firms with undiversified controllers. On *a priori* grounds, it may seem that the likely scope of index fund activism or engagement at controlled firms is more muted than at firms with dispersed ownership because the controller will ultimately decide what happens at the firm.[21] Index funds could threaten to sell all or some of their

[19] See e.g. Bebchuk, Lucian A., Alma Cohen, and Scott Hirst. "The agency problems of institutional investors." *Journal of Economic Perspectives* 31, no. 3 (2017): 89-102. Note that index funds *per se* do not make decisions - their investment advisors do, and their incentives are not the same as those of a person who owns the index fund. For example, a $1 billion rise in the fund's value does not usually translate into a $1 billion rise in the advisor's fees. Fees for most index funds are very small – indeed, that is one of the key features on which they compete – so that changes in the value of the fund (e.g., holdings in one industry) may not have as significant an impact on the size of the advisor's fees and may not be worth the costs of these actions. On the other hand, there is an emerging body of empirical evidence that is broadly consistent with the claims of the universal owner theory. Professors Dyck et al. find a positive relationship between institutional ownership and firms' environmental and social performance across 41 countries; they argue for a causal interpretation of this relationship (Dyck, Alexander, Karl V. Lins, Lukas Roth, and Hannes F. Wagner. "Do institutional investors drive corporate social responsibility? International evidence." *Journal of Financial Economics* 131, no. 3 (2019): 693-714.). Professors Chen, Dong and Lin (Chen, Tao, Hui Dong, and Chen Lin. "Institutional shareholders and corporate social responsibility." *Journal of Financial Economics* 135, no. 2 (2020): 483-504.) analyze the impact on measures of firms' corporate social responsibility (CSR) of exogenous increases in institutional ownership associated with reconstitutions of the Russell index. They find that increases in institutional ownership lead to improved CSR performance, consistent with a view that index funds encourage firms to take account of externalities. Perhaps the most direct evidence for the theory is that provided by Professors Azar et al. (Azar, J., Duro, M., Kadach, I. and Ormazabal, G., 2021. The big three and corporate carbon emissions around the world. *Journal of Financial Economics*, 142(2), pp.674-696). They collect data on engagements by the "Big Three" index funds (BlackRock, Vanguard, and State Street Global Advisors) on climate-related environmental issues in 2018 and 2019, using the fund sponsors' public disclosures, across a global sample of firms. They also construct a dataset of firm-level carbon dioxide (CO_2) emissions over 2005-2018. Using this data, they find that Big Three environmental engagements are targeted at large firms with high CO_2 emissions. They also find that increases in Big Three index fund ownership of firms are associated with lower CO_2 emissions (including when the focus is on exogenous increases in Big Three ownership generated by reconstitutions of the Russell index). This evidence does not, however, take account of the role of firms' ownership structure in mediating the frequency of environmental engagements by the index funds or the efficacy of these interventions. Moreover, the strongest causal evidence (based on Russell index reconstitutions) is restricted to US firms, and thus only applies to a market in which controlled firms are substantially less common than in most other countries.

[20] See e.g Roberto Tallarita "The Limits of Portfolio Primacy" Working paper, available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3912977. In addition, Michal Barzuza, Quinn Curtis, and David H. Webber "Shareholder Value (s): Index Fund ESG Activism and the New Millennial Corporate Governance." (2019) argue that index funds' increasing focus on climate change and on corporate social responsibility more generally is driven by the demands for socially responsible investing among the younger generation of investors (accountholders), rather than by considerations of internalization of externalities.

[21] A recent study argues that Stewardship Codes are likely to be ineffective in countries with primarily controlled firms. See Puchniak, supra note 13. See also Christie, supra note 9.

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shares if the controller resists certain suggestions, but given that index funds are supposed to hold a representative sample of the market that threat seems not entirely credible.[22]

III. CONTROLLING SHAREHOLDERS AND EXTERNALITIES

A. Controller Wealth Concentration (CWC)

Suppose that firm F is controlled by a controlling shareholder Z. Z has personal wealth that consists of both stock in firm F and various other assets. Controller wealth concentration (CWC) can then be defined as the fraction of Z's personal wealth that consists of stock in her controlled firm F (see the Appendix for a formal mathematical definition). For example, suppose that Z owns 60% of the stock of firm F and owns no other assets. Then, CWC = 1, or 100%. On the other hand, suppose Z owns 10% of F (while controlling F through a controlling minority structure such as dual class stock), the aggregate value of firm F is $100, and Z's personal wealth (including her stock in F) amounts to $200. Then, CWC = ((0.1)(100))/200 = 0.05 (or 5%).

Figure 1 illustrates the types of circumstances in which controllers may have high or low CWC. It is important to emphasize that a low CWC is a necessary, but not a sufficient, condition for controllers to have incentives (based on cash flow rights from stocks) to take account of the externalities generated by their controlled firms. Of course, a controller may have nonpecuniary motivations to take account of these externalities, but CWC is intended to capture pecuniary incentives. If CWC is high, then such pecuniary incentives will necessarily be very limited. Even if CWC is low, however, it may be the case that a controller's investments outside her controlled firm are in a small and non-diversified set of assets (for instance, other firms in the same sector as her controlled firm). In such circumstances, there may be very little incentive for the internalization of externalities. Thus, CWC is admittedly an imperfect measure of controllers' incentives. However, as we generally find high values of CWC, it is possible – notwithstanding the limitations

[22] A further conceptual point that we raise briefly here is that the growth of index fund activism may itself make controlled structures more common. For instance, consider an externality-generating firm that has value of $110 if it pollutes, but imposes a $12 aggregate cost on other publicly-traded firms. If it scales down its activity to the socially efficient level, its value falls to $100 (but it imposes no costs on other firms). Under dispersed ownership, index funds will be among the largest shareholders and can potentially influence its managers to behave in a socially efficient manner (so that the firm is worth $100). A concentrated blockholder who owns no other assets and bears no liability risk, however, would value the firm at $110 (operating at the larger scale that imposes costs on other firms). An equilibrium analysis would have to explain why such a blockholder would prefer a concentrated position in this firm rather than a diversified market portfolio (perhaps due to some idiosyncratic value of control), but it is possible that in some circumstances ownership of the firm would tend to pass to blockholders.

Perhaps most pertinently, index fund activism to restrain externality-generation may give rise to an arbitrage strategy for private equity (PE) funds. In particular, a PE fund could take a concentrated position in the firm in the example above, take it private, increase its activity level, and earn returns for several years that exceed the returns under dispersed ownership (and index fund influence). The price at which the PE fund would eventually sell the firm on the public market would likely reflect reversion to a dispersed ownership structure (and renewed index fund influence). Nonetheless, the firm would generate higher returns in the interim period for the PE fund than it would have under dispersed ownership. Such an arbitrage strategy would of course generate social costs. Whether it would be privately optimal for the PE fund would depend on a variety of factors (such as the length of the interim period), and would have to be analyzed more fully in an equilibrium framework. However, the possibility of such a strategy suggests that endogenous responses of ownership structure to index fund activism should be the subject of further research. It also underlines that the market for corporate control easily cannot solve – and indeed may exacerbate – problems related to externalities.

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of the CWC measure – to conclude that controllers have limited incentives based on cash flow rights from stocks to take account of externalities.

CWC captures the overall portfolio diversification of the controller. Z's *marginal* incentives to raise the value of firm F (despite potentially negative effects on other firms) can be measured by a related but distinct concept that we term "controller's delta" (by analogy to a concept widely used in the study of executive compensation).[23]

B. Controller Wealth Concentration (CWC): Estimates

To provide some preliminary evidence on the magnitude and distribution of CWC, we use various publicly available sources to collect data on controlling shareholders' holdings in controlled firms and their aggregate personal wealth.[24] We begin by identifying the largest technology-oriented firms by market capitalization, focusing on those for which a controlling shareholder can be identified, and data on his or her personal wealth and company holdings is available. This leaves us with the set of 24 firms and 24 controllers listed in Table 1. Some notable features of this data are that CWC is generally quite high, even for these very large firms and for these particularly wealthy controllers. For instance, the controlling shareholders of Amazon and Facebook have CWC of over 90%. This is the case even though controllers' holdings of the controlled firms' stock are not generally all that large in percentage terms – the mean holding is 14% and the median is 7%. Figure 2 illustrates this absence of any particularly strong relationship between CWC and controllers' shares of their controlled firm's common stock.

For a substantial fraction of these controllers, CWC is considerably below 100% (the mean is 65% and the median is 68%). Even the lower values of CWC, however, represent a dramatic over-representation of the controller's firm relative to its role in a fully diversified portfolio. If it were the case that controllers are diversified to a significant extent, they would potentially have greater pecuniary incentives to care about the externalities generated by the firm(s) they control: those externalities might impact investments the controller has in firms that are negatively affected by the externality (of course, externalities will not be fully reflected in other firms' values as some of the external effects will fall on parties other than listed firms, but this limitation applies to index funds as well). Further, if the costs of the externality were large enough the controller might prefer to take steps at the controlled firm to reduce these costs. Given her status as a controller, the

[23] Jensen, Michael C., and Kevin J. Murphy. "Performance pay and top-management incentives." *Journal of Political Economy* 98, no. 2 (1990): 225-264. There is an extensive literature on stock-based compensation for managers – e.g. Hall, Brian J., and Kevin J. Murphy. "Stock options for undiversified executives." *Journal of accounting and economics* 33, no. 1 (2002): 3-42 – but discussion of controller incentives has been more limited. Controller's delta is defined mathematically in the Appendix, but for present purposes a simple example suffices to elaborate on the concept and why we focus more on CWC. For example, if Z owns 60% of the stock of firm F and changes in the value of firm F do not have any spillover effects on other firms, then controller's delta = 0.6 (a $1 change in firm F's value increases Z's wealth by 60 cents). On the other hand, if a $1 increase in firm F's value reduces the value of other firms by 40 cents, then Z's ownership of these other firms will affect controller's delta and hence Z's marginal incentives to raise the value of firm F. When cross-firm spillovers exist, it is not possible to compute the controller's delta without knowing the magnitude of these external effects. Thus, we focus below on computing estimates of CWC.

