Public Takeover Bid Resistance: Board Discretion, Antitakeover Provisions, and Bid Premium

Nicholas F. Carline[1], Sridhar Gogineni[2], and Pradeep K. Yadav[3]

Abstract

Our primary aim is to examine whether post-bid takeover resistance decisions of U.S. target-firm boards are motivated preponderantly by bona-fide bargaining in shareholder interest, or by self-serving entrenchment-related considerations. In this context, we first examine, through a research design that accounts for endogeneity and sample selection, the effect of preexisting antitakeover provisions on post-bid resistance decisions. Similarly, we simultaneously examine, again in a way that facilitates causal inference, the effect of initial public bid premium on post-bid resistance. Lastly, we develop a conceptual modelling framework, incorporating pre-public-bid negotiations and price-revision, for inferring what these pathways imply for preponderant board motivation underlying post-bid resistance. Our findings indicate that, over our twenty-year sample period, post-bid resistance decisions of U.S. target-firm boards are driven significantly more by entrenchment considerations than by bona-fide bargaining. Our study underscores the importance of the long-standing policy debate around board discretion/primacy in U.S. takeover-related law and practice.

Keywords: takeover resistance; antitakeover provisions; bid premium; bargaining; entrenchment

JEL codes: G34; G38

This version: July 3, 2024

[1] Department of Finance, Birmingham Business School, University of Birmingham, Birmingham, B15 2TY, U.K. Email: n.carline@bham.ac.uk.

[2] Department of Finance, John H. Sykes College of Business, University of Tampa, Tampa, FL 33606, U.S. Email: sgogineni@ut.edu.

[3] Corresponding author. Division of Finance, Michael F. Price College of Business, University of Oklahoma, Norman, OK 73019, U.S. Email: pyadav@ou.edu.

Public Takeover Bid Resistance: Board Discretion, Antitakeover Provisions, and Bid Premium

1. Introduction

Target firm boards often take reactive action to resist a public takeover bid. Examples of such post-bid action include formally rejecting the bid, releasing financial and strategic information, lobbying relevant stakeholders, raising antitrust concerns, and using standstill agreements, litigation, asset and liability restructuring, and targeted share repurchases (see Ruback, 1987). Based on searches of Factiva for this study, boards of 17.4 percent of our twenty-year sample of 995 U.S. target firms put up post-bid resistance. However, despite its prevalence, and an extensive literature on the market for corporate control, there is little consensus on whether the decisions of target-firm boards to use post-bid resistance are motivated preponderantly by bona-fide considerations of serving the best interests of shareholders, or by self-serving entrenchment related considerations. This question is the overarching focus of this paper.

We address the above question through two new empirical investigations, together with a conceptual modeling framework for interpreting the findings from them. In line with the extant literature, we posit that target-board motivation is preponderantly anchored either around good-faith bargaining in stockholder interests or around self-serving entrenchment considerations. However, new to the literature, we also posit that these binary target-board motivation possibilities influence target-firm board decisions to use post-bid resistance not just directly (for which there can be no credible identification strategy), but also in two intermediate ways: first, through the generic antitakeover provisions (hereafter 'ATPs') that the target firm board chooses to keep in its charters and bylaws prior to receiving bid interest; and, second, through the response of the board to the initial public bid premium. Each of these intermediate ways facilitate credible identification of the underlying board motivation behind post-bid takeover resistance.

Accordingly, our first empirical investigation is of the relationship from preexisting ATPs (e.g., classified/staggered boards, supermajority amendments, fair price amendments, and poison pills) to the board's post-bid resistance decision. We are the first to do so through an empirical

design that accounts for endogeneity and sample selection, thereby facilitating causal inference. Our second empirical investigation is of the relationship from the initial public bid premium to the target board's decision to use post-bid resistance. Again, we are the first to do so in a way that facilitates causal inference. Lastly, the conceptual modelling framework that we develop enables us to infer what these relationships arguably imply for the underlying board motivation that is our primary focus: i.e., when U.S. target firm boards offer post-bid resistance, do they act (significantly) more as bona fide fiduciaries serving the best interest of shareholders, or more as self-serving fiduciaries?

This question has important policy implications. From a legal perspective, this is because boards of U.S. takeover target firms have complete discretion in deciding whether to use post-bid resistance. In contrast, target firm boards in the U.K., Australia, New Zealand, and the E.U. countries that have adopted Article 9 of the E.U. Takeover Directive are prevented in varying degrees from taking reactive action that could frustrate a public bid, unless that action has been duly considered and approved by shareholders. Indeed, there has long been a debate amongst legal scholars about the normatively optimal level of target board discretion in this context. In particular, Easterbrook and Fischel (1981) argue for altogether removing board discretion by enacting a 'board neutrality' rule; Bebchuk (2002) makes a case for requiring shareholder approval of board intentions through a less restrictive 'no board veto' rule, whilst Bebchuk (2005) advocates shareholder empowerment more generally, in contrast to board primacy; and Gilson and Schwartz (2021) recommend placing minimal restrictions on board discretion to resist public bid interest.

From an economic perspective, the issue of board discretion and primacy in the post-bid takeover resistance decision is contentious because board decisions to use post-bid resistance can be motivated not just by bargaining to get a better offer for shareholders (Fishman, 1988; Hirshleifer and Titman, 1990), but also by entrenchment considerations reflecting an inclination to impede acceptance of a public bid so as to preserve incumbency and concomitant private benefits of control (Baron, 1983). These conflicting board motivations – good-faith bargaining in stockholder interests versus self-serving entrenchment considerations – are a conundrum around

which other theoretical models in the corporate control literature have also been developed: e.g., by Shleifer and Vishny (1986), Stulz (1988), Berkovitch and Khanna (1990), and Levit (2017).

The rationale for our first empirical investigation is that the underlying board motivation arguably influences the ATPs that boards choose to have in place in firms in the absence of takeover bid interest; and, by implication, whether or how target-firm boards use these ATPs as a bargaining tool in the event of prior negotiations with an eventual public bidder, and hence how their post-bid resistance decisions then become dependent on the preexistence of these ATPs.[1] This is because ATPs have the potential to not only deter public bid interest in a firm altogether, but to also impede public bid interest in a firm during prior negotiations with an eventual public bidder, including for the benefit of target firm shareholders in the form of a higher price. It is the board that ordinarily decides on whether to adopt, leave in place, or revoke an ATP at a given point in time (Smith, 2019; Cuñat, Giné, and Guadalupe, 2020). Nonetheless, irrespective of board motivation, our conceptual modelling framework allows for the possibility that external factors – like public perceptions, signaling imperatives, and the views of influential stakeholders – condition the general policy of the board in relation to the presence of at least a subset of ATPs in the absence of takeover bid interest.

The rationale for our second empirical investigation is that the underlying board motivation also arguably influences how boards respond to the premium in an initial public takeover bid (i.e., the premium incorporating price revision from prior negotiations with an eventual public bidder), and hence how their post-bid resistance decisions then become dependent on the quality of an initial public takeover bid. Boone and Mulherin (2007) present evidence suggesting that most public takeover bids are preceded by negotiations with potential public bidders. These prior negotiations can generate substantial price revision in the run-up to an initial public bid (see Liu and Officer, 2021). They are accordingly integral to our conceptual modelling framework, whilst potentially being aided by preexisting ATPs.

[1] ATPs can also be adopted after a public bid: e.g., a 'morning after' poison pill (see Heron and Lie, 2006). However, our conceptual modelling framework dictates that we classify ATPs newly adopted post-bid, and not those only triggered post-bid, as another form of post-bid resistance.

These two pathways – from extant ATPs to post-bid resistance and from initial public bid premium to post-bid resistance – equate to two specific, causal effects on board decisions to use post-bid resistance. The interpretation of these causal effects does not therefore depend on how the market evaluates the eventual public bid, or on byproducts of the bid in the form of revised and rival offers and final outcomes, all of which are not entirely within the board's control. This includes the eventual public form and perception of a bid: i.e., merger or tender offer; and solicited or unsolicited. Importantly, their interpretation also does not depend on (endogenous) structures and incentives of boards in place at the time of post-bid resistance decisions.

Figures 1A, 1B, and 2 present a visual representation of our conceptual modelling framework. The implications are as follows. Firstly, there will be support for good-faith bargaining in stockholder interests as the primary board motivation behind post-bid takeover resistance only if we find, overall, a negative impact of preexisting ATPs on post-bid resistance. Alternatively, either a positive effect or the absence of an effect will be supportive of self-serving entrenchment as the primary board motivation behind post-bid resistance. Essentially, bona-fide boards will use preexisting ATPs and post-bid resistance as substitute bargaining mechanisms in stockholder interests, whilst self-serving boards will use preexisting ATPs and post-bid resistance as complementary entrenchment mechanisms.[2] Secondly, a negative impact of the initial public bid premium on post-bid resistance will support good-faith bargaining in stockholder interests as the primary board motivation behind post-bid resistance, whilst no effect will be supportive of self-serving entrenchment as the primary board motivation behind post-bid resistance. There will be no clear support for either motivation if the initial public bid premium has a positive effect on post-bid resistance.

[2] An important assumption here, as in the theoretical context of Fishman (1988), is that whilst private information advantages of initial public bidders over potential rivals will, in some cases, render preexisting ATPs less effective as a bargaining mechanism than they would otherwise be, thereby necessitating post-bid resistance as a compliment to preexisting ATP strength by some bona-fide boards, this will not be the case for the majority of bona-fide boards. As such, our empirical analysis incorporates a proxy for private information held by initial public bidders about the value implications of selecting firms as public takeover targets.

Our empirical design is based on well-documented context-relevant instrumental variables (IVs), as well as adjustment for sample selection. Our principal measure for preexisting ATPs is the commonly-used Gompers, Ishii, and Metrick (2003) G-index. However, we also use the Bebchuk, Cohen, and Ferrell (2009) E-index, which consists of only the six arguably most potent, or publicly sensitive ATPs, and the O-index, which consists of the other eighteen ATPs in the G-index.[3] As discussed in a greater detail in Section 2.3, since boards can adjust the ATPs at their disposal in expectation of a public takeover bid, our instrumented measures of ATPs rely on two IVs – one solely headquarters (HQ) proximate-based and the other solely initial public offering (IPO) proximate-based. Karpoff, Schonlau, and Wehrly (2017) argue that these kinds of past connections give rise to distinct sources of positive variation in firms' current G-, E-, and O-indices by virtue of ATPs being sticky through time, whilst filtering variation in firms' G-, E-, and O-indices due to distinctly relevant factors other than those non-arbitrarily driven by immediate likelihood of receiving a public takeover bid. It therefore follows that if these IVs are exogenous to the possibility that a focus firm adopts or revokes ATPs, not only in the absence of public bid interest but also in the immediate expectation of public bid interest, then theoretically they should also be exogenous to the board's post-bid resistance decision in the event of a public bid not being deterred.

Our principal measure of the quality of an initial public bid is the premium after incorporating price revision during prior negotiations with potential public bidders. Given that the level of the initial public bid price could itself be affected by the bidder's assessment of the likelihood of the target firm's board putting up post-bid resistance, we rely on another well-documented context-relevant IV for instrumenting for the initial public bid premium. Baker, Pan, and Wurgler (2012) argue that the 52-week-high price serves as a general reference point for a bidder in setting a public takeover bid price. However, the target board's post-bid resistance decision is based instead on full information that includes all relevant private information (Levit, 2017). Theoretically therefore, the 52-week-high price does not serve as a reference point for the

[3] In common with the extant literature, we analyze the effects of various ATP indices, not individual ATPs. This reduces the risk of measurement error, as well as, in our case, the risk of generating weaker instruments.

target board's post-bid resistance decision. We rely on the ratio of the pre-run-up price to the 52-week-high price because it is a distinct (i.e., distinct from the IVs for preexisting ATPs) source of negative variation in the initial public bid premium, and because it filters variation in the initial public bid premium due to distinctly relevant factors other than that non-arbitrarily driven by the bidder's expectation of post-bid resistance.

On results, we firstly find a positive effect from our instrumented measures of ATPs to the likelihood of post-bid resistance based on the full set of ATPs included in the G-index and on the subset of ATPs included in the O-index, but no statistically significant effect based on the subset of ATPs included the E-index. The magnitudes of the instrumented effects of the G- and O-indices are also economically significant. For instance, the effect of the instrumented G-index, after correcting for public takeover bid selection and hence for unobservable factors in this selection, equates to an average 4.3 percentage points increase in the likelihood of the use of post-bid resistance for each additional preexisting ATP. Hence, ceteris paribus, the increase in pre-public-bid bargaining power from having more preexisting ATPs does not reduce the likelihood of post-bid resistance – as would be expected if target firm boards are motivated primarily by bona-fide considerations – but instead significantly increases the likelihood of post-bid resistance, which is what would be expected if target firm boards are motivated by entrenchment considerations.

Secondly, and simultaneously, we do not find a statistically or economically significant effect from our instrumented measure of initial public bid premium to the board's post-bid resistance decision. Nor do we find a significant effect from preexisting ATPs to the initial public bid premium. Hence again, ceteris paribus, the likelihood of post-bid resistance is not lower for a higher initial public bid premium – as would be expected if target firm boards are primarily bona-fide fiduciaries – but instead is unrelated to the initial public bid premium, which is what would be expected if target firm boards are preponderantly self-serving fiduciaries.

Our findings and inferences are robust to the use of multiple econometric specifications, extending to linear probability IV regressions, distinct types of probit IV regressions, and to different construction lags on the IVs for preexisting ATPs and the initial public bid premium. Our findings and inferences are also robust to multiple variable specifications, extending to a

summation-based G-index, a threshold-based G-index, and to different measures of the quality of the initial public bid.

Therefore, based on our two specific empirical investigations and accompanying conceptual modeling framework, we conclude that, for our twenty-year sample period, post-bid resistance decisions of U.S. takeover target firm boards are motivated significantly more by self-serving entrenchment considerations than by good-faith bargaining in stockholder interests. Independent of this conclusion, we also find evidence to indicate that boards tend to be more active (passive) in relation to influencing the status quo of ATPs that are less (more) potent/publicly sensitive. An important caveat is that our findings and inferences reflect an overall picture of board behavior. A significant fraction of boards could well be exercising their discretion as *bona fide* fiduciaries in the best interests of shareholders. We leave examination of cross-sectional differences across firms to future research. Irrespective, our results underscore the need for U.S. law and practice to revisit the issue of takeover resistance related board discretion/primacy.

The rest of the paper is organized as follows. Section 2 presents our contributions and develops our conceptual modelling framework and technique for causal inference. Section 3 concerns the sample, variables, and univariate results. Sections 4 and 5 discuss the multivariate findings for preexisting ATPs and the initial public bid premium, respectively, and robustness. Section 6 provides non-causal evidence on the effect of post-bid resistance on bid outcome-related variables. Section 7 summarizes and provides concluding remarks.

2. Contributions, Conceptual Modelling Framework, and Technique for Causal Inference

2.1. Contributions

Our study makes important contributions with respect to each of the three questions that we address in relation to the decision of target-firm boards to offer post-bid resistance: (a) the overarching question of bonafide versus self-serving board motivation governing the decision; (b) the impact of existing ATPs on the decision; and (c) the impact of the initial public bid premium on the decision.

Firstly, earlier empirical studies on the question of preponderant board motivation behind post-bid takeover resistance are not anchored in research designs and modeling frameworks that permit causal inference. The overall bottom-lines of these studies also lack consensus. Jennings and Mazzeo (1993), Franks and Mayer (1996), Schwert (2000), and Bates and Becher (2017) conclude that post-bid resistance is primarily motivated by good-faith bargaining for a higher price. These studies attach considerable weight to revised and rival bids, which are byproducts but not drivers of post-bid resistance decisions. Other studies document evidence that indicates that post-bid resistance is motivated at least in part by self-serving entrenchment considerations. In particular: (a) Walkling and Long (1984) and Cotter and Zenner (1994) find that post-bid resistance is more likely if the wealth of the board is more aligned to incumbency and concomitant private benefits of control; (b) Harford (2003) finds that post-bid resistance is more likely if the board predicts a greater likelihood of loss of incumbency in the event of a successful bid; and (c) Hartzell, Ofek, and Yermack (2004) find that boards sometimes use post-bid resistance to personally benefit from a bid at the expense of shareholders. The contribution of our study here is the use of a research design that posits, in conjunction with the conceptual modeling framework that we develop, that the preponderant board motivation induces dependence of post-bid resistance decisions on the preexisting ATPs the board has chosen to keep in place, and on the initial public bid premium. These dependencies facilitate credible identification of the preponderant board motivation behind post-bid resistance.