[24] See the notes to Table 3 for the sources.

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controller would be more effective than index funds or small dispersed shareholders in achieving this aim.[25]

Further, one might expect the risk bearing costs of being over-weighted in one firm would provide a powerful incentive for (risk averse) controllers to diversify by relinquishing control. However, this must be weighed against the possibility that controllers capture private benefits of control. These may take various forms. For example, controllers may derive pecuniary private benefits by structuring related-party transactions (RPTs) in advantageous ways for themselves, such as by having firm F buy inputs at an artificially high price from a related firm in which Z owns 100% of the cash flow rights. Controllers may also derive nonpecuniary private benefits, for example from having the ability to implement their idiosyncratic vision for the firm. Thus, controllers may be reluctant to diversify if that means they must sell down their stake in their controlled firm (thereby sacrificing private benefits) in order to have the financial resources to purchase enough shares of other firms to diversify.[26]

Yet, it is not always necessary to relinquish control to diversify. If there are ways in which controllers could maintain control but still sell down their stakes in the controlled firm then they would be able to maintain control and still have the resources to diversify. Controlling minority structures – such as dual class shares – enable precisely this behavior.[27] Controllers retain control through, say, a dual class structure and can use the resources freed up by selling down their common stock to buy shares in other firms or in a market-wide portfolio. This enables controllers to diversify more easily and is potentially a social benefit of dual class shares and controlling minority structures that has not been discussed in the literature.

While a dual class structure allows controlling shareholders to diversify, our descriptive statistics in Table 1 and Figure 2 suggest that controllers typically do not avail themselves of this

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[25] A simple example might prove illustrative. Let us assume Z controls firm F with a 60% stake, and also owns shares in each of 10 other firms. An externality produced by F generates costs of $100 to each of the 10 other firms (i.e., a total of $1000) and that externality can be prevented if F spends $110 on precautions. If Z's stake in each of the 10 other firms is 7%, then she bears $70 in losses from the externality which can be avoided at a cost of $66 to her (60% of the $110 in precautions). One would expect her to push F to take the precautions to avoid the externality, assuming that undertaking the precautions does not violate any corporate law duties that the controller may have to the minority shareholders of firm F. Moreover, because she is F's controller (and does not need to coordinate with others) she is likely to be quite successful in ensuring this happens. Simply put, a *diversified controlling shareholder* will likely internalize some of the costs of externalities generated by the controlled firm and is better placed than other diversified investors to make the controlled firm change its behavior. We hasten to add that one can think of counter-examples where a diversified controller will still decide to favor the controlled firm. Our point, however, is not that diversified controllers will *always* internalize enough of the costs to act in the social welfare maximizing manner, but rather that they may often have incentives to do so and that compared to other diversified shareholders they may be more effective in changing the firm's behavior. Their effectiveness in changing the controlled firm's behavior is undoubtedly one of the reasons why controllers sometimes bear liability for their subsidiaries via statute – see Allen, Kraakman, and Khanna, supra note 18, at Ch. 8.

[26] There is a vast literature on private benefits of control – see e.g. Zingales, Luigi. "The value of the voting right: A study of the Milan stock exchange experience." *The Review of Financial Studies* 7, no. 1 (1994): 125-148; Dyck, Alexander, and Luigi Zingales. "Private benefits of control: An international comparison." *The journal of finance* 59, no. 2 (2004): 537-600.

[27] e.g. Bebchuk, Lucian A., Reinier Kraakman, and George Triantis. "Stock pyramids, cross-ownership, and dual class equity: the mechanisms and agency costs of separating control from cash-flow rights." In *Concentrated Corporate Ownership*, pp. 295-318. University of Chicago Press, 2000.

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opportunity. Of course, there are a number of important caveats to that evidence. It is limited to a small sample of very large firms. It is possible that controllers of smaller dual-class firms may be more diversified (although each of these smaller firms would typically have less impact in terms of generating externalities than the large firms on which we collect data). The sample also consists of technology companies, in which founders may play a particularly prominent role. However, controlling shareholders are also common in other sectors where externalities may be thought to be generated, such as energy and automobile manufacturing.[28] Finally, note that it is possible that CWC may be even higher if dual-class stock (or other controlling minority structures) did not exist. In our sample, we determine (using publicly available information, as reported in Table 1) whether each firm appears to issue dual-class stock or to have some other controlling minority structure (CMS). About 70% of the firms have such a structure, but the mean CWC for these firms (65%) is only slightly lower than that for firms without CMS (66%). In any event, our basic claim is merely that CWC tends to be very high, even with dual-class structures.

It is also possible that there may be variation across countries in CWC, especially based on governance and ownership structures. While there is some cross-country variation (US-headquartered firms have the lowest mean CWC of 59%; mean CWC is 70% for firms headquartered in China, 73% for Korean and Taiwanese firms, 87% for the single Australian firm, and 93% for the single Indian firm), average CWC is quite high for all countries. In particular, in no country is CWC sufficiently low that significant pecuniary incentives to internalize externalities would exist. It is also possible to group countries by the prevalent ownership structure, using data from a recent study by Professors Aminadav and Papaioannou of the ultimate ownership of a large global sample of firms.[29] They report the fraction of controlled firms for each country in their sample in 2012. For firms in countries that they classify as having the lowest fractions of controlled firms (Australia, Taiwan and the US), the mean CWC is 61%, while for other countries (with highly controlled ownership structures) mean CWC is 75%. While these numbers are somewhat different, both are quite high, such that it is unlikely that controller diversification is of great significance in either group of countries.

In the next subpart, we develop a detailed numerical example that clarifies the potential efficiency costs from the failure to diversify and provides a framework within which to discuss the possible reasons why controllers typically do not diversify.

C. Controller Diversification and Dual Class Stock: A Simple Example

Assume that firm F was founded by Z. Immediately prior to F's initial public offering (IPO), Z holds 50% of its stock. The other 50% of its stock is held by others, in particular by venture capital (VC) funds that are assumed to sell their stock as soon as F goes public. Z is wealth-constrained, in the sense that she has no source of wealth or assets other than her stock in F, and is risk-averse. Assume that holding a 50% stake is (just) sufficient to exert control of firm F. Z

[28] An earlier version of this paper reported (using publicly-available data sources) that the majority of the largest twenty-five firms in the energy and automobile sectors had controlling shareholders. However, due to a number of factors (including the prominent role of governments as controlling shareholders, especially in the energy sector) calculations of CWC for these sectors is challenging.

[29] Aminadav, Gur, and Elias Papaioannou. "Corporate control around the world." The Journal of Finance 75, no. 3 (2020): 1191-1246.

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derives a (nonpecuniary) idiosyncratic value of control (denoted IVC) when she is in control of F's decision making, as control allows her to pursue her idiosyncratic vision for the firm. For now, the utility gained from pursuing her idiosyncratic vision is assumed to be independent of the value of the firm and of its pecuniary returns. Initially, we assume away the possibility that Z can extract pecuniary private benefits of control (PBC), but this possibility is introduced and discussed later.

The timing of the scenario that we assume is depicted in Figure 3. At time 1, firm F goes public. The IPO decision is assumed to be exogenous, although we discuss later how incentives to go public might be affected by the different legal regimes that we analyze. The market portfolio, denoted by P, consists of a large number of firms (other than F), each of which is potentially subject to negative spillovers from F's activities. At the time of the IPO, the VC investors are assumed to exit, and the stock they sell is bought by widely dispersed risk averse investors who are fully diversified, in the sense that they hold the market portfolio P. The crucial decision at time 1 is taken by Z, who decides whether to sell her stock in F and use the cash proceeds to buy the diversified portfolio P (thereby relinquishing control of F, under the one-share-one-vote regime discussed below, though not under a dual-class regime), or to hold on to her F stock (and thereby retain control, even in the one-share-one-vote regime).

At time 2, firm F decides whether to undertake a high (H) or low (L) level of activity. In practice, Z makes this decision if she has retained control at time 1. Alternatively, if Z has not retained control, firm F's choice is made by a Board representing diversified outside shareholders (reflecting the latter's interest in maximizing the value of their diversified portfolio). Importantly, it is assumed that there is no commitment that can be made at time 1 about the decision at time 2; for instance, Z cannot commit at time 1 to choose H at time 2.

Choosing H increases F's value but imposes a negative externality on all other firms. While the external harm experienced by any individual firm is assumed below to be small, the aggregate external harm (summed across all firms in P) is assumed to be larger in magnitude than the incremental gain to F's value from choosing H rather than L. Thus, L is the socially efficient – and market-portfolio-value-maximizing – choice. It is assumed that firm F (whether or not it is controlled by Z) faces few serious legal constraints in choosing between H and L. For instance, corporate law is assumed not to compel firm F to take account of the harms to other firms, nor to require that F ignore harms to other firms. This assumption seems reasonable in the light of the discussion of the relevant legal doctrines in Section IV below.

Finally, at time 3, the values of the firms are realized. From the perspectives of time 1 and time 2, the ultimate value of F is a random variable – that is, it is partly determined by chance and hence risky. This uncertainty is resolved at time 3. If firm F chose H at time 2, then the values of F and P realized at time 3 reflect the consequent gain to F and the harms to other firms. Specifically, ex ante (prior to time 3), there are two possible contingencies, each of which occurs with probability ½. In the first (the "good" contingency from the perspective of firm F), F's value is 12 under H and 10 under L. In the second (the "bad" contingency from the perspective of firm F), F's value is zero, regardless of whether it chose H or L at time 2. The value of the diversified portfolio P is assumed to be deterministic (i.e. not random), and hence is unaffected by whether the first or second contingency occurs. The assumptions here abstract from market (or systematic) risk, and focus on the impact of the external harms generated by firm F on the value of P. In particular, if F

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chooses L at time 2, the value of P is 1000, and if F chooses H at time 2, then the value of P is 998. Thus, the losses from choice H to other firms (1000 – 998 = 2) exceed the expected gain of (½)(2) = 1 to firm F. Table 4 shows the values of firm F and the market portfolio P under each possible scenario (i.e. each contingency under each choice of activity level by F). Note that, strictly speaking, the "market portfolio" following F's IPO should include firm F. However, it is convenient in characterizing the outcomes to distinguish between P (the market portfolio excluding firm F) and firm F; moreover, as long as F is small in relation to the aggregate market, its exclusion from P makes little difference.

Using this simple framework, we analyze the outcomes that result under two alternative legal regimes – one that mandates a one-share-one-vote (OSOV) rule, and one that permits firms to issue dual class stock.

C.1) Outcomes under One-Share-One-Vote (OSOV)

Under an OSOV regime, Z faces two possible choices at time 1. The first is to retain her 50% stake in F and maintain control, while the second is to sell this stake and diversify by using the cash proceeds (which, by assumption, are Z's only source of wealth) to buy the market portfolio P. In the latter scenario, it is expected that firm F will choose L (a low level of activity) at time 2, and so market participants anticipate that F will have a value of either 10 or zero at time 3 and that P will have a value of 1000.[30]

Investors in the market are assumed to be fully informed and rational. They anticipate that if Z is in control at time 2, Z will choose H or L to maximize her expected payoff. This consists of her expected wealth, her IVC and a risk premium, denoted R, that reflects her loss from risk-bearing. This expected payoff can be expressed as:

$$E[W_Z] + IVC - R$$

where IVC is the idiosyncratic value of control (assumed to be a utility gain to Z from being in control, and not a transfer from minority shareholders) and R is the loss from bearing risk (and is equal to the risk premium Z would pay to be insured against this risk). Investors also anticipate that if Z is not in control, a Board representing diversified outside shareholders will choose the activity level to maximize diversified shareholders' expected wealth. In these circumstances, it is clear that the Board will choose L.

If Z chooses at time 1 to retain ownership and control, it is clear that Z will then choose H at time 2. Thus, the expected value of F is (1/2)12 + (1/2)0 = 6. As Z owns 50% of F, Z's expected wealth is 3 (albeit with variance of 36 and thus a loss R from risk-bearing). Z's payoff is thus:

$$3 + IVC - R$$

[30] Note that any intermediate strategy on the part of Z – selling part of her stock and ending up somewhat diversified but over-weighted in F relative to F's share of the market – is clearly dominated by one or other of the choices sketched above. An intermediate strategy will result in a loss of control (and hence the loss of IVC), while leaving Z less than optimally diversified. Thus, we can focus only on the choice between the two options described above.

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Suppose instead that Z sells her stock and diversifies at time 1. Then, investors anticipate that F will choose L at time 2 and so the expected value of F is (1/2)10 + (1/2)0 = 5.[31]

We normalize the market return between time 1 and time 3 to zero, which implies that diversified outside investors are willing to pay the expected value for Z's stock at time 1. Thus, Z's stock in F is worth half the expected value of F, conditional on the choice of L at time 2. The expected value of F conditional on the choice of L is denoted by $E[F_L]$ = ½(10) + ½(0) = 5. Thus, Z raises 2.5 from selling her stock at time 1, and is assumed to use this cash to buy the diversified portfolio P. Z's payoff is thus 2.5 with certainty (as IVC and R are both equal to 0 when Z has no control and faces no risk).

Thus, retaining ownership and control will be preferred by Z when IVC > R – 0.5. For example, if we assume that IVC = R = 1, then Z will choose to retain ownership and control. When Z chooses to retain ownership and control at time 1, the choice at time 2 is straightforward. H leads to wealth of either 6 or 0 (each with probability ½), while L leads to wealth of either 5 or 0 (each with probability ½), so H is preferred (note that although H involves greater risk, this risk is all on the upside). Given that Z chooses H, aggregate shareholder wealth is the sum of the value of P (which is 998 when F chooses H) and the expected value of F ($E[F_H]$ = 6) – i.e. 1004. This characterization of shareholders' aggregate payoff ignores the small amount of risk entailed by the two possible contingencies for firm F, but this is innocuous to the extent that F is small in relation to the aggregate market.

C.2) Outcomes when Dual Class Stock is Permitted

Now suppose that dual-class stock can be issued at time 1. In particular, we assume in this subsection that when dual-class stock is issued F has two classes of stock – class A stock (which has sufficient voting rights to exert control and – for simplicity – no cash flow rights) and class B stock (i.e., common stock). As before, we assume that Z holds 50% of the common stock; we add here the assumption that Z initially holds all the voting stock. In principle, Z could sell the voting stock to someone else (who would then become the controller). However, if we assume that Z's IVC > 0 and everyone else has IVC = 0 (or at least that Z's IVC exceeds anyone else's) then Z will always wish to retain control via holding the voting stock.

Clearly, dual class stock allows Z to retain control and enjoy IVC while also diversifying her asset holdings to eliminate firm-specific risk. Given that she always retains control via the voting stock, what will Z do with the common stock at time 1? If she holds it, then she will choose H at time 2. Thus, the expected value of F is (1/2)12 + (1/2)0 = 6. As Z owns 50% of F, Z's expected wealth is 3 with variance of 36, just as under OSOV, and her expected payoff is identical to that from retaining control under OSOV (i.e., Z's payoff = 3 + IVC – R). If Z sells her common stock at time 1, unlike under OSOV, Z still has control. However, having diversified, Z will choose L rather than H at time 2. Buyers of Z's stock are willing to pay 2.5 for her common stock, under the same assumptions as before. Thus, Z raises 2.5 from selling her stock, and uses this cash to

[31] By assumption, those investors who buy Z's stock at time 1 are fully diversified. Thus, they care only about the expected value when deciding how much to pay for F's stock and do not care about F's idiosyncratic risk (more generally, they would care only about the relationship between F's idiosyncratic risk and the systematic risk of the market portfolio, but the latter is assumed away here for simplicity).

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buy the diversified portfolio P. Z's payoff is now 2.5 + IVC (as Z still gains the idiosyncratic value of control).

If R > 0.5 (i.e., Z's risk-aversion is sufficiently large in relation to the gains to F from pursuing the externality-generating activity), then Z will choose to sell the common stock and diversify (regardless of how large IVC is). This will happen, for instance, under the assumption made earlier that R = 1. Permitting dual class stock obviously makes Z better off, by allowing her to retain control and enjoy IVC while also diversifying and eliminating firm-specific risk. Moreover, permitting dual class stock also increases aggregate shareholder wealth. When Z diversifies and chooses L, aggregate shareholder wealth is the sum of the value of P (which is 1000 when F chooses L) and the expected value of F ($E[F_L] = 5$) – i.e., 1005. This is higher than the value of 1004 under OSOV when Z chooses H, for instance under the assumption made earlier that R = 1). Thus, a legal regime permitting dual class stock potentially makes the ordinary diversified shareholder better off through the internalization of cross-firm externalities.

C.3) Factors Constraining Controller Diversification

Despite the opportunity that a dual class regime creates to diversify while retaining control, the evidence in Table 1 indicates that controllers of dual class firms (such as Facebook) typically fail to diversify and have very high values of CWC. Large-sample evidence on the effects of dual-class structures on controller holdings is scarce. However, an exception is a study by Baugess and Sushka using a sample of 142 US firms that change from OSOV to a differential voting structure over 1978 to 1998.[32] They find that dominant shareholders do indeed divest some of their holdings of common stock following these changes, consistent with greater diversification of their personal wealth. However, the magnitude (about a 5% reduction in cash flow rights) appears insufficient to yield a large reduction in CWC.

In our simple framework, the only reason why Z may choose to hold on to the common stock of F is a low degree of risk aversion in relation to the gains to F from pursuing the externality-generating activity (for instance, if R < 0.5 in the example). In reality, there are additional reasons why a controller may retain common stock. This subsection describes four of these – optimism bias, private benefits of control, controllers' incentives to exert effort, and the deferral of capital gains taxes. Note also that, in reality, divestment by Z of her F stock does not necessarily imply that Z will then invest in a diversified portfolio. Z could buy any of a wide variety of assets with the proceeds from the IPO. If these assets happen not to be significantly affected by the external harms generated by F, then any incentive to choose L rather than H would be attenuated (even when CWC appears to be low).[33]

C.3.1) Optimism Bias

[32] Bauguess, S.W., Slovin, M.B. and Sushka, M.E., 2012. Large shareholder diversification, corporate risk taking, and the benefits of changing to differential voting rights. Journal of Banking & Finance, 36(4), pp.1244-1253.

[33] As founder/controllers are typically quite wealthy, it may not be realistic to imagine that – in the counterfactual scenario in which they divest – they would invest in, for instance, an index fund. The most natural investment vehicles for wealthy individuals may involve a search for "alpha" (i.e. returns in excess of those on a diversified market portfolio), and thus may not be diversified. The practical difficulties associated with controller diversification tend to reinforce the general point we make that controllers are typically undiversified.