Secondly, extant studies only broadly address the question of whether ATPs, and antitakeover laws, are beneficial for shareholders or more likely to be abused by boards. Straska and Waller (2014) and Karpoff and Wittry (2024) provide a comprehensive review of these studies, including those that examine whether ATPs serve as a bargaining tool for extracting a higher price during times of bid interest. In particular, Comment and Schwert (1995) and Bates, Becher, and Lemmon (2008) find a positive relationship between bid premiums and the existence of poison pills and staggered boards respectively, but not in a way that permits causal inference. Cain, McKeon, and Solomon (2017) rely on the exogenous passage of takeover laws and find evidence to support a positive effect of takeover protection on bid premiums. However, Karpoff et al. (2017)

and Cuñat et al. (2020) exploit exogeneities in the presence and absence, respectively, of ATPs and find evidence to suggest that having more ATPs reduces the probability of a takeover, and in the case of the latter the benefits to shareholders too.[4] Notwithstanding the importance of all of these findings, none of these studies address the specific question that we address in this paper in relation to ATPs; namely, *do preexisting ATPs directly affect board decisions to put up post-bid resistance, and if so how?* This question is important for addressing concerns around whether ATPs are beneficial for shareholders, or more likely to be abused by boards, because: (a) both preexisting ATPs and post-bid resistance can be used as bargaining tools on behalf of shareholders at different stages during the process of a bid, as well as effective means for a board to remain self-serving and entrenched; and (b) boards have virtually complete discretion in deciding whether to use post-bid resistance.

Thirdly, earlier research addressing the relationship between the initial public bid premium and the post-bid resistance decision does not necessarily document how boards respond to the premium in an initial public takeover bid. This is because the level of the initial public bid premium can itself be affected by the bidder's assessment of the likelihood of the target firm's board putting up post-bid resistance. Jennings and Mazzeo (1993) examine this relationship through the use of simultaneous equations, but with no means of fully circumventing this endogeneity. Bates and Becher (2017) examine this relationship from the perspective of an abnormal component of the initial public bid premium, and hence do not account for this endogeneity at all. Both of these studies find a negative relationship and conclude that post-bid resistance is primarily motivated by good-faith bargaining for a higher price. Our research design accounts for endogeneity through well-documented context-relevant IVs, adjusts for sample selection, and generates findings that

[4] In another strand of the literature, other studies find evidence in support of empire building when firms have more ATPs (e.g., Masulis, Wang, and Xie, 2007; Harford, Humphery-Jenner, and Powell, 2012), consumption of private benefits of control and associated misallocation of corporate resources when firms have a classified/staggered board (e.g., Karakaş and Mohseni, 2021), and risk-reducing value-destroying behavior by boards in the wake of passage of antitakeover laws (e.g., Atanassov, 2013; Gormley and Matsa, 2016), although the latter evidence conflicts with that of Chemmanur and Tian (2018) from exploiting exogeneities in revocation of ATPs. A recent group of studies (Eldar and Wittry, 2021, Guernsey, Sepe, and Serfling, 2022, and John, Kadyrzhanova, and Lee, 2023) exploit the arrival of extreme market events to infer effects from ATPs, but again these studies also document conflicting findings concerning whether ATPs are beneficial for shareholders or more likely to be abused by boards.

can be interpreted within a conceptual modelling framework positing specific causal effects on the post-bid resistance decision. Our empirical analysis, both with and without the use of these IVs, indicates that the endogeneity induced through dependence of the initial public bid premium on board motivation biases the negative relationship documented in prior studies downwards, potentially leading to incorrect inferences on how boards respond to the premium in an initial public takeover bid.

2.2. Conceptual Modelling Framework

Board motivation for post-bid resistance is not likely to be sharply definable in simple black or white terms but is likely to be nuanced with multiple shades of grey. However, in order to draw tractable inferences from empirical analyses, we follow extant literature in positing a binary framework in which post-bid resistance by boards is driven either by good-faith bargaining in stockholder interests; or by entrenchment considerations. Theoretical models of post-bid resistance by boards suggest that differentiating between different forms of post-bid resistance is unlikely to be helpful for inferring primary board motivation behind post-bid resistance. All forms of post-bid resistance can be either beneficial for shareholders or can be abused by boards (see, in particular, Berkovitch and Khanna (1990) and Levit (2017). As such, our conceptual modelling framework does not differentiate between different forms of post-bid resistance. Within this binary-driven and all-encompassing post-bid resistance framework, we develop two sets of ex-ante scenarios for inferring the main board motivation for post-bid resistance that relate, first, to the ATPs already in place in the firm and, second, to the initial public bid premium for the firm.

2.2.1. Ex-Ante Scenarios Relating to the ATPs Already in Place in the Firm

Figures 1A and 1B present a schematic summary representation of the ex-ante scenarios relating to ATPs and implied board motivation for post-bid resistance. The following considerations are relevant in relation to the impact of ATPs already in place in the firm on the board decision to resist post-bid, and therefore integral to our conceptual modelling framework.

(a) First, we know from Boone and Mulherin (2007) that most public takeover bids are preceded by negotiations with an eventual public bidder (see also Aktas, de Bodt, and Roll, 2010; Brown

Jr., Liu, and Mulherin, 2022). These negotiations, which can generate substantial price revision in the run-up to an initial public takeover bid (Liu and Officer, 2021), occur in the 'pre-bid' (run-up) phase of our conceptual framework, prior to a takeover bid going public at the start of the 'post-bid' phase.[5]

(b) Second, we know from Comment and Schwert (1995), Bates et al. (2008), and Cain et al. (2017) that ATPs and the presence of antitakeover laws can be an effective bargaining tool for boards in extracting a higher price for the firm from an eventual public bidder. This occurs from the outset of the 'pre-bid' phase of our conceptual framework. We also know from Eldar and Wittry (2021) and Guernsey et al. (2022) that ATPs and antitakeover laws can be exploited by boards to preserve shareholder value in the face of crises.

(c) Third, we know from Karpoff et al. (2017), Cuñat et al. (2020), and John et al. (2023) that ATPs can reduce the likelihood that a public bid occurs. If a public bid does occur then this happens in the 'post-bid' phase of our conceptual framework. We also know from Masulis et al. (2007), Harford et al. (2012), Atanassov (2013), Gormley and Matsa (2016), and Karakaş and Mohseni (2021) that ATPs and antitakeover laws can be exploited by boards for capitalizing incumbency and private benefits of control of one form or another.

(d) Fourth, and ceteris paribus, the underlying perspective of the board – shareholder wealth maximization or entrenchment – should condition the ATPs the firm chooses to keep in place.

(e) Fifth, the same underlying perspective of the board should also condition how the firm's post-bid resistance decision depends on the presence of ATPs; and it is this that we want to infer.

In this context, we note that it is the board of a firm that ordinarily decides on whether to adopt, leave in place, or revoke an ATP, and that the right of the board to do so is not constrained de jure in the U.S. legal system. However, we also allow for the possibility that the board functions de facto within an external environment that is governed by influential external factors – e.g.,

[5] The 'pre-bid' phase of our conceptual framework allows for both solicited and unsolicited bids (e.g., see Masulis and Simsir, 2018). Our empirical analysis though also accounts for unsolicited bids in the rarer and stricter sense of having by-passed pre-bid negotiations (e.g., see Bange and Mazzeo, 2004), which could be the case for instance if the initial public bidder has a significant information advantage over potential rivals.

stakeholder pressures, public perceptions, and signaling imperatives – and these factors may necessitate, from time to time, independent of the underlying motivation of the board, general board "policies" about actively influencing or remaining passive in relation to specific ATPs or subsets of ATPs.

Accordingly, for our ex-ante scenarios, we develop hypotheses about what to expect based on a framework in which the board's "policy" in normal 'no-bid' periods (in which a bid neither exists nor is imminently expected) is the following.

(a) It is active in influencing ex-ante one specific subset of ATPs (say, subset "Y").

(b) It is passive with respect to the presence of the remaining subset of ATPs (say, subset "X").

(c) Each of these subsets can include all ATPs, or none; in which case, the other subset will be an empty set, or will include all ATPs.

(d) We thereby explicitly allow board "policies" to be potentially different for different ATPs.

Firstly, consider the case where the board is motivated by good-faith bargaining in stockholder interest.

(i) If board policy is to actively influence ATPs ex-ante, one reason it will have more of subset "Y" ATPs already in place is that it intends to, and will actually, utilize them in pre-bid negotiations with an eventual public bidder to secure bid price improvement. Hence, ceteris paribus, the board is less likely, on average, to need to use post-bid resistance to strengthen its bargaining position post-bid when it has more existing ATPs overall. This implies, on average, a negative relationship between subset "Y" ATPs and its decision to resist post-bid.

(ii) If board policy is ex-ante passive with respect to the presence of ATPs, it will still want to use whatever subset "X" ATPs the firm happens to have as a bargaining tool for securing bid price improvement. Hence, ceteris paribus, if the firm has more of subset "X" ATPs, the board will be less likely, on average, to also need to use post-bid resistance for price improvement beyond pre-bid negotiations. Thus, identical to that before, this ex-ante scenario also implies, on average, a negative relationship from subset "X" ATPs to post-bid resistance by boards.

(iii) It is important to underscore that the hypothesized relationships in the above scenarios continue to hold when both subset "Y" and subset "X" ATPs are not empty sets. In this

scenario, the board will have more subset "Y" ATPs already in place in the firm and will use whatever subset "X" ATPs the firm happens to have as a bargaining tool for extracting price improvement. This again implies, on average, a negative relationship from either subset of ATPs separately to post-bid resistance.

Alternatively, consider the case of a board motivated by entrenchment considerations.

(i) If board policy is to actively influence ATPs ex-ante, the only reason that it will have more subset "Y" ATPs already in place in the firm is because more ATPs generate greater entrenchment value through deterring, impeding, or generating greater personal benefit from a bid. However, if a bid does happen despite these ATPs, the board will be more likely to resist post-bid if it has greater entrenchment propensity. This greater entrenchment propensity will manifest in having more subset "Y" ATPs already in place in the firm implying a positive relationship from existing ATPs in the firm to post-bid resistance by boards.

(ii) If board policy is ex-ante passive with respect to the presence of ATPs, whatever subset "X" ATPs that happen to already be in place will be unrelated to the actual entrenchment propensity of the board to deter, impede, or otherwise personally benefit from a bid. If a bid does happen despite whatever subset "X" ATPs exist, the board's use of post-bid resistance to secure its entrenchment will depend on its entrenchment propensity, which will be unrelated to these ATPs. Hence, in this scenario, there will be no relationship between existing ATPs and the decision to resist post-bid.

(iii) The above-mentioned predictions continue to hold in a scenario where both subset "Y" and subset "X" ATPs are not empty sets. In this case, we expect a positive relationship (no relationship) from subset "Y" (subset "X") ATPs to post-bid resistance by boards.

Accordingly, the bottom-line is that our evidence will preponderantly support good-faith bargaining in stockholder interest only if there is a negative relationship between existing ATPs and the decision to use post-bid resistance. A positive relationship, or the absence of a relationship, will represent dominant support for the entrenchment motivation for post-bid takeover resistance.

2.2.2. Ex-Ante Scenarios Relating to the Initial Public Bid Premium for the Firm

If boards are motivated by good-faith bargaining in stockholder interest, their decision of whether to use post-bid resistance will depend on the bid premium at the start of the 'post-bid'/public phase of our conceptual modelling framework, since it is that which determines the potential for post-bid resistance to secure price improvement beyond the initial public bid price for the firm (Fishman, 1988; Hirshleifer and Titman, 1990; and Dimopoulos and Sacchetto, 2014). Hence, ceteris paribus (inclusive of the extant ATPs of the firm), the lower the initial public bid premium, the more likely, on average, will be a need for the board to use post-bid resistance.

Alternatively, if boards are motivated by entrenchment considerations, they will prioritize those entrenchment considerations irrespective of the initial public bid premium. Hence, the board decision of whether to use post-bid resistance will be based on its entrenchment propensity and remain unrelated to the initial public bid premium. Accordingly, a negative relationship between the initial public bid premium and the decision to use post-bid resistance will represent preponderant support for the good-faith bargaining view of post-bid takeover resistance, whilst the absence of a relationship will represent preponderant support for the entrenchment motivation for post-bid takeover resistance. Also, there will be no clear inference if the initial public bid premium relates positively to the board's decision to resist post-bid.

Figure 2 presents a schematic summary representation of these ex-ante scenarios. Unlike for Figures 1A and 1B, this has no explicit 'pre-bid' phase because here the ex-ante scenarios concern effect of the initial public bid premium, measured relative to the target firm's pre-run-up price, and hence before price revision occurs from pre-bid negotiations with an eventual public bidder.

2.3. Technique for Causal Inference

We exploit well-documented IVs for extant ATPs and for the initial public bid premium that are distinct, relevant, and exogenous in the specific context of our study, as well as multiple econometric specifications for exploiting them.

For our inferences concerning extant ATPs to be causal, each instrumental variable, IPO-proximate G-index and HQ-proximate G-index, should be a source of variation in the G-index that

is exogenous to takeover target selection for a focus firm in a given year. These are similar IVs to those of Karpoff et al. (2017) and are used in a similar setting to them. Karpoff et al. (2017) duly theoretically scrutinize these conditions. Their rationale is as follows. Each IV is restricted to a group of proximate firms for the focus firm. Endogeneity induced from industry takeover waves is removed by only including proximate firms from sectors not shared with the focus firm. Remaining endogeneity is removed by summing relative presence of the individual ATPs counted in the G-index for the proximate firms at a point in time years before the takeover year under consideration, and by ensuring that each group of proximate firms has a distinct but remote connection to the focus firm related to past adoption of ATPs. For the IPO-proximate G-index, the connection relates to time in that the focus firm and the proximate firms have experienced the same legal environment for the adoption of ATPs because of sharing the same year of IPO. For HQ-proximate G-index, the connection relates to geography in that the focus firm and the proximate firms are likely to have received similar legal advice on the adoption of ATPs because of sharing the same HQ location with a given state. Hence, IPO-proximate G-index and HQ-proximate G-index filter only those historic parts of the G-index of the focus firm due to distinctly relevant factors unrelated to its current takeover target likelihood and, hence, to its board's decision to put up post-bid resistance in the event of a bid.[6] These IV s therefore allay concerns, otherwise, around boards adopting or revoking ATPs in expectation of a bid and around the adoption or revocation of ATPs changing as the likelihood of a bid changes over time. They also allay concerns around boards having the option to adopt a poison pill at short notice relative to a bid (e.g., see Coates, 2000). We also duly account for endogeneity in the ATPs of our target firms preceding their selection as public takeover targets.

For our inferences concerning initial public bid premiums to be causal, the IV, pre-run-up price to 52-week-high price, should be a source of variation in the initial public bid premium that is exogenous to the decision to use post-bid resistance. This IV is based on that used by Baker et al. (2012), in a similar setting to ours. Their rationale in theoretically scrutinizing the relevance

[6] As a testament to the distinctness of these IVs, we observe that the positive correlation between these two IVs, for observations corresponding to the firms being selected as a takeover target, is only 12.3 percent.

condition is that because the IV equates to the proportionate difference between the pre-run-up price and the preceding fifty-two-week high price of the takeover target, the preceding price serves as a general reference point for the initial bidder in setting the initial public offer price. They go on to rationalize that the pre-run-up price to 52-week-high price is exploitable for examining whether there is a negative association from the bid premium to the announcement return to the bidder – as a way of cleanly assessing overpayment. We rationalize that the pre-run-up price to the 52-week-high price is also exogenous to the decision to use post-bid resistance, since the preceding fifty-two-week high price is a generic reference point for the initial public bid premium and thus filters only that part of the initial public bid premium for the firm due to a distinctly relevant factor unrelated to bidder expectation of post-bid resistance by boards. In addition, it is unlikely to reflect private information held by the initial bidder and boards about the value of selecting the firm as a takeover target.[7] This IV therefore allays concerns, otherwise, around bidders bringing their best public offer to the target after adjusting the bid premium ex-ante to avoid post-bid resistance.

3. Sample, Variables, and Univariate Results

3.1. Sample

Our sample is at the intersection of the RiskMetrics dataset for the component Gompers et al. (2003) G-index data and Center for Research in Security Prices and Compustat Merged (CCM) database for other firm data. We construct an unbalanced panel of U.S.-incorporated firms for the period 1990-2011. We stop in 2011 because changes in complete component G-index data are unavailable after 2006, as highlighted by Karpoff et al. (2017). Accordingly, in this paper, we keep our sample period compatible with that of Karpoff et al. (2017).

Furthermore, since dual class stock and antitrust authorities could potentially impede a firm's selection as a takeover target regardless of a proven deterrent effect of having more ATPs already in place, we remove observations for which the firm is flagged in RiskMetrics as having

[7] Baker et al. (2012) find no significant difference in the relationship between the 52-week-high-price ratio and the bid premium when they also consider the target board's attitude to a bid (see Table 6 in their paper).

dual class common stock or coded in the CCM database as having primary operations in the financial or utility sectors. Our sample contains 21,375 observations for the period 1992 to 2011. For 995 of these observations, the firm is selected as a takeover target the following year. Henceforth, we refer to our sample period as being from 1993 to 2012. The RiskMetrics dataset covers the period 1990-2006. However, we begin our sample period in 1993 to construct the IVs for the G-index at least three years before ascertaining takeover target selection for a firm each year. In addition, we end our sample period in 2012 as a compromise between requiring a longer forward fill of the component G-index data for 2006 than for earlier data points, and cutting off fewer more recent years, when according to Cain et al. (2017), bid hostility is still an important phenomenon.[8]

We utilize the Securities Data Company (SDC) database for ascertaining takeover target selection for a firm each year. We require a bid to be an attempt to acquire common stock of more than fifty percent and disclose an offer price. Firms are often selected as a takeover target multiple times in quick succession. Consistent with Bates and Becher (2017), we therefore merge into a single bid multiple attempts to acquire a firm when the separation is no more than one year. We also do not count bids that are, or involve, an attempt by managers to acquire the firm, because a management buyout could impede a firm from becoming a takeover target regardless of a proven deterrent effect of existing ATPs.

We depend entirely on news sources from the Factiva database for ascertaining the decision to use post-bid resistance because Bates and Becher (2017) raise concerns about the criteria that the SDC database applies to flag resistance. For general consistency with the criteria applied by them and in most other empirical research, as well as consistency with the spirit of the theoretical models of Berkovitch and Khanna (1990) and Levit (2017) for all types of resistance, we search only for a first board decision to use post-bid resistance. Resistance ends up ranging from recommending rejection of the initial offer to deploying a defense discriminating against at least

[8] Diagnostic tests that reject the null hypothesis that G-index is sufficiently exogenous to the decision to use post-bid resistance (as to require not being instrumented) become statistically more significant if we end our sample period in 2009, which leaves the forward fill of component G-index data for 2006 compatible with earlier data.

the initial bidder. However, we also end up with cases of boards adopting a 'morning after' poison pill (see, in particular, Heron and Lie, 2006). In addition, our searchable timeframe extends from the first public announcement of a bid (i.e., from the start of the 'post-bid' phase of our conceptual framework) to the very end of a bid, in the context of having merged multiple attempts to acquire a firm. Consistent with Jennings and Mazzeo (1993), Schwert (2000) and Bates and Becher (2017), and because of the 'pre-bid' phase of our conceptual framework, the eventual public form and perception of a takeover bid – i.e., merger or tender offer and solicited or unsolicited – does not matter to our categorization of the use of post-bid resistance.

Columns (1), (2), and (3) in Table 2 present, respectively: frequency distributions for all observations; observations for which the firm is selected as a takeover target; and takeover targets that use post-bid resistance. Columns (4) and (5) present rates of takeover target selection and the use of post-bid resistance, respectively. Column (4) shows that firms selected as takeover targets are 4.7 percent of the overall observations. This is compatible with the rate of takeover target selection documented by Karpoff et al. (2017) for a comparable sample. Column (5) shows that overall 17.4 percent, i.e., 173, of the takeover targets use post-bid resistance. This is much higher than the post-bid resistance rate documented by Bates and Becher (2017) for a comparable sample period, albeit a non-comparable sample of takeover targets. We surmise that the difference is partially attributable to their sample not being restricted to takeover targets with coverage in the RiskMetrics dataset because the component G-index data is for larger firms. Indeed, Schwert (2000) and Bates and Becher (2017) themselves find that boards of larger takeover targets are more likely to use post-bid resistance. Another likely reason though is that they only depend on news sources for a select group of takeover targets in their sample. Indeed, Jennings and Mazzeo (1993) search news sources for all takeover targets in their sample and document a post-bid resistance rate that is higher than in our data, albeit for a non-comparable timeframe.

3.2. Variables and Univariate Results

Our analysis integrates variables for firm and bid features that are standard to the literature on the market for corporate control, as framed by Jensen and Ruback (1983). The variables are

defined in Table 1. Table 3 presents descriptive statistics after grouping takeover targets based on whether their boards decided to use post-bid resistance.

3.2.1. Firm Features

The G-index is our main measure of ATPs already in place before a firm's selection as a takeover target. A larger number of existing ATPs, which for the G-index can be a number as large as twenty-four, equates to the board having a more effective set of mechanisms for achieving its objectives. According to the ex-ante scenarios in Figures 1A and 1B, if bargaining for price improvement in stockholder interest is the main board motive driving post-bid resistance decision, we would expect to find a smaller G-index, on average, for takeover targets that use post-bid resistance relative to those that do not. On the other hand, if board motive is preponderantly entrenchment related, we would expect to find a G-index that is larger or no smaller, on average, for targets using post-bid resistance, relative to those that do not. The G-index averages, respectively, 9.376 and 8.878 for takeover targets that use and do not use post-bid resistance. The difference in the means is positive and statistically significant at the five percent level, which is therefore consistent with entrenchment motive for post-bid resistance. However, this result could reflect a mere association between the G-index and the decision to use post-bid resistance when what really matters is whether the G-index has a causal effect on post-bid resistance.

As a partial assessment of causal effect, we examine differences in the means for the IVs for the G-index, namely IPO-proximate G-index and HQ-proximate G-index.[9] IPO-proximate G-index and HQ-proximate G-index average 9.115 and 9.082 respectively for takeover targets that use post-bid resistance, and 8.787 and 8.927 for those that do not. The differences in the means are positive and statistically significant in each case to at least the ten percent level. This therefore suggests early support for the positive association between the G-index and the decision to use post-bid resistance being of a form whereby the G-index has a causal effect on post-bid resistance.

[9] In satisfaction of the exclusion condition, an IV should be exogenous to the outcome variable, which means that, in satisfaction of the relevance condition, it should not affect the outcome variable in a way other than as being a source of variation in the suspect endogenous variable. However, Angrist and Pischke (2009, p. 213) also emphasize that an association from the instrumented variable to the outcome variable would be dubious should it not be possible to detect a matching indirect effect of the IV on the outcome variable.

Consistent with Schwert (2000), few of the other firm features are different at conventional levels of statistical significance between takeover targets that do and do not use post-bid resistance. However, in contrast to what he finds, our results show that size is no larger on average for takeover targets that use post-bid resistance. We, again, surmise that the difference is attributable to his sample, like the sample of Bates and Becher (2017), containing a greater number of smaller firms because of not being restricted to takeover targets with coverage in the RiskMetrics dataset.

3.2.2. Bid Features

The initial premium is our main measure of the quality of the initial public offer. A higher initial public bid premium equates to boards having less bargaining potential for price improvement post-bid. According to the ex-ante scenarios in Figure 2, if bargaining for price improvement in stockholder interest (entrenchment) is in the main the board motive driving the decision to use post-bid resistance, we would expect to find a lower (no lower) initial public bid premium, on average, for takeover targets that use post-bid resistance, relative to those that do not. The initial public bid premium averages 34.0 (42.4) percent for takeover targets that use (do not use) post-bid resistance. The difference in the means is negative and statistically significant at the one percent level, which therefore suggests that bargaining for price improvement is the main driver behind the decision to use post-bid resistance. Although this is consistent with the conclusions of both Jennings and Mazzeo (1993) and Bates and Becher (2017), it could well be documenting just a mere association between the initial public bid premium and the decision to use post-bid resistance.

As a partial assessment of whether the initial public bid premium has a causal effect on the decision to use post-bid resistance, we again examine the difference in the means for the IV for the initial public bid premium, namely pre-run-up price to 52-week-high price. We expect pre-run-up price to 52-week-high price to be negatively associated with the initial public bid premium. Pre-run-up price to 52-week-high price averages -24.4 percent for takeover targets that use post-bid resistance, and -24.5 percent for those that do not. The difference in the means is not statistically significant at conventional levels, which therefore suggests early on that the negative

association between the initial public bid premium and the decision to use post-bid resistance is unlikely to be one whereby the initial public bid premium is likely to influence post-bid resistance.

The other bid feature, namely a cash offer, is also different at a conventional level of statistical significance between takeover targets that do and do not use post-bid resistance. The use of only cash as the intended method of payment by the initial bidder is more frequent for takeover targets that use post-bid resistance. This result accords with the inference of Malmendier, Opp, and Saidi (2016), who infer that the intended method of payment tends to comprise more cash when the initial bidder wants to send a signal that the takeover target is undervalued.

4. Multivariate Findings for G-index and the Post-Bid Resistance Decision

We model the decision to use post-bid resistance as a limited dependent variable that equals one (zero) for takeover targets that use (do not use) post-bid resistance. However, the results in Tables 4 and 5, and in the main elsewhere, are from linear probability regressions to enable us to evaluate a comprehensive set of diagnostic test results related to examining the effect of instrumenting for the G-index. Nonetheless, we get near identical results from (probit) regressions specifically intended for a limited dependent variable.[10]

4.1. Effect of Instrumenting for the G-index

We draw on an ordinary least squares (OLS) regression to examine the effect of the non-instrumented G-index on the decision to use post-bid resistance. The results are presented in Column (1) of Table 4. The coefficient on the G-index is not statistically significant at conventional levels, which is therefore inconsistent with the univariate results that are suggestive of a positive association. Collinearity between the G-index and the initial public bid premium and other firm and bid features could account for the difference. However, regardless of how significant a role collinearity plays, and despite what is collectively suggested by the univariate results, there are compelling reasons to suspect that the G-index, as it stands, is not sufficiently exogenous to the

[10] Parallel results for Tables 4 and 5 are presented in Tables IA.1 and IA.2, respectively, in the Internet Appendix.

decision to use post-bid resistance. For instance, reverse causality could engender an unreliable association from the G-index to the decision to use post-bid resistance because a firm could have adopted (revoked) an ATP to signal more (less) intransigence in expectation of a takeover bid.

We therefore draw on a two stage least squares (2SLS) regression to examine the effect of instrumenting for the G-index on the decision to use post-bid resistance.[11] We jointly exploit the IVs because IPO-proximate G-index and HQ proximate G-index are distinct, exogenous sources of variation in the G-index. The first stage and the second stage results are presented in Columns (2) and (3), respectively, of Table 4. The coefficient on the G-index is positive, statistically significant at the one percent level, and equates to an average 5.9 percentage points increase in the likelihood of the use of post-bid resistance for each additional ATP already in place before a firm's selection as a takeover target. The effect is also economically materially significant given the overall high rate of the use of post-bid resistance for our sample.

The comprehensive set of diagnostic test results related to the effect of instrumenting for the G-index are also presented in Table 4. The F-statistic for the IVs is from the first stage test of the null hypothesis that the IVs alone have no statistically significant joint effect on the G-index. The value of 38.4 exceeds the five percent of worst-case bias robust critical value of 13.9 recommended by Olea and Pflueger (2013). We therefore have confidence in rejecting the null hypothesis. The R^2-statistic for the IVs is the first stage measure of the overall variation in the G-index explained by the joint variation in the IVs alone. Despite there being no recommended critical value, the value of 7.8 percent is sizable considering the historic rationale for the IVs having theoretical validity as sources of variation in the G-index. The results therefore suggest that the IVs also have statistical validity as sources of variation in the G-index.

Since we jointly exploit the IVs, the Chi^2-statistic for no over-identification is from the second stage test of the null hypothesis that at least one of the IVs is likely to be exogenous to the decision to use post-bid resistance. The value of 0.1 is not statistically significant at conventional

[11] We get near identical results from alternative specifications in which we use limited information maximum likelihood and generalized method of moments regressions specifically intended for examining the effect of instrumenting for a suspect endogenous variable on an outcome variable.

levels. The remaining result is the Chi^2-statistic for exogeneity from the second stage test of the null hypothesis that the G-index is likely to be sufficiently exogenous to the decision to use post-bid resistance as to not require instrumenting. The value of 8.8 is statistically significant at the one percent level, which therefore gives us confidence in rejecting the null hypothesis.[12]

The first stage coefficients on size and the return on assets show that these other firm features correlate positively and negatively, respectively, with the G-index. The result for size suggests that being a larger takeover target does not substitute for a greater set of ATPs already in place in the firm. The positive collinearity runs contrary to Schwert (2000), who posits that a larger takeover target equates to boards having an already effective mechanism for bargaining for price improvement. However, consistent with the univariate results, the second stage coefficients on size and the return on assets are not statistically significant at conventional levels. The reduced form results for the effect of instrumenting for the G-index are presented in Column (4) of Table 4. The coefficients on IPO-proximate G-index and HQ-proximate G-index are positive, quite close in magnitude, and statistically significant at the one percent level for the first IV. In view of all the above, we at this stage conclude that there is likely to be a positive causal association from the G-index to the decision to use post-bid resistance.

4.2. Effect of Private Information Held by the Initial Bidder

So far, we infer a positive relationship running from ATPs already in place before a firm's selection as a takeover target to post-bid resistance decision. According to the ex-ante scenarios in Figures 1A and 1B, the positive relationship is contrary not only to the bargaining for price improvement in stockholder interest view for specifically explaining the preponderant motive behind the decision to use post-bid resistance, but also to an often espoused positive association

[12] In view of the concerns highlighted by Roberts and Whited (2013) and Jiang (2017), we also rely on a conditional likelihood ratio (CLR) test, proposed by Moreira (2003), for obtaining a distribution of the instrumented effect of the G-index. This simulation-based test relies on 10,000 draws from our sample and, crucially, does not depend on the strength of the first stage. The CLR test statistic has a value of 11.0 and is significant at the one percent level. The corresponding ninety five percent confidence interval of 2.5 to 10.0 percentage points is positive throughout and, importantly also, does not overlap that from our OLS regression. We later posit an explanation for the downward bias in our OLS result.

between ATPs already in place and bargaining in stockholder interest more broadly (see, in particular, Comment and Schwert, 1995; Bates et al., 2008; and Cain et al., 2017).

However, there could be a scenario in which a greater set of ATPs already in place is made less effective for this purpose because the initial bidder holds more private information about the value of selecting the firm as a takeover target. In this scenario, which may be especially pertinent to takeover bids that occur unexpectedly from a public perspective, the target board could be more likely to need to use post-bid resistance to strengthen its bargaining position. Fishman (1988) shows theoretically that private information before selecting a firm as a takeover target gives the initial bidder an advantage over a potential rival, but that the decision to use post-bid resistance can serve to make public the private information and therefore narrow the advantage. His modelling therefore predicts a positive association between private information held by the initial bidder and the decision to use post-bid resistance. For our analysis, the main issue then becomes to what extent the positive relationship from the G-index to the decision to use post-bid resistance manifests from the omission of positive collinearity between an exogenous estimate of private information held by the initial bidder and the instrumented G-index.

To address the issue, we exploit the inverse Mills ratio (IMR) for takeover target selection in the presence of unobservable factors as an exogenous estimate of private information held by the initial bidder. We model takeover target selection as a limited dependent variable that equals one (zero) for firms selected (not selected) as a takeover target each year. However, Karpoff et al. (2017) suggest that reverse causality muddles the true association from the G-index to takeover target selection. We therefore account for the effect of instrumenting for the G-index, although in the reduced form because of the confines of a probit regression, to enable us to exploit the IMR.[13] We then add the IMR to the same 2SLS regression, which requires a correction to the standard errors. Wooldridge (2010, pp. 809-813) emphasizes that this procedure is the correct way to treat a suspect endogenous variable warranting inclusion in not only the outcome stage but also the selection stage of a model.

[13] This also serves to circumvent situations in which boards endogenously match to firms because of the presence of ATPs and their propensity for wanting to deter a takeover bid.