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Perhaps the most intuitively appealing reason for founders to hold on to substantial cash flow rights – even when this is unnecessary for control – is over-optimism about the value of their firms. For instance, suppose that Z wrongly perceives the value of F in the top left cell of Table 2 as being 18 rather than 12 and that in the top right cell of Table 2 as being 15 rather than 10. Essentially, Z believes the upside potential of F is greater than it really is.[34]

Consider the outcomes under the dual class regime. Holding all other assumptions fixed, if Z were to sell at time 1 and diversify, she would receive 2.5 from outside investors (who do not, by assumption, share Z's over-optimism about F, and whom Z may view as being overly pessimistic).[35] Z's payoff is thus 2.5 + IVC, as above. Z's perceived expected value of F from holding her common stock at time 1 (and therefore choosing H at time 2) is (1/2)18 + (1/2)0 = 9 and her expected wealth is thus 4.5 (versus 2.5 with certainty by selling and diversifying). For R = 1, Z will prefer to hold her common stock at time 1. This may be a plausible scenario in that founders of startups are often thought to be over-optimistic about their firms' prospects of success, and this trait may carry over to the post-IPO setting as well.[36]

C.3.2) Private Benefits of Control

The basic framework described above assumes a nonpecuniary IVC, with no possibility of Z extracting pecuniary private benefits of control. In reality, it is possible that when Z has control via the voting stock and holds low cash flow rights (i.e., when she sells the common stock and diversifies), she will have greater incentives to extract pecuniary private benefits of control (PBC) than if she held on to the common stock and had greater cash flow rights.

For instance, suppose that Z extracts $4 of PBC when diversified in contingency 1 (i.e., when L is chosen), but would extract zero PBC when she holds the common stock (i.e., when H is chosen). Note that no PBC can be extracted in contingency 2, where the value of F is zero. Then, rational forward-looking investors will anticipate that F's value with a diversified controller will

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[34] Obviously, this is not the only way to formulate optimism bias: Z could instead (or also) overestimate the probability of contingency 1, or believe that the downside in contingency 2 is not as bad as it really is. These alternative formulations also lead to similar conclusions, however. Another possible distinction is between optimism bias about firm F's prospects (regardless of who manages it) and optimism bias about firm F's prospects when it is managed by Z. The former would lead Z to demand high cash flow rights in F but not necessarily to maintain control (indeed, Z may be willing to sell her voting stock in a dual class setting while retaining her common stock). The latter would entail maintaining control (via the voting stock) while also holding a large amount of common stock to benefit from the perceived high returns that F is thought to generate. While these possibilities have somewhat different implications, they would both lead Z to be an undiversified holder of F stock.

[35] In principle, a related but distinct possibility is that Z is not over-optimistic, but rather that outside investors are irrationally pessimistic about F's value. That scenario would also induce Z to hold on to her common stock, as potential buyers would not be willing to pay its true value. This, however, requires a significant degree of market inefficiency, as underpricing due to the excessive pessimism of outside (retail) investors is readily subject to arbitrage. In contrast, it may be difficult for arbitrage to correct Z's optimism bias.

[36] See Barros, Lucas Ayres Barreira de Campos and Di Miceli da Silveira, Alexandre, "Overconfidence, Managerial Optimism and the Determinants of Capital Structure" (February 25, 2007). Available at SSRN: https://ssrn.com/abstract=953273; Verheul, Ingrid and Carree, Martin A., "Overoptimism Among Founders: The Role of Information and Motivation" (March 2008 3,). ERIM Report Series Reference No. ERS-2008-008-ORG, Available at SSRN: https://ssrn.com/abstract=1117785.

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be ½ ($E[F_L]$ - PBC) = ½(10 – 4) = 3. Thus, Z will receive 1.5 at time 1 for her 50% stake in F, while also receiving expected PBC = 2. Z's payoff from diversifying will be 1.5 + 2 + IVC = 3.5 + IVC. The payoff from retaining her stock (and, by assumption, extracting zero PBC) is 3 + IVC – R (as above). Thus, Z will choose to sell and diversify at time 1 (regardless of the value of R).

Aggregate shareholder wealth in the scenario above will be the sum of the value of P (which is 1000 when F chooses L) and the expected value of F to outside shareholders ($E[F_L]$ – E[PBC] = 5 – 2 = 3) – i.e. 1003. This is lower than aggregate shareholder wealth of 1004 when Z chooses H. Thus, outside shareholders may encourage Z to retain a substantial holding of cash flow rights in F in order to disincentivize the extraction of PBC. It should be noted, however, that for outside shareholders to be worse off due to Z's extraction of PBC, it is necessary that the magnitude of PBC is quite large in relation to the economy-wide external harms from F's activities.

Note also that in reality it may be the case that Z's control raises the expected value of firm F. This can be accommodated within our framework by assuming a higher value for F in contingency 1 when Z is the controller. Under the OSOV regime, this will tend to make Z more inclined to retain control (and hence more likely to choose H). It makes no difference under the dual class regime, where (under our assumptions) Z will always retain control via the voting stock. Thus, taking account of value effects of control by Z tends to reinforce the basic conclusions above.

C.3.3) Incentivizing Controller Effort

A possibility that is also not part of our basic framework is that Z may face stronger incentives to exert effort (in implementing her idiosyncratic vision or in managing the firm more generally) when she has greater cash flow rights in F (i.e., more "skin in the game"). Thus, even if she were to sell and diversify at time 1, the Board may provide her with stock-based compensation at time 2 that leads to her being over-weighted in F. If this over-weighting is sufficiently large, Z will choose H rather than L at time 2 (and, anticipating this, may prefer not to sell and diversify at time 1).

For instance, suppose that the value of F in contingency 1 when Z is diversified and chooses L is not 10 (as in the top right cell in Table 2) but rather 6, due to low effort by Z. This would make diversification less attractive to Z, but suppose that due to either the extra utility obtained from lower effort or a high degree of risk aversion (or some combination of the two) Z nonetheless diversifies (and therefore chooses L). Aggregate shareholder wealth in this scenario is the sum of the value of P (which is 1000 when F chooses L) and the expected value of F to outside shareholders ($E[F_L] = 3$) – i.e. 1003. This is lower than aggregate shareholder wealth of 1004 when Z retain her stock and chooses H. Thus, aggregate shareholder wealth is higher in this example when Z is undiversified and exerts greater effort. This possibility also implies that the diversification outcome is less likely to occur under the dual class structure, and so represents a countervailing consideration to the internalization of externalities.

However, this outcome requires that the productivity of Z's incremental effort due to being undiversified is quite large in relation to the economy-wide external harms from F's activities. It is also worth noting the following two points. First, diversified shareholders of F would want Z to exert effort, but would also take account of the external harms of choosing H. This would temper

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their inclination to compensate Z with large amounts of stock in F (or any preference on their part that Z not diversify at time 1). Second, the amounts of stock or stock options that are granted to managers are often substantial, but typically are far smaller than the stock holdings of founders/controllers who choose not to diversify. Moreover, these grants generally take the form of stock options that, while they give the manager an undiversified stake in the firm over the vesting period, tend to be exercised and sold (enabling diversification) soon after vesting. The incentivization of Z's effort through stock-based compensation is likely to have similar features to managers' stock-based compensation, and these would limit the extent to which it would leave Z over-weighted in F stock.

C.3.4) Deferring Capital Gains Taxation

The discussion so far has not taken account of the likelihood that at the IPO stage (time 1 in Figure 5) Z's stock is likely to have appreciated substantially in value since the founding of firm F. Founders such as Z receive large amounts of stock in their firm as compensation for their labor and ideas.[37] As a general matter, stock received as compensation is taxed as ordinary income at the time that it is vested (that is, no longer subject to restrictions on sale). However, founders can make what is known as a Section 83(b) election to elect to be taxed immediately on the value of the stock grant as ordinary income, while treating future appreciation as capital gain (that is subject to a lower tax rate imposed at the time of future sale). The reported value of the stock grant is typically small - which may be reasonable in view of the high probability that startups fail – and implies a small tax liability at the time the firm is founded.

However, the upshot of this situation is that a founder (such as Z) of what turns out to be a successful startup will reach time 1 in Figure 5 with a large embedded gain. Selling her stock in order to diversify her portfolio would trigger capital gains tax on this gain. Retaining her stock – while exposing her to continued firm-specific risk – would enable the deferral of capital gains tax until a realization event occurs. Moreover, if Z were to hold the stock until her death and bequeath it to her heir, the tax basis of the stock would be "stepped up" to its market value at the time of Z's death (exempting her heir from being taxed on the gain that occurred over Z's lifetime).[38] Thus, there will often be a fairly powerful tax incentive for Z to defer the sale of her stock at time 1, even if she is somewhat risk-averse and has an unbiased expectation about the future value of F.

If the deferral of capital gains taxes were the sole reason for controller nondiversification, there would be an incentive for Z to attempt to divest herself of her economic stake in firm F by some means other than a sale, in order to diversify her portfolio. Tax deferral in itself does not require that Z exert control or be active in management. However, provisions of US tax law designed to prevent the avoidance of capital gains taxes create obstacles to a strategy of divesting without triggering taxation. In particular, the constructive sale provisions of §1259 treat certain transactions that would eliminate Z's economic exposure to firm F as equivalent to a sale (including short sales that offset Z's long position in F and certain derivative transactions that have similar effects).[39] Thus, Z is essentially locked in to holding F stock if she wishes to defer taxation

[37] Fleischer, Victor. "Taxing Founders' Stock." *UCLA L. Rev.* 59 (2011): 60.
[38] 26 U.S. Code § 1014.
[39] 26 U.S. Code § 1259. It has been argued that these provisions play an important (albeit indirect and unintended) role in underpinning the current structure of stock-based executive compensation by imposing a tax penalty on

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of gains. This severely limits her ability to simultaneously diversify her portfolio and continue to defer taxation of gains.

The realization doctrine – the deferral of capital gains taxation until sale – is generally thought to give rise to various inefficiencies such as the lock-in effect (a tendency to maintain the same portfolio over time to defer taxation, even when it is no longer optimal). The possibility that founders/controllers retain stock in their firm in order to defer capital gains taxes – thereby placing themselves in a situation where they are less likely to internalize external harms generated by their firms – represents a distinctive variant of the wider lock-in effect. There is a long tradition in the tax policy literature of proposals to replace the realization doctrine with alternatives, such as imposing an interest charge on deferred taxes or taxing the appreciation of assets independently of whether they are sold or not.[40] Increasing controllers' diversification would potentially be an additional benefit of such a reform.