However, to be beyond reasonable doubt that the IMR is exogenous, we exploit a source of variation in takeover target selection that is exogenous to the decision to use post-bid resistance. This source of variation is a dummy variable that equals one (zero) for firms incorporated (not incorporated) in California. Our rationale is that all other things equal, California incorporation makes a firm more susceptible to selection as a takeover target because of a long history of legal hostility to ATPs in the state (see, in particular, Catan and Kahan, 2016; and Amihud, Schmid, and Solomon, 2017). At the same time, and as emphasized by Catan and Kahan (2016), most re-incorporations coincided with the peak in the passage of state takeover laws in the second half of the 1980s, and therefore years before firms in our sample make the post-bid resistance decision.

The results from the probit regression for takeover target selection, and for exploiting the IMR, are presented in Column (1) of Table 5. The average marginal effect of California incorporation is positive and statistically significant (at the one percent level).[14] The reduced form results for the effect of instrumenting for the G-index suggest that a larger G-index is more likely to impede a firm from selection as a takeover target, which is consistent with Karpoff et al. (2017).

The first and second stage results from the 2SLS regression for the decision to use post-bid resistance, after adding the IMR, are presented in Columns (2) and (3), respectively, of Table 5. The first stage coefficient on the IMR is positive and statistically significant (at the five percent level). This result suggests that more (less) private information held by the initial bidder is associated with a larger (smaller) G-index, which is possibly because of the adoption (revocation) of an ATP to signal more (less) intransigence in expectation of selection as a takeover target.[15] The second stage coefficient on the IMR is also positive and statistically significant (at the ten percent level). This result suggests that the decision to use post-bid resistance is more likely in response to

[14] Amihud et al. (2017) find that California incorporation is negatively associated with a classified/staggered board. However, whilst a classified/staggered board is counted in the IVs for the G-index, we find no material negative collinearity between California incorporation and our IVs (maximum correlation coefficient = -11.9 percent).

[15] Data collected by Smith (2019) shows that the adoption and revocation of an ATP are both frequent, but that revocation is more frequent. Despite the stickiness of ATPs through time, data collected by Cuñat et al. (2020), for a timeframe covering our sample period, also shows that revocation is frequent. Moreover, they find evidence to suggest that passage of a shareholder proposal to revoke an ATP causes less board intransigence, as indicated by a greater subsequent likelihood of the firm being taken over. This may therefore provide one explanation for the downward bias in our OLS result as compared to that from our 2SLS regression.

more private information held by the initial bidder, which therefore accords with the theoretical prediction of Fishman (1988).

Nonetheless, our main results continue to indicate that there is a positive relationship from the G-index to the decision to use post-bid resistance, although with a slight reduction in its average effect, suggesting that for some takeover bids, but by no means an average bid, private information held by an initial bidder before selecting a firm as a takeover target renders ATPs less effective than would otherwise be the case, making it more likely for the board to need to use post-bid resistance to strengthen the firm's bargaining position. The same is true of the reduced form results presented in Column (4) of Table 5.

4.3. Additional Robustness Checks for the G-index

4.3.1. Alternative Time Horizon for the G-index Instrumental Variables

In our earlier analysis, we construct the IVs for the G-index three years before ascertaining takeover target selection for a firm each year. We therefore first aim a robustness check at the sufficiency of this rationale in part satisfaction of the second stage exclusion condition. We do so by replacing the rolling IVs with equivalent variables constructed from the earliest available component G-index data, which is at the beginning of the RiskMetrics dataset for most firms. Since we exploit new IVs for the G-index, preceding the 2SLS regression is a new probit regression for exploiting the IMR, the results from which are presented in Column (1) of Table IA.3 in the Internet Appendix. The first stage, second stage, and reduced form results are presented in Columns (2), (3), and (4), respectively, of Table IA.3. Despite these changes, our main results and inferences stay the same.

4.3.2. Alternative Functional Form for the G-index

We next aim a robustness check at the reliability of a summation-based measure of ATPs in capturing the collective power of existing ATPs. We accordingly replace the G-index with a dummy variable that equals one (zero) for firms each year with a G-index in excess (not in excess) of the median G-index for all firms in that year. However, for the G-index dummy, we once again exploit the rolling IVs, which means that the probit regression for exploiting the IMR is as in

Column (1) of Table 5. We also replace the 2SLS regression with a two-equation probit regression because now not only the outcome variable but also the suspect endogenous variable is a limited dependent variable.[16] Columns (1) and (2) in Table IA.4 in the Internet Appendix present in full the first equation results for instrumenting the G-index dummy and the second equation results for the effect of instrumenting for the G-index dummy on the decision to use post-bid resistance, respectively. Column (1) in Table 6 presents abridged second equation results. Despite these changes, our main results, whilst limited in the diagnostic test sense because of the nature of the new estimation process, continue to indicate that there is a positive relationship from ATPs already in place in the firm to the decision to use post-bid resistance.

4.4. The E-index and the O-index as Subsets of the G-index

Bebchuk et al. (2009) make a case for an E-index – with just six out of the twenty-four ATPs counted in the G-index – as having the most potency for entrenchment. These six include a classified/staggered board, a supermajority amendment, and a poison pill. However, after correcting for endogeneity in existing ATPs, Karpoff et al. (2017) find evidence to suggest that a higher index comprised of the other eighteen ATPs is as statistically significant as a higher E-index in outright deterring a takeover bid.

We next aim a robustness check at the reliability of a broad-based measure of existing ATPs for inferring entrenchment in the more specific context of the post-bid resistance decision. To do so, we revert to a summation-based G-index and replace it and the rolling IVs with an index, namely O-index, and IVs, namely IPO-proximate O-index/HQ-proximate O-index, identically constructed, except for no longer counting ATPs set apart for the E-index. Complete results are presented in Table IA.5 in the internet appendix and abridged second stage results are presented in Column (2) of Table 6. Despite these changes, our main results continue to indicate that there is a positive association from ATPs already in place in the firm to the decision to use post-bid

[16] Since estimation of the two-equation probit regression is via a system of simultaneous equations and therefore automatically accounts for correlation between the error terms, an advantage over the 2SLS regression is that the estimation process is less reliant on the validity of the IVs.

resistance. We do the same for the E-index. Complete results are presented in Table IA.6 in the Internet Appendix and abridged second stage results are presented in Column (3) of Table 6. The results indicate that there is no statistically significant association from the most potent ATPs already in place in the firm to the decision to use post-bid resistance by boards.

We reasoned in section 2.2.1 that if a board is conditioned because of external factors (irrespective of its motivation) to be passive with respect to one subset of ATPs (subset "X") and is able to actively influence another subset of ATPs (subset "Y") then: (a) if the board is motivated by good-faith bargaining in stockholder interest, we will observe a negative, average, relationship from either subset of ATPs to post-bid resistance; and (b) if the board is motivated by entrenchment considerations, we will observe a positive impact on post-bid resistance from existing subset "Y" ATPs, but no impact on post-bid resistance from existing subset "X" ATPs.

We observe a positive impact on post-bid resistance from the ATPs in the O-index, but no impact on post-bid resistance from the ATPs in the E-index. In this context, our results for both the O-index and the E-index support a preponderant entrenchment motivation for the decision to use post-bid resistance. They are also consistent with boards being ex-ante more constrained in actively influencing the E-index ATPs, the most potent ATPs in the G-index, relative to the other (O-index) ATPs in the G-index. It is important to point out that the only ATP analyzed by Bates and Becher (2017) is the presence of a classified/staggered board, and this ATP is part of the E-index. The results of Bates and Becher (2017), in relation to the one ATP that they analyzed, should thus be interpreted in the backdrop of our findings.

To examine independently the extent to which boards actively influence the ATPs included in the E-index and the O-index, we examine mean percentages of firms in our wider sample that adopt, but also do not revoke, one ATP counted in these subsets of the G-index between consecutive updates to the RiskMetrics dataset. Table 7 presents the results. We find that the mean percentage of firms that adopt one ATP counted in the O-index is higher than the mean percentage of firms that adopt one ATP counted in the E-index. This is true regardless of whether firms are selected as takeover targets and is consistent with boards being more constrained in actively influencing the most potent ATPs of the firm. Additionally, however, the results reveal that,

statistically, a significantly higher mean percentage of firms selected as a takeover target adopt one ATP counted in the G-, O-, and E-indices, as compared to other firms. This therefore provides support for the conclusion of Karpoff et al. (2017) of upward bias in effect of ATPs on takeover target likelihood in the absence of methods capable of circumventing endogeneity.

5. Multivariate Findings: Initial Public Bid Premium and Post-Bid Resistance Decision

Fishman (1988) proves theoretically that the decision to use post-bid resistance can serve to make public the private information that the initial bidder holds, about the value of selecting the firm as a takeover target, and therefore narrow the advantage over a potential rival. An implication of his proof is that the initial bidder is likely to pre-empt more costly post-bid competition by setting a higher initial public bid premium than would otherwise be the case. In contrast, an implication of the structural work of Dimopoulos and Sacchetto (2014) is that the initial bidder is likely to pre-empt more costly post-bid resistance by disregarding the private information that it holds, and the consequences for post-bid competition, and setting a lower-than-normal initial public bid premium. These implications amount therefore to compelling reasons to suspect that reverse causality is likely to muddle the true association from the initial public bid premium to the decision to use post-bid resistance.

We therefore expand the earlier 2SLS regression in Table 5 to examine the effects of simultaneously instrumenting for the G-index and initial public bid premium on the decision to use post-bid resistance.[17] Results are presented in Table 8.

5.1. Effect of Instrumenting for the Initial Public Bid Premium

[17] We use a standard run-up period of sixty-three trading days before bid announcement for the initial public bid premium, and thus here also for the pre-run-up price to 52-week-high price. However, we produce near identical results when we use a longer run-up period of one-hundred-and-five trading days before bid announcement, as recommended by Eaton, Liu, and Officer (2021). These results are presented in Table IA.7 of the Internet Appendix.

Columns (1), (2), and (3) in Table 8 present the results from the first stage for instrumenting the G-index, first stage for instrumenting the initial public bid premium, and second stage for the effects of simultaneously instrumenting for the G-index and initial public bid premium, respectively. The coefficient on the initial public bid premium in Column 3 is not statistically significant at conventional levels.

The comprehensive set of diagnostic test results related to the effects of simultaneously instrumenting for the G-index and initial public bid premium are presented at the base of the regression. The F-statistic for pre-run-up price to 52-week-high price is from the first stage test of the null hypothesis that the IV alone has no statistically significant effect on the initial public bid premium at conventional levels. The value of 28.1 gives us confidence in rejecting the null hypothesis, knowing also that the coefficient on pre-run-up price to 52-week-high price is negative. The R^2-statistic for pre-run-up price to 52-week-high price is the first stage measure of the overall variation in the initial public bid premium explained by the variation in the IV alone. The value of 9.7 percent is sizable considering the generic reference point rationale for the IV having theoretical validity as a source of variation in the initial public bid premium. The results therefore suggest that the IV also has statistical validity as a source of variation in the initial public bid premium.

Since we simultaneously exploit the IVs for the G-index and initial public bid premium, the Chi^2-statistic for no over-identification is from the second stage test of the null hypothesis that at least one of the IVs is likely to be exogenous to the decision to use post-bid resistance. The value (of 0.0) is clearly not statistically significant. We therefore have confidence in accepting the null hypothesis. The results therefore give us reassurance that pre-run-up price to 52-week-high price has not only theoretical validity but also statistical validity as an exogenous source of variation in the initial public bid premium. The remaining result is the Chi^2-statistic from the second stage test of the null hypothesis that the G-index and initial public bid premium are likely to be simultaneously, sufficiently exogenous to the decision to use post-bid resistance as to not require instrumenting. The value of 7.7 is statistically significant at five percent level. We therefore have confidence in rejecting the null hypothesis.

The first stage coefficients on IPO-proximate G-index/HQ-proximate G-index for instrumenting the initial public bid premium are not statistically significant at conventional levels (Column 2). These results suggest that there is no association from ATPs already in place to the initial public bid premium, which is further contrary to an often-espoused positive association between ATPs already in place and bargaining in stockholder interest. For instance, Cain et al. (2017) exploit the exogenous passage of antitakeover laws and find that greater protection from a hostile takeover leads to a better-quality outcome for stockholders, if a bid does happen despite having more protection. However, Cuñat et al. (2020) contest these findings by exploiting regression discontinuity applied to stockholder voting and finding that revocation of an ATP leads to a similar outcome for stockholders in the event of a future takeover bid. Only Cuñat et al. (2020) correct, as we do, for takeover target selection in the presence of unobservable factors.

The first stage coefficient on the IMR for instrumenting the initial public bid premium is also not statistically significant at conventional levels, which suggests that there is no tendency for the initial bidder to set the initial public bid premium by taking into consideration the private information that it holds before selecting the firm as a takeover target, and the consequences for post-bid competition. This result does not therefore provide support for the implication that arises from the theory of Fishman (1988), but instead supports the structural inference of Dimopoulos and Sacchetto (2014), who infer that pre-emption of competition from a potential rival bidder account for only a fraction of the bid premium.

Column (4) in Table 8 presents the reduced form results for the effects of simultaneously instrumenting for the G-index and initial public bid premium. The coefficient on pre-run-up price to 52-week-high price shows no indication that the IV for the initial public bid premium is statistically significant at conventional levels. All things so far considered, we at this stage infer that there is no association from the initial public bid premium to the post-bid resistance decision.

5.2. Effect of the Unexplained Component of Initial Public Bid Premium

According to the ex-ante scenarios in Figure 2, no association runs contrary to the bargaining for price improvement motive behind the board decision to use post-bid resistance. In

a related study, Bates and Becher (2017) find no (negative) correlation between the initial public bid premium (unexplained component of initial public bid premium) and the decision to use post-bid resistance and suggest that the unexplained component is a more reliable measure the initial public offer quality. An implication of their findings, again supporting our argument, is that the initial public bid premium is endogenous with respect to the post-bid resistance decision. We now examine the implications of what no association from initial public bid premium to post-bid resistance means for the unexplained component of initial public bid premium.

For our analysis, the unexplained component is the difference between the observed and estimated initial public bid premium from an OLS regression identical to that used in Column (2) of Table 8.[18] We then replace the initial public bid premium with the unexplained component of initial public bid premium in the same 2SLS regression, except for once again only instrumenting for the G-index. Columns (1) and (2) in Table 9 present the first and second stage results, respectively. The second stage coefficient on the unexplained component is negative and statistically significant (at the one percent level), which is consistent with the results of Bates and Becher (2017). However, they contend that this negative association supports the bargaining in stockholder interest view of post-bid resistance. In contrast, the main issue for our analysis then becomes to what extent this negative association manifests from reverse causality muddling the true relationship from the initial public bid premium to the decision to use post-bid resistance.

To address this issue, we add the initial public bid premium to the same 2SLS regression and exploit the Durbin-Wu-Hausman procedure to evaluate whether the initial public bid premium, alone, is likely to be sufficiently exogenous to the post-bid resistance decision. Columns (3) and (4) in Table 9 present the first and second stage results, respectively. The second stage coefficient on the initial public bid premium is not statistically significant at conventional levels. It is also

[18] Bates and Becher (2017) drop bids with post-bid competition from a rival bidder, and uncompleted bids, and predict a bid premium, in or out of sample, for subtracting from the initial public bid premium. We retain such bids to ensure identicalness to when we instrument the initial public bid premium in Column (2) of Table 8, because our intention is to examine the implications of what no causal association means for the unexplained component of initial public bid premium. Nonetheless, implementing their procedure does not materially alter our results. They include a predictor variable in their regression that is like the IV for the initial public bid premium in our regression. However, they do not correct, as we do, for takeover target selection in the presence of unobservable factors.

equivalent to the effect of instrumenting for the initial public bid premium in Column (3) of Table 8 because of already accounting for the unexplained component. However, the second stage coefficient on the unexplained component is still negative and statistically significant (at the five percent level), which indicates that the initial public bid premium is not sufficiently exogenous to the decision to use post-bid resistance.

The results are underpinned by material positive collinearity between the unexplained component of initial public bid premium and the initial public bid premium itself (correlation coefficient = 93.2 percent), and by the fact that the unexplained component is orthogonal to the IMR. As such, this suggests that there is a tendency for the initial bidder to pre-empt more costly post-bid resistance by setting a higher-than-normal initial public bid premium regardless of their private information and the consequences for post-bid competition, which may account for the downward bias in our OLS result as compared to that from our 2SLS regression. The results therefore provide support for the implication that arises from the structural work of Dimopoulos and Sacchetto (2014), who infer that resistance, rather than pre-emption of competition from a potential rival bidder, mostly accounts for the bid premium, irrespective of the decision to use post-bid resistance.