IV. DISCUSSION

A. Dual Class Structures and CMS

Generally speaking, the arguments related to CMS can be grouped into two categories. First, a number of scholars have noted that CMS create an agency cost "wedge" between cash flow and control rights.[41] For example, if someone has voting control of a firm but possesses only 12.5% of the cash flow rights, then she bears only 12.5% of the costs of a decision but may receive more than this in terms of benefits (as these benefits may include private benefits of control). A number of empirical studies have found evidence consistent with the presence of an agency wedge with CMS.[42] More recently, some scholars have argued that CMS structures are potentially useful because they enable a controller with an idiosyncratic vision that can add value to the firm to stay in control even when the firm becomes publicly traded.[43] In addition, some scholars argue that CMS structures can provide controllers with insulation from "short-termist" market pressures in order to make valuable long term investments. In this latter respect, the advantages of CMS are analogous to the benefits that have been claimed for staggered boards and other anti-takeover devices.[44]

Both sides of this argument are about whether CMS structures benefit the firm (considered in isolation) in net terms. Our argument is different in scope – we are not arguing that CMS increases firm value, but rather that it can facilitate the internalization of externalities. Thus, it is

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hedging transactions by executives that would eliminate their economic exposure to the stock-based compensation that they receive - see David M. Schizer "Executives and hedging: The fragile legal foundation of incentive compatibility." 100 *Columbia L. Rev.* 440 (2000).

[40] Vickrey, William. "Averaging of income for income-tax purposes." *Journal of Political Economy* 47, no. 3 (1939): 379-397; Auerbach, Alan J. "Retrospective Capital Gains Taxation." The American Economic Review 81, no. 1 (1991): 167.; Weisbach, David A. "A Partial Mark-to-Market Tax System." *Tax L. Rev.* 53 (1999): 95.

[41] e.g. Bebchuk, Kraakman, and Triantis op cit. fn. X.

[42] See e.g. Adams, Renée, and Daniel Ferreira. "One share-one vote: The empirical evidence." *Review of Finance* 12, no. 1 (2008): 51-91; Masulis, Ronald W., Cong Wang, and Fei Xie. "Agency problems at dual-class companies." *The Journal of Finance* 64, no. 4 (2009): 1697-1727; Gompers et al. op. cit. fn. X.

[43] Goshen, Zohar, and Assaf Hamdani. "Corporate control and idiosyncratic vision." *Yale LJ* 125 (2015): 560.

[44] Cremers, KJ Martijn, Lubomir P. Litov, and Simone M. Sepe. "Staggered boards and long-term firm value, revisited." Journal of Financial Economics 126, no. 2 (2017): 422-444.

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possible that on firm value grounds CMS may create a net loss for externality-generating firms, while being potentially beneficial in social welfare terms because it facilitates externality internalization. Of course, we do not know in general if any beneficial effect of internalizing externalities would outweigh the social costs associated with CMS. Morever, just because a CMS is available does not mean that it will be used. Even if it is, the controller may not choose to hold a diversified portfolio as noted above (e.g., because the controller is overly optimistic about the controlled firm or invests in only a couple of sectors). If we think that more diversified controllers are a desirable outcome then we may wish to consider other steps that can be taken in addition to (or perhaps instead of) CMS to cajole controllers into acquiring a more diversified portfolio.[45]

B. Controllers' Fiduciary Duties

The analysis thus far has assumed that controllers face few fiduciary duty, or other legal, constraints in reducing externality causing activity at their controlled firms. Here we examine this assumption and ask whether these sorts of duties might seriously constrain controllers. We conclude that, at present, they do not. In theory fiduciary duties could potentially constrain controllers on these sorts of facts (although to the best of our knowledge there are few, if any, cases addressing this situation), but it appears fairly easy to avoid violating these duties. Further, if it seems useful to encourage controllers to internalize cross-firm externalities, then there may be ways to limit the effects of these potential constraints.

In the United States, many states impose fiduciary duties on controllers when there is a conflict between the controller and minority shareholders.[46] However, most of these cases involve situations where a controller is on both sides of a transaction so that it is conflicted in a financial sense (e.g., a freezeout merger) or where the controller usurps an opportunity that belongs, in some legally cognizable way, to the firm.[47] Thus, in the simple case of a decision by an undiversified controller to reduce externalities because of her intrinsic preferences, one doubts that the controller's fiduciary duties would be serious obstacles. First, controllers are generally entitled to vote their shares as they see fit (e.g., in favor of certain directors, green-friendly policies etc.); it is when they use their *control over the board* (as distinct from just casting their votes as shareholders) to obtain a particular outcome, that benefits them in some way differently than other shareholders, that they may risk fiduciary duty liability.[48] Second, we suspect few controllers would baldly assert they are making a decision simply to pursue an intrinsic motivation and would probably dress up their decision in language that sounds more consistent with pursuing the interests of the firm (e.g., a step taken to reduce the firm's carbon footprint may enhance its long run

[45] An interesting analog – although not an exact one – is when an asset manager such as BlackRock has within its family of funds some index funds and some private equity funds (which typically take a controlling position in their investee firms). If BlackRock is willing and able to coordinate some activity between the private equity funds and the index funds, then it may produce somewhat similar results to the diversified controlling shareholder. While there are noteworthy differences – the private equity fund and index fund would be run by different managers and hence coordination is not as simple as with a diversified controlling shareholder – the parallels are notable. Further, to the extent that BlackRock is required by law to keep the management of its private equity fund independent from the index funds our analysis suggests potential costs arising from that separation.

[46] For a general discussion see Allen, Kraakman and Khanna, *supra* note 18, at Section 8.5.

[47] See id.

[48] See id.

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reputation amongst customers or employees) thereby making a breach of duty case harder to show.[49]

The case of the more diversified controller who reduces one firm's externalities (thereby reducing its profits) in order to increase profits (or avoid losses) to some other firm(s) in her portfolio presents a more difficult case. To the best of our knowledge, there are no cases exploring this fact pattern, but it more closely fits the scenario where a controller's fiduciary duties might trigger liability (i.e., harming one firm to benefit another firm controlled by the controller thereby signaling a conflict).[50] Of course, a controller is allowed to act in his own interest, but when that activity involves the use of the controller's power over the firm (e.g., to get the board to put a freeze out merger up for a vote) then judicial scrutiny becomes more intense. The *Sinclair* decision provides the general guidelines on how to police this line: if the controller did not rely on the power of control to act (e.g., simply voting her own shares in the way she desires) then she is unlikely to face serious judicial scrutiny.[51] Further, even if the controller relies on control, that seems unlikely to generate liability unless the decision results in different corporate outcomes for different shareholders (e.g., there are "unique benefits" the controller receives that other shareholders do not).[52] Thus, it is plausible that minority shareholders could make a case that a more diversified controller relied on control of the firm to compel it to reduce its externalities to benefit some other firms in which the controller has an interest thereby creating different outcomes for different shareholders. However, we do not consider this to be a large liability risk because one anticipates that a controller could justify this decision fairly easily (e.g., describing it as a way to enhance goodwill, or having an independent committee approve it) and many minority shareholders are typically also diversified and may benefit from the controller's decision in a portfolio sense.

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[49] Moreover, it seems fairly clear that if the board of a diffusely-held firm chose to pursue measures to reduce the carbon footprint of the firm for long run reputational gains that would not generate liability if the board was unconflicted, informed and acting in good faith. See *A.P. Smith Manufacturing Co.* v. *Barlow*, 98 A.2d 581 (N.J. 1953); Allen, Kraakman, and Khanna, supra note 18, at 8.1.2. It probably would not generate liability for the controller in this situation either.

An interesting case is *EBay Holdings* v. *Newmark* 16 A.3d 1 (Del. Ch. 2010) where Craigslist's controllers and directors put in place defensive measures (and other steps) to ostensibly protect the culture of Craigslist from minority shareholder EBay's profit-oriented preferences. The Court relied on case law addressing directors' duties (rather than controllers' duties) and found some of these steps violated the directors' duties because they were openly taken to keep Craigslist a community service rather than that they might have beneficial effects on the profitability of Craigslist. The case does not specifically address controller's duties and involves a case where the fiduciary is openly pursuing non-profit maximizing motivations.

[50] See Allen, Kraakman, and Khanna, supra note 18, at 8.5.

[51] See *Sinclair Oil Corp.* v. *Levien* 280 A.2d 717 (Del. 1971). See also *Tanzer v. International General Industries, Inc.*, 379 A.2d 1121, 1124 (Del. 1977); *Thorpe v. CERBCO, Inc.*, 676 A.2d 436 (Del. 1996) (controller can vote against sale of all assets that public shareholders regard as advantageous without having to justify fairness because this is purely exercising power as shareholder).

[52] See *Sinclair*, *supra* note 68, at X. *See GAMCO Asset Management Inc., v. iHeartmedia, Inc.,* WL 6892802 (Del. Ch. Nov. 23, 2016). Nonetheless, cases finding controllers liable admittedly involve fairly "extreme" facts and thus we do not expect controllers to face much liability risk. *See id.,* at 41 – 45. The "unique benefit" line of cases involve unusual facts, where narrow circumstances sustain entire fairness review. For example, the liquidity crisis argument "would have to involve a crisis, fire sale where the controller, in order to satisfy an exigent need. . . agreed to a sale of the corporation without any effort to" engage in a sales process that would reflect the market value." Id. at 44 – 45 (quoting then V.C. Strine in *In re Synthes, Inc. S'holder Litig.,* 50 A.3d 1022, 1036 (Del. Ch. 2012)).

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In any case, even if current law in the US might provide a way to potentially sue the controller successfully (which again we consider fairly unlikely), that would simply mean that if it were thought desirable to encourage controllers to reduce externalities then it would be helpful to examine options for how they might do that without subjecting themselves to heightened fiduciary duty liability (e.g., a safe harbor of some type).

When we leave the United States and look at other jurisdictions the fiduciary duties of controlling shareholders tend to be weaker with two partial caveats. First, in many jurisdictions an important remedy an aggrieved minority may have is a general statutory oppression or mismanagement claim.[53] However, it seems unlikely that a controller's decision to reduce the externalities her firm is producing would amount to oppression or mismanagement unless it affected a very large part of corporate profits or threatened the firm's solvency.[54] Second, many jurisdictions have "shadow director" liability for those individuals and entities who *de facto* exercise the power of directors.[55] Controllers might fit this definition (though this is by no means a given in all jurisdictions),[56] but many cases have tended to arise in bankruptcy proceedings (rather than more generally) and none, to our knowledge, address the fact patterns noted here.[57]

This suggests that both in the United States and elsewhere the fiduciary duty-like liability risks faced by controllers are either quite thin or can be reduced through various steps controllers might take. Further, to the extent that the risks might become greater and operate as something of a constraint one could argue that if we thought encouraging controllers to internalize cross-firm externalities were important then we might want to at least partially insulate controllers from liability in these circumstances. This could be with "safe harbors" for controllers in these situations or other ways to cabin liability risk.[58]

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[53] See, e.g., Cheffins, Brian R. and Black, Bernard S., "Outside Director Liability Across Countries", Texas Law Review, Vol. 84, pp. 1385-1480, 2006; Khanna, Vikramaditya S. and Varottil, Umakanth, "The Rarity of Derivative Actions in India: Reasons and Consequences" (November 25, 2015). In Dan W. Puchniak, Harald Baum & Michael Ewing-Chow (eds.), The Derivative Action in Asia: A Comparative and Functional Approach (Cambridge University Press, 2012; Ben-Ishai, Stephanie and Puri, Poonam, "The Canadian Oppression Remedy Judicially Considered: 1995 – 2001" (June 30, 2004). Queen's Law Journal, Vol. 30, pp. 79-113, 2004.

[54] See Cheffins and Black, supra note 53; Khanna and Varottil, supra note 53; Ben-Ishai and Puri, supra note 53.

[55] See Hopt, Klaus J., "Groups of Companies - A Comparative Study on the Economics, Law and Regulation of Corporate Groups" (January 21, 2015). This article is to be published as ch. II 26 Groups of Companies in Jeffrey Gordon/Georg Ringe, eds., Oxford Handbook of Corporate Law and Governance, Oxford University Press 2015., European Corporate Governance Institute (ECGI) - Law Working Paper No. 286/2015, Available at SSRN: https://ssrn.com/abstract=2560935; Moore, Colin Robert, "Obligations in the Shade: The Application of Fiduciary Directors' Duties to Shadow Directors" (August 30, 2014). Available at SSRN: https://ssrn.com/abstract=2489472; Bicker, Eike Thomas, "Creditor Protection in the Corporate Group" (July 2006). Available at SSRN: https://ssrn.com/abstract=920472.

[56] See cites in note 55.

[57] See cites in note 55. There are also other doctrines that may aid those bringing suit against controlling shareholders in various situations. For greater discussion see Conac, Pierre-Henri and Enriques, Luca and Gelter, Martin, "Constraining Dominant Shareholders' Self-Dealing: The Legal Framework in France, Germany, and Italy" (October 2007). European Company and Financial Law Review, Vol. 4, No. 4, 2007, ECGI - Law Working Paper No. 88/2007, Harvard Olin Fellows' Discussion Paper No. 18/2008, Available at SSRN: https://ssrn.com/abstract=1532221.

[58] Marcel Kahan and Edward Rock "Systemic Stewardship with Tradeoffs" (available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3974697) argue that liability risks will cause index funds to act in a disguised manner, which will reduce the effectiveness of their interventions.

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C. Would Controllers' Efforts Matter?

Even if one thought that controllers might attempt to reduce externalities if they were diversified and there was little risk of fiduciary duty liability, we might still think controllers' efforts might be of little consequence. For instance, how much can one controller's efforts matter to global externalities? Although focusing on one controller leads to this conclusion, we think it is important to note that for much of the world controlled firms are the norm (and many important firms in the US are controlled). Thus, the collective impact of controlled firms is likely to be fairly large. Whether they can reverse certain externalities (e.g., climate change) is of course unclear, but their efforts – if they were to occur – are likely to dwarf those of firms without controllers across a range of potential externalities. Another related question is whether diversified controllers are likely to be more (or less) effective than index funds.[59] Prior scholarship has already discussed economic and legal reasons for why index funds face challenges to engaging in activism to address externalities in the typical U.S. firm.[60]

Finally, a more natural comparison, if one is desired, is between conglomerate business groups and index funds. Conglomerate business groups typically involve one holding company controlling many firms in different lines of business (where the holding company is generally controlled by a family or other group). Here we have a controlling shareholder with interests across multiple firms in different sectors but with control over each of these firms. One would expect some degree of externality internalization. Index funds, on the other hand, usually own shares in many more firms than conglomerates but do not typically exercise day-to-day control at any of them (though they may have influence in certain respects). The index funds are likely to have an impact if they can bring along other shareholders (e.g., other index funds, hedge funds, mutual funds, pension plans), whose interests may differ, so that they can direct the firm's policies on externalities. This involves collective action and should require more effort than when a controller decides to police firm externalities (especially when that controller might control other firms affected by the externality as in some conglomerates). Our point is not that conglomerates are good or bad, but rather that they may be a more natural comparison to index funds.[61] There is, however, little evidence on whether jurisdictions with more conglomerates tend to have fewer externalities (perhaps conglomerates strongly influence political outcomes in their home countries to avoid regulation or liability). Ultimately, though, we think it is important to emphasize that diversified controllers are unlikely to be a panacea for addressing externalities.

D. Additional Reforms

[59] Our analysis does not depend upon a "horse race" between index funds and diversified controllers in reducing externalities – rather if the goal is to reduce externalities then one might presume the more entities that are likely to do so the better. A related point is that diversified controllers may try to reduce externalities at firms that have index funds as significant owners as well as those that do not. However, index funds are unlikely to successfully push for externality reduction at controlled firms where the controller is not diversified (as we noted earlier).

[60] See cites in note 9.

[61] As discussed earlier, another interesting analog is to situations where an asset manager such as BlackRock has within its family some index funds and some private equity funds (which typically take a controlling position in their investee firms).

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Some jurisdictions or stock exchanges impose minimum float requirements for firms undertaking IPOs. That is, the firm must offer some minimum fraction of the firm's stock to the public in order to conduct an IPO.[62] This approach can be adapted to encourage controller diversification. For example, suppose that firm F were required to offer 90% of its common stock to the public (under the dual class regime; we assume that this requirement does not apply to the voting stock). Under the assumptions made earlier, the VC investors exogenously wish to exit at the IPO stage, and so will automatically offer their 50% of the common stock for sale. Z will then have to offer a further 40% of F's common stock (i.e., 80% of her 50% stake) to the public in order to conduct the IPO. Recall the scenario assumed above in which Z is over-optimistic. Generally, Z will then prefer to hold her common stock at time 1, absent a minimum float requirement. In such circumstances, a minimum float requirement will force Z to sell more of her common stock than she would otherwise have sold, and potentially induce greater diversification.[63]

An altogether different approach may involve tax policy. In particular, a higher tax rate on equity returns derived by a controller from a firm that she controls may counteract the effects of controller over-optimism. Such a tax provision would be unusual but not completely without precedent. In some jurisdictions, taxes on inter-corporate dividends vary depending on the level of ownership (and therefore) by one corporation of the other (although the tax rate is generally lower when dividends are paid by one corporation to another that it controls).[64] Some countries' tax systems include special provisions for imputing the wage and dividend income of owner-managers from their controlled closely-held firms, and imposing different tax rates on these different types of income.[65] Thus, the hypothetical policy sketched above is not necessarily unimaginable. However, it would entail some error costs (inducing non-optimistic controllers who would optimally hold their common stock to sell). It would also require some anti-avoidance rules.[66]

If over-optimism is indeed the reason that controllers resist diversification, then the types of policies outlined above may, in a sense, make controllers themselves (along with everyone else) better off. From the perspective of the controller's long-run self, diversification will typically be optimal as long as the degree of risk-aversion is sufficiently high. The misperception of the returns from firm F due to over-optimism imposes an "internality" on the controller's long-run self. This

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[62] Minimum float requirements can be found in many countries. For a recent discussion of many of them see Baker McKenzie, *Global PIPE Guide*, June 2020, available at: https://www.bakermckenzie.com/-/media/files/insight/publications/2020/06/global-private-investment-in-public-equity-guide-050620.pdf.

[63] A minimum float requirement might reduce the perceived value to Z of undertaking an IPO, as it forces her to sell more common stock than she would like and may disincentivize IPOs. Another important point to note is that the minimum float requirement would have to be an ongoing requirement (that 90% of the common stock is in the hands of public investors at any given time), rather than applying only at the IPO stage; this would prevent the controller from buying up common stock from dispersed outside investors following the IPO.

[64] Morck, Randall, and Bernard Yeung. "Dividend taxation and corporate governance." *Journal of Economic Perspectives* 19, no. 3 (2005): 163-180.

[65] Alstadsæter, Annette, and Martin Jacob. "Dividend taxes and income shifting." *The Scandinavian Journal of Economics* 118, no. 4 (2016): 693-717.

[66] For example, it would be straightforward for Z to sell her common stock but subsequently enter into a total return equity swap (TRES) with a counterparty who promises to pay Z the dividends and net capital gains that a shareholder of F would receive (with the counterparty typically holding F stock to hedge the risk created by these payments), if the payments under the TRES were subject to a lower tax rate than were dividends from a controlled firm. The economic exposure to F's common stock would induce Z to choose H at time 2. This type of scenario, however, is already addressed by anti-avoidance rules in the context of withholding taxes on cross-border dividend payments (26 U.S. Code § 871).