6. Effect of the Decision to Use Post-Bid Resistance

Our analyses of the decision to use post-bid resistance rely on hypothesized drivers of this decision and techniques that permit causal inferences. We conclude that, for an average bid, more ATPs already in place before a firm's selection as a takeover target give more impetus to the post-bid resistance decision, and that more potential for price improvement because of a lower initial public bid premium does not impact (measurably) the decision to use post-bid resistance. According to the ex-ante scenarios in Figures 1A, 1B, and 2, we further conclude that the board decision to use post-bid resistance is likely to be primarily driven by entrenchment considerations.

In contrast, Franks and Mayer (1996), Schwert (2000), and Bates and Becher (2017) document support for the bargaining for price improvement view. However, none of their findings

emanate from relationships that permit causal inference. Instead, they mostly infer board motive behind post-bid resistance from analyzing the effects of the decision to use post-bid resistance. In view of this, and despite the ex-post nature of this form of analysis, our aim in this section is to further explore the question of board motivation behind post-bid resistance by examining the effect of the post-bid resistance decision on key bid outcome related variables, albeit without addressing causality, as in the above studies. We focus on the use of a target termination fee, final public bid premium, bid completion, and overall return to target stockholders. These variables are widely used in the market-for-corporate-control literature to capture determinants and measures of stockholder wealth beyond the run-up to a public bid.

Table 10 presents multivariate results. Bates and Lemmon (2003) and Officer (2003), infer from extensive analyses target termination fee is used to serve as a signal of commitment in exchange for a better-quality outcome for stockholders. The probit regression results presented in Column (1) suggest that the effect of the post-bid resistance decision on the use of a target termination fee is unlikely in the main to be in the best interests of stockholders. The OLS regression results presented in Column (2) suggest that final public bid premium is unaffected by whether there is post-bid resistance. In unreported results, we also note that final public bid premium is seldom higher than the initial public bid premium for takeover targets that do not use post-bid resistance, a result that is consistent with bargaining for price improvement in the run-up to a public bid for takeover targets that do not use post-bid resistance (see, Boone and Mulherin, 2007; Aktas et al., 2010; and Brown Jr. et al., 2022). Again, it appears unlikely in the main that post-bid resistance represents good faith bargaining for stockholders.

The probit regression results presented in Column (3) suggest that takeover bids are less likely to be completed when there is post-bid resistance. This result is consistent with those documented by Walkling (1985) and again suggests that the effect of the decision to use post-bid resistance on bid completion is unlikely in the main to be in the best interests of stockholders. Finally, the OLS regression results presented in Column (4) suggest that the decision to use post-bid resistance has an adverse effect on the overall return to stockholders and is unlikely therefore to in the main be in their best interests. This result contrasts with the findings of Schwert (2000),

who finds a beneficial effect on the overall return to target stockholders for measures of bid hostility closest to our measure of the post-bid resistance decision. However, we require a measurement period for the overall return that impounds information for multiple offers separated by up to one year, whereas he is reliant on a shorter measurement period. In addition, we extend the measurement period for the overall return to one year after an uncompleted bid to allow for sufficient settling down in the stock price of the takeover target, whereas, despite an analogous measure of bid completion, he is again reliant on the shorter measurement period.

To summarize, for each of the bid outcome related variables that we examine in this section, the average effect of post-bid resistance does not come out as being in the best interests of stockholders and, hence, is inconsistent with dominance of the bargaining for price improvement view of why the board uses post-bid resistance. Instead, these results are further indicative of a primary entrenchment motivation for post-bid resistance. Furthermore, taken together, our analysis here and our earlier core analysis suggests that revised and rival offers, long associated with bargaining for price improvement in stockholder interest, are a by-product and not a driver of the decision to use post-bid resistance.

7. Summary and Concluding Remarks

The overarching focus of this paper is to examine whether board decisions of U.S. firms to offer post-bid takeover resistance are motivated preponderantly by bona-fide considerations of serving the best interests of shareholders, or by self-serving entrenchment related considerations. In this context, we undertake two new empirical investigations and develop a conceptual modeling framework for interpreting the findings from them. Besides being valuable contributions to the literature in their own right, the specific rationale of these two empirical investigations is that the two preponderant board motivation possibilities influence target firm board decisions to use post-bid resistance not only directly (for which there can be no credible identification strategy), but also in the two intermediate ways that we examine in this paper – through the antitakeover provisions ('ATPs') the board chooses to keep in place prior to receiving any bid interest, and through the

response of the board to the initial public bid premium – each of which facilitate credible identification of the preponderant underlying board motivation behind post-bid takeover resistance. Accordingly, we analyze, through empirical research designs that account for endogeneity and sample selection, the causal relationships from preexisting ATPs, and from the initial public takeover bid premium, to the target board's decision to resist post-bid; and our conceptual modeling framework enables us to infer what these causal relationships arguably imply for our overarching underlying question: whether U.S. boards offering post-bid takeover resistance act preponderantly as bona-fide or as self-serving fiduciaries.

We find a positive and significant relationship from exogenous and distinct sources of variation in ATPs already in place to the post-bid resistance decision. After correcting for sample selection, which is itself impacted by ATPs, the effect of an instrumented ATP index that counts all widely-accepted ATPs equates to an average 4.3 percentage points increase in the likelihood of the use of post-bid resistance for each additional ATP already in place. This is economically important, since boards of 17.4 percent of our sample of 995 U.S. takeover target firms over a period of twenty years use post-bid resistance of one form or another. In other words, having more ATPs already in place prior to receiving public bid interest, and hence more potential to bargain pre-bid for a higher public bid premium, does not in general result in a lower likelihood of the target firm board taking action to resist the public takeover bid. In fact, target firms with more ATPs tend to resist significantly more post-bid, rather than less. This is after accounting for cases in which an initial public bidder's private information advantage renders existing ATPs less effective than they would otherwise be, thereby increasing the likelihood of post-bid resistance by boards in addition to extant ATP strength.

We simultaneously find no evidence to indicate a causal relationship between the initial public takeover bid premium and post-bid resistance, nor a causal relationship between ATPs already in place prior to receiving bid interest and the initial public takeover bid premium. This therefore suggests that the decisions of target firm boards to use post-bid resistance are unrelated, in general, to the potential for further price improvement beyond that included in the initial public takeover bid premium.

Our conceptual modeling framework is fully aligned with the extant literature to infer what these effects imply for board motivation behind post-bid takeover resistance. We assume that negotiations with an eventual public bidder, and associated price revisions, occurs prior to an initial public takeover bid, and is undertaken within the context of the ATPs already in place in the target firm. We conceptualize board motivation behind post-bid resistance as being either good-faith bargaining to get the best outcome for shareholders, or self-serving entrenchment driven. Whilst recognizing that boards in the U.S. have full discretion de jure in regard to ATPs, we also allow for time-varying external factors (like public perceptions, signaling imperatives, and views of influential stakeholders) to condition, irrespective of board motivation, the general policy of the board in relation to the presence of different subsets of ATPs.

Our conceptual modelling framework has the following implications. With respect to preexisting ATPs, we can conclude good-faith bargaining as board motivation for post-bid resistance only if we find a significant negative relationship from existing ATPs to post-bid resistance, whilst a positive relationship, or the absence of a relationship, will point to an entrenchment motivation for post-bid takeover resistance. Similarly, we can conclude good-faith bargaining as board motivation for post-bid resistance only if we find a negative relationship from the initial public bid premium to post-bid resistance, whilst the absence of a relationship will point to an entrenchment motivation; and no clear inference is possible if the initial public bid premium relates positively to the board decision to resist post-bid.

Hence, the findings from our empirical investigations of the relationships from extant ATPs and from initial public bid premiums to post-bid resistance both indicate that U.S. takeover target firm boards in our twenty-year sample period are motivated significantly more by entrenchment considerations than by good-faith bargaining for stockholders. This conclusion is consistent with, in particular, Cuñat et al. (2020), who also generate ATP-based causal inferences, but of a different form to ours. We are the first to arrive at this conclusion after directly framing the post-bid resistance decision and examining effects of specific variables. We also infer, again from both of our empirical analyses, with and without the use of instrumental variables, that material non-circumvented endogeneities are likely to be present in earlier studies, stemming largely from the

fact that the salient determinants of the post-bid resistance decision, as well as the post-bid resistance decision itself, are likely to be dependent upon the motivation of the target firm's board.

Interesting avenues for future research emerge from our study. Firstly, whilst our causal inferences contribute to the broader debate around board motivation for resisting takeovers, what our findings reflect is the overall picture, and with respect to two specific effects posited by our conceptual modelling framework. A meaningful proportion of target firm boards could well be exercising their discretion diligently as bona fide (rather than as self-serving) fiduciaries for shareholders when they decide to resist post-bid. Indeed, our findings in relation to the initial public bidder's private information advantage attest to the likelihood of this possibility. We therefore leave to future research the examination of narrower cross-sectional differences across firms in the context of the issues that we address in this paper. Secondly, our results also suggest that boards could be constrained in relation to changing the status quo for what may be the most potent ATPs, or the ATPs involving the greatest public sensitivity, at a given point in time. Our study therefore highlights a need for future research into the motivation of boards in relation to influencing ATPs already in place in the firm (actively or otherwise) to meet their overall corporate control objectives. Thirdly, given that pre-public-bid negotiations by boards with an eventual public bidder are fairly ubiquitous, our findings and inferences also point to a need for greater understanding of the nature and the tools of the bargaining process in the run-up to a public bid, particularly for target boards that decide not to use post-bid resistance to aid further bargaining beyond the initial public offer.

Lastly, the findings and inferences that we document in this paper have important implications for a key policy level difference between the U.S., on the one hand, and the U.K., Australia, New Zealand, and most E.U. countries, on the other hand. This is the difference in the level of discretion permissible to boards to resist a public takeover bid within their respective governance and legal regimes. Overall, our paper highlights the critical relevance of the ongoing debate around the unfettered board discretion that exists in U.S. law and practice in the context of public takeover bid resistance. Our findings and inferences suggest a need to introduce (in the U.S.) a framework of checks and balances in the hands of shareholders, or measures that can

effectively incentivize intransigent boards to exercise their discretion and primacy in a manner that best serves shareholders. In this context, and in relation to the latter issue, it is worth noting that recent research into another key board decision – voting policy for shareholders – documents that shareholders benefit from mandatory voting in the U.K. (Becht, Polo, and Rossi, 2016), and from voluntary non-mandatory voting in the U.S. (Li, Liu, and Wu, 2018). We leave a deeper examination of these and related issues for future research.

8. References

Aktas, N., E. de Bodt, and R. Roll, 2010. Negotiations under the threat of an auction. Journal of Financial Economics, 98, pp. 241-255.

Amihud, Y., M. Schmid, and S.D. Solomon, 2017. Do staggered boards affect firm value? Working paper, available at http://dx.doi.org/10.2139/ssrn.2948141.

Angrist, J.D. and J.-S. Pischke, 2009. Mostly Harmless Econometrics: An Empiricist's Companion. Princeton University Press.

Atanassov, J., 2013. Do hostile takeovers stifle innovation? Evidence from antitakeover legislation and corporate patenting. Journal of Finance, 68, pp. 1097-1131.

Baker, M., X. Pan, and J. Wurgler, 2012. The effect of reference point prices on mergers and acquisitions. Journal of Financial Economics, 106, pp. 49-71.

Bange, M.M. and M.A. Mazzeo, 2004. Board composition, board effectiveness, and the observed form of takeover bids. Review of Financial Studies, 17, pp. 1185-1215.

Baron, D.P., 1983. Tender offers and management resistance. Journal of Finance, 38, pp. 331-343.

Bates, T.W. and D.A. Becher, 2017. Bid resistance by takeover targets: managerial bargaining or bad faith? Journal of Financial and Quantitative Analysis, 52, pp. 837-866.

Bates, T.W., D.A. Becher, and M.L. Lemmon, 2008. Board classification and managerial entrenchment: evidence from the market for corporate control. Journal of Financial Economics, 87, pp. 656-677.

Bates, T.W. and M.L. Lemmon, 2003. Breaking up is hard to do? An analysis of termination fee provisions and merger outcomes. Journal of Financial Economics, 69, pp. 469-504.

Bebchuk, L.A., 2002. The case against board veto in corporate takeovers. University of Chicago Law Review, 69, pp. 973-1035.

Bebchuk, L.A., 2005. The case for increasing shareholder power. Harvard Law Review, 118, pp 833-914.

Bebchuk, L., A. Cohen, and A. Ferrell, 2009. What matters in corporate governance? Review of Financial Studies, 22, pp. 783-827.

Becht, M., A. Polo, and S. Rossi, 2016. Does mandatory shareholder voting prevent bad acquisitions? Review of Financial Studies, 29, pp. 3035-3067.

Berkovitch, E. and N. Khanna, 1990. How target shareholders benefit from value reducing defensive strategies in takeovers. Journal of Finance, 45, pp. 137-156.

Boone, A.L. and J.H. Mulherin, 2007. How are firms sold? Journal of Finance, 62, pp. 847-875.

Brown Jr., W.O., T. Liu, and J.H. Mulherin, 2022. The development of the takeover auction process: the evolution of property rights in the modern wild west. Journal of Law and Economics, 65, pp. 715-751.

Cain, M.D., S.B. McKeon, and S.D. Solomon, 2017. Do takeover laws matter? Evidence from five decades of hostile takeovers. Journal of Financial Economics, 124, pp. 464-485.

Catan, E.M. and M. Kahan, 2016. The law and finance of antitakeover statutes. Stanford Law Review, 68, pp. 629-680.

Chemmanur, T.J. and X. Tian, 2018. Do antitakeover provisions spur corporate innovation? A regression discontinuity analysis. Journal of Financial and Quantitative Analysis, 53, pp. 1163-1194.

Coates, J.C., 2000. Takeover defenses in the shadow of the pill: a critique of the scientific evidence. Texas Law Review, 79, pp. 271-382.

Comment, R. and G.W. Schwert, 1995. Poison or placebo? Evidence on the deterrent and wealth effects of modern antitakeover measures. Journal of Financial Economics, 39, pp. 3-43.

Cotter, J.F. and M. Zenner, 1994. How managerial wealth affects the tender offer process. Journal of Financial Economics, 35, pp. 63-97.

Cuñat, V., M. Giné, and M. Guadalupe, 2020. Price and probability: decomposing the takeover effects of antitakeover provisions. Journal of Finance, 75, pp. 2591-2629.

Dimopoulos, T. and S. Sacchetto, 2014. Pre-emptive bidding, target resistance, and takeover premiums. Journal of Financial Economics, 114, pp. 444-470.

Easterbrook, F.H. and D.R. Fischel, 1981. The proper role of a target's management in responding to a tender offer. Harvard Law Review, 94, pp. 1161-1204.

Eaton, G.W., T. Liu, and M.S. Officer, 2021. Rethinking measures of mergers and acquisitions deal premiums. Journal of Financial and Quantitative Analysis, 56, pp. 1097-1126.

Eldar, O. and M.D. Wittry, 2021. Crisis poison pills. Review of Corporate Finance Studies, 10, pp. 204-251.

Fishman, M.J., 1988. A theory of pre-emptive takeover bidding. Rand Journal of Economics, 19, pp. 88-101.

Franks, J. and C. Mayer, 1996. Hostile takeovers and the correction of managerial failure. Journal of Financial Economics, 40, pp. 163-181.

Gilson, R.J. and A. Schwartz, 2021. An efficiency analysis of defensive tactics. Harvard Business Law Review, 11, pp. 1-54.

Gompers, P., J. Ishii, and A. Metrick, 2003. Corporate governance and equity prices. Quarterly Journal of Economics, 118, pp. 107-155.

Gormley, T.A. and D.A. Matsa, 2016. Playing it safe? Managerial preferences, risk, and agency conflicts. Journal of Financial Economics, 122, pp. 431-455.

Guernsey, S., S.M. Sepe, and M. Serfling, 2022. Blood in the water: the value of antitakeover provisions during market shocks. Journal of Financial Economics, 143, pp. 1070-1096.

Harford, J., 2003. Takeover bids and target directors' incentives: the impact of a bid on directors' wealth and board seats. Journal of Financial Economics, 69, pp. 51-83.

Harford, J., M. Humphery-Jenner, and R. Powell, 2012. The sources of value destruction in acquisitions by entrenched managers. Journal of Financial Economics, 106, pp. 247-261.

Hartzell, J.C., E. Ofek, and D. Yermack, 2004. What's in it for me? CEOs whose firms are acquired. Review of Financial Studies, 17, pp. 37-61.

Heron, R.A. and E. Lie, 2006. On the use of poison pills and defensive payouts by takeover targets. Journal of Business, 79, pp. 1783-1807.

Hirshleifer, D. and S. Titman, 1990. Share tendering strategies and the success of hostile takeover bids. Journal of Political Economy, 98, pp. 295-324.

Jennings, R.H. and M.A. Mazzeo, 1993. Competing bids, target management resistance, and the structure of takeover bids. Review of Financial Studies, 6, pp. 883-909.

Jensen, M.C. and R.S. Ruback, 1983. The market for corporate control: the scientific evidence. Journal of Financial Economics, 11, pp. 5-50.

Jiang, W., 2017. Have instrumental variables brought us closer to the truth? Review of Corporate Finance Studies, 6, pp. 127-140.

John, K., D. Kadyrzhanova, and S. Lee, 2023. Do classified boards deter takeovers? Evidence from merger waves. Journal of Financial and Quantitative Analysis, forthcoming.

Karakaş, O. and M. Mohseni, 2021. Staggered boards and the value of voting rights. Review of Corporate Finance Studies, 10, pp. 513-550.

Karpoff, J.M., R.J. Schonlau, and E.W. Wehrly, 2017. Do takeover defense indices measure takeover deterrence? Review of Financial Studies, 30, pp. 2359-2412.

Karpoff, J.M. and M.D. Wittry, 2024. Corporate takeover defenses. In Denis, D.J., Handbook of Corporate Finance, pp. 410-454. Elgar.

Levit, D., 2017. Advising shareholders in takeovers. Journal of Financial Economics, 126, pp. 614-634.

Li, K., T. Liu, and J. Wu, 2018. Vote avoidance and shareholder voting in mergers and acquisitions. Review of Financial Studies, 31, pp. 3175-3211.

Liu, T. and M.S. Officer, 2021. Public news, stock market reactions, and bidding behavior in private merger negotiations. Working paper, available at http://dx.doi.org/10.2139/ssrn.3383209.

Malmendier, U., M.M. Opp, and F. Saidi, 2016. Target revaluation after failed takeover attempts: cash versus stock. Journal of Financial Economics, 119, pp. 92-106.

Masulis, R.W. and S.A. Simsir, 2018. Deal initiation in mergers and acquisitions. Journal of Financial and Quantitative Analysis, 53, pp. 2389-2430.

Masulis, R.W., C. Wang, and F. Xie, 2007. Corporate governance and acquirer returns. Journal of Finance, 62, pp. 1851-1889.

Moreira, M.J., 2003. A conditional likelihood ratio test for structural models. Econometrica, 71, pp. 1027-1048.

Officer, M.S., 2003. Termination fees in mergers and acquisitions. Journal of Financial Economics, 69, pp. 431-467.

Olea, J.L.M. and C. Pflueger, 2013. A robust test for weak instruments. Journal of Business and Economic Statistics, 31, pp. 358-369.

Roberts, M.R. and T.M. Whited, 2013. Endogeneity in empirical corporate finance. In Constantinides, G.M., M. Harris, and R.M. Stulz, Handbook of the Economics of Finance, 2, pp. 493-572. North-Holland.

Ruback, R.S., 1987. An overview of takeover defenses. In Auerbach, A.J., Mergers and Acquisitions, pp. 49-67. University of Chicago Press.

Schwert, G.W., 2000. Hostility in takeovers: in the eyes of the beholder? Journal of Finance, 55, pp. 2599-2640.

Shleifer, A. and R.W. Vishny, 1986. Greenmail, white knights, and shareholders' interest. Rand Journal of Economics, 17, pp. 293-309.

Smith, E.E., 2019. Are antitakeover amendments good for shareholders? Evidence from the adoption of antitakeover provisions in the post-SOX era. Quarterly Journal of Finance, 9, pp. 1-40.

Straska, M. and H.G. Waller, 2014. Antitakeover provisions and shareholder wealth: a survey of the literature. Journal of Financial and Quantitative Analysis, 49, pp. 933-956.

Stulz, R.M., 1988. Managerial control of voting rights: financing policies and the market for corporate control. Journal of Financial Economics, 20, pp. 25-54.

Walkling, R.A., 1985. Predicting tender offer success: a logistic analysis. Journal of Financial and Quantitative Analysis, 20, pp. 461-478.

Walkling, R.A. and M.S. Long, 1984. Agency theory, managerial welfare, and takeover bid resistance. Rand Journal of Economics, 15, pp. 54-68.

Wooldridge, J.M., 2010. Econometric Analysis of Cross Section and Panel Data. MIT Press.

Figures

Figure 1

Ex-ante scenarios relating to the antitakeover provisions already in place in the firm for inferring board motivation for post-bid resistance

Figures 1A and 1B schematically represents *ex-ante* scenarios relating to the antitakeover provisions (ATPs) already in place in the firm for inferring the preponderant board motivation for post-bid resistance. The *ex-ante* scenarios assume a binary conceptual modelling framework, in which post-bid resistance by boards is driven either by good-faith bargaining in stockholder interest (Figure 1A) or by entrenchment considerations (Figure 1B). While acknowledging the right of the board to adopt, leave in place, or revoke an ATP *de jure*, we also allow for the possibility that the board functions *de facto* within an external environment that is governed by influential external factors – e.g., stakeholder pressures, public perceptions, and signaling imperatives – and these factors may necessitate, independent of the motivation of the board, general board "policies" about actively influencing or remaining passive in relation to adopting, leaving in place, or removing specific subsets of the ATPs. The 'no-bid' phase denotes a period in the absence of a takeover bid, and not in the immediate expectation of one. The 'pre-bid' phase denotes a period in the run-up to a public takeover bid, in which pre-bid negotiations with an eventual public bidder, and hence associated price revision, can occur. The 'post-bid' phase denotes a period that begins with the first public announcement of a takeover bid. The implied relationships from the extant ATPs of the firm to post-bid resistance by boards are set out in the last column and amount to average relationships. Section 2.1(.1) provides full details of the *ex-ante* scenarios and underlying conceptual modelling framework.

Figure 1A: Boards driven by good-faith bargaining in stockholder interest

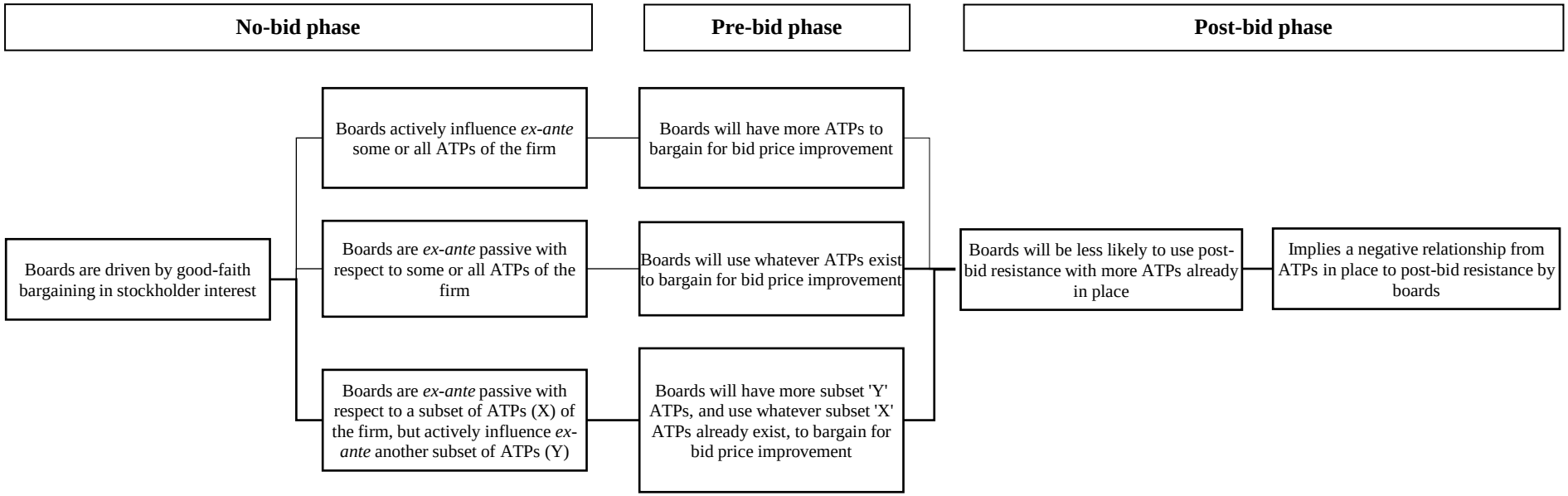

Figure 1 (continued)

Figure 1B: Boards driven by entrenchment considerations

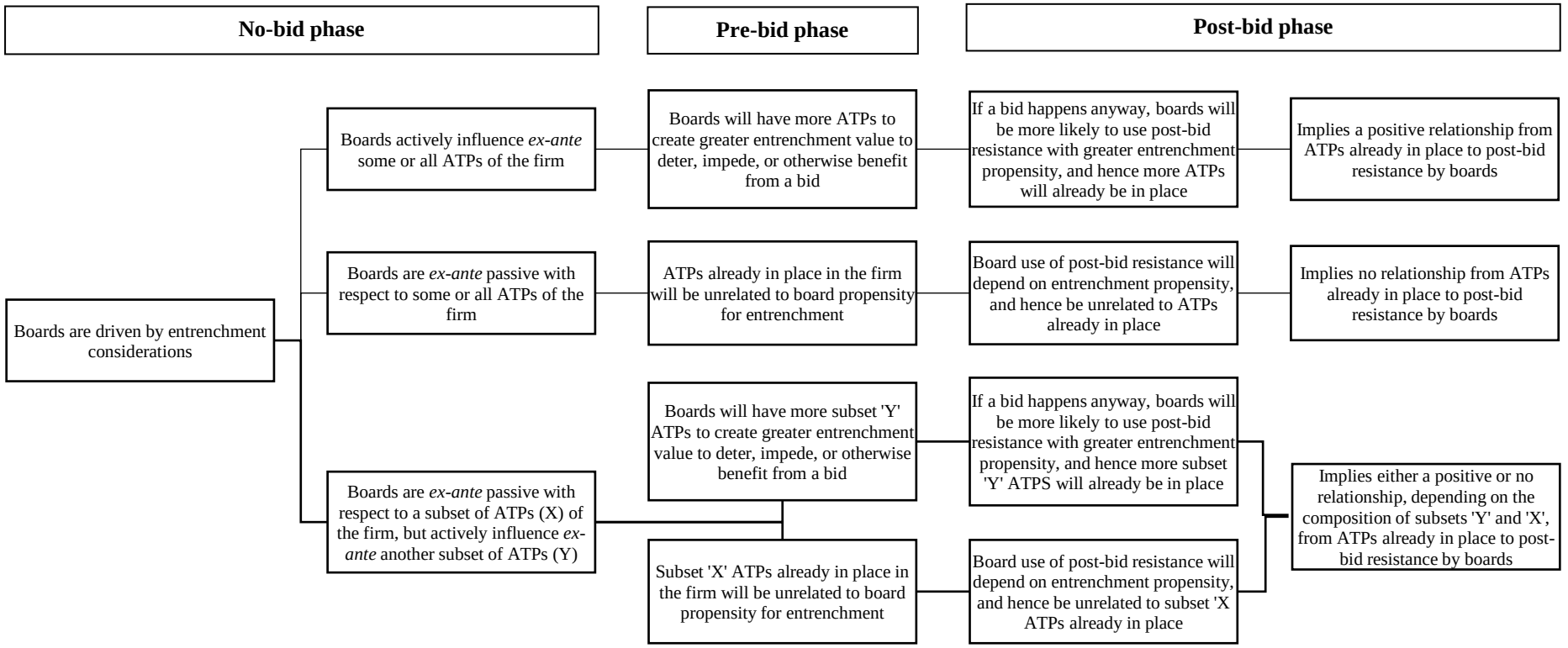

Figure 2

Ex-ante scenarios relating to the initial public bid premium for the firm for inferring board motivation for post-bid resistance

This figure schematically represents *ex-ante* scenarios relating to the initial *public* bid premium for the firm for inferring the preponderant board motivation for post-bid resistance. The *ex-ante* scenarios assume a binary conceptual modelling framework, in which post-bid resistance by boards is driven either by good-faith bargaining in stockholder interest or by entrenchment considerations. The 'no-bid' phase denotes a period in the absence of a takeover bid, and not in the immediate expectation of one. There is no explicit 'pre-bid' phase because here the *ex-ante* scenarios concern effect of the initial public bid premium, measured relative to the target firm's pre-run-up price, and hence before price revision occurs from pre-bid negotiations with an eventual public bidder. The 'post-bid' phase denotes a period that begins with the first public announcement of a takeover bid. The implied relationships from the initial public bid premium to post-bid resistance by boards are set out in the last column and amount to average relationships. Section 2.1(.2) provides full details of the *ex-ante* scenarios and underlying conceptual modelling framework.

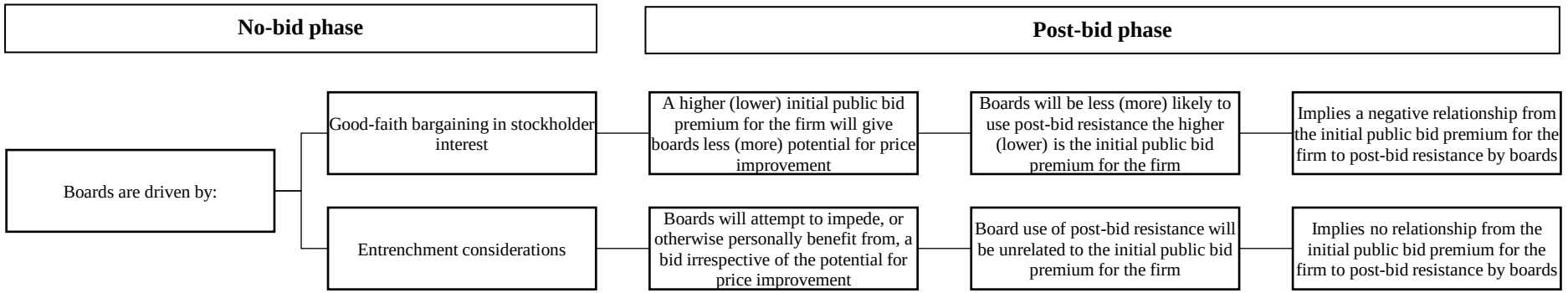

Table 1: Variable descriptions

Variable	Description
Firm features	
G-index	The Gompers, Ishii, and Metrick (2003) measure of antitakeover provisions (ATPs) already in place one year before ascertaining takeover target selection for a firm each year. The G-index adds one for each ATP out of a counted twenty-four. The component G-index data is from the RiskMetrics dataset after forward filling the data for 2006 and between earlier data points.
IPO-proximate G-index	The first IV for the G-index constructed three years before ascertaining takeover target selection for a focus firm in a given year but restricted to a group of firms proximate to the focus firm. IPO-proximate G-index sums the relative presence of the individual ATPs for the group of proximate firms from sectors not shared with the focus firm (based on two-digit SIC codes) and sharing the same year of initial public offering (IPO).
HQ-proximate G-index	The second IV for the G-index constructed in a similar manner to the first IV but the group of proximate firms now consist of those that share the same state locale of headquarters (HQ) which is taken to be a state locale with a radius of one-hundred miles based on zip codes from the CCM database and geographical coordinates from the GeoNames database.
Size	The book value of total assets in millions of 2011 dollars one year before ascertaining takeover target selection for a firm each year. Source: CCM database.
Leverage	The total debt as a proportion of the book value of total assets one year before ascertaining takeover target selection for a firm each year. Source: CCM database.
Market value to book value	The market value of total assets as a proportion of the book value of total assets one year before ascertaining takeover target selection for a firm each year. Source: CCM database.
Liquidity	The working capital as a proportion of the book value of total assets one year before ascertaining takeover target selection for a firm each year. Source: CCM database.
Tangibility	The tangible assets as a proportion of the book value of total assets one year before ascertaining takeover target selection for a firm each year. Source: CCM database.
Sales growth	The proportionate difference between sales one and two years before ascertaining takeover target selection for a firm each year. Source: CCM database.
Return on assets	The operating income before depreciation as a proportion of the book value of total assets one year before ascertaining takeover target selection for a firm each year. Source: CCM database.
Industry concentration	The Herfindahl-Hirschman measure of industry concentration one year before ascertaining takeover target selection for a firm each year. Industry concentration sums the squared proportionate sales for the sector in which the firm primarily operates based on historic two-digit SIC codes. Source: CCM database.
Bid features	
Initial premium	The proportionate difference between the initial public bid price and the pre-run-up price of the takeover target. The initial public bid price is from the SDC database, and the pre-run-up price is the stock price of the takeover target sixty-four trading days before initial public bid announcement from CCM database. The initial premium is winsorized at the fifth and ninety-fifth percentiles.
Pre-run-up price to 52-week-high price	The IV for the initial premium is the proportionate difference between the pre-run-up price and the preceding fifty-two-week high price of the takeover target. The pre-run-up price is the stock price of the takeover target sixty-four trading days before initial public bid announcement. Source: CCM database.
Cash offer = 1	A dummy variable that equals one (zero) for takeover targets for which the use of only cash is (is not) the intended method of payment by the initial public bidder. Source: SDC database.