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can be corrected by policies that force the controller to diversify, and these policies can potentially benefit the controller (in a long-run sense) as well as raise aggregate shareholder value.

While ideas along these lines may hold some promise, we are ultimately skeptical that they would have a dramatic impact on the extent of controller diversification, given the powerful forces discussed in Section III that tend to limit such diversification. Nonetheless, we view them as worthy of further discussion, in view of the importance of corporate externalities in today's world.

E. Non-Pecuniary Motivations of Controllers

The evidence we have provided and discussed above suggests that the pecuniary incentives for controllers to internalize externalities generated by their firms is weak or nonexistent. However, this leaves open the possibility that controllers' nonpecuniary motivations may lead them to pursue social goals (including restraining the external harms created by their firms). We acknowledge this as a possibility, and view this as an important area for further research. Indeed, our findings about the absence or weakness of pecuniary motivations makes this an even more urgent inquiry than it might otherwise be. However, as nonpecuniary motivations are largely outside the scope of this paper, we make only a few preliminary remarks on this topic here.

In general, it is quite possible that nonpecuniary motivations are important to controlling shareholders. It is usually assumed that the marginal utility of wealth is declining, and so wealthy controllers might reasonably be expected to care strongly about nonpecuniary considerations (including social goals). However, controllers' preferences with regard to social goals may differ widely from each other, and from those of ordinary people. In other words, it is not sufficient that controllers have social or other-regarding preferences; internalizing externalities requires them to have preferences over social goals that are not idiosyncratic (and reasonably close to those of society as a whole). Moreover, controllers' wealth and their secure control rights over their firms tend to insulate them from forces that may align their social goals with those of society. Reputational incentives are more likely to align controllers' goals with those typically found in society. However, even reputational forces may tend to be relatively weak. To the extent that reputational concerns are instrumental (i.e. a means to gain further wealth), the declining marginal utility of wealth also attenuates reputational effects. Even if reputational concerns are intrinsic in nature, there may be a sufficient diversity of views among the wider population in which controllers cultivate reputations that it is unclear whether these concerns would lead to the internalization of externalities.

Overall, these considerations suggest some skepticism about the extent to which nonpecuniary motivations may be expected to solve externality problems among controlled firms. Nonetheless, this is an issue that warrants further conceptual – and perhaps empirical – analysis.

V. CONCLUSION

Externalities generated by corporations (such as those associated with climate change and harmful speech) are widely considered to be among the central issues facing the world today. The first-best responses – in the form of Pigouvian taxation or better government regulation – are currently thought to be politically infeasible. Attention has thus turned to the possibility of market-

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based solutions implemented by private actors. A particularly important example is a rapidly growing body of scholarship that conceptualizes index funds as diversified "universal owners" with incentives to maximize portfolio value (and hence to internalize cross-firm externalities).

This paper has sought to develop a general conceptual framework for understanding the interrelationships among firms' ownership structure, corporate law, and the internalization of cross-firm externalities. Within this framework, we highlight an important limitation of the "universal owner" theory that has not previously drawn much attention, namely that index funds may have little power to influence behavior in the presence of a controlling blockholder. Moreover, this implies a potentially severe constraint on the ability of index funds to internalize cross-firm externalities, as controlled ownership structures are dominant globally (and are also of great importance in the United States).

We introduce the concept of controller wealth concentration (CWC), defined as the fraction of a controller's aggregate personal wealth that consists of stock in the firm that she controls. We argue that a low CWC is a necessary (though not sufficient) condition for controllers to have a pecuniary incentive to internalize externalities. We construct measures of CWC for the controlling shareholders of a global sample of large technology-focused firms, and show that in this sample, CWC is very high relative to that of a diversified portfolio, typically varying from about 50% to close to 100%. These high levels of personal wealth concentration in controllers' controlled firms prevail despite the existence of controlling minority ownership structures, such as dual class stock, that permit controlling shareholders to exert control while holding modest cash flow rights.

Our framework suggests that, in principle, dual class and other CMS structures have the hitherto ignored – and potentially important - advantage of allowing controllers to diversify their personal wealth (thereby potentially mitigating cross-firm externalities). We discuss possible reasons – including founders' over-optimism about their firms, the need to incentivize founders' ongoing effort, the possibility that the divergence of cash flow and control rights will lead to controllers extracting larger private benefits of control, and founders' incentives to defer capital gains taxes – why controllers nonetheless fail to diversify. We discuss possible reforms that may encourage higher levels of diversification, although their ability to yield substantial changes seems limited.

Ultimately, we conclude that the widespread prevalence of controlled firms with undiversified controlling shareholders constitutes a significant obstacle to the internalization of cross-firm externalities. Although regulation, taxes and liability present significant challenges, there may be few effective alternatives in a world of undiversified controlling shareholders.

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Table 1: Controller Wealth Concentration

Company	Founder/ Controller	Controller's % Share of Company (z_f)	Controller's Company Wealth ($z_f V_f$)	Controller's Personal Wealth (W_Z)	CWC ($\frac{z_f V_f}{W_Z}$)	HQ Country	Dual-Class or other CMS?
Alphabet	Larry **Page**	7%	$35.5	$66.5	53%	USA	Yes
	Sergey **Brin**	7%	$35.5	$64.1	55%	USA	Yes
Amazon	Jeff **Bezos**	11.1%	$131.68	$143	92%	USA	No
Atlassian	Scott **Farquhar**	23%	$8.65	$9.9	87%	Australia	Yes
Dell	Michael **Dell**	54%	$19	$32.1	59%	USA	Yes
Facebook	Mark **Zuckerberg**	29.3%	$68	$72.3	94%	USA	Yes
Foxconn	Terry **Gou**	12%	$4.5	$6.2	73%	Taiwan	Yes
Intuit	Scott **Cook**	3%	$2.3	$3.6	64%	USA	No
Lenovo	**Yang** Yuan Qing	5.96%	$0.47	$1.25	38%	China	Yes
LG	**Koo** Gwang-Mo	15%	$1.53	$1.6	95%	Korea	Yes
Microsoft	Bill **Gates**	1.4%	$14.46	$110	13%	USA	No
Netflix	Reed **Hastings**	1.3%	$2.35	$4.6	51%	USA	Yes
NVIDIA	Jensen **Huang**	3.43%	$5.8	$5.59	96%	USA	No
Oracle	Larry **Ellison**	28%	$64.4	$68.4	94%	USA	No
Qualcomm	Irwin **Jacobs**	1%	$1.03	$1.2	86%	USA	No
Salesforce.com	Marc **Benioff**	4.14%	$4.33	$6.5	67%	USA	No
Samsung Electronics	**Lee** Kun Hee	4.18%	$11.74	$20.6	57%	Korea	Yes
SK Holdings	**Chey** Tae-won	18.4%	$2.57	$3.8	68%	Korea	Yes
Snap	Evan **Spiegel**	5.59%	$1.16	$3.7	31%	USA	Yes
Tata Consultancy Services	Ratan **Tata**	0.83%	$0.93	$1	93%	India	Yes
Tencent	**Ma** Huateng	8.53%	$39.13	$44.7	88%	China	Yes
Tesla	Elon **Musk**	18.5%	$27.3	$40.1	68%	USA	Yes
Twitter	Jack **Dorsey**	2.05%	$0.5	$4.2	12%	USA	No
VMware	Michael **Dell**	14%	$2.42	$32.1	8%	USA	Yes
Xiaomi	**Lei** Jun	73.4%	$9.89	$11.7	85%	China	Yes

Note: Wealth is in billions of US $. The data are for various recent years (2017 to 2019). Family names are in bold letters. The sources are the following:
List of 25 largest technology firms by market capitalization:

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https://www.globaldata.com/globaldata-presents-top-25-global-technology-companies-by-market-capitalization-in-q3-2019/; Alphabet: and:https://www.quora.com/Larry-Page-has-almost-40B-but-only-60M-75-000-shares-of-that-is-in-GOOG-stock-According-to-sources-Sergey-Brin-has-nearly-21-million-shares-of-GOOG-stock-yet-both-are-worth-almost-40B-Where-is-the-rest-of-Page%E2%80%99s-money-invested; Amazon: https://www.forbes.com/profile/jeff-bezos/#40bd5fab1b23; Atlassian: https://www.forbes.com/profile/scott-farquhar/#2c41f5166362; Facebook: https://www.investopedia.com/articles/insights/082216/top-9-shareholders-facebook-fb.asp and: https://www.cnbc.com/2019/08/22/mark-zuckerberg-has-sold-296-million-of-facebook-shares-in-august.html; Foxconn: and: https://www.bloomberg.com/quote/2317:TT; Lenovo: https://www.forbes.com/profile/yang-yuanqing/#11a83b3a61ae; LG: https://www.forbes.com/lists/2012/83/korea-billionaires-12_Koo-Bon-Joon_M3B5.html and: https://www.forbes.com/profile/koo-kwang-mo/#3dbd841b3988; Microsoft: https://www.investopedia.com/articles/investing/122215/top-4-microsoft-shareholders.asp; Oracle: https://www.bloomberg.com/news/articles/2017-09-29/oracle-s-ellison-adds-2-9-billion-to-fortune-on-pledged-shares and: https://www.businessinsider.com/rise-of-oracle-founder-larry-ellison-2017-1; Samsung:https://business.inquirer.net/286397/samsung-chairman-retains-top-spot-as-wealthiest-businessman-in-s-korea; SK: theinvestor.co.kr/people_detail.php?q=Chey%20Tae-won&mode=rich&num=5; Snap: https://www.forbes.com/profile/evan-spiegel/#2579ffde529c; Tesla: https://www.forbes.com/profile/elon-musk/#10d31efe7999; Twitter: https://www.forbes.com/profile/jack-dorsey/#70861f8f2372; VMWare: https://finance.yahoo.com/quote/VMW/key-statistics/; Xiaomi: https://www.forbes.com/profile/lei-jun/#141e005b6e64; Other firms' data are from www.cnbc.com for stock quotes, outstanding shares, and some controlling shareholders. "HQ Country" refers to the country or territory in which the firm's headquarters are located. "Dual-class or other CMS" refers to whether the firm has either issued multiple classes of stock with different voting rights, or some other mechanism by which the controller exerts control with a minority of the common stock.