Table 2

Sample

This table describes the sample. The sample is at the intersection of the RiskMetrics dataset for the component Gompers, Ishii, and Metrick (2003) G-index data and Center for Research in Security Prices and Compustat Merged (CCM) database for other firm data. Observations are removed for which the firm is flagged in the RiskMetrics dataset as having dual class common stock or coded in the CCM database as having primary operations in the financial or utility sectors based on historic two-digit standard industrial classification. An unbalanced panel of U.S.-incorporated firms is initially constructed for the period 1990-2011 by forward filling the component G-index data for 2006 and between earlier data points. The sample contains 21,375 observations for the period 1992-2011. For 995 of the observations the firm is selected as a takeover target the following year. The following years, 1993-2012, are the sample period. The Securities Data Company database is utilized for ascertaining takeover target selection for a firm each year. A bid is required to be an attempt to acquire common stock of more than fifty percent and disclose an offer price. Multiple attempts to acquire a firm are merged into a single bid when the attempts are separated by no more than one year. Bids beginning before the sample period are then not counted. Bids that are, or involve, an attempt by managers to acquire the firm are also not counted. All observations for a firm after a bid that is, or involves, an attempt by managers to acquire the firm are removed. News sources from the Factiva database are searched for ascertaining a first decision to use post-bid resistance, which ranges from recommending rejection of the initial offer to deploying a defense discriminating against at least the initial bidder. Also counted is the decision by boards to adopt a post-bid antitakeover provision, the most common type of which is a 'morning after' poison pill. The searchable timeframe extends from the first public announcement of a bid to the very end of a bid, in the sense of having merged multiple attempts to acquire a firm. Columns (1)-(3) present frequency distributions for all observations, observations for which the firm is selected as a takeover target, and takeover targets that use post-bid resistance, respectively. Columns (4) and (5) present rates of takeover target selection and the use of post-bid resistance, respectively.

Year	Firms (Year -1) (1)	Firms selected as a takeover target (Year) (2)	Takeover targets that use post-bid resistance (Year) (3)	Percentage of firms selected as a takeover target (4)	Percentage of takeover targets that use post-bid resistance (5)
1993	753	9	3	1.2	33.3
1994	854	22	5	2.6	22.7
1995	845	33	10	3.9	30.3
1996	899	36	10	4.0	27.8
1997	876	50	10	5.7	20.0
1998	873	55	6	6.3	10.9
1999	1,192	103	15	8.6	14.6
2000	1,068	88	9	8.2	10.2
2001	1,052	43	4	4.1	9.3
2002	1,008	17	3	1.7	17.7
2003	1,264	30	4	2.4	13.3
2004	1,243	43	10	3.5	23.3
2005	1,344	79	15	5.9	19.0
2006	1,278	72	11	5.6	15.3
2007	1,304	93	11	7.1	11.8
2008	1,203	52	19	4.3	36.5
2009	1,134	41	5	3.6	12.2
2010	1,099	38	7	3.5	18.4
2011	1,064	44	10	4.1	22.7
2012	1,022	47	6	4.6	12.8
Overall	21,375	995	173	4.7	17.4

Table 3

Variables and univariate results

This table presents descriptive statistics for the explanatory variables for the decision to use post-bid resistance. Columns (1)-(3) and Columns (4)-(5) present mean, standard deviation, and observations for the explanatory variables for takeover targets that do and do not use post-bid resistance, respectively. The sample is described in Table 2. The explanatory variables include the instrumental variables for the G-index (IPO-proximate G-index/HQ-proximate G-index) and initial premium (pre-run-up price to 52-week-high price). The explanatory variables are described in Table 1. ***, **, * indicate statistical significance at the one, five, and ten percent levels, respectively, of differences in the means.

	Takeover targets that use post-bid resistance			**Takeover targets that do not use post-bid resistance**		
	Mean	**Std dev.**	**Obs**	**Mean**	**Std dev.**	**Obs**
Explanatory variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Firm features						
G-index	9.376**	2.436	173	8.878	2.635	822
IPO-proximate G-index	9.115***	1.100	172	8.787	1.079	820
HQ-proximate G-index	9.082*	0.926	167	8.927	0.945	809
Size	3,237.3	6,350.0	173	2,548.8	6,254.3	820
Leverage	0.198	0.162	173	0.184	0.179	819
Market value to book value	1.539***	0.795	172	1.780	0.979	815
Tangibility	0.589**	0.356	171	0.522	0.395	809
Liquidity	0.196**	0.187	173	0.236	0.211	820
Sales growth	0.023	0.164	173	0.161	2.282	820
Return on assets	0.109	0.099	171	0.115	0.159	812
Stock return	-0.114	0.445	173	-0.116	0.450	822
Industry concentration	0.094	0.069	173	0.095	0.075	821
Bid features						
Initial premium	0.340***	0.265	173	0.424	0.297	822
Pre-run-up price to 52-week-high price	-0.244	0.203	173	-0.245	0.202	822
Cash offer = 1	0.566***		173	0.454		822

Table 4

Multivariate findings for G-index and the decision to use post-bid resistance: effect of instrumenting for G-index

Column (1) presents the results from an ordinary least squares regression for the effect of the non-instrumented G-index on the decision to use post-bid resistance. Columns (2)-(4) present the results from a two stage least squares regression for the effect of instrumenting for the G-index on the decision to use post-bid resistance. Column (2) presents the first stage results for instrumenting the G-index. Column (3) presents the second stage results for the effect of instrumenting for the G-index. Column (4) presents the reduced form results for the effect of instrumenting for the G-index. The instrumental variables are IPO-proximate G-index/HQ-proximate G-index. First and second stage diagnostic test results are presented at the base of the regression. The sample is described in Table 2. Post-bid resistance equals one (zero) for takeover targets that use (do not use) post-bid resistance. The explanatory variables are described in Table 1. Industry and year dummies are also included. Industry dummies are based on historic two-digit standard industrial classification codes from the Center for Research in Security Prices and Compustat Merged database. Robust standard errors are presented in parentheses below coefficients. ***, **, * indicate statistical significance at the one, five, and ten percent levels, respectively.

	Ordinary least squares regression	**Two stage least squares regression**		
		First stage	**Second stage**	**Reduced form**
	Post-bid resistance = 1	**G-index**	**Post-bid resistance = 1**	**Post-bid resistance = 1**
Explanatory variables	**(1)**	**(2)**	**(3)**	**(4)**
G-index	0.0063		0.0592***	
	(0.0046)		(0.0191)	
IPO-proximate G-index		0.5954***		0.0339***
		(0.0742)		(0.0116)
HQ-proximate G-index		0.2783**		0.0198
		(0.1091)		(0.0134)
Initial premium	-0.1280***	0.1354	-0.1296***	-0.1214***
	(0.0402)	(0.2729)	(0.0427)	(0.0401)
ln(Size)	0.0176	0.3267***	-0.0057	0.0138
	(0.0108)	(0.0650)	(0.0136)	(0.0108)
Leverage	0.0281	0.6910	-0.0301	0.0098
	(0.0741)	(0.4984)	(0.0793)	(0.0733)
Market value to book value	-0.0263*	-0.0780	-0.0156	-0.0199
	(0.0137)	(0.0902)	(0.0148)	(0.0131)
Tangibility	0.0507	-0.1090	0.0469	0.0402
	(0.0336)	(0.2335)	(0.0356)	(0.0335)
Liquidity	-0.0534	-0.5032	-0.0257	-0.0552
	(0.0681)	(0.4541)	(0.0733)	(0.0684)
Sales growth	-0.0031*	-0.0079	-0.0019	-0.0023
	(0.0016)	(0.0105)	(0.0017)	(0.0016)
Return on assets	-0.1542	-1.4563**	-0.1116	-0.2024*
	(0.1077)	(0.6838)	(0.1135)	(0.1121)
Stock return	0.0069	0.2418	-0.0063	0.0080
	(0.0303)	(0.1964)	(0.0322)	(0.0300)
Industry concentration	-0.2037	-1.4263	-0.0825	-0.1669
	(0.1610)	(1.1269)	(0.1742)	(0.1619)
Cash offer = 1	0.0799***	-0.0752	0.0882***	0.0840***
	(0.0258)	(0.1612)	(0.0273)	(0.0258)
Constant	0.0769	-0.5182	-0.2756*	-0.3255*
	(0.0998)	(1.2067)	(0.1626)	(0.1743)

Table 4 (continued)

	Ordinary least squares regression	Two stage least squares regression		
		First stage	Second stage	Reduced form
	Post-bid resistance = 1	G-index	Post-bid resistance = 1	Post-bid resistance = 1
Explanatory variables	**(1)**	**(2)**	**(3)**	**(4)**
F-statistic overall	4.7***			5.1***
R^2-statistic overall	4.1%			5.0%
Chi^2-statistic overall		58.3***		
F-statistic IPO-proximate G-index/HQ-proximate G-index		38.4		
R^2-statistic IPO-proximate G-index/HQ-proximate G-index		7.8%		
Chi^2-statistic no over-identification		0.1		
Chi^2-statistic exogeneity		8.8***		
Obs	975	954		954

Table 5

Multivariate findings for G-index and the decision to use post-bid resistance: effect of private information held by the initial bidder

Column (1) presents the results from a probit regression for takeover target selection. Takeover target equals one (zero) for firms selected (not selected) as a takeover target each year. The explanatory variables include the instrumental variables for the G-index (IPO-proximate G-index/HQ-proximate G-index), and California incorporation that equals one (zero) for firms incorporated (not incorporated) in California based on codes from the Center for Research in Security Prices and Compustat Merged (CCM) database. Columns (2)-(4) present the results from a two stage least squares (2SLS) regression for the effect of instrumenting for the G-index on the decision to use post-bid resistance. Column (2) presents the first stage results for instrumenting the G-index. Column (3) presents the second stage results for the effect of instrumenting for the G-index. Column (4) presents the reduced form results for the effect of instrumenting for the G-index. First and second stage diagnostic test results are presented at the base of the regression. Post-bid resistance equals one (zero) for takeover targets that use (do not use) post-bid resistance. The explanatory variables exclude California incorporation but include the inverse Mills ratio from the probit regression as an exogenous estimate of private information held by the initial bidder. The sample is described in Table 2. The explanatory variables are also described in Table 1. Industry and year dummies are also included. Industry dummies are based on historic two-digit standard industrial classification codes from the CCM database. Firm clustered (corrected) standard errors are presented in parentheses below average marginal effects (coefficients) for the probit (2SLS) regression. ***, **, * indicate statistical significance at the one, five, and ten percent levels, respectively.

	Probit regression	**Two stage least squares regression**		
		First stage	**Second stage**	**Reduced form**
	Takeover target = 1	**G-index**	**Post-bid resistance = 1**	**Post-bid resistance = 1**
Explanatory variables	**(1)**	**(2)**	**(3)**	**(4)**
G-index			0.0490**	
			(0.0209)	
IPO-proximate G-index	-0.0033**	0.5638***		0.0276**
	(0.0014)	(0.0751)		(0.0119)
HQ-proximate G-index	-0.0044***	0.2357**		0.0114
	(0.0016)	(0.1110)		(0.0138)
Initial premium		0.1224	-0.1299***	-0.1239***
		(0.2728)	(0.0416)	(0.0398)
California incorporation = 1	0.0396***			
	(0.0121)			
Inverse Mills ratio		0.9664**	0.1427*	0.1901***
		(0.4784)	(0.0795)	(0.0710)
ln(Size)	-0.0104***	0.2343***	-0.0158	-0.0043
	(0.0012)	(0.0780)	(0.0131)	(0.0120)
Leverage	0.0215**	0.9422*	0.0130	0.0592
	(0.0102)	(0.5137)	(0.0814)	(0.0744)
Market value to book value	-0.0080***	-0.1228	-0.0227	-0.0287**
	(0.0017)	(0.0925)	(0.0155)	(0.0138)
Tangibility	-0.0051	-0.1439	0.0404	0.0333
	(0.0044)	(0.2336)	(0.0350)	(0.0336)
Liquidity	-0.0328***	-0.7621	-0.0688	-0.1061
	(0.0089)	(0.4636)	(0.0756)	(0.0699)
Sales growth	0.0017	0.0002	-0.0007	-0.0007
	(0.0012)	(0.0108)	(0.0017)	(0.0017)
Return on assets	-0.0154	-1.4000**	-0.1229	-0.1913*
	(0.0153)	(0.6809)	(0.1105)	(0.1100)
Stock return	-0.0030	0.1213	-0.0216	-0.0157
	(0.0035)	(0.2031)	(0.0324)	(0.0316)
Industry concentration	-0.0588***	-1.8936*	-0.1661	-0.2588
	(0.0192)	(1.1389)	(0.1736)	(0.1602)

Table 5 (continued)

	Probit regression	Two stage least squares regression		
		First stage	Second stage	Reduced form
	Takeover target = 1	G-index	Post-bid resistance = 1	Post-bid resistance = 1
Explanatory variables	**(1)**	**(2)**	**(3)**	**(4)**
Cash offer = 1		-0.0749	0.0877***	0.0840***
		(0.1607)	(0.0267)	(0.0257)
Constant	0.0460***	-1.0311	-0.3767**	-0.4265**
	(0.0014)	(1.2250)	(0.1613)	(0.1772)
Chi^2-statistic overall	365.2***	66.5***		
R^2-statistic pseudo	4.9%			
F-statistic overall				5.3***
R^2-statistic overall				5.8%
F-statistic IPO proximate G-index/HQ proximate G-index		31.7		
R^2-statistic IPO-proximate G-index/HQ-proximate G-index		6.4%		
Chi^2-statistic no over-identification		0.0		
Chi^2-statistic exogeneity		5.0**		
Obs	20,717	954		954

Table 6

Multivariate findings for different functional forms of the G-index, and for the E-index and the O-index subsets of the G-index

Column (1) presents abridged second equation results from a two-equation probit regression for the effect of instrumenting for the G-index in dummy form on the decision to use post-bid resistance. The results are presented in full in Table IA.4 in the Internet Appendix. A second equation diagnostic test result is presented at the base of the regression. G-index in dummy form equals one (zero) for firms each year with a G-index in excess (not in excess) of the median G-index for all firms in that year. The instrumental variables are IPO-proximate G-index/HQ-proximate G-index. The G-index and instrumental variables are described in Table 1. The explanatory variables also include the inverse Mills ratio from the probit regression for takeover target selection in Column (1) of Table 5 as an exogenous estimate of private information held by the initial bidder. Column (2) presents abridged second stage results from a two stage least squares (2SLS) regression for the effect of instrumenting for the G-index in partial form (O-index) on the decision to use post-bid resistance. The results are presented in full in Table IA.5 in the Internet Appendix. First and second stage diagnostic test results are presented at the base of the regression. The O-index and instrumental variables for the G-index in partial form (IPO-proximate O-index/HQ-proximate O-index) are identically constructed to the G-index and instrumental variables except for not counting the six antitakeover provisions (ATPs) set apart by Bebchuk, Cohen, and Ferrell (2009). The explanatory variables also include the inverse Mills ratio from the probit regression for takeover target selection in Column (1) of Table IA.5. Column (3) presents the second stage results from a 2SLS regression for the effect of instrumenting for the G-index in partial form (E-index) on the decision to use post-bid resistance. The results are presented in full in Table IA.6 in the Internet Appendix. First and second stage diagnostic test results are presented at the base of the regression. The E-index and instrumental variables for the G-index in partial form (IPO-proximate E-index/HQ-proximate E-index) are identically constructed to the G-index and instrumental variables except for only counting the six ATPs set apart by Bebchuk et al. (2009). The explanatory variables also include the inverse Mills ratio from the probit regression for takeover target selection in Column (1) of Table IA.6. The sample is described in Table 2. Post-bid resistance equals one (zero) for takeover targets that use (do not use) post-bid resistance. Corrected standard errors are presented in parentheses below average marginal effects (coefficients) for the two-equation probit regression (2SLS regressions). $^{***, **, *}$ indicate statistical significance at the one, five, and ten percent levels, respectively.