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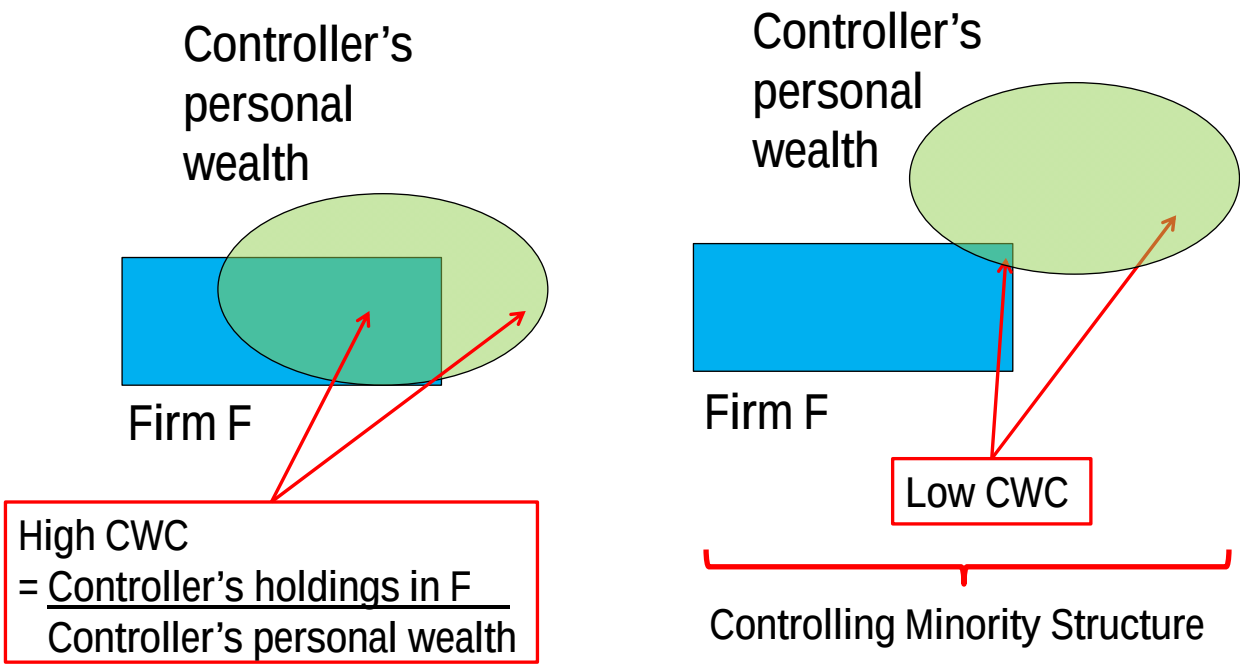
Table 2: Firm and Portfolio Value in Each Contingency, given Firm F's Choice of Activity Level

		Firm F's Choice	
		High Activity (H)	Low Activity (L)
Contingency	1 (probability ½)	12, 998	10, 1000
	2 (probability ½)	0, 998	0, 1000

Note: The first number in each cell is F's value and second number is the value of the market portfolio P (consisting of all firms other than F).

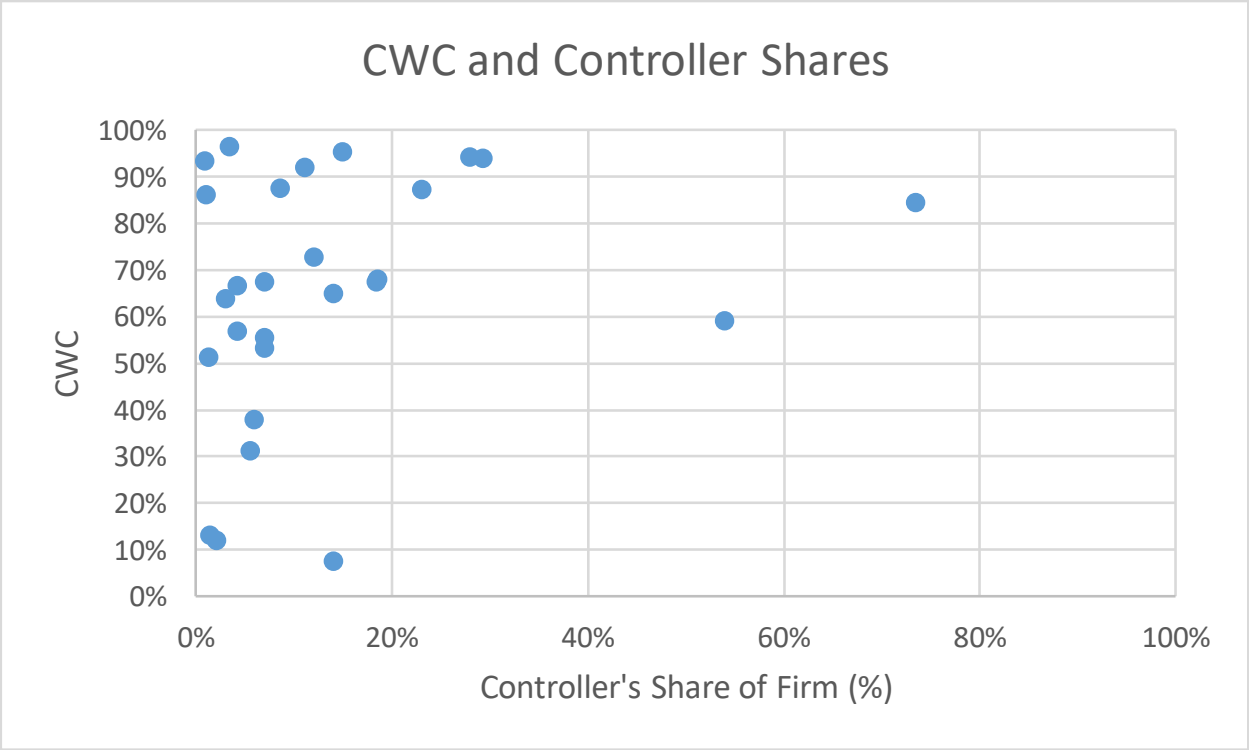
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Figure 1: Illustration of Ownership Structures and Controller Wealth Concentration



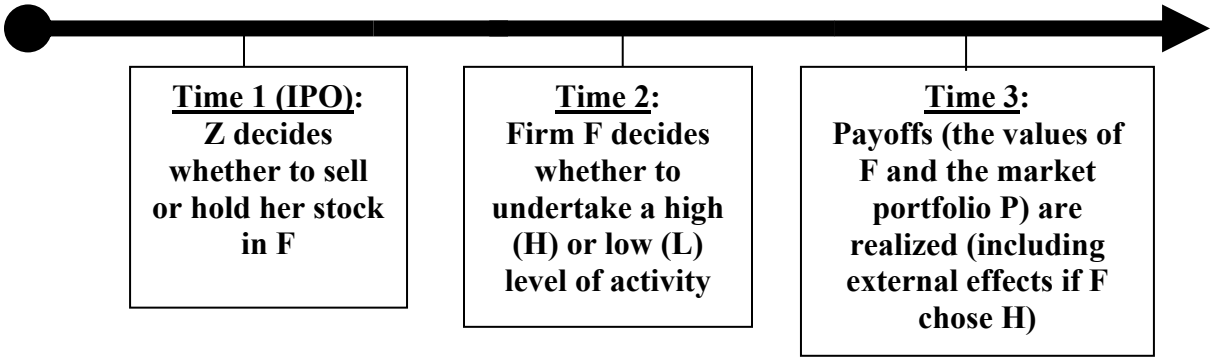
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Figure 2: Controller Wealth Concentration (CWC) and Controller Shares of Firms



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Figure 3: Timing of the IPO and Firm F's Choices



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Appendix: Definitions of CWC and Controller's Delta

A. Controller Wealth Concentration (CWC)

Suppose that there exist *N* assets, indexed by $i = 1$ to *N*, where asset *i* has value V_i. Asset *f* is firm F, which is controlled by the controller Z. Assume Z owns a share z_i of asset *i* (where z_i takes on values from 0 to 1). Then, Z's personal wealth, denoted W_Z, is:

$$W_Z = \sum_{i=1}^{N} z_i V_i$$

Controller wealth concentration (CWC) can then be defined as:

$$CWC = \frac{z_f V_f}{W_Z} = \frac{z_f V_f}{\sum_{i=1}^{N} z_i V_i}$$

CWC measures the degree of Z's diversification of her personal asset holdings. For example, suppose that Z owns 60% of the stock of firm F ($z_f = 0.6$) and owns no other assets ($z_i = 0$ when $i \neq f$). Then, CWC = 1, or 100%. On the other hand, suppose Z owns 10% of F (while controlling F through a controlling minority structure such as dual class stock), V_f = \$100, and W_Z = \$200. Then, CWC = ((0.1)(100))/200 = 0.05 (or 5%).

B. Controller's Delta

Suppose that when V_f increases by \$1, asset *i*'s value changes by δ_i. Then, the controller's delta, denoted δ_Z, can be defined (noting that $\delta_f = 1$ by definition when V_f increases by \$1) as:

$$\delta_Z = \sum_{i=1}^{N} z_i \delta_i$$

For example, if Z owns 60% of the stock of firm F and changes in the value of firm F do not have any spillover effects on other firms ($\delta_i = 0$ when $i \neq f$), then $\delta_Z = 0.6$ (a \$1 change in firm F's value increases Z's wealth by 60 cents).

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