	Two equation probit regression	**Two stage least squares regression**	**Two stage least squares regression**
	Post-bid resistance = 1	**Post-bid resistance = 1**	**Post-bid resistance = 1**
Explanatory variables	**(1)**	**(2)**	**(3)**
G-index = 1	0.2655***		
	(0.0934)		
O-index		0.0729***	
		(0.0259)	
E-index			0.0098
			(0.0623)
Inverse Mills ratio	0.1716***	0.1323*	0.2059***
	(0.0664)	(0.0779)	(0.0725)
Chi^2-statistic overall	227.7***	64.7***	60.6***
F-statistic IPO proximate O-index/HQ proximate O-index		42.4	
R^2-statistic IPO-proximate O-index/HQ-proximate O-index		8.2%	
F-statistic IPO proximate E-index/HQ proximate E-index			10.8
R^2-statistic IPO-proximate E-index/HQ-proximate E-index			2.5%
Chi^2-statistic no over-identification		0.2	0.6
Chi^2-statistic exogeneity	6.1**	8.3***	0.0
Obs	954	954	954

Table 7

Mean percentages of firms that adopt one antitakeover provision counted in the G-index, the E-index, and the O-index

This table presents mean percentages of firms that adopt, but also do not revoke, one antitakeover provision (ATP) counted in the Gompers, Ishii, and Metrick (2003) G-index in complete and partial forms. O-index (E-index) does not count (only counts) the six ATPs set apart by Bebchuk, Cohen, and Ferrell (2009). Adoptions occur between consecutive updates to the RiskMetrics dataset for the component G-index data. Columns (1) and (2) are for updates for firms selected as a takeover target. Columns (3) and (4) are for updates for firms not selected as a takeover target. The sample is described in Table 2. ***, **, * indicate statistical significance at the one, five, and ten percent levels, respectively, of differences in the means for firms selected and not selected as a takeover target. ^^^, ^^, ^ indicate statistical significance at the one, five, and ten percent levels, respectively, of differences in the means for the O-index and E-index.

	Updates for firms selected as a takeover target	Obs	Updates for firms not selected as a takeover target	Obs
Mean percentages of firms	**(1)**	**(2)**	**(3)**	**(4)**
That adopt one ATP counted in the G-index	36.8***	2,225	28.5	4,060
That adopt one ATP counted in the O-index	24.9***, ^^^	2,225	19.3^^^	4,060
That adopt one ATP counted in the E-index	18.2***	2,225	13.6	4,060

Table 8

Multivariate findings for initial public bid premium and the decision to use post-bid resistance: effect of instrumenting for initial public bid premium

Columns (1)-(4) present the results from a two stage least squares regression for the effects of simultaneously instrumenting for the G-index and initial premium on the decision to use post-bid resistance. Column (1) presents the first stage results for instrumenting the G-index. Column (2) presents the first stage results for instrumenting the initial premium. Column (3) presents the second stage results for the effects of simultaneously instrumenting for the G-index and initial premium. Column (4) presents the reduced form results for the effects of simultaneously instrumenting for the G-index and initial premium. First and second stage diagnostic test results are presented at the base of the regression. The sample is described in Table 2. Post-bid resistance equals one (zero) for takeover targets that use (do not use) post-bid resistance. The instrumental variables are IPO-proximate G-index/HQ-proximate G-index for the G-index and pre-run-up price to 52-week-high price for the initial premium. The explanatory variables also include the inverse Mills ratio from the probit regression for takeover target selection in Column (1) of Table 5 as an exogenous estimate of private information held by the initial bidder. The explanatory variables are also described in Table 1. Industry and year dummies are also included. Industry dummies are based on historic two-digit standard industrial classification codes from the Center for Research in Security Prices and Compustat Merged database. Corrected standard errors are presented in parentheses below coefficients. ***, **, * indicate statistical significance at the one, five, and ten percent levels, respectively.

	Two stage least squares regression			
	First stage	**First stage**	**Second stage**	**Reduced form**
	G-index	**Initial premium**	**Post-bid resistance = 1**	**Post-bid resistance = 1**
Explanatory variables	**(1)**	**(2)**	**(3)**	**(4)**
G-index			0.0520**	
			(0.0219)	
IPO-proximate G-index	0.5495***	0.0086		0.0293**
	(0.0758)	(0.0086)		(0.0120)
HQ-proximate G-index	0.2217**	0.0018		0.0137
	(0.1113)	(0.0103)		(0.0142)
Initial premium			0.1492	
			(0.1443)	
Pre-run-up price to 52-week-high price	0.5954	-0.5370***		-0.0499
	(0.4373)	(0.0585)		(0.0713)
Inverse Mills ratio	1.0750**	-0.0540	0.1304	0.1765**
	(0.4880)	(0.0604)	(0.0809)	(0.0708)
ln(Size)	0.2165***	-0.0063	-0.0112	-0.0005
	(0.0794)	(0.0096)	(0.0136)	(0.0122)
Leverage	0.9808*	0.1418**	-0.0333	0.0379
	(0.5086)	(0.0586)	(0.0869)	(0.0748)
Market value to book value	-0.1230	-0.0107	-0.0199	-0.0276**
	(0.0912)	(0.0117)	(0.0151)	(0.0135)
Tangibility	-0.1530	-0.0762***	0.0622*	0.0427
	(0.2321)	(0.0264)	(0.0373)	(0.0332)
Liquidity	-0.7755*	-0.0346	-0.0553	-0.1002
	(0.4615)	(0.0618)	(0.0782)	(0.0703)
Sales growth	0.0021	-0.0113***	0.0017	0.0001
	(0.0108)	(0.0014)	(0.0021)	(0.0017)
Return on assets	-1.5585**	0.1246	-0.1112	-0.1761
	(0.6919)	(0.1136)	(0.1088)	(0.1093)
Stock return	-0.0140	0.0290	0.0012	0.0052
	(0.2134)	(0.0291)	(0.0346)	(0.0341)
Industry concentration	-1.9864*	-0.0025	-0.1394	-0.2422
	(1.1487)	(0.1149)	(0.1792)	(0.1599)

Table 8 (continued)

	Two stage least squares regression			
	First stage	**First stage**	**Second stage**	**Reduced form**
	G-index	**Initial premium**	**Post-bid resistance = 1**	**Post-bid resistance = 1**
Explanatory variables	**(1)**	**(2)**	**(3)**	**(4)**
Cash offer = 1	-0.0896	-0.0117	0.0941***	0.0878***
	(0.1610)	(0.0195)	(0.0279)	(0.0260)
Constant	-0.6631	0.3745***	-0.5405***	-0.5297***
	(1.2434)	(0.1340)	(0.1951)	(0.1803)
Chi^2-statistic overall		52.9***		
F-statistic overall				4.4***
R^2-statistic overall				4.9%
F-statistic IPO proximate G-index/HQ proximate G-index		22.1		
R^2-statistic IPO-proximate G-index/HQ-proximate G-index		6.5%		
F-statistic pre-run-up price to 52-week-high price		28.1		
R^2-statistic pre-run-up price to 52-week-high price		9.7%		
Chi^2-statistic no over-identification		0.0		
Chi^2-statistic exogeneity		7.7**		
Obs		954		954

Table 9

Multivariate findings for initial public bid premium and the decision to use post-bid resistance: effect of unexplained component of initial public bid premium

Columns (1) and (2) and Columns (3) and (4) present the results from two, two stage least squares (2SLS) regressions for the effect of instrumenting for the G-index on the decision to use post-bid resistance. Columns (1) and (3) present the first stage results for instrumenting the G-index. Columns (2) and (4) present the second stage results for the effect of instrumenting for the G-index. First and second stage diagnostic test results are presented at the base of the regressions. The sample is described in Table 2. Post-bid resistance equals one (zero) for takeover targets that use (do not use) post-bid resistance. The instrumental variables are IPO-proximate G-index/HQ-proximate G-index. The explanatory variables also include the inverse Mills ratio from the probit regression for takeover target selection in Column (1) of Table 5 as an exogenous estimate of private information held by the initial bidder, and the residual from an ordinary least squares regression that is identical to the first stage for instrumenting the initial premium in Column (2) of Table 8 as the unexplained component of initial premium. The second 2SLS regression also includes the initial premium. The explanatory variables are also described in Table 1. Industry and year dummies are also included. Industry dummies are based on historic two-digit standard industrial classification codes from the Center for Research in Security Prices and Compustat Merged database. Corrected standard errors are presented in parentheses below coefficients. ***, **, * indicate statistical significance at the one, five, and ten percent levels, respectively.

	Two stage least squares regression		**Two stage least squares regression**	
	First stage	**Second stage**	**First stage**	**Second stage**
	G-index	**Post-bid resistance = 1**	**G-index**	**Post-bid resistance = 1**
Explanatory variables	**(1)**	**(2)**	**(3)**	**(4)**
G-index		0.0504**		0.0520**
		(0.0209)		(0.0213)
IPO-proximate G-index	0.5633***		0.5590***	
	(0.0750)		(0.0751)	
HQ-proximate G-index	0.2345**		0.2237**	
	(0.1108)		(0.1110)	
Initial premium			-1.1088	0.1492
			(0.8143)	(0.1406)
Unexplained component of initial premium	0.2526	-0.1596***	1.3614	-0.3092**
	(0.2864)	(0.0448)	(0.8540)	(0.1506)
Inverse Mills ratio	0.9712**	0.1369*	1.0151**	0.1304
	(0.4775)	(0.0798)	(0.4807)	(0.0803)
ln(Size)	0.2319***	-0.0136	0.2095***	-0.0112
	(0.0777)	(0.0131)	(0.0810)	(0.0131)
Leverage	0.9616*	-0.0086	1.1380**	-0.0333
	(0.5097)	(0.0813)	(0.5211)	(0.0836)
Market value to book value	-0.1240	-0.0214	-0.1349	-0.0199
	(0.0927)	(0.0154)	(0.0925)	(0.0155)
Tangibility	-0.1533	0.0505	-0.2376	0.0622*
	(0.2313)	(0.0348)	(0.2397)	(0.0368)
Liquidity	-0.7673*	-0.0625	-0.8139*	-0.0553
	(0.4633)	(0.0757)	(0.4636)	(0.0766)
Sales growth	-0.0008	0.0004	-0.0104	0.0017
	(0.0104)	(0.0016)	(0.0123)	(0.0020)
Return on assets	-1.4020**	-0.1175	-1.4203**	-0.1112
	(0.6810)	(0.1102)	(0.6821)	(0.1098)
Stock return	0.1111	-0.0110	0.0181	0.0012
	(0.2009)	(0.0322)	(0.2060)	(0.0334)
Industry concentration	-1.9031*	-0.1536	-1.9892*	-0.1394
	(1.1365)	(0.1739)	(1.1432)	(0.1760)

Table 9 (continued)

	Two stage least squares regression		Two stage least squares regression	
	First stage	Second stage	First stage	Second stage
	G-index	Post-bid resistance = 1	G-index	Post-bid resistance = 1
Explanatory variables	**(1)**	**(2)**	**(3)**	**(4)**
Cash offer = 1	-0.0777	0.0907***	-0.1026	0.0941***
	(0.1605)	(0.0266)	(0.1622)	(0.0272)
Constant	-0.9533	-0.4530***	-0.2478	-0.5405***
	(1.2086)	(0.1577)	(1.3621)	(0.1904)
Chi^2-statistic overall		66.9***		66.9***
F-statistic IPO proximate G-index/HQ proximate G-index		31.7		30.8
R^2-statistic IPO-proximate G-index/HQ-proximate G-index		6.4%		6.2%
Chi^2-statistic no over-identification		0.0		0.0
Chi^2-statistic exogeneity		5.3**		5.5**
Obs		954		954

Table 10

Multivariate findings for effect of the decision to use post-bid resistance

Target termination fee equals one (zero) for takeover targets that agree (do not agree) to pay a termination fee during a bid. Final premium equals the proportionate difference between the final offer price and the pre-run-up price of the takeover target. Bid completion equals one (zero) for takeover targets for which a bid is (is not) completed. Overall return equals the value weighted market adjusted return to the takeover target from sixty-three trading days before bid announcement to bid completion or one year after an uncompleted bid. The sample is described in Table 2 and variables are described in Tables 1 and 5. Industry and year dummies are also included. Corrected standard errors are presented in parentheses below average marginal effects (coefficients) for the probit (OLS) regressions. ***, **, * indicate statistical significance at the one, five, and ten percent levels, respectively.

	Probit regression	**OLS regression**	**Probit regression**	**OLS regression**
	Target termination fee = 1	**Final premium**	**Bid completion = 1**	**Overall return**
Explanatory variables	**(1)**	**(2)**	**(3)**	**(4)**
Post-bid resistance = 1	-0.3689***	0.0274	-0.3170***	-0.1048**
	(0.0416)	(0.0253)	(0.0386)	(0.0453)
IPO-proximate G-index	-0.0090	0.0056	0.0023	0.0048
	(0.0120)	(0.0086)	(0.0088)	(0.0107)
HQ-proximate G-index	0.0076	0.0096	-0.0068	-0.0124
	(0.0128)	(0.0108)	(0.0103)	(0.0120)
Pre-run-up price to 52-week-high price	0.0741	-0.5544***	0.0879*	-0.3692***
	(0.0664)	(0.0585)	(0.0510)	(0.0717)
Inverse Mills ratio	-0.1962***	-0.0453	-0.0179	0.0139
	(0.0681)	(0.0593)	(0.0509)	(0.0689)
ln(Size)	0.0301**	0.0003	-0.0101	-0.0046
	(0.0118)	(0.0099)	(0.0081)	(0.0115)
Leverage	0.0257	0.1393**	-0.0333	0.0642
	(0.0798)	(0.0598)	(0.0570)	(0.0923)
Market value to book value	0.0268*	-0.0106	0.0143	-0.0158
	(0.0151)	(0.0117)	(0.0123)	(0.0135)
Tangibility	0.0047	-0.0727***	0.0413	-0.0148
	(0.0342)	(0.0265)	(0.0275)	(0.0413)
Liquidity	0.0535	-0.0206	0.0386	-0.0087
	(0.0706)	(0.0610)	(0.0507)	(0.0785)
Sales growth	0.0010	-0.0093***	0.0014	-0.0129***
	(0.0028)	(0.0014)	(0.0020)	(0.0018)
Return on assets	0.0795	0.0947	-0.0165	0.3188*
	(0.1167)	(0.1104)	(0.0849)	(0.1802)
Stock return	0.0130	0.0301	-0.0172	0.0193
	(0.0308)	(0.0287)	(0.0234)	(0.0383)
Industry concentration	-0.3503**	0.0119	0.1381	-0.0938
	(0.1521)	(0.1189)	(0.1472)	(0.1437)
Cash offer = 1	-0.0110	-0.0316	-0.0379**	-0.0216
	(0.0247)	(0.0196)	(0.0193)	(0.0274)
Tender offer = 1	0.0448*	0.1365***	0.1166***	0.1487***
	(0.0255)	(0.0212)	(0.0142)	(0.0269)
Constant	0.8111***	0.2548*	0.8930***	0.2265
	(0.0115)	(0.1343)	(0.0088)	(0.1650)
Chi^2-statistic overall	136.0***		155.5***	
R^2-statistic pseudo	15.2%		23.7%	
F-statistic overall		13.0***		18.4***
R^2-statistic overall		17.7%		8.2%
Obs	954	954	954	